

“Good design must be at the masterplan’s heart, to ensure that the place is beautiful, and of Cambridge.”



5.0 /
**Masterplan
Design Principles**



Fig. 69 Illustrative Exterior Render of Masterplan

- 5.0.1 The English Garden City movement of the early 20th Century and the car-centred International Movement defined two philosophies that have shaped the context of Cambridge North in the last 70 years. The western side of the context is dominated by development inspired by Garden City ideals, a low density urbanity characterised by individual houses, gardens and private parking. The business parks to the North-West speak of a postwar philosophy of work and car dependency, with isolated low rise office buildings, surrounded by large surface car parks, and very segregated ideas of urbanity, with no mixing of uses.
- 5.0.2 A new masterplan vision is called for at the Appeal Site, less wasteful in its land use, less dependent on individual car usage, and richer in its combination of uses and functions. This represents in many ways a return towards a vision with a more diverse range of scales, higher densities and more complex layering of functions that is characteristic of the historic centre of Cambridge, and other cities from the pre-car age

5.1 / Vision, Aspirations

- 5.1.1 We want North Cambridge to be a new quarter of Cambridge that is healthy, inclusive, walkable and low-carbon with a vibrant mix of science, workplaces, homes, services and social spaces. We aspire for the Appeal Site to become a stepping stone for the wider regeneration of North-East Cambridge, creating a thriving community in the first phase but incorporating the connections indicated in the AAP vision to become part of a much larger community over the course of time. (NECAAP, Nov 2021, Fig.10 Page 31)
- 5.1.2 **Excellence in Science.** There is a clear known demand for Life Science and Laboratory Spaces in Cambridge, and the Appeal Site is the best possible location for employment-led development in Cambridge, due to its great transport links and potential infrastructure. Science is evolving, requiring contemporary buildings that are flexible in use, and designed for collaboration and the exchange of knowledge, which the Appeal Site can deliver.
- 5.1.3 **A great place to stay.** Cambridge is suffering from a shortage of housing, especially in the provision of quality and affordable spaces for young graduates, researchers, nurses and young doctors. Cambridge needs to provide opportunities for a Good Life after graduation, with close proximity between working and living, with open spaces inviting socialising and play, and enough room to start a family. For Cambridge to retain its position in the knowledge economy, it needs to provide significant quantum of new housing, which the Appeal Site can deliver.
- 5.1.4 **A place embracing the future of transport.** While Cambridge has above average cycling rates, it has remained so far a city dominated by individual car use. Cambridge North Station and the Chisholm Trail Bridge provide the Appeal Site with exceptionally good connectivity, enabling this site to truly challenge the amount of parking required. We aspire to provide an exceptionally low number of parking for office and residential use, and to design a Mobility Hub with future reuse in mind.
- 5.1.5 We aspire for the Appeal Site to become **a fitting addition to the visual townscape of Cambridge in the Cam River valley.** The centre of Cambridge has historically established a silhouette of large horizontal structures appearing in the river landscape and the Appeal sits and its wider NECAAP context have the design objective to become a rich visual extension of this townscape. A visually rich townscape in this context is understood to include the careful composition of heights to create a stepping silhouette, the terracing of heights towards high points in the centre of the site, the use of planting at roof level, the integration of roof terraces and the careful screening of technical plant.
- 5.1.6 **Ready for Zero Carbon.** We aspire for the Appeal Site to be setting new standards with the elimination of carbon based heating and cooling, and to design for a future of electric mobility.
- 5.1.7 We aspire for the Appeal Site to become the **centre of a new neighbourhood**, a place that caters to the daily needs of its inhabitants, and a place responding to the needs of the wider community. Good design must be at its heart, to ensure that the place is beautiful, and of Cambridge.
- 5.1.8 **A Transformational Scheme.** We aspire to deliver a scheme that will bring about meaningful and needed change to an existing brownfield site, unlocking the full potential of a site in proximity to a national rail station and enabling the delivery of wider visions for the area



