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Atlas Business Park

Aviva Investors

Sustainability Statement
Planning Stage



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Introduction

This report sets out the Sustainability Statement for the new development at Atlas Business Park, Manchester

The proposed site consists of 5no. B2 B8 Industrial units totalling approximately 411,300 sq. ft and associated offices, service yards, car parking, access, and landscaping.

This report considers Energy and Sustainability with a view to verifying initiatives that have been considered

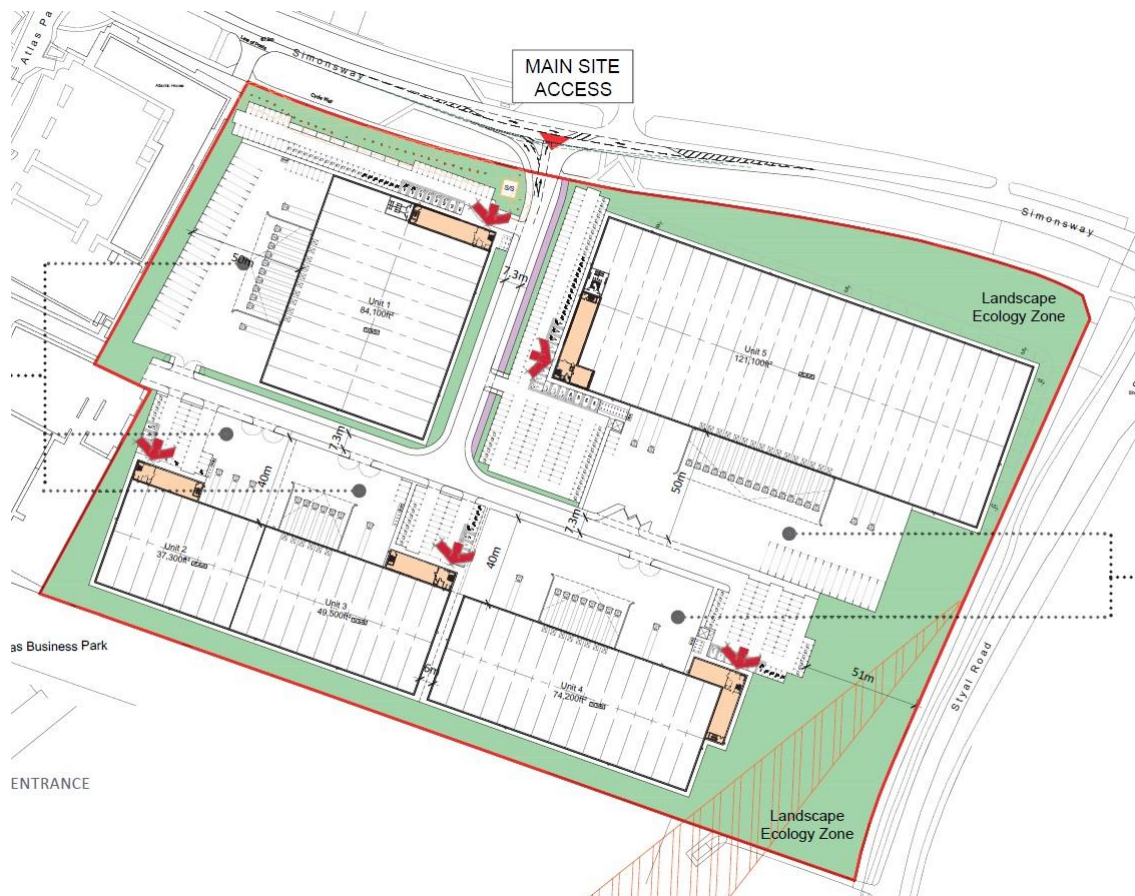


Figure 1 – Site Masterplan

Local Planning Policy

Manchester Core Strategy 2012 to 2027

This report covers in detail the following Rugby Local Plan (2011-2031) Policies that are applicable to this development, under the overall theme of sustainable development.

Policy SDC1: Sustainable Design

All development will demonstrate high quality, inclusive and sustainable design and new development will only be supported where the proposals are of a scale, density and design that responds to the character of the areas in which they are situated. All developments should aim to add to the overall quality of the areas in which they are situated.

Policy SDC4: Sustainable Buildings

Non-residential buildings

All non-residential development over 1000 sqm should aim to achieve as a minimum BREEAM standard 'very good' (or any future national equivalent) unless it can be demonstrated that it is financially unviable.

In meeting the carbon reduction targets set out in the Building Regulations and BREEAM standards the Council will expect development to be designed in accordance with the following energy hierarchy:

- Reduce energy demand through energy efficiency measures; then
- Supply energy through efficient means (i.e., low carbon technologies); then
- Utilise renewable energy generation.

Actual provision will be determined through negotiation, taking account of individual site characteristics and issues relating to the viability of development.

The re-use and recycling of surface water and domestic wastewater within new development will be encouraged.

Policy SDC8: Supporting the Provision of Renewable Energy and Low Carbon Technology

Proposals for new low carbon and renewable energy technologies (including associated infrastructure) will be supported in principle subject to all of the following criteria being demonstrated:

- The proposal has been designed, in terms of its location and scale, to minimise any adverse impacts on adjacent land uses and local residential amenity.
- The proposal has been designed to minimise adverse impacts (including any cumulative impacts) on the natural environment in terms of landscape, and ecology and visual impact.
- There is no unacceptable impact on heritage assets and their setting.
- The scheme maximises appropriate opportunities to address the energy needs of neighbouring uses (for example linking to existing or emerging District Heating Systems).
- For biomass, it must be demonstrated that fuel can be obtained from a sustainable source and the need for transportation will be minimised.

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- For proposals for hydropower the application must be supported by a Flood Risk Assessment and Water Framework Directive assessment.
 - For wind turbines, the proposed development site is identified as suitable for wind energy development in a Local or Neighbourhood Plan.
 - For solar farms proposed on the best and most versatile agricultural land a sequential test has to be undertaken as outlined in the supporting text to this policy. Where it is proven that the use of the best and most versatile agricultural land is necessary, conditions may be applied to an approval to require the land to be restored to its previous greenfield use when the operation ceases; and
 - Following consultation, it can be demonstrated that the planning impacts identified by affected local communities have been fully addressed and therefore the proposal has their backing.

