

**“In anticipating a car-light or even car-free future, several adaptive reuse strategies have been developed from its onset to allow the building the flexibility to adapt to the anticipated and evolving needs of the community.”**

An architectural rendering of a modern building with a distinctive perforated facade. The building is multi-storied and features a series of large, dark, geometric panels that create a screen-like effect. In the foreground, there is a mobility hub with a bicycle icon and a shopping bag icon. People are walking on the sidewalk, and there are trees and other buildings in the background. The overall scene is set in a city environment with a clear sky.

7.0 /

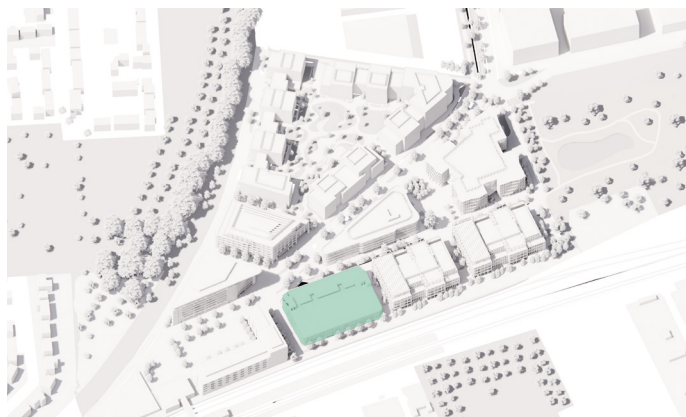
# Detailed Proposal - Mobility Hub ( S5 )

In this section I will set out how the building consolidates the existing surface parking into a sustainable Mobility Hub that optimises use of the land and provides a compact building for existing commuter needs, an active ground floor facing station row, an animated facade when seen from the train and the opportunity to convert the building in the future for more cycle parking spaces or alternative uses such as commercial or other uses that are compatible with the Open Space quanta available.

# 7.1 / Context



**Fig. 126** Site context plan



**Fig. 127** Aerial View of Site Context, S5 highlighted

7.1.1 Located on the Southern end of the Masterplan, the Mobility Hub (S5) is located north of the existing Cambridge North train station and hotel. Situated at the intersection of Milton Avenue and the proposed Station Row, it serves as a gateway to the scheme guiding commuters who arrive at Cambridge North Station towards the lab and office buildings towards the North and linking Station Square to Chesterton square through Station Row.

7.1.2 The Mobility Hub occupies a strategically central location within the masterplan, allowing for a maximising of pedestrianised and cyclist streets and reducing traffic routes running across key open spaces. The Mobility Hub has been designed to meet the existing transport needs and trip budget of the area whilst anticipating a car-free future with an emphasis on adaptive reuse across the lifespan of the building, allowing it to meet the evolving transport needs of its inhabitants.

7.1.3 Sitting on the eastern boundary of the Appeal Site, the building acts as a buffer between the proposed pedestrianised street of station row and the existing train tracks. Although the Mobility Hub sits on the eastern boundary of the Appeal Site, it is fronted by a line of proposed mature trees, an access road to the Mobility Hub and further separated in distance to its surrounding context by the existing train tracks and sound barrier to the west. Existing mature trees and planting are present just west of the tracks as well, further mitigating the potential view impacts of the Mobility Hub from the surrounding travellers site and green belt east of the tracks.