Fig. 70 Excellence in Science



Fig. 71 A great place to stay



Fig. 72 Ready for Zero Carbon

5.2 / Constraints & Site Considerations



Fig. 73 Aerial view of application site and context

- 5.2.1 In order to successfully deliver on its aspirations, the masterplan needs to be mindful of the significant constraints set out below that require careful consideration.
- 5.2.2 The Appeal Site is an existing brownfield site set within a very varied context, ranging from lower buildings of caravans, bungalows to significant sewage works and industrial estate structures. Beyond the immediate context, it is surrounded by the Fen and the floodplains of the River Cam, in an open landscape with long distance views into the distance. The Appeal Site has been earmarked for major regeneration since the 1990s. The use of the Appeal Site will need to be optimised through good design to craft a nuanced approach to the articulation of heights and form, to minimise harm to long-distance townscape vistas and protected heritage assets.
- 5.2.3 Careful modelling has been undertaken to understand the constraints imposed upon the site by Long-Distance views from the context, and to understand where harm may arise, and how it can be mitigated. Visibility cannot always be equated with harm, and it is inevitable that the development of previously vacant brownfield land in a very flat visual landscape will likely be partially visible. How this impact can best be articulated, and how to define the balance between impact and harmful impact have been informed by Townscape assessments from the earliest stages of masterplan thinking. As established in the LVIA Proof of Evidence, prominent new buildings, if well designed, can result in positive landscape and visual effect, and care has been taken in the establishment of design guidelines and principles to create a well designed scheme fit for such purpose. (LVIA PoE, Page 42, Paragraph 124-125)
- 5.2.4 An innovative approach to water management is required, both for supply and discharge. Irrespective of any future developments in the NECAAP area, innovative strategies must be considered to ensure water is available where needed, and that water demand from the Appeal Site is minimised as far as possible. At the same time, the Appeal Site needs to work with the available landscape on site to ensure that Stormwater is managed effectively on site, ensuring the site plays its part in minimising Flood Risk on site and in the wider context.

- 5.2.5 The location of the site in close proximity to the River Cam, and its relationship with the First Public Drain that bisected the site historically before it was diverted by running track works give clear indication of the flood risk on the Site, both from the river and from the low-lying land west of the Site. Careful assessment of flood risk and flooding models have been assessed and mitigation measures reviewed to ensure that site is resilient to flooding, and minimises flood risks in the wider context through proactive passive and active design features.
- 5.2.6 The highway network, in particular Chesterton Road, Milton Road, and its junction with the A14 are frequently suffering from congestion and very high traffic volumes. Working with all stakeholders around the Appeal Site is important to manage present and future traffic and ensure that the scheme works successfully within its allocated trip budget.
- 5.2.7 Given the uncertainty of the timeframe for the relocation of the sewage works, the Appeal Site needs a resilient masterplan that anticipates and enables future development, assuming the sewage works move by 2027, but also allow for alternative long-term scenarios for the next phase in the North of the Appeal Site with retained sewage works.
- 5.2.8 For a detailed assessment of the current and evolving policy considerations and how they have been reflected in the masterplan over time, please refer to the Evidence of Mike Derbyshire.