Minimising Energy Consumption

Energy use for the development has been minimised via design in accordance with the Energy Hierarchy, improving the efficiency of the fabric and passive servicing methods before the application of energy reducing and then low carbon technologies. The following sets out the strategy for the proposed development to reduce carbon emissions on site.

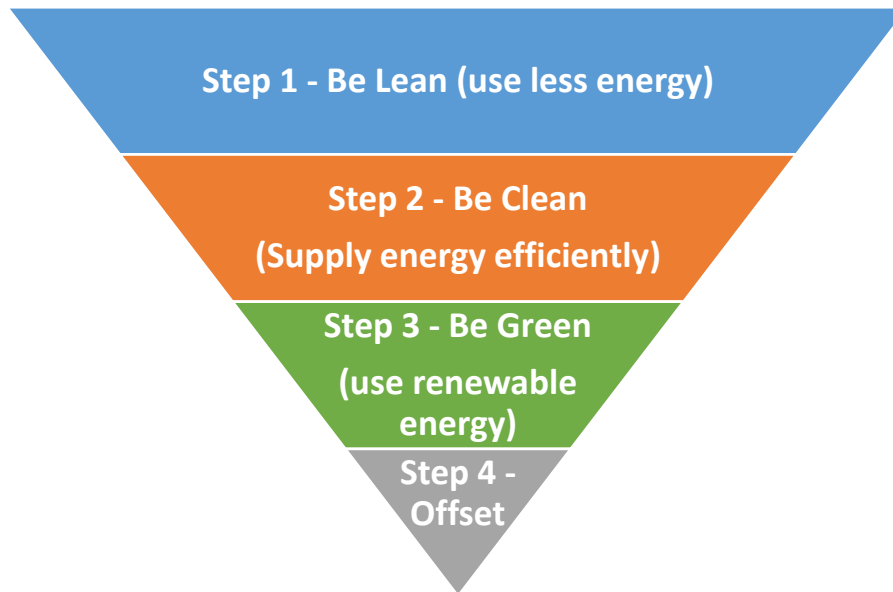


Figure 2 – Energy Hierarchy

Factors such as the building massing, layout, orientation, fabric design, daylighting provision, ventilation strategies and thermal mass will significantly affect the heat gains and losses in a building.

Air-conditioning is a high energy user and can conflict with more biophilic approaches to health and wellbeing. It should be avoided or minimised where possible, as its adoption will typically increase operational energy costs by around 50% to the running costs of the building.

A Passive Design analysis will be carried out on the proposed development's design to identify opportunities for the implementation of passive design measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption.

Lower than limited U values and air permeability ensure minimal heat losses from the building in the winter, whilst solar shading reduces the need for comfort cooling in the summer, meaning lower demand on heating and cooling systems throughout the year, thus reducing the overall energy consumption.

In summary, the recommendation for this development, as the most technically and economically viable option, is as follows:

- Passive design measures in the form of improved U-values, solar controlled glazing and reduced air
- permeability have been applied to reduce the base energy demand of the building

- Rooflights to 12% of warehouse floor area to enhance natural light, reducing the need for artificial light.
- Energy efficiency measures in the form of low energy fans, high efficiency LED lighting, etc. have been
- applied to reduce the energy consumption of the building
- Air source heat pumps supplying the office heating & cooling
- The building roofs are to be designed with a structural integrity capable of mounting PV to offset the

proposed developments operational carbon. U-values for thermal elements such as external walls, windows, the roof, and the ground floor will be equal to, or improve on, the requirements of building regulations, as will air-tightness values. This ensures a controlled internal environment in terms of heat loss to the exterior. Details will also be reviewed to ensure that thermal bridging is avoided, with a focus on continuity of insulation.

The units will be fitted-out by tenants – a strategy envisaged to include either natural ventilation via adjustable vents, or an efficient mechanical ventilation system, potentially incorporating heat recovery units.

The fit-out works will be carried out by tenants in future, with the strategy yet to be confirmed.

Energy use will be further reduced via the use of low energy lighting, featuring dedicated energy efficient fittings and controls to occupied spaces, designed to the latest CIBSE standards, and automatic lighting control layouts and systems to circulation spaces. External lighting will employ a variety of control methods including presence and daylight control, while also benefitting from energy efficient luminaires. The lift specified will incorporate energy efficient features such as LED lighting and a stand-by mode.

All systems to commercial areas will be subject to a BREEAM compliant commissioning and seasonal commissioning process, utilising CIBSE and BSRIA guidelines to ensure that systems and controls are appropriately balanced for all seasonal variations and levels of occupancy.

To aid the occupants in monitoring energy use, metering will be provided for electricity, separated such that heating can be monitored apart from lighting and small power uses.

As the development is designed to be electric only, the scheme is well equipped to be carbon neutral in line with the government's target of net zero by 2050.

A Minimum of EPC A rating is targeted for the development. Please refer to Part L2A Compliance report Section 4.2 BRUKL Output document and Section 4.3 Energy Performance Certificate for details of calculations carried out to date.

It is worthy of note that a large impact on end energy efficiency will be defined by the fit-out of the unit, which will be carried out by the future tenant. The strategy envisaged may include either natural ventilation via adjustable vents, or an efficient mechanical ventilation system, potentially incorporating heat recovery units, however, this cannot be confirmed at this stage.

Maximising the Provision of On-Site Renewable Energy Supply

Renewable energy on site will potentially be provided via a yet to be confirmed area of photovoltaic cells to flat roof areas. This will provide low carbon electricity to service the development. Depending on the choice of tenants during fit-out works, heat may be provided to office areas by low-carbon Air-Source Heat Pumps. The exact mix of PV to be provided will be confirmed as the servicing strategy develops.