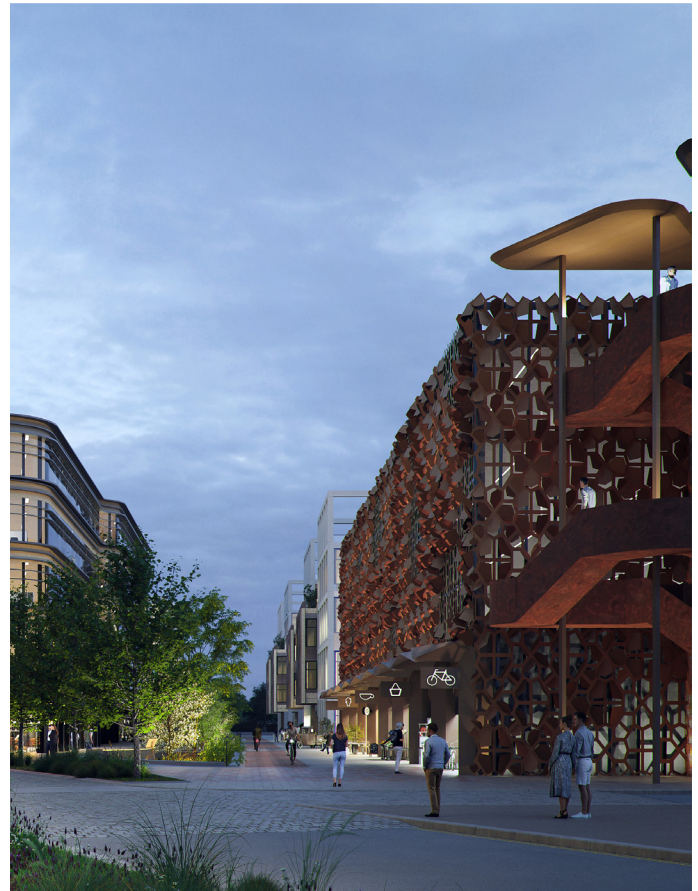
## 7.2 / Brief

- 7.2.1 The brief of the Mobility Hub has evolved following its development and consultation. The primary principles that had been set forth by the client from the conception of the Mobility Hub include:
- Create a landmark building of high quality architecture that will serve as a gateway into the proposed masterplan
  - Consolidate all surface level parking where possible to maximise pedestrian and cyclist streetscapes
  - Incorporate a well-activated ground level to activate Station Row
  - Design for meaningful adaptive reuse in anticipation of a car light future
  - Adopt a sensitive approach to the Eastern edge to minimise long distance view impacts.
  - Maintain a distinctly local identity with its design and materiality

## 7.3 / Compliance with Masterplan Design Principles

In Summary, the design of the Mobility Hub supports the Urban Design principles set forth by the masterplan of UDP 1, UDP 2, UDP 3, UDP 5. and UDP 8 and the Architectural Design Principles ( Commercial ) of ADPC 3 and ADPC 4.

- 7.3.1 Compliance With these Design Principles is achieved through:
- The consolidation of parking into one building reduces the number of surface parking spaces required and minimises traffic throughout the scheme, thus contributing to a more pedestrian and cyclist centric scheme. (UDP 1)
  - Retail spaces provided at ground level on the western facade, activate station row and help build a vibrant and activated public realm (UDP 2)
  - Adaptive reuse strategies allow flexibility for adoption across multiple use cases to meet ever evolving local demand (UDP 3)
  - Provision of ample electric charging stations to encourage the use of more sustainable modes of transport. (UDP 5)
  - Located on an activated street with suitable architectural strategies for security such as glazed lobby doors to ensure security in its design. The lighting strategy has also been carefully developed to deter anti-social behaviour in line with secure by design principles (UDP 8.)
  - Stepping down on its eastern facade, allowing for a significant set back of 32m along the eastern edge (ADPC 3)
  - Utilising a dynamic 3 dimensional facade to enliven long flat elevations.(ADPC 4)



**Fig. 128** View along the Mobility Hub looking North

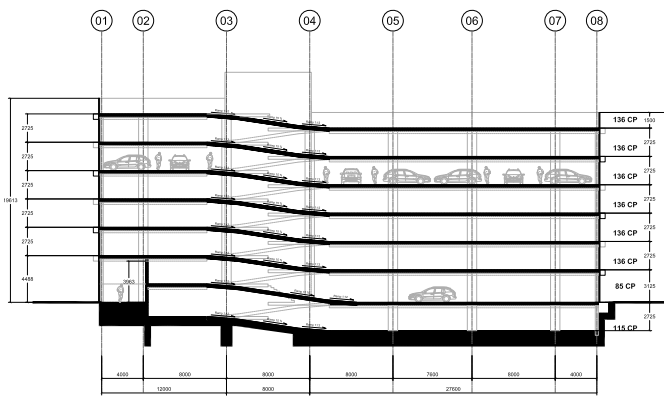
# 7.4 / Response to Consultation



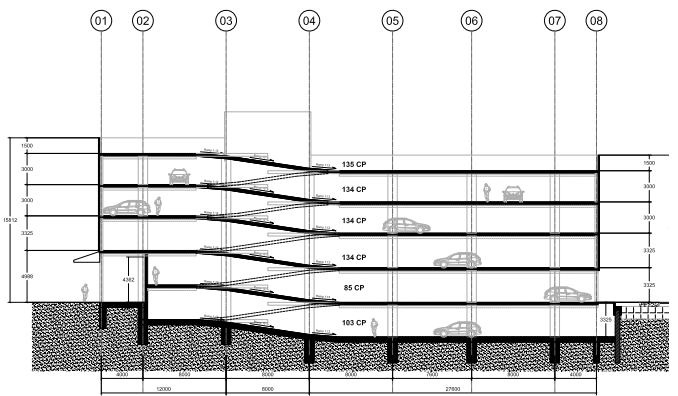
02.11.2021 - 8 Storeys With PV Panels



01.12.2021 - 6 Storeys increased floor to floor height



14.02.2022 - 8 Storeys with Full Basement



28.04.2022 - 6 Storeys increased floor to floor height

**Fig. 129** Sectional Evolution of the Mobility Hub

Throughout the development of the Mobility Hub, a number of key design decisions had been made in response to feedback from consultation with the planners. The overarching evolution of the Mobility Hub in relation to the wider masterplan can be seen in the Design and Access Statement, Pages 83 to 101. In particular, some of the keys changed adopted include:

**7.4.1 Inclusion of Basement**

Following discussion with the planners regarding height and the silhouette of the eastern edge, a full basement level was included to minimise overall height of the building and create a differentiated facade line across the Eastern Edge.

