

November 2020



# EXPANSION OF ANFIELD ROAD STAND, ANFIELD

## N1/1 - Sustainability Statement



**Turley**

# Sustainability Statement

## Anfield Road Stand Expansion

November 2020



**Turley**  
Sustainability

# Anfield Road Stand Expansion

## “Reds Going Green”

The proposed Anfield Road Stand Expansion responds positively to the sustainable development agenda by promoting resource and energy efficiency, sustainable travel modes and climate change resilient.



### Renewable Energy

The proposals include approximately 100sqm of solar photovoltaics (PV) panels and air source heat pumps (ASHP) to generate sustainable heat and power on-site and reduce carbon emissions.



### Biodiversity Protection

Habitats on-site have negligible ecological importance, existing trees will be retained and protected where possible and any that are lost will be replaced.



### Sustainable Transport

A reduction in car parking spaces and increase in bus services, cycle storage and wayfinding will promote sustainable transport whilst maintaining capacity for the increase in fans.



### Embodied Carbon

Carbon emissions during construction will be considered and the use of low or impact materials and local suppliers will be promoted where feasible.



### Water Efficiency

Water efficiency will be promoted through a range of measures including low flow sanitary fittings.



### Energy Efficiency

Low energy LED lighting, natural ventilation, solar PV and air source heat pumps are proposed to reduce energy demand as targeted by the 'Reds Going Green' Campaign.

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**Client** – Liverpool Football Club

**Turley Reference** – LIVM3025

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This Sustainability Statement sets out the various measures incorporated into the construction and operation of the proposed Anfield Road Stand Expansion in response to national and local planning policy and Liverpool Football Club's sustainability objectives.

# 1. Introduction

## 1.1 Introduction

This Sustainability Statement is one of a suite of documents prepared in support of the application submitted on behalf of Liverpool Football Club and Athletic Grounds Limited (“Liverpool FC” or “the Club”) for full planning permission to expand the Anfield Road Stand to accommodate an additional circa 7,000 spectators with associated hospitality and spectator facilities, new public realm, and the realignment of Anfield Road.

This development forms part of the phased regeneration of Anfield stadium and follows successful delivery of the Main Stand redevelopment and associated public realm (96 Avenue and Paisley Square) and a new free-standing Liverpool FC retail store and cafe.

The planning application description is as follows:

*“Full planning permission for:*

*(i) The partial demolition and extension of the Anfield Road Stand to provide up to 7,000 additional seats and internal facilities including general admission concourses, hospitality lounges, a family fan zone, club offices, staff facilities and plant and equipment; with associated public realm; lighting; landscaping and associated infrastructure.*

*(ii) Use of Anfield Stadium for other team sporting events and to host up to 12 concerts and / or major events per annum”*

## 1.2 Anfield Stadium

The primary business of Anfield stadium is as a Premiership football club home to, on average, 28 – 32 matches (including cup ties) per annum. The stadium also contains other ancillary functions that broaden the range of activity at the ground on match and non-match days. The stadium also benefits from a temporary planning permission that enables it be used to host

concerts and other major events, resulting in a three-concert series in summer 2019.

Anfield Stadium reflects its historic 4-stand structure that has evolved over the last 130 years. Each stand is different and this contributes to Anfield’s famous and unique character.

The Stadium includes extensive external concourse areas and manages a total of 1,871 car parking spaces on match days.

See **Figure 1** for the plan of the existing stadium, and **Figure 2** overleaf for the illustrative image of the proposed expansion.

**Figure 1: Existing Anfield Stadium [Plan-it]**



## 1.3 Document Structure

**Chapter 2** of this Statement sets out the planning policy context for the proposals in relation to sustainable development at the national and local levels. **Chapter 3** reports Liverpool FC’s corporate sustainability strategy ‘Reds Going Green’, whilst the sustainability strategy for the proposed stadium expansion is presented in **Chapter 4**. **Chapter 5** summarises the key sustainability measures that are proposed and provides a conclusion as to their compliance with relevant policy.



This Sustainability Statement should be read in conjunction with other documents submitted in support of the planning application, particularly the Planning Statement, Environmental Statement, and Design and Access Statement.

Please note the terms “carbon”, “carbon dioxide (CO<sub>2</sub>)” and “greenhouse gases (GHGs)” are used interchangeably in this report depending on the terminology of the referenced documents.