Figure 3 – ASHP and PV panels

The carbon emission results when implementing the improved U values, improved air permeability Photovoltaic panels and ASHP the following reductions could be achieved

		Emission Rate (kgCO ₂ /m ²)	Total Regulated CO ₂ Emissions (tCO ₂ /annum)	CO ₂ Savings (tCO ₂ /annum)	Percentage Improvements [%] <i>compared to baseline</i>
Unit 1	Baseline	20.4	168.28	-	
	Be Lean	12.6	103.94	64.34	38%
	Be Clean	12.6	103.94	64.34	38%
	Be Green	11.8	97.34	70.94	42%
Unit 2	Baseline	21.4	75.83	-	
	Be Lean	12.8	45.36	30.47	40%
	Be Clean	12.8	45.36	30.47	40%
	Be Green	12.2	43.23	32.60	43%
Unit 3	Baseline	20.8	96.81	-	
	Be Lean	12.2	56.78	40.03	41%
	Be Clean	12.2	56.78	40.03	41%

	Be Green	11.7	54.46	42.35	44%
Unit 4	Baseline	20.6	143.07	-	
	Be Lean	12.6	87.51	55.56	39%
	Be Clean	12.6	87.51	55.56	39%
	Be Green	11.9	82.65	60.42	42%

These figures are indicative at this stage, being based on detailed design without specific technical information, and so must be reviewed and recalculated as the technical design progresses.

Zero Carbon Roadmap

The purpose of a Net Zero Carbon Assessment is to develop a pathway to a Net Zero Carbon footprint. 'Net Zero Carbon' is the achievement of effectively delivering zero emissions from the development, through residual reduction of carbon and then offsetting of the remaining carbon emissions.

The UK Green Building Council (UKGBC) have developed a framework definition for Net Zero Carbon buildings, which sets out the process for demonstrating that a development has achieved Net Zero Carbon status (ref: Net Zero Carbon Buildings: A Framework Definition, 2019).

The UKGBC route applies the principles of the RICS methodology for whole life carbon (Ref: Whole life carbon assessment for the built environment 1st edition, November 2017). At this stage of the framework's development, the emphasis is on two different definitions for Net Zero Carbon buildings –

- o - Net Zero Carbon - construction (for new buildings and major renovations)
- o - Net Zero Carbon – operational energy (for all buildings in operation)

The UKGBC Framework instils principles that aim to improve transparency, to create robust requirements and encourage action.

Carbon

Anthropogenic global warming is caused by an increase of greenhouse gasses (GHG) in the earth's atmosphere. These gasses reflect some of the heat radiated from the earth's surface that would normally escape into space, back to the surface of the earth. Over time this warms the earth. Common GHGs include CO₂, N₂O, CH₄ and volatile organic compounds (VOCs). Global Warming Potential (GWP) is expressed in equivalent GHGs released - kgCO₂e.

The standard measurement of embodied carbon impacts following EN15978 is GWP - Global warming potential measured in kgCO₂e

UKGBC Net Zero Carbon Process

The process of declaring a development as Net Zero Carbon using the UKGBC framework involves the following –

- Quantification of the total carbon emissions associated with the specific development. This modelling should be carried out once prior to commencement of Technical Design (RIBA Stage 4) and again at practical completion (RIBA Stage 5) – this first set of modelling should be revised at Stage 4/5 and updated again at Stage 6 with actual quantities from the construction team.
- Where 1.1 Net Zero Carbon - construction only is sought, evidence is also required to demonstrate how the development has been designed to reduce energy demand and consumption and increase on-site renewable energy (to facilitate the future achievement of 1.2 Net Zero Carbon – operational energy).
- Purchase of carbon offsets to compensate for the carbon emissions associated with the practical completion modelling (UKGBC recommend existing frameworks, or others could be used providing they meet the same level of rigour – further information on the frameworks is included below).
- Public disclosure of the 'minimum level of reporting' required by UKGBC (appendices in the UKGBC definition document provide a template to ensure the minimum information is covered).

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- The publicly reported information should be subjected to third-party auditing, to ensure that the information is transparent and proportionate.

The carbon offsetting frameworks suggested by UKGBC are the United Nations Clean Development Mechanism (CDM) (<http://cdm.unfccc.int/>) and Gold Standard (<https://www.goldstandard.org/>). Both frameworks facilitate the purchase of carbon credits (known as verified emission reductions, or VER's under the CDM). These credits support development projects e.g., the installation of photovoltaic arrays, reforestation efforts or improvement of cook stoves which all lead to a reduction in carbon emissions (amongst other benefits). The price associated with each tonne of carbon varies between the different projects, and the quantity of credits available to purchase on a project-by-project basis also varies.

Both frameworks are global schemes, with most projects located in developing countries. UKGBC are currently developing further guidance on offsetting frameworks, and some flexibility exists in providing offsets via local projects (possibly even local authority schemes). Any deviation from the recommended frameworks would need to demonstrate credibility, with the benefits made clear and delivery of the projects assured.

The other route to offsetting carbon emissions is to ensure the installation of on-site renewable energy generation (e.g. photovoltaics). Any on-site energy generation must first be used to offset the anticipated operational energy use of the development, with any leftover energy then able to be used for the emissions associated with the construction impacts. This would require full modelling of the operational energy of the development, even if only definition 1.1 is sought.

BREEAM

The proposed development has undergone a pre-assessment based on the BREEAM 2018 – New Construction – Industrial [Shell-and-Core] criteria. With, a commitment made by the developer to achieve a BREEAM Rating of 'Excellent,

Highlights of the proposed strategy include:

- Best-practice construction stage site management practices and procedures including resource and transport monitoring, environmental protection and Considerate Construction.
- A thorough commissioning, seasonal commissioning and handover process to promote the efficient and correct use of building services and systems.
- Best-practice thermal, lighting, acoustic and ventilation design methods to promote optimal occupant comfort and productivity.
- Safe and inclusive site design.
- Energy modelling for both regulated and unregulated uses.
- Passive design, energy efficiency measures and LZC technology as previously described.
- Travel Planning.
- Water efficient sanitary ware, along with monitoring, leak detection & prevention systems.
- Life Cycle Materials Assessment.
- Responsible materials sourcing.
- Design studies into robustness and resilience, waste minimisation, functional adaptability and adaptation to climate change.
- Strict waste production and recycling targets in construction.
- Provision of dedicated recyclable waste facilities.
- Ecological enhancements to the site.
- Measures to minimise local air pollution, and the potential for leakages from refrigerant containing systems.
- Management of rainwater run-off.
- Measures to protect against watercourse, light and noise pollution in operation.