**7.4.2 Height**

Originally 8 storeys tall, the Mobility Hub was ultimately reduced by 2 storeys to 6 storeys inclusive of a full basement level, significantly reducing the overall height of the planned Mobility Hub. This was done to further mitigate the long distance view impacts of the building. For more information on the massing evolution of the Mobility Hub please refer to the Design and Access Statement ( 7.3 Mobility Hub, Page 297). The reduction of Mobility Hub height is only possible

and enabled through the introduction of basements across the commercial quarter of the Appeal Site. This was done in line with feedback.

**7.4.3 Set Back of Building Along Eastern Edge**

The overall building footprint was set back along the eastern edge to allow for adequate space for mature tree planting and create a more pedestrian friendly streetscape in line with feedback from the planners.

**7.4.4 Floor Heights**

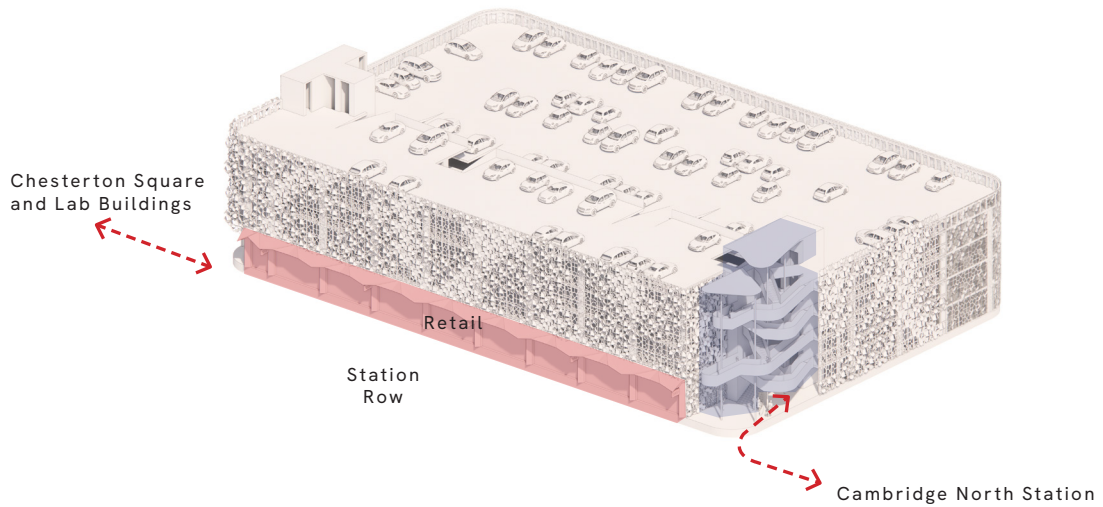
The clear heights of the ground and first floor have been raised from 2.6m to 3m to allow for the adoption of double stack bicycles in anticipation of future adoption of the Mobility Hub for additional bicycle storage.

**7.4.5 Adaptive Reuse**

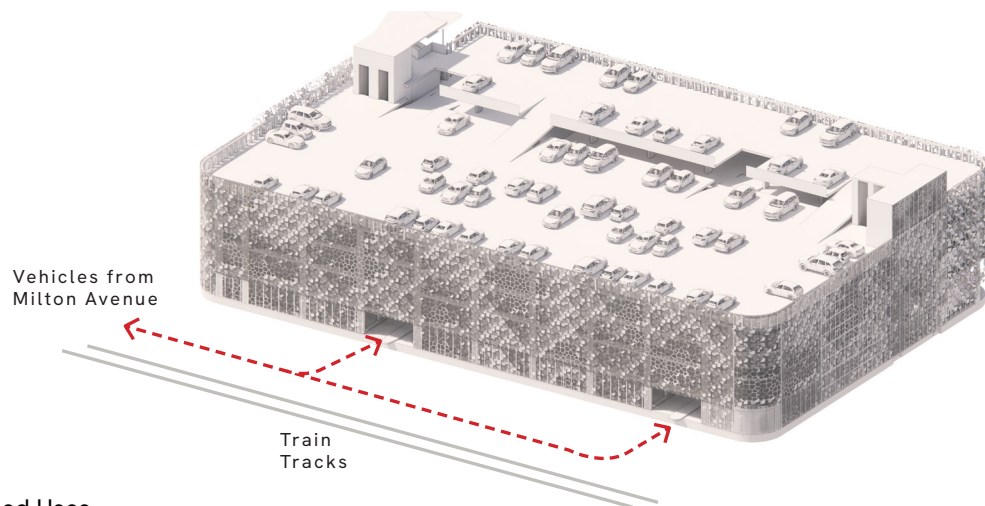
In consideration of the broader life span and re-use of the building, the Mobility Hub has been designed to allow for conversion to multiple use cases. The Mobility Hub has been designed to allow for conversion into cycle storage, residential as well as last mile logistics hub as detailed in the Design and Access Statement (7.3 Mobility Hub, Pages 293 - 295 )