**Figure 2: Visualisation of the proposed Anfield Road Stand façade [KSS]**



## 2. Planning Policy Context

### 2.1 Introduction

This Chapter summarises the planning policy context and related guidance for the proposed development in relation to sustainability, energy and climate change at the national and local levels. For full details, please refer to the Planning Statement that accompanies the application.

### 2.2 National Policy

Planning policy is set at the national level by the National Planning Policy Framework (NPPF) and associated Planning Practice Guidance (PPG) as summarised below.

#### 2.2.1 National Planning Policy Framework

Most recently updated in February 2019, the NPPF sets out the Government's planning policies for England.

NPPF paragraph 7 states *"the purpose of the planning system is to contribute to the achievement of **sustainable development**"*.

The planning system is required to jointly perform three objectives aligned to the 'three pillars' of sustainability as follows:

An **economic** objective to build a strong and competitive economy by ensuring sufficient land of the right type is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;

A **social** objective supporting strong, vibrant and healthy communities by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment with accessible local services that reflect the community's needs and support its health, social and cultural well-being;

An **environmental** objective to protect and enhance our natural, built and historic

environment; help to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change as we transition to a low carbon economy.

This Sustainability Statement primarily focuses on the environmental aspect of sustainable development.

#### 2.2.2 Planning Practice Guidance

PPG underpins policies within the NPPF and provides guidance on their implementation. As such PPG is a material consideration in planning decisions and should generally be followed unless there are clear reasons not to do so.

#### National Design Guide

The National Design Guide published in October 2019 forms part of the PPG. It sets out the characteristics of well-designed places and explains what good design means in practice.

The guide explains how well-designed places and buildings conserve natural resources including land, water, energy and materials. Their design also responds to the impacts of climate change such as rising temperatures and increased flood risk, whilst contributing to climate change mitigation through GHG emissions reduction during both construction and operation.

### 2.3 Local Policy

The following sections set out the local planning policy relevant to the proposed Anfield Road Stand expansion.

#### 2.3.1 Liverpool Unitary Development Plan

The Liverpool Unitary Development Plan was adopted in November 2002 and provides the statutory framework to guide development, and protect and enhance the environment of the City. It includes a number of policies relating to sustainability in new developments, these are summarised below:



**HD21 Energy Conservation** – there is an expectation for developers to minimise energy demand from development proposals by taking into account siting, orientation and layout.

**HD22 Existing Trees and Landscaping** – relevant surveys e.g. tree and hedge must be undertaken where these features are present on site, and key ecological features must be retained.

**HD23 New Trees and Landscaping** – all new development proposals should incorporate new trees and landscaping, in particular native species.

**T6 Cycling** – new developments must provide secure cycle parking facilities.

**EP11 Pollution** – development must not create unacceptable air, water, noise or other pollution.

**EP13 Flood Prevention** – development must not be at direct unacceptable risk from flooding or be likely to increase the risk of flooding elsewhere.

### **2.3.2 Joint Waste Local Plan for Merseyside and Halton (2013)**

The Joint Waste Local Plan provides the **sub-region** with waste management policies; relevant policies to the proposed development are summarised below:

**WM8 Waste Prevention and Resource Management** – development must implement measures to achieve the efficient use of resources, taking account of:

- Construction and demolition methods that minimise waste production and encourage re-use and recycling on-site;
- Designing out waste; and
- Use of waste audits or site waste management plans.

**WM9 Sustainable Waste Management Design and Layout for New Development** – the design and layout of new developments and uses must provide measures to address collection and storage of waste.

### **2.3.3 Anfield Spatial Regeneration Framework (2014)**

The Anfield Spatial Regeneration Framework (SRF) was produced by Liverpool City Council with the purpose of delivering the comprehensive and sustainable regeneration of the Anfield area.

The SRF aims to explore and harness the potential of the area, bringing a number of projects and proposals together in a coordinated and comprehensive manner to deliver lasting social, economic and environmental regeneration. In particular it seeks to capitalise on Liverpool Football Club's preference to extend its existing stadium and remain in Anfield.

### **2.3.4 Liverpool Local Plan 2013-2033**

The Liverpool Local Plan 2013-2033 Pre-submission Draft (January 2018) includes a number of sustainability planning policies of relevance to the proposed development as summarised below:

**GI 7 New Planting and Design** – new development should make provision on site for the planting and successful growth of new trees and landscaping.