Fig. 74 Flat nature of the context



Fig. 75 Proximity to River Cam



Fig. 76 A14 Highway looking onto application site

5.3 / Design Principles

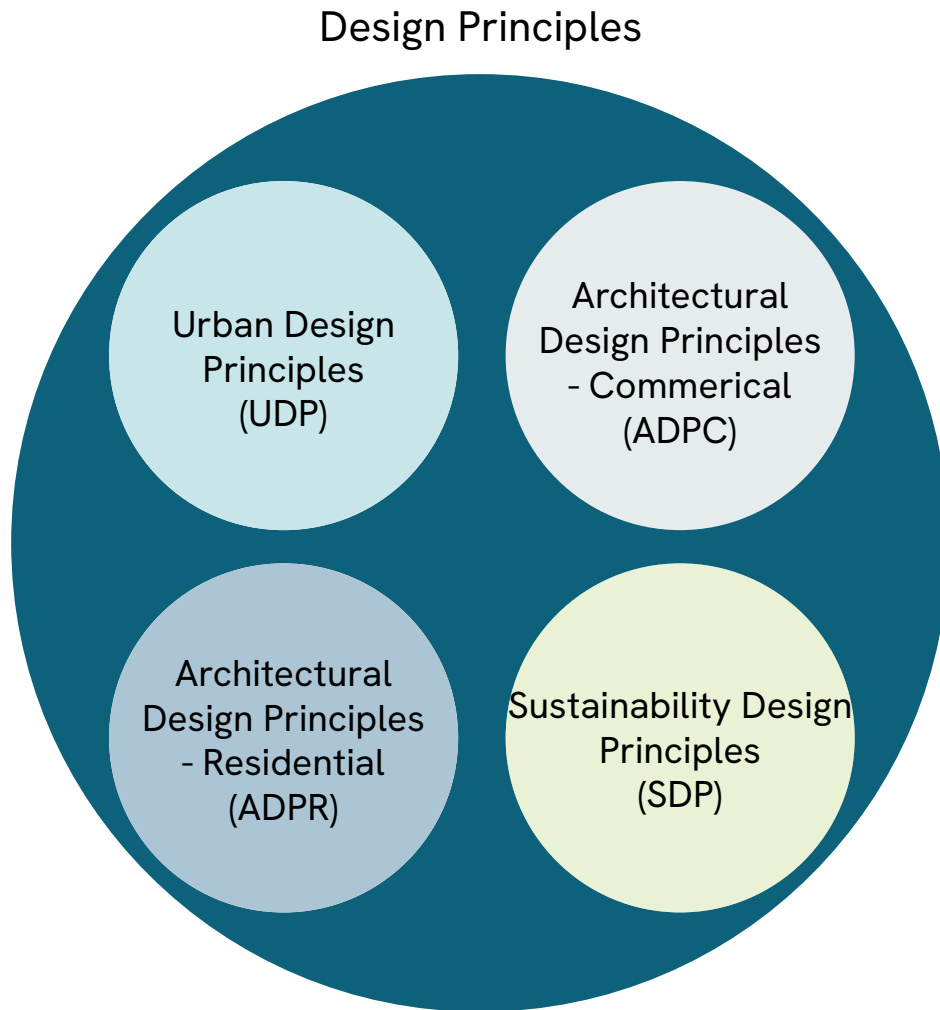


Fig. 77 The four sets of Design Principles

5.3.1 In order to articulate the overarching Design Principles for the Appeal Site, the masterplanning team have defined four sets of Principles, which have been the subject of precedent studies and detailed discussions with the Local Planning Authority prior to agreement. The four sets of principles are:

- Urban Design Principles (UDP)
- Architectural Design Principles - Commercial (ADPC)
- Architectural Design Principles - Residential (ADPR)
- Sustainability Design Principles (SDP)

5.3.2 The following sections 5.4 to 5.7 will outline these sets of principles, as agreed with the Local Planning Authority, and as detailed in the Design and Access Statement, Pages 50 to 71. These agreed principles have been used to inform the masterplan and the design of all individual plots

5.4 / Urban Design Principles

5.4.1 This section sets out the Urban Design Principles that have shaped and informed the masterplan. These principles are intended as overarching design principles that are embedded in all parts of the masterplan and provide guidance across plot boundaries and design disciplines. The Urban Design Principles have been carefully reviewed and are considered to be closely aligned with Local Planning guidance.



UDP 1. Pedestrian and cyclist led

The Masterplan is designed prioritising the needs of pedestrians and cyclists, with the aim to minimising overall car usage and reliance throughout the scheme.



UDP 6. Providing high quality housing for all

The scheme will deliver a mixture of unit sizes and tenures. Variation in unit typology are important to address different needs, with at grade units, at grade duplex units with gardens and a wide range of apartment types.



UDP 2. Vibrant and activated public realm

By providing a range of different types of open spaces and by being strategic in its retail and amenity placement, the Masterplan seeks to create a community with a vibrant and activated public realm, creating a sense of place and community.



UDP 7. Enhancing local biodiversity

Through the introduction of open mosaic habitats as well as robust green roofing strategies, the Masterplan seeks to enhance local biodiversity by achieving biodiversity net gain across the Appeal Site.



UDP 3. Allows flexibility in anticipation of future needs

As the Masterplan is the first of a broader regional regeneration project, it must be designed to meet the needs of its occupants whilst allowing for adequate flexibility in programme and space to anticipate the future needs of the area.