Thermal Comfort

As the scheme progresses through the technical a thermal comfort analysis will be undertaken.

The development will be designed with reference to a CIBSE AM11 compliant, full, dynamic thermal analysis. The development will thereby ensure that summertime overheating is reduced and managed, while heating loads in winter are minimised, providing adequate thermal comfort for building users, with minimal reliance on energy intensive heating and cooling systems.

Research has shown that extreme temperatures are associated with an increased risk of illness and have an immediate effect on occupant health and wellbeing. It is also recognised that measures taken to improve energy efficiency, such as increased airtightness, thermal insulation levels etc. have the potential to result in more instances of overheating in summer.

With a changing climate, both under and overheating are an increasing problem in the buildings. Effective temperature regulation is therefore an integral part of ensuring a healthy and comfortable internal environment. Achieving thermal comfort is dependent on the building being designed to allow for seasonal changes and occupier preferences. However, it is also important to consider future temperatures which are expected throughout the lifetime of the building, so as to ensure future thermal comfort.

The proposals for include the following, to be undertaken as technical design progresses:

- The use of robust thermal modelling to support the energy efficient design, while also ensuring environmental comfort in-use.
- Designing the building with thermal zones and controls to ensure building user comfort by enabling a level of occupant control.
- Modelling with consideration of a range of projected climate change environments to allow future-proofing of the building for projected climate conditions.

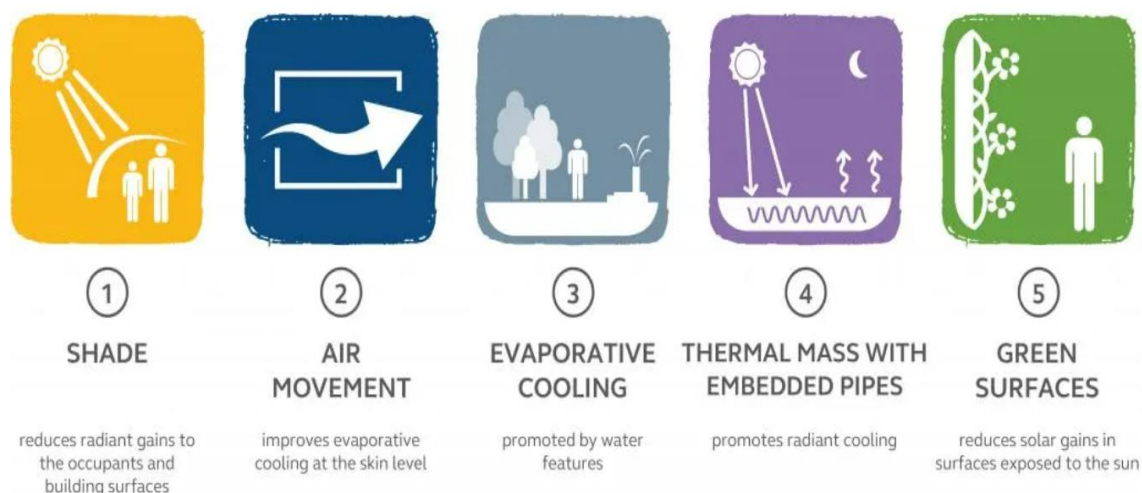


Figure 4 – Thermal Comfort strategies

Adaptation to Climate Change

Annual average UK temperature was 0.9°C higher during the period 2005-2014 compared with 1961-1990. Moreover, sea levels around the UK have risen by 15-20 centimetres since 1900[194]. These figures are forecast to continue to change as a result of climate change.

At the same time, there are upward trends in rainfall across the UK. Higher levels of winter rainfall have been experienced often in increasingly heavy rainfall events leading to more flooding and damage to buildings and infrastructure. These patterns are consistent with projections of more and heavier rainfall for the UK in a warmer global atmosphere.

These changes increase health and safety risks to people and the built environment, increasing costs and disruption for repair and adaptation. The building stock will largely remain as it currently is for the next 50 to 60 years, given the relatively low levels of replacement that are likely to occur.

Hazard Identification and Assessment

UK Climate Projections (UKCP09) indicate that the main nation-wide trends of climate change are:

- Wetter winters
- Drier summers
- Increased temperatures across all seasons

This information, as well as information from other identified sources, has informed the identification of hazards that are likely to occur resulting from climate change. The hazard identification section of the following table outlines the climate change related hazards identified.

A climate change adaptation strategy will be carried out to mitigate the risks of climate change on the development.

Risk Management

The aim of this section is to provide potential design mitigation measures for the climate change hazards whose risk has been deemed significant. Significant risks have been determined using the table in the Risk Estimation and Evaluation section, with amber and red risks considered in need of mitigation measures.

Risk ID	Issue	Potential Design Mitigation Measures
1	Increased likelihood of overheating	- Thermal assessment of the building has been undertaken and this has been extended to consider future climate changes in the 2020's and 2050's. - Ensure that solar controls are provided on buildings. - Integrate passive measures into the design (e.g. shape and orientation). - Use reflective building materials on the roof/facades to reduce thermal absorption of the fabric. - Allow for future provision of solar shading if needed. - Maximise the thermal insulation in the building if possible. - Specify efficient appliances and lighting that reduce internal heat gains. - Ensure mechanical air handling units do not discharge into frequented external spaces. - Use natural ventilation where possible.
2	Reduced air quality due to increased smog	- Increased vegetation planting on and around the site. - Encouraging staff and visitors to reduce the use of private vehicles. - Choose surface materials that reduce dirt particles in the air. - Design of the building to increase separation distances from sources of air pollution.
3	Reduced biodiversity due to extreme weather	- Choose a wide variety of weather hardy plants. - Shelter planting from strong wind and rain. - Use rainwater harvesting to provide irrigation during dry periods.
4	Increase in UV rays	- Health and safety procedures should be put into place for people working outside on days with a high UV Index. - External building materials should be specified that are highly resilient to corrosion from UV. - Measures should be put into place to minimise glare for building users e.g. blinds or brise soleil.
7	Increased sea level rise caused by higher global temperatures	- A Flood Risk Assessment has been undertaken to ensure full Flood Risk is considered. - Drainage has been designed to ensure an allowance is included to combat future changes in runoff (allow +40%). - Drainage design is in line with SUDS requirements. - Building services should be situated higher up to reduce likelihood of damage from flooding.
8	Reduced soil moisture content clay rich soils in summer months	- Ensure Ground Investigation looks at soil types to further confirm the likelihood of this. - Ensure the building is designed to avoid any potential soil shrinkage/subsidence/swelling issues.