## 7.5 / Uses

### Western Elevation



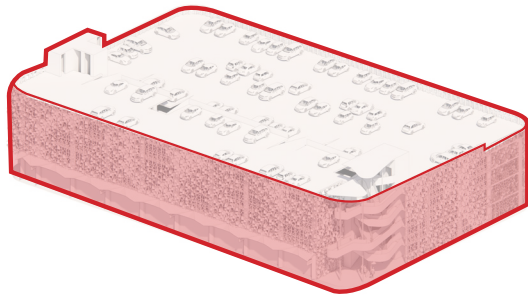
### Eastern Elevation



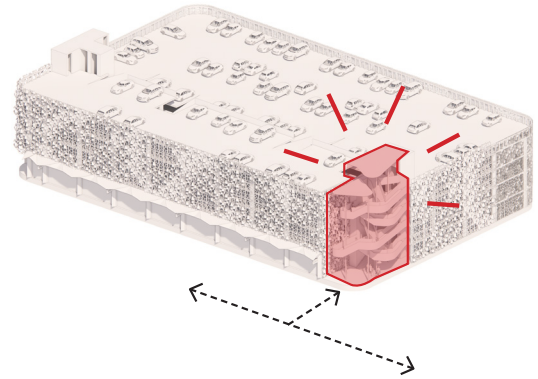
**Fig. 130** Proposed Uses

- 7.5.1 The proposed Mobility Hub will consolidate all existing above ground parking on the Appeal Site into a 5 storey building with an additional full basement level. The Mobility Hub will house a total of 725 parking spaces. With 622 spaces serving network rail commuters across the ground to the fifth floor and the remaining 103 parking spaces allocated for the surrounding commercial developments located in the basement level.
- 7.5.2 A line of retail units line the western facade of the building, facing onto station road and activating the public realm and entry towards Chesterton Square. The retail units are flanked by the pedestrian entrances to the north and south, with a feature stair located to the south, as a landmark for arrivals to the masterplan from Cambridge North station and Station Square.

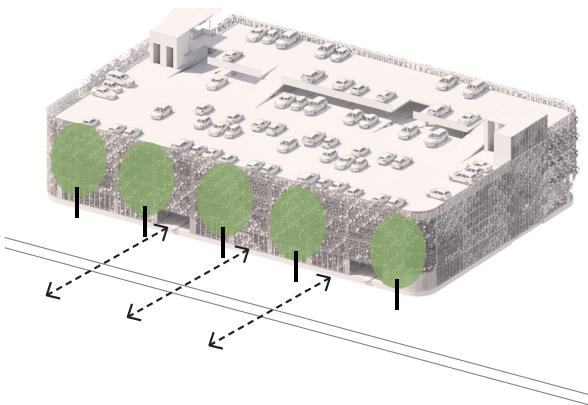
## 7.6 / Built Form



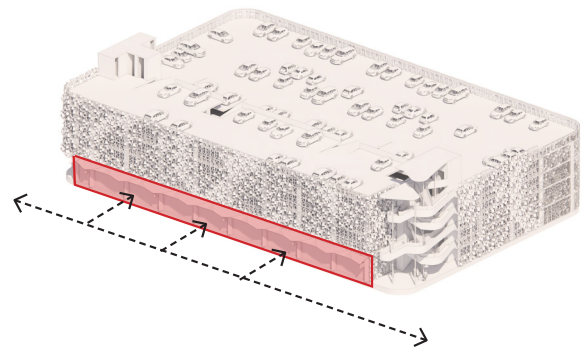
CONSOLIDATE ALL EXISTING ABOVE GROUND PARKING



FEATURE STAIRCASE TO SIGNAL LANDMARK BUILDING



MATURE TREE PLANTING STRATEGY



LINE OF RETAIL ACTIVATING GROUND LEVEL ALONG KEY PEDESTRIAN ROUTES

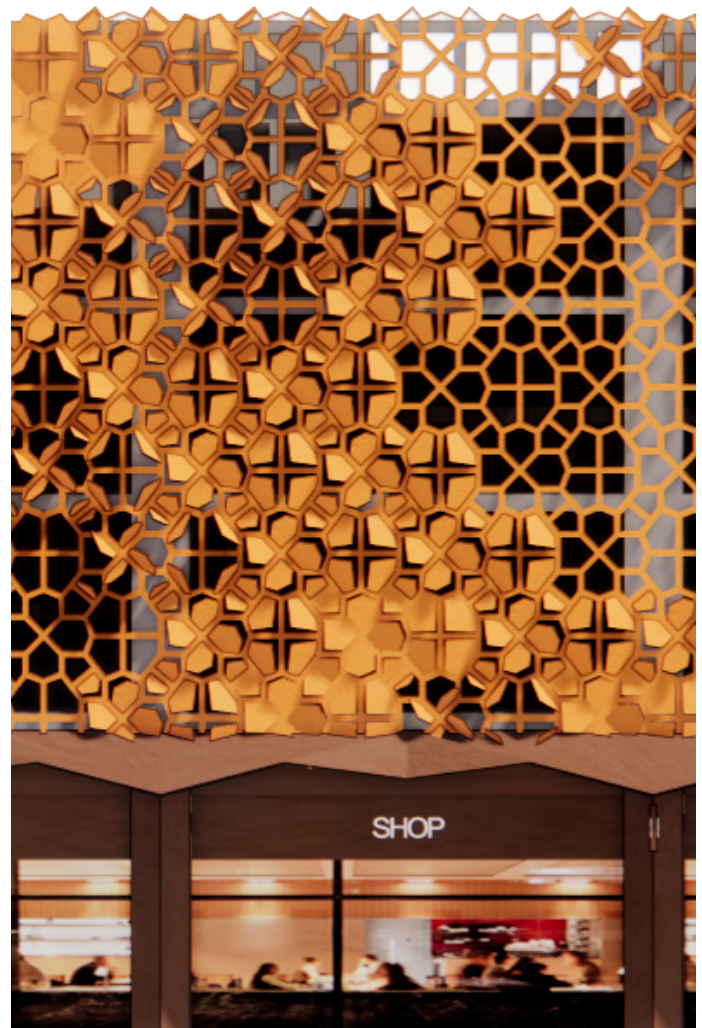
**Fig. 131** Diagram of the evolution of Mobility Hub