**GI 8 Management of Existing Site Vegetation** – where trees are present on site or the development is within 3m of a tree canopy, an Arboricultural Impact Assessment must be carried out.

**GI 9 Green Infrastructure Enhancement** – all development proposals, where possible, should contribute to ensuring a net gain in biodiversity.

**R1 Air, Light and Noise Pollution** – development proposals should demonstrate that measures are incorporated to avoid pollution to air, water and soil. Proposals must not lead to a significant decline in air quality.

**R3 Flood Risk and Water Management** – development proposals should protect and enhance water quality, reduce flood risk and include water efficiency measures. A Flood Risk Assessment may be required, and development proposals should incorporate Sustainable Drainage Systems (SuDS) to manage surface

water run-off, taking climate change into account.

**R7 Renewable Energy** – future development will be required to connect to a decentralised energy network where one has been or is programmed to be constructed (unless not viable). All major development proposals should seek to integrate low carbon energy and decentralised energy networks into the design.

**R9 Solar Panels** – building and ground mounted solar panels will be supported where there are no adverse impacts elsewhere (such as heritage, biodiversity, aircraft and visual amenity).

**TP5 Cycling** – new development proposals should be designed to encourage cycling by providing appropriate cycle access and sufficient, secure cycle parking facilities.

**TP6 Walking and Pedestrians** – new development proposals should be designed to encourage walking and provide appropriate pedestrian access.

**TP8 Car Parking and Servicing** – a minimum of 5% if all parking spaces in the development should have an electric charging point.

**UD5 New Buildings** – developments are designed to highest design standards, demonstrating:

- Robustness and adaptability; and,
- The building design is resource and energy efficient, and includes features such as renewable energy generation, green infrastructure and low carbon materials.

Designs should meet the highest environmental quality standards in accordance with recognised building sustainable certification systems.

**R10 Non-Fossil Fuel Energy Sources** – the adoption of non-fossil fuel technologies will be supported as part of the transition to a low carbon economy where there are no adverse impacts.

**TP1 Improving Accessibility and Managing Demand for Travel** – all developments should address the accessibility of pedestrians and cyclists, as well as public transport users and other users of the transport and movement networks within the City and make a positive contribution to the reduction and mitigation of climate change and road safety issues.

## 2.4 Climate Emergency

Liverpool City Council declared a climate emergency in July 2019, recognising the growing risks the region faces as a result of climate change. As a result, the City has adopted a zero carbon target of 2040, which is ten years earlier than the national target.

## 2.5 Planning Policy Summary

Local policy, both adopted and emerging, seeks high quality development which; is resource and energy efficient, encourages low carbon modes of transport and, contributes to the biodiversity of Liverpool City Region.

The declaration of climate emergency in July 2019, and a zero carbon target of 2040 demonstrates Liverpool City Council's aspirations to cut carbon emissions and become a sustainable place to visit, live and work.

This Sustainability Statement demonstrates how the proposed Anfield Road Stand will deliver a sustainable, high quality extension to Anfield Stadium, providing local, national and international visitors with an enhanced experience of Liverpool.

# 3. Reds Going Green

## 3.1 Introduction

'Reds Going Green' is the successful environmental initiative launched by Liverpool FC in 2012. The initiative has already improved the Club's energy efficiency performance, and pledges an ongoing commitment to reducing carbon emissions to both the local community in Liverpool and the Football Club's 1.2 million annual visitors.



Reds Going Green engages the entire football club from 'Boardroom to Boot Room'. So far, implementation of the initiative has resulted in a 29% reduction in energy and carbon emissions against the baseline. Following this, the Football Club is aiming to achieve a 5% year on year reduction in energy and carbon emissions. The Football Club is also aiming to achieve ISO 50001 Energy Management System accreditation.

In 2014, Reds Going Green was awarded Carbon Champion of the Year Award in the ECHO Environment Awards, an award recognising businesses who reduce energy and emissions by adapting the way they operate and lowering their carbon footprint.

## 3.2 Objectives

The Club have set out 5 key objectives that they want to achieve through the Reds Going Green campaign. These objectives are outlined below:

1. To reduce energy and carbon emissions by 10%;
2. Reduce waste by 15% and increase recycling by 20%;
3. Implement an ISO 50001 Energy Management System for all sites;
4. Developing into the wider transport & sustainability issues; and
5. Three-year target to ensure electricity is below the Carbon Reduction Commitment (CRC) threshold of 6GWh.