9	Increased risk of drought	- Consider Rainwater or Greywater Recycling – or allowing for future fitting of such a system. - Ensure low consumption sanitaryware is fitted. - Ensure future maintenance regimes manage water consumption (e.g. review of data to identify leakages). - Review demand for water and identify means by which demand can be reduced (e.g. more efficient equipment). - Do not irrigate landscaping – ensure that drought tolerant native species are planted.
10	Reduced water quality	- Implement sustainable urban drainage systems (SuDS) to limit the amount of polluted water going into watercourses. - Install water filtration systems for drinking water.
11	Increased risk of flooding	- A Flood Risk Assessment has been undertaken to ensure full Flood Risk is considered. - Drainage has been designed to ensure an allowance is included to combat future changes in runoff (allow +40%). - Drainage design is in line with SUDS requirements. - Building services should be situated higher up to reduce likelihood of damage from flooding.
12	Higher risk of landslips from increased precipitation	- Ensure Ground Investigation looks at soil types to further confirm the likelihood of this. - Locate the building in a flat area where possible, away from sloped ground. - Ensure the building is designed to withstand ground movement.

Sustainable Water

In accordance with the fundamental objectives of the National Planning Policy Framework (NPPF), the FRA demonstrates that:

- (i) The development is safe;
- (ii) The development does not increase flood risk; and,
- (iii) The development does not detrimentally affect third parties

The site in Fluvial Flood Zone 1 (Low Risk). Pluvial (Surface Water Flooding) Generally very low Risk with areas of Low, Medium and High Risk at site Low Spots. For events up to and including the 100 year design event (medium risk), there is minimal risk to off-site property. The 1000 year, residual flood risk does involve some off site flow paths contributing to on site flooding. These have been mapped using Environment Agency, Risk of Flooding from Surface Water (RoFSW) mapping and have been mitigated through the design. The site is at low risk of flooding from all other sources, surface water floodrisk will be mitigated through appropriate levels design.

There is a Main River (Gatley Brook) 200m east of the site. The main river flows north to the River Mersey and is a mixture of open channel and culverted watercourse. Gatley Brook is a principal flood risk generator within Gatley Town Centre. There is a culverted ordinary watercourse approximately 400m west of the site (a tributary of Baguley Brook). This watercourse is shown as a flood risk generator through Sharston.

There is a public Combined Water Sewer which crosses the entrance to the site. There is a UU Surface Water Sewer approximately 400m west of the site which discharges to the Baguley Tributary described above. The previous development is assumed to have drained to the public combined sewer.

Based on the above, Infiltration – Infiltration will be investigated further once the Phase 2 SI is progressed. Watercourse – Both of the adjacent watercourses are considered to be flood risk generators downstream of the site. As no existing flows from the site enter either watercourse, any new connection, event at greenfield run off rates would increase flows within the watercourse and could potentially increase the number of properties at risk of flooding within Gatley and Sharston. Surface Water Sewer – Connection to the surface water sewer east of the site would have the same potential impact on downstream properties (the UU SW Sewer discharges to the Baguley Brook Tributary).

Combined Sewer – Discharge to the combined sewer is considered the most sustainable method for the discharge of surface water as it is the only option that does not increase flood risk downstream.

In accordance with the SFRA, existing run off rates will be reduced by 50%. The remainder of the site will discharge as a greenfield, in accordance with the Non Statutory Standards for Sustainable Drainage Systems, QBAR Rates will be used to limit discharge from the greenfield areas.

Geocellular Storage Tank attenuation will be used to contain the 100year + 45% event.

There is no residual flood risk from the development site to the surrounding district due to the reduction of existing storm water flow rates. Therefore, the development does not increase the risk of flooding to the other adjacent properties and roads.

Land Use and Wildlife

An ecological desk study undertaken in January 2021 identified no internationally designated statutory sites within 6 km of the Site; no nationally designated statutory sites and no locally designated statutory sites within 2 km of the Site; and three non-statutory designated sites within 2 km of the Site. The Site also falls within one or more Site of Special Scientific Interest (SSSI) Impact Risk Zones (IRZ), however, as the Proposed Development does not meet any of the criteria for which the LPA would need to consult with Natural England over risks posed by development (for internationally and nationally designated statutory sites), and due to the development's type, small scale and distance from all these designated sites, it is considered unlikely that the Proposed Development would have a significant adverse impact on designated sites.

The habitats on Site were surveyed and assessed for their suitability to support protected/otherwise notable species by Delta-Simons in January 2021. The Site covers an area of 9.84 ha and comprises woodland, grassland, scrub, scattered trees, bare ground, hardstanding, and buildings bounded by perimeter fencing. There are no Habitats of Principal Importance present on Site. However, the woodland on-Site qualifies as a Manchester BAP Priority Habitat, and fall within the W10 Oak Bracken Bramble Woodland classification. The habitats present on Site are widespread on both a local and national scale, with none of the habitats being considered rare. No fixed landscaping plans are currently available, however, the proposals will result in the loss of woodland, grassland, and scrub on-Site, which are all medium distinctiveness habitats, though it is understood that a lot of boundary vegetation will be retained.

The Site was found to be suitable for several protected/otherwise notable species and further surveys were carried out for bats and reptiles. Following further surveys, reptiles were considered likely to be absent from Site. Whilst no bats were recorded emerging from the Site and activity levels were generally low, several mature trees on-Site have features suitable for roosting bats and further surveys and appropriate mitigation will be required.