- 7.6.1 The Mobility Hub is designed along its western and eastern facades, with both edges responding to specific contextual considerations.
- 7.6.2 The western facade, fronting station row is designed with a pedestrian centric approach, designed primarily with mid distance and pedestrian level views in mind. On its south eastern corner, a feature stair welcomes commuters on approach from the Cambridge North Station. Framed between the feature stair and the North-Western pedestrian entrance to the Mobility Hub is a row of retail spaces designed to activate station row. The stepped structural configuration of the Mobility Hub allows for increased floor to floor heights along the western edge of the building creating attractive retail frontages that face onto the green swale that extends further north down Station Row

- 7.6.3 To create visual interest along the western facade, laser cut and folded metal panels have been used to create a dynamic facade where the bent metal petals play with light and shadows to alter and shift pedestrian perception of the facade across different viewpoints within the scheme. The nature of the metal petals also allows for a play in opacity in mid distance views where a network of sinuous organic forms is revealed. The interplay of pedestrian perceptions at different scales creates a unique experience that anchors the building as a landmark gateway building.
- 7.6.4 The eastern facade is designed with a focus on long distance view impacts and vehicular access routes in mind. The routing of vehicles along Milton Avenue across the southern edge of the building towards the eastern edge of the scheme allows for a complete separation of vehicular and pedestrian/cyclist routes to the west of the building. This creates a civic plaza fronting the western face of the Mobility Hub, and serves as an entrance that highlights the pedestrianised nature of the streetscape along Station Row.



**Fig. 132** Folded Metal Facade Detail



**Fig. 133** Facade pattern as seen from a distance

7.6.5 The eastern facade of the building is clad in a perforated metal facade that mimics the overall visual appearance of the western facade. A perforated facade was intentionally used along this edge to minimise light pollution from the building, this allowed for the apertures of the perforation to be controlled whilst maintaining a coherent visual appearance across the entire building.

7.6.6 For more detailed information on the eastern and western facade, please refer to the Design and Access Statement (7.3 Mobility Hub, Pages 305-326).

7.6.7 The Mobility Hub features a full basement level that has been designed to be largely naturally ventilated. The footprint has been carefully coordinated to ensure sufficient ventilation and also accommodate the necessary root cells to allow for mature tree planting. The ventilation grilles have been designed to be flushed with pedestrian floor finishes and have been located on the northern, eastern and southern elevations to minimise impacts on the pedestrian experience along Station Row. Please refer to DAS (7.3 Mobility Hub, Pages 331&332) for additional information.