## 3.3 Action Taken

The Reds Going Green initiative has delivered a wide range of actions to date, as summarised below under different topic areas.

### 3.3.1 Staff Engagement

Liverpool Football Club has engaged with staff using a survey, feedback from which tailored energy awareness communication, training and engagement programmes. Staff surveys are circulated every year to monitor staff's improving awareness relating to climate change, energy consumption and environmental issues.

Comprehensive training has been delivered to over 1,500 staff in the form of toolbox talks, to raise awareness of climate and environmental issues.

Furthermore, the Club operates a league table, which reports energy, water and carbon performance across all sites operated by Liverpool FC, including the Stadium, a number of official merchandise stores and training grounds. These league tables make a visual impression that evokes friendly competition between sites to manage resource use.

### 3.3.2 Energy

A smart metering strategy has been developed which will enable the Club to understand and determine energy use within specific departments. Smart metering is an effective tool in tracking down where energy hotspots are, enabling management to implement effective energy reduction strategies.

Energy saving projects are implemented by the Club every year and have so far included replacing lighting throughout assets to low energy fittings with presence detection controls. Additionally, a number of air conditioning systems have been replaced with high efficiency heat pumps.

Further measures to reduce energy wastage include a pool cover at the Melwood Training Ground and management systems to ensure equipment such as fridges and bars are turned off.

### 3.3.3 Waste

To reduce plastic waste produced by the Club, a number of measures have been introduced, including:

- Replacing plastic straws with paper;
- Replacing plastic cutlery with compostable cutlery;
- Fully recyclable drinking cups; and
- Biodegradable cornware food boxes.

Additional recycling compactors, recycling collectors, and green skips are provided at the Stadium to enable a large percentage of waste to be recycled.

### 3.3.4 Community

The Reds Going Green campaign not only works to reduce the environmental impact of the Club's assets, but also works with the wider community to support areas of need including food poverty and education, the elderly community, encouraging physical activity, and creating memorable experiences for young people.

Alongside competitive rivals, Everton Football Club, Liverpool FC fans and staff donated 3,191kg of food to local foodbanks to date.

Furthermore, the Club officially opened its first allotment in 2016, which will provide organically grown fresh produce for use on match days. The allotment includes a beehive which is capable of housing over 10,000 bees, and garden furniture created from recycled plastic bottles. During the 2016/17 season, the Club engaged with the local community and schools to encourage them to cultivate the allotment.

LFC employees are encouraged to volunteer their time one day a month within the local community, supporting groups such as Anfield Children's Centre, Royal Liverpool Hospital, Larkhill Care Home, Alder Hey Children's Hospital, and Liverpool Personal Support Centre.

## 3.4 Achievements

The Reds Going Green campaign has so far had a very positive impact on the Club. Utilising staff engagement, feedback and effective monitoring techniques, the following environmental savings have been achieved:

- Total utility saving of over £950,000 and energy savings of 18,449,000 kWh;
- Carbon reduction of 782 Tonnes per year; and,
- 98% Landfill Free waste programme.

The energy savings achieved are equivalent to running 782 average UK homes for a year. Additionally, social and economic benefits achieved by community engagement include:

- Providing support for some of the poorest areas in Liverpool;
- Working with young adults and children to help them realise their potential;
- Bring together multiple faiths to help break down barriers;
- 21,000 people benefitting from LFC Foundation programmes;
- 5,238 school children engaged through primary stars; and
- 117 students gained qualifications at LFC Foundation College.

Through Reds Going Green, Liverpool FC are providing a more sustainable future for fans of the Club and the City of Liverpool.



# 4. Sustainability Strategy

## 4.1 Introduction

This chapter describes the Sustainability Strategy for the proposed Anfield Road Stand expansion, demonstrating how it responds to national and local planning policy regarding environmental sustainability.

## 4.2 Meeting the Challenges of Climate Change

A key challenge facing the built environment in the UK and elsewhere is the need to mitigate and adapt to a changing climate, as recognised by Liverpool City Council's climate emergency declaration. The Government is committed to tackling climate change and meeting its ambition for net zero carbon emissions by 2050.

Climate change is projected to cause the UK to become warmer