The Site is considered to be of low value for foraging and commuting bats. The woodland, grassland, scrub, and scattered trees are suitable for foraging/commuting bats, although it is expected to experience relatively high levels of artificial illumination from streetlights on/adjacent to the Site, in addition to significant disruption from passing planes. Any bats that do make use of the Site are likely to be relatively light-tolerant species only. During the operational phase there is expected to be a negligible effect of neutral significance.

It is concluded that provided the Proposed Development is built as proposed, further survey works for bats are undertaken, as required, a full Biodiversity Net Gain (BNG) assessment is undertaken, and all relevant mitigations are implemented during construction and operation, the impacts of the proposed development will be negligible and of neutral significance.

In order to ensure a biodiversity net gain for the Site the loss of the habitats on Site will be compensated for through the provision of new habitats on Site. The plants included in the landscape strategy have been carefully chosen in line with best practice guidance to maximise the Site's biodiversity value post development.

To reduce the net loss of bird breeding habitat on Site, additional tree, shrub, and hedgerow planting at the Site post development will provide opportunities for nesting and foraging birds. Furthermore, it is recommended that 20 bird boxes are installed for species known to occur within the local area that are of conservation concern. Furthermore, invertebrate boxes and log piles should be incorporated into the design to increase foraging opportunities for wildlife on-Site.

Despite no bats being recorded roosting within the building during the nocturnal surveys, several mature trees with features suitable for roosting bats are likely to be lost to facilitate the proposed development. Whilst no bats were recorded emerging from trees during the activity surveys, the features remain intact and could be utilised by bats in the future. To compensate for the loss of valuable roosting features, it is recommended that 20 bat

boxes be installed on trees to be retained around the Site. Furthermore, five invertebrate boxes and five log piles should be incorporated into the design to increase invertebrate foraging opportunities for bats on-Site.

To reduce the net loss of hedgehog habitat on Site, additional tree, shrub, and hedgerow planting at the Site post development will provide opportunities for foraging and sheltering hedgehogs. Furthermore, it is recommended that the designs include hedgehog box provision for this species, and hedgehog highways (13 cm x 13 cm gaps in the base of close-board fencing) to enable hedgehogs to continue to move across the Site.

Noise Impact

Operational and fixed plant noise assessments have been carried out on the basis that the rating level should be 5dB below the measured background sound level, as required by Manchester City Council.

The operational assessment results have shown that the rated level of noise is more than 5dB below the daytime background sound levels at the closest receptors.

Results for the night-time scenario have shown that the rated level of noise would be more than 5dB below the background sound levels at the majority of receptors, however at one receptor, the rated level of noise would only be 4dB below background sound levels. The assessment has shown that internal noise levels would still be below guideline levels. Therefore, a **negligible impact** is predicted.

This assessment has set noise limits for fixed plant items at the closest receptors. Provided the noise emission at receptor locations from fixed plant on the Site does not exceed 49dB L_Ar,1hour in the daytime and 40dB L_Ar,15min at night-time at the closest receptor, a **negligible impact** is predicted.

The BS 8233:2014 night-time L_AF_{max} event assessment has concluded that the calculated internal noise level from a L_AF_{max} event would not exceed internal noise level criteria at any NSR. Therefore, a **negligible impact** is predicted.

An indicative construction phase assessment has been undertaken based on typical examples of construction tasks and scheduling, concluding a **negligible impact** on noise and vibration sensitive receptors.

The traffic assessment results have shown that there is up to +0.8 LA₁₀,18hour change in basic noise level on surrounding roads due to traffic associated with the Site, which indicates a **negligible impact**.

Air Quality

A qualitative assessment of the potential impacts on local air quality from construction activities has been carried out for this phase of the Proposed Development using the IAQM methodology. This identified that there is a **medium risk** of dust soiling impacts and a **low risk** of increases in PM concentrations due to unmitigated construction activities. However, through good site practice and the implementation of suitable mitigation measures, the effect of dust and PM10 releases would be significantly reduced. The residual effects of dust and PM10 generated by construction activities on air quality are, therefore, considered to be **not significant**. The residual effects of emissions to air from construction vehicles and plant on local air quality are considered to be **not significant**.

The Site lies within an area where air quality is mainly influenced by emissions associated with traffic along B5166 Styal Road, Simonsway and the local road network. Pollutants considered in this assessment were NO2, PM10 and PM2.5.

The Proposed Development is expected to result in a **negligible** impact associated with the operational phase traffic on nearby receptors and the residual effects are considered to be **not significant**. As such, in accordance with the assessment criteria, additional mitigation is not required.

Additionally, pollutant concentrations within the assessment extents are predicted to be below the relevant AQOs without the risk of exceedance.

Based on the assessment significance criteria, the residual effects of the Proposed Development are considered to be **not significant** for all pollutants assessed, and therefore, in accordance with the assessment criteria, additional mitigation is not required.

Furthermore, it is considered that, the Proposed Development complies with national and local policy for air quality.

Based on the assessment results, air quality is not considered a constraint to planning consent.

Sustainable Materials

Consideration has been given to the use of sustainable materials for the development, in an approach that will encompass careful selection of new materials.

Standards will be set for the Main Contractor in the procurement of new materials. All timber will be required to be of FSC / PEFC certified standard; all concrete products and aggregate from BES6001: Very Good or Excellent certified suppliers; and all other materials from ISO14001 accredited suppliers.

The selection of new materials / specifications will also favour those that achieve an A or A+ rating according to the Green Guide to Specification – certainly at least three of the five key elements will achieve between an A+ and a D rating. The roof structure and finishes, upper floors, external and internal walls will all achieve this standard, based on the current selection, with most specifications achieving either an A or A+ rating at present.

The overall approach to materials specification adopted ensures high standards of environmental manufacturing and minimal embodied energy for all materials on site, as well as the avoidance of the use of excessive amounts of environmentally damaging materials. However, the potential for locally sourced alternatives that may not meet these high procurement standards in full will be considered. In addition to this, paints, varnishes, and internal fixings that can demonstrate low VOC content in accordance with best-practice UK and EU standards will be favoured in specifications.