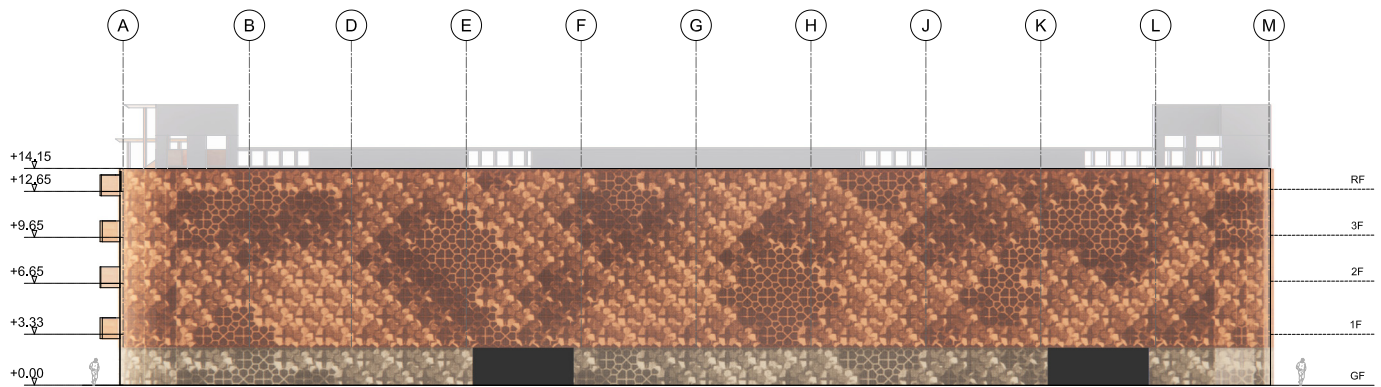


## 7.7 / Height and Scale

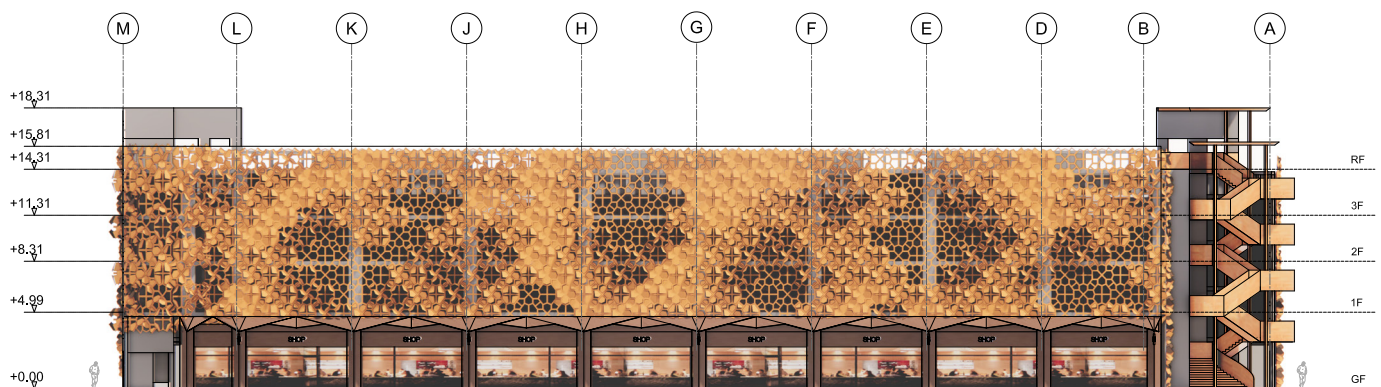


**Fig. 134** Aerial view illustrating the proposed Masterplan

- 7.7.1 Cambridge North Station and Novotel, together with the proposed mobility hub (S5) and two subsequent lab buildings (S6&S7) make up the eastern edge of the Appeal Site ( From South to North ) . It was the intention of the masterplan to create an articulated edge that is varied in elevation to prevent a ‘wall of development’ of equal height from forming along this edge.
- 7.7.2 Although the Mobility Hub and lab buildings are all 5 levels tall, this is significantly mitigated by the floor to floor height requirements, with the Mobility Hub needing only about 3m-3.3m of floor to floor height across the building. This is contrasted to the lab enabled S6 & S7 that each require approximately 4.2m floor to floor and even higher plant level height requirement of 4.5m . This results in a height difference of about 6.2m comparing the highest points of each building.
- 7.7.3 The Mobility Hub also consists of a stepped structure that falls from a height of 15.8m on the western edge ( measured from the top of the parapet ), to a low point of 14.1m on the Eastern edge ( measured from the top of the parapet ). This stepping reduces the visual mass of the building along the eastern edge, further minimising its long distance view impacts.
- 7.7.4 The highest points of the Mobility Hub are a result of lift and stair overruns that step up to a height of 18.3m. These overruns measure 7m and 11m in width respectively out of a total elevational length along the eastern edge of 75m. Additionally, the overruns are set back significantly from the eastern edge of the building by 19.6m at its minimum, thus minimally impacting the long distance views.
- 7.7.5 An additional mitigation strategy for long distance view impacts was the planting strategy for the eastern edge of the building. The footprint of the building was carefully considered to allow for adequate room for root cells that would enable mature tree growth. ( Refer to Robert Myers Proof of Evidence for further information).



**Fig. 135** Eastern elevation



**Fig. 136** Western elevation

7.7.6 Ultimately, the height, positioning, and additional mitigating strategies adopted for the Mobility Hub have resulted in a largely imperceptible building from most key long distance views identified with the planners. The Mobility Hub thus serves as a physical break in the eastern facade line of the masterplan and marks a separation of the existing buildings on site with the proposed lab buildings S6 & S7 to the north.