UDP 8. Secure by design

The Masterplan aims to be secure by design, creating a safe and secure environment by ensuring adequate activation and visibility across public realm spaces. A robust cycle parking (CD2.38 & CD2.39) and lighting strategy have been developed enabling the overall scheme to be a safe and secure environment for all its users.



UDP 4. Creating buildings suitable for lab use

The scheme will bring about a number of commercial buildings specifically designed to cater for the growing biomedical science industries within Cambridge.



UDP 9. Balanced mixed use scheme

The Masterplan will generate a balanced mixed use scheme, building a thriving community by offering the right mix of offices, commercial, residential and open spaces.



UDP 5. Ambitious sustainability targets

The Masterplan strives to reach ambitious sustainability targets by integrating sustainable practices into its design and construction from day one, reducing overall energy usage within the scheme and the carbon footprint of the project. In addition, the scheme will also aim to contribute to local biodiversity through its open space and roofing strategies.

Fig. 78 Reference images for Urban Design Principles

5.5 / Architectural Design Principles (Commercial)

5.5.1 The Local Planning Authority Policy Guidance is clear that development of the Appeal Site should be employment led. The Architectural Design guidelines for Commercial buildings are thus the most important part of the Architectural Guidelines. Cambridge North has been identified by the Local Planning Authority as the preferred site for future science and research buildings, for which there is a known demand in Cambridge. These types of buildings differ from other commercial buildings through their emphasis on higher ceiling heights for technical services, and generally large regular floorplates for the layout of efficient laboratories. These types of buildings often have to adapt quickly to new funding/ research and technical requirements, therefore placing more emphasis on regular column layouts and efficient cores to allow spaces to be reconfigured quickly. These types of requirements can result in buildings that may appear large and bulky, which would be considered harmful in the context of the Appeal Site and its setting in the townscape. The architectural guidelines have been specifically written to address this concern, and to mitigate harm that would result from buildings that appear overbearing from street level or long distance views.

5.5.2 The section below sets out the Architectural Design Principles that have shaped and informed the commercial elements of the masterplan. The Architectural Design Principles reflect Local Planning guidance.



ADPC 1. Plan Stepping to break down massing and avoid long monotonous facades

Steps along extended, flat building faces will break down the massing and avoid long monotonous facades.



ADPC 2. Terracing to introduce gardens and balconies for greenery along roof line

Stepping at roof level to initiate gardens and balconies for greenery along the roof line and the introduction of articulation introduces articulation to the massing.



ADPC 3. Variable stepping across different edges to maximise impact

Varying articulation across different edges minimises visual impact at street level and from long distance views.



ADPC 4. Facade articulation through stepping, kinking and three-dimensionality

Buildings with potentially long, flat elevations are intrinsically boring and overbearing. Various approaches can be used to create interest and break down the uniformity.



ADPC 5. Neutral Palettes

The architects are working with neutral colour palettes to sensibly integrate the new commercial buildings into their context and to correlate with historic and contemporary Cambridge precedents.



ADPC 6. Coloured frit glazing at recesses

All commercial buildings play an important role in the ground floor activation of the wider Masterplan and therefore need to be treated adequately. Ground floor activation also contributes to a more fluid work-life balance.



ADPC 7. Activation at ground level

Class E/F uses are to be allocated strategically on ground level to allow flexibility within the scheme to adapt to the needs of the community as the rest of the draft NEC AAP is developed.



ADPC 8. Outdoor terrace space for offices

Every office should aspire to have access to its own outdoor area. There shall be at least one shared semi-public outdoor area in each office building.



ADPC 9. Eastern Edge Articulation - Fingers

The eastern edge of the Appeal Site sits adjacent to existing train tracks, a low lying residential neighbourhood and the green belt to the east. Given the low lying context along this edge, particular care was taken with the application of design principles here to ensure the visual mitigation impacts were maximised.

5.5.3 Multiple view studies were conducted to test the adoption of the architectural design principles along these blocks. Depth, height and width of divisions across the blocks were identified parameters, tested to finetune and adopt a clear massing strategy along this edge. The 'fingers' concept stipulated the division of each block in quarters, stepped in minimum increments of 3m along the eastern edge in plan and further articulate in elevation with further setbacks at the roof level of minimum 5m along the eastern edge to further articulate and break down the massing.