Recycled materials will be used where possible.

Embodied Carbon

An embodied Carbon assessment will be undertaken once the design has progressed further.

The quantification of carbon dioxide emissions associated with the development has been achieved through the application of the Life Cycle Assessment (LCA) software. LCA covers a wide range of environmental indicators for materials, including amongst others, Global Warming Potential or GWP (kgCO₂eq). GWP allows for the quantification of an elements embodied carbon emissions, which when carried across all the project elements can then reflect a full developments impact.

The scope of impacts under an LCA is often characterised across various modules (A to C) reflecting the timeline from production of materials and products through to their eventual disposal as set out in Figure 1 below;

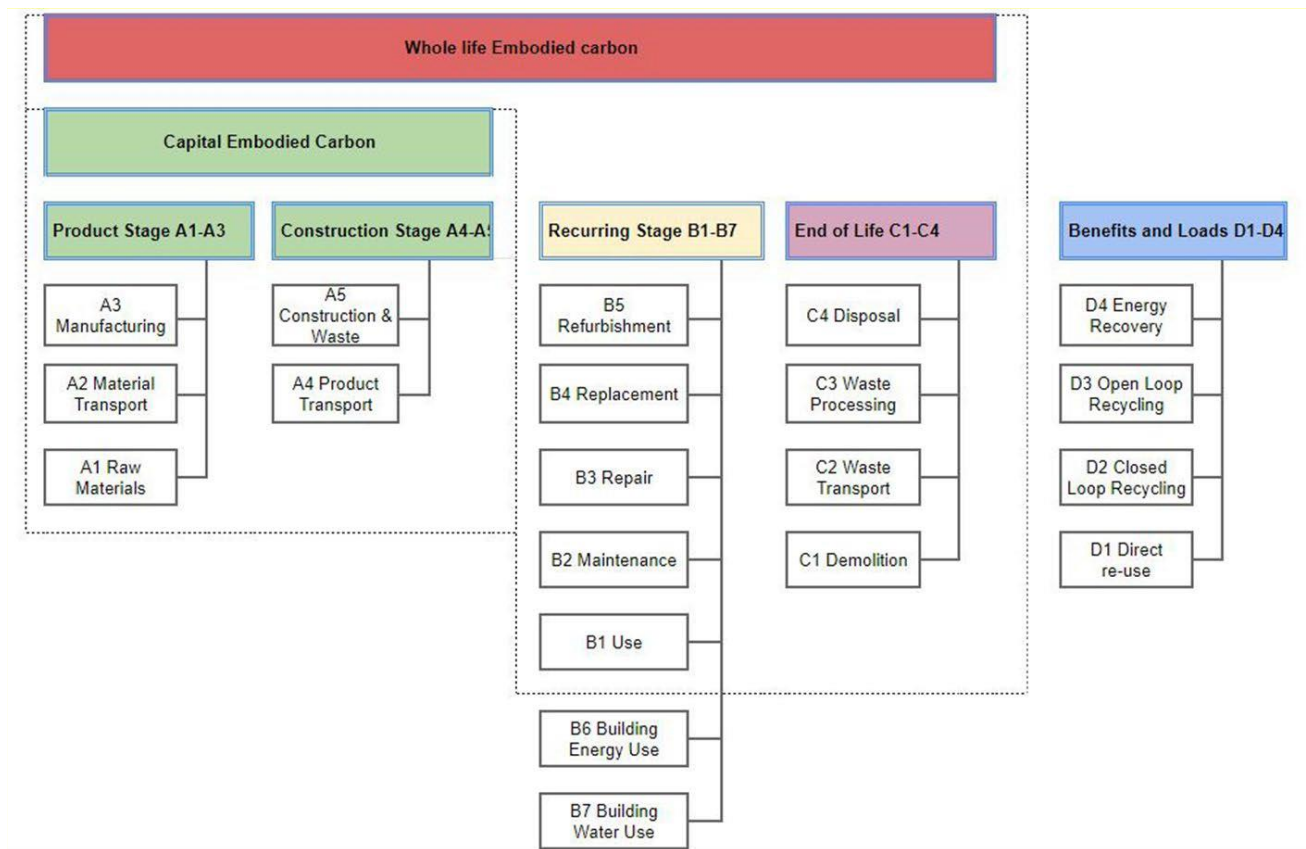


Figure 6 – Life cycle stages and modules as per EN 15804 – source

For this project the scope of works best fits with the UKGBC Net Zero Carbon (NZC) Framework definition 1.1 construction stage, which covers EN 15978 modules A1-A5.

The modelling approach will be based on the RICS guidance on whole life carbon to ensure that the contents are aligned with the UKGBC Construction Stage NZC scope. The software used was One Click LCA , an online software system allowing organisations to undertake detailed Life Cycle Assessment studies.

The dataset used through One Click LCA was the One Click LCA Default dataset, which complies with ISO 14040 and 14044 and is based on Ecoinvent's globally recognised database with regionalised scaling for the UK. The One Click LCA Default dataset is also accepted by the BRE as an IMPACT equivalent database, allowing for its use under the optioneering credits associated with BREEAM (Mat 01).

According to the RICS guidance, new build projects should be considered to commence on a cleared, flat site for consistency purposes. Therefore, works associated with site preparation such as cut and fill have been excluded, though general topsoil strip and excavation for individual elements (e.g. foundations) have been included.

The RICS 'Whole Life Carbon' guidance requires that 95% of the cost of each major element (e.g. substructure, superstructure) is included in the modelling, allowing for some smaller items to be excluded. This approach is based on the correlation between high cost and high environmental impact for materials, generally. This rule was applied where possible throughout each of the key elements.

Minimising Construction Waste

The Main Contractor will be required to operate an ISO14001 certified Environmental Management System, including a full Site Waste Management Plan, containing procedures for waste minimisation as well as optimisation of waste recovery and recycling, in accordance with the Waste Hierarchy. The methods used to minimise waste will be left to the expertise of the selected contractor, however, an overarching set of targets will be clearly laid out within the tender package to comply with the BREEAM criteria via formal evidence, as follows:

- 85% by volume / 90% by weight of non-hazardous construction waste will be diverted from landfill and reused, reclaimed, salvaged, returned to the manufacturer or recycled. 90% by volume / 95% by weight of demolition waste will similarly be diverted from landfill.