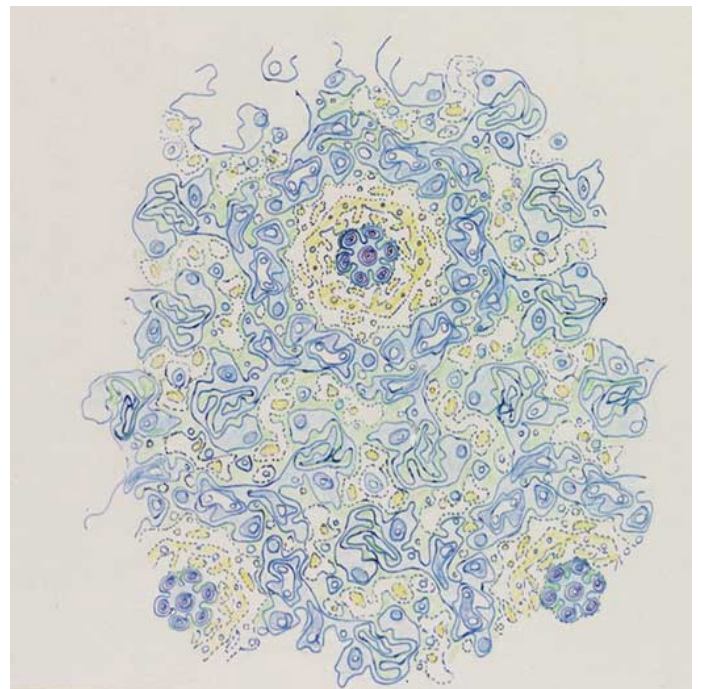
## 7.8 / Identity



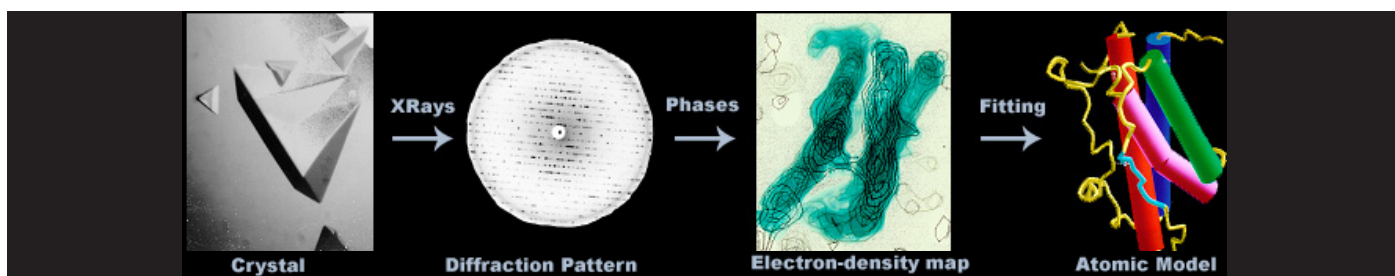
**Fig. 137** Dorothy Hodgkin

7.8.1 In keeping with the vision of the masterplan to create a scheme that is of and from Cambridge, the Mobility Hub's facade has aimed to capture this by referencing the work of famed Cambridge University Alumnus, Dorothy Hodgkin. Dorothy Hodgkin is the only female nobel prize winner in Chemistry, and received the prestigious prize in 1964 for her work in the determination of the atomic structure of a number of complex molecules including penicillin, vitamin B12, and insulin. Her work was instrumental in advancing our understanding of the molecular basis of life and helped pave the way for the development of new drugs and treatments for diseases.

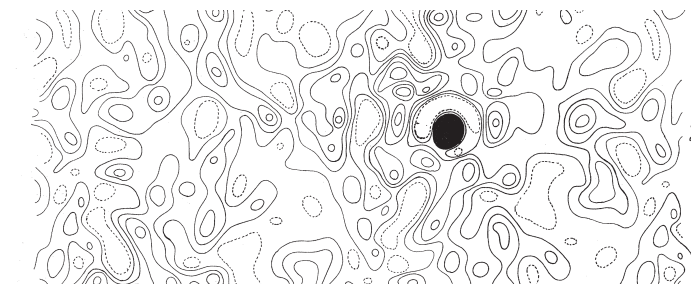
7.8.2 Dorothy Hodgkin was a pioneer that helped revolutionise the field of x-ray crystallography, a powerful technique used to determine the three-dimensional structure of molecules. The technique involved shining X-rays on crystals of the molecule and measuring the pattern of diffracted X-rays that result. This pattern can be then used to determine the positions of the atoms within the molecule and reveal its overall structure.



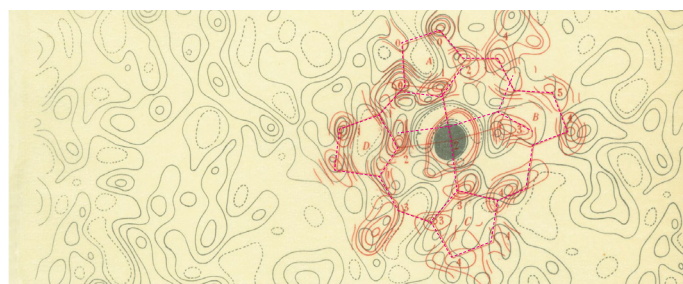
**Fig. 138** Insulin Structure Illustration



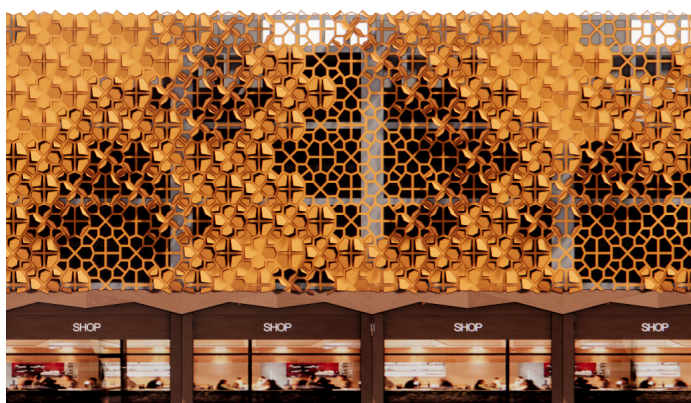
**Fig. 139** Outline of Crystallography Process