Fig. 79 Reference images for Commercial Design Principles

5.6 / Architectural Design Principles (Residential)

5.6.1 Given the scale of the housing need in Cambridge, and the outstanding level of transport connectivity of the site, the Appeal Site should seek to deliver a significant quantum of housing alongside employment. In order to ensure that the housing proposed on the Appeal Site is of the highest possible quality, Design Principles have been defined to ensure break down the scale of the urban blocks to maximise double aspect units, and

prevent building from appearing scaleless or overbearing when seen in the streetscape or in long-distance townscape views.

5.6.2 The section below sets out the Architectural Design Principles that have shaped and informed the residential elements of the masterplan. The Architectural Design Principles reflect Local Planning guidance.



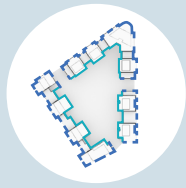
ADPR 1. Stepping in massing breaking down long facades

Stepping shall be introduced to the building massing in order to break down long & flat facades. This will help give a more human scale to the development by creating the impression of multiple smaller buildings.



ADPR 6. Integrated private balconies along street

Balconies facing onto public streets will be recessed and integrated within facade lines, providing open space for the residents whilst maintaining some privacy and reducing visual noise of the facades along the main streetscapes.



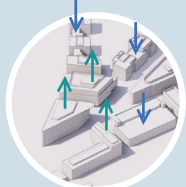
ADPR 2. Stepping in plan introducing more double aspect units

In order to create more double aspect units within the buildings, stepping of the facades shall be introduced. The depth and length of steps may vary between the different blocks depending on its use and location.



ADPR 7. Expressed balconies facing courtyard

Balconies facing the internal courtyard of the residential quarter will be expressed to create a dynamic activated frontage along the edges of the courtyard. This creates a sense of immersion as part of the lush open green space and also helps create a sense of activity and community.



ADPR 3. Designated high points within the masterplan

The heights of the buildings shall be carefully coordinated aiming to create a dynamic composition with higher points at the southern Station end and in the north near Cowley Circus. These points have been carefully assessed from both long and short distance views.



ADPR 8. Integrating planters to every balcony

In line with the objectives of creating sustainable green spaces across the Appeal Site, planters will be integrated into every balcony, bringing additional amenity to all residents and creating green breaks across all facades of the residential quarter



ADPR 4. Articulated heights within a building block

The individual residential building blocks are articulated through stepping, aiming to achieve a more dynamic overall appearance whilst accommodating for terraces, gardens and areas for planting. These have been assessed from street level as well as long distance views.



ADPR 9. Variation of balconies through materiality and arrangement

To avoid repetition and create dynamic and active frontages, the arrangement of balconies should avoid linear stacks along facades. Further articulation through variation in materials and arrangement where possible should be used to create greater visual interest.



ADPR 5. Distinct street and courtyard facades

To create dynamic character zones, the enclosed courtyard facades will be distinct in its architectural treatment from the exterior facades fronting the streetscapes around it. This allows the residential quarter to blend architecturally into the curated streetscapes of the masterplan whilst maintaining an identifiable sense of transition on entering the more private residential courtyard. (Design and Access Statement, Page 60-61)

Fig. 80 Reference images for Residential Design Principles

5.7 Sustainability Design Principles

5.7.1 Sustainability needs to be embedded at all scales of the masterplan to deliver a new City Quarter of Cambridge that moves closer to Zero Carbon in use. Sustainability includes water management encompassing drinking water, rain water and flooding, to minimise water usage, and to provide passive water management on site that allows water to stay on site and be reused as much as possible. Sustainability includes passive design measures that optimise the use of simple, user operated means to control comfort, to reduce our reliance on high tech elements with short life-spans. Sustainability includes new approaches to landscaping, to increase biodiversity, natural shading and happiness by providing the experience of a haptic and sensory natural landscape across scales.

5.7.2 In order to ensure the development is sustainable and of its place, the design guidelines have been devised addressing building material, energy strategy and integration of planting into build form. These guidelines will ensure that the buildings and the masterplan as a whole will be Zero carbon in use, and made from materials with low embodied carbon wherever possible, to ensure the development feels 'of its place' and not just meets but exceeds policy requirements.

5.7.3 The section below sets out the Sustainability Design Principles that have shaped and informed the masterplan. The Sustainability Design Principles reflect Local Planning guidance




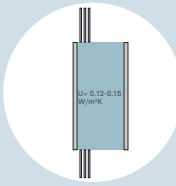

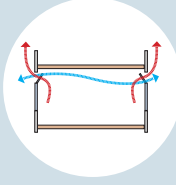

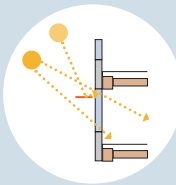
 <p>SDP 1. Sustainable urban drainage systems (SUDs) Various SUDs strategies will be adopted across the Appeal Site. A swale will be introduced along station row to serve as a key SUDs feature and ecological asset. Rain gardens and swales to be distributed across the site to slow and store run off, with careful plant species selection for tolerance to wet and dry conditions.</p>	 <p>SDP 5. Opacity within the facade All facades of the office buildings should have a maximum of 50% glazed area. This will help to reduce the environmental impact, heat transfer and over-heating.</p>
 <p>SDP 2. Enhancing biodiversity Biodiversity is enhanced through supporting the development of Open Mosaic Habitats(OMH) across the Appeal Site. Biodiversity of existing OMH is to be expanded within pockets of the residential quarter, roofscapes are to be utilised to create biodiverse green/brown roofs and a central ecological park will be created retaining and enhancing OMH.</p>	 <p>SDP 6. Achieving lowest possible heat transfer Office buildings should aim to achieve the lowest possible heat transfer through the build up in order to reduce the environmental impact and cost of operating the building.</p>
 <p>SDP 3. Sustainable Construction Sustainable materials and methods of constructions such as timber and hybrid (steel and timber) structural solutions should be adopted where possible.</p>	 <p>SDP 7. Natural Ventilation Office buildings should create naturally ventilated spaces in order to increase the comfort of the users as well as to reduce the environmental impact and operational costs.</p>
 <p>SDP 4. Use of locally sourced materials Material choice should prioritise the use of locally sourced materials to reduce carbon footprint and reduce overall carbon footprint.</p>	 <p>SDP 8. Solar gain control Passive design elements should be used and appropriately located in all office buildings in order to avoid internal over-heating.</p>

Fig. 81 Reference images & diagrams for Sustainability Design Principles

5.8 / Accessibility



Fig. 82 Designed for inclusivity

- 5.8.1 The proposed development is designed to be as inclusive as possible so that it can be comfortably and independently used by residents, people working in and visiting the development, and the wider community.
- 5.8.2 The Development has the potential to meet the guidance of Approved Document M, Volumes 1 and 2, and the access and inclusive design policies of the South Cambridgeshire policies as a minimum.

Designing Inclusively is defined by The Commission for Architecture and the Built Environment (CABE) as:

- Placing people at the heart of the design process;
- Acknowledging diversity and difference;
- Offering choice where a single design solution cannot accommodate all users;
- Providing for flexibility in use; and
- Providing buildings and environments that are convenient and enjoyable to use for everyone.

For further information please refer the Planning and Access Statement (CD1.74 a-g)

- 5.8.3 In conclusion, the Masterplan Design Principles as defined above and in the Application have emerged from a long series of planning and design workshops. Both the Appellant's masterplanning design team and the Local Authorities NEC AAP team have prepared extensive studies of precedents and comparison studies to illustrate how successful masterplanning and place making can look like. The Design Principles seek to distil the learnings from this research into a set of parameters that define key qualities while allowing for future change and evolution.
- 5.8.4 Cambridge has grown significantly over the last few decades, and will continue to grow and evolve. It is impossible to anticipate exactly how it will evolve in the future. But while every masterplans reflects a moment in time, good masterplans seek to anticipate a number of futures, and build the right level of flexibility into their schemes. The Masterplan Design Principles are intended as a robust set of parameters that enshrine important qualities, while allowing for emerging detailed designs to adapt, as the context of the Appeal Site begins to materialise.