The Main Contractor will be required to carry out a pre-works audit of the materials already on site that may be re-used, as well as forecasting the waste likely to be produced on site, with potential re-use or reclamation applications, as well as the potential and end destination for materials identified in order to maximise recycling rates. Waste will be segregated either on site, or via a licensed waste contractor.

The Site Waste Management Plan will be prepared as detail design progresses as part of the overarching Construction Management Plan, with initiatives and practices outlined to confirm how these targets will be achieved. Measures will be required to minimise waste generated via practices as follows:

- Careful ordering of materials sizes and quantities.
- The use of prefabricated building elements;
- Negotiating deliveries without packaging left on site.
- Deliveries timed to meet the programmed needs, thereby minimising on-site storage.
- Safe storage of materials kept on site.

Designing for Durability & Resilience

Exposed elements of a building or landscaping are at risk of damage through impact or wear and tear. This can result in significant and unnecessary materials use and waste generation across the life of a building.

This can be minimised by risk areas being identified and designed out, and suitable protection measures being provided. The inclusion of this issue within BREEAM highlights the need to consider future repairs and replacements, as well as their associated costs, when designing and specifying materials for a new building. In addition, climate change can significantly accelerate the deterioration of materials used in a building.

It is therefore important to consider the impact of climate change and its associated environmental changes on the vulnerable elements within the built environment. Impacts of climate change can be mitigated by good design and specification.

Vulnerable areas of the building have been identified and suitably protected through the use of appropriate protection measures or design solutions to prevent damage to the internal and external building and landscaping elements.

Sustainable Transport

The reuse of the existing access position from Simonsway is proposed in the form of a new priority junction with a ghost island right turn lane. The proposed junction will provide access to the internal estate road which will accommodate a width of 7.3 metres and facilitate the simultaneous passing of cars and heavy goods vehicles.

The proposed parking provision has been assessed against Manchester City Council car parking standards contained within the Core Strategy document and shows the proposals are compliant with car and cycle parking standards for B2 and B8 uses.

In line with the minimum requirement of 1 Electric Vehicle Charge Point (EVCP) per 1,000sqm of floor space, the site will provide a total of 42 active and 84 passive EVCPs.

Cycling is becoming an increasingly popular mode of transport and is an effective mode for short trips. Consequently, cycling has the potential to replace short car journeys, particularly those under 5 kilometres. To illustrate this a cycle accessibility plan has been produced to show a 5-kilometre cycle catchment from the site, that would equate to a journey of around 25 minutes based on a leisurely cycle speed of around 12 kilometres per hour.

Also within this 5-Kilometre catchment are a range of railway stations such as Heald Green and Manchester Airport railway stations. This offers a realistic opportunity for employees to undertake linked cycle / rail trips.

a number of signalised junctions in the vicinity of the site provide Advanced Stopping Lines (ASL). This is of benefit to cyclists as they provide a safe place to stop at busy crossing points and allow a dedicated position for cyclists to wait ahead of vehicles to provide segregation from the traffic.

The site's nearest Metrolink Station is Peel Hall that is located approximately 450m walk distance along Simonsway. As such, pedestrians are able to use the aforementioned footways and the crossing facilities at the Simonsway / Shadowmoss Road junction when travelling between this transport node and the site. Shadowmoss is also located approximately 1km from the site's existing access point on Shadowmoss Road.

All Metrolink stops provide shelters, seating and real-time journey information. All Metrolink trams and stations also provide disabled access in the form of step-free access, tactile paving and dropped kerbs.

The site's Greater Manchester Accessibility Level (GMAL) has also been investigated. GMAL is a detailed and accurate measure of the site's accessibility using the public transport network. The method is essentially a way of measuring the density of public transport provision at any location within the Greater Manchester region. the site is located within Accessibility Level 5 which translates as an area of good public transport accessibility.

It is therefore concluded that the proposed scheme would not result in a severe or material impact in transport terms. As such, there are no transport reasons why the proposed development should not come forward and be granted planning permission.

Health and Wellbeing

The development will be designed in a way that has a positive impact on occupiers health and wellbeing.

As humans, we have always been dependent on our environments to nurture and sustain us. We rise with the sun, we eat off the land, we make shelter of stones and trees. We need water, air and light to *survive*. We need good water, good air and good light to *thrive*.

We build structures to protect ourselves – from nature and other forces. And we spend increasing amounts of time in these structures, living more than 90% of our lives indoors. Our buildings are designed to keep us safe, to protect us from the elements. But many of the places where we spend our time also get in the way of our health, putting one degree of separation between us and that which has always kept us alive.

Nature has long been our caretaker. With intentional design, our buildings can be too.

The scheme design incorporates extensive landscaping to allow building occupants the opportunity to spend time outside and engage with the natural environment.

Indoor Air Quality

Indoor air quality plan has been considered. The objective is to facilitate a process that leads to design, specification and installation decisions and actions that minimise indoor air pollution during occupation of the building. The following points have been considered during design:

- Removal of contaminant sources.
- Dilution and control of contaminant sources.
- Procedures for pre-occupancy flush out.
- Third party testing and analysis.
- Maintaining good indoor air quality in-use.

Maximum TVOC Content for Paints and Coatings

Product Category	Free TVOC Content of Ready-to-Use Product (g/l)	Testing Requirements
Interior matt walls and ceilings [Gloss = <25@60°]	10	ISO 11890-2 or ISO 17895 or Calculation based on the ingredients and raw materials
Interior glossy walls and ceilings [Gloss = >25@60°]	40	
Interior trim and cladding paints for wood and metal	90	
Interior trim varnishes and wood stains, including opaque wood stains	65	
Interior minimal build wood stains	50	
Primers	15	
Binding primers	15	
One-pack performance coatings	100	
Two-pack reactive performance coatings for specific end use such as floors	80	
Multi-coloured coatings	80	