**Fig. 140** Electron Density Mapping Diagram



**Fig. 141** Structure Determination



**Fig. 142** Pattern as seen from a distance

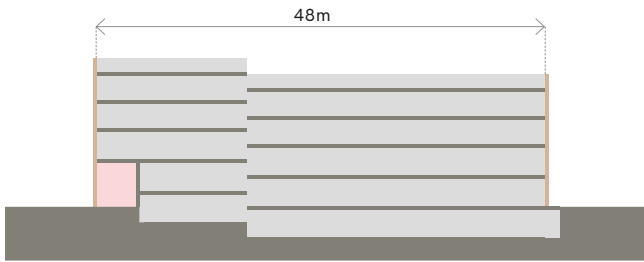


**Fig. 143** Protein Base Structure Pattern Adoption

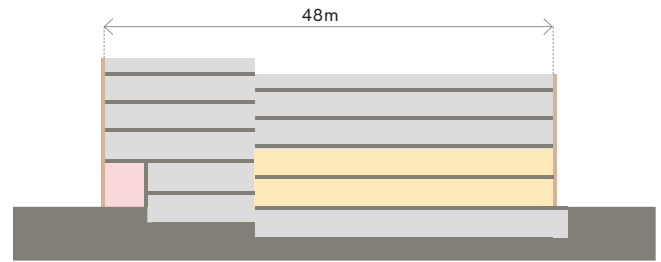
7.8.3 The facade of the building pays homage by using the base structure outline of the vitamin B-12 molecule as the base module of the bent metal petal facades. The facade mirrors the process of crystallography through an interplay in scale. From a distance, the facade conveys the pattern of that of the electron maps used to deduce the B12 molecule, with its organic concentric forms, up close however, one is then able to identify the base module that forms this pattern. This mirrors the process from which the molecular structures of proteins are derived from a much broader pattern created through the electron density mapping down to the final determination and understanding of the molecular structure itself.

7.8.4 For further information, please refer to Design and Access Statement (7.3 Mobility Hub, Pages 306-312).

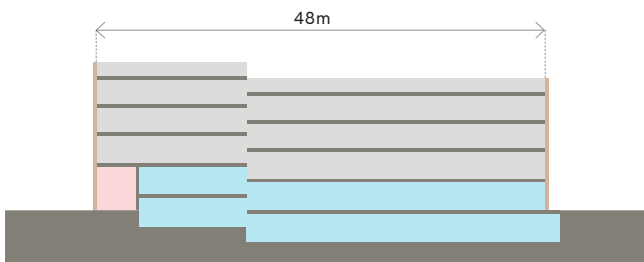
# 7.9 / Resources and Lifespan



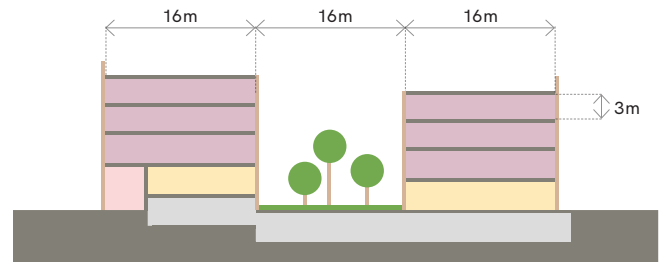
**Fig. 144** Diagram Proposed Mobility Hub Section



**Fig. 145** Diagram illustrating potential Cycle Parking conversion



**Fig. 146** Diagram illustrating potential Logistic Hub conversion



**Fig. 147** Diagram illustrating potential Residential conversion

*Legend:*

- Retail
- Carpark
- Cycle Parking
- Residential
- Logistic Hub

7.9.1 The building has been designed with its long term life span in mind, In anticipating a car-light or even car-free future, several adaptive reuse strategies have been developed from its onset to allow the building the flexibility to adapt to the anticipated and evolving needs of the community..

7.9.2 Floor heights have been carefully considered to allow for a variety of use cases, such as bicycle storage, last mile logistics hubs and even residential use or a combination thereof. The structural grid and spans have additionally been considered to allow for the potential adoption of residential use through the creation of an internal courtyard with the removal of the central spans of the building. These strategies are outlined in greater detail in the Design and Access Statement (7.3 Mobility Hub, Pages 293-295)

7.9.3 The use of concrete, although not preferred from a material sustainability perspective, was ultimately chosen to support these goals of long term adaptive reuse strategy. The structure allowed for larger spans and shallower beam depths to accommodate a wider range of potential functions both in plan and section. It also helped reduce the overall height of the building in comparison to alternative construction methods, a key consideration in light of the Eastern Edge sensitivities raised by the planners.



Fig. 148 Illustrative view along Cowley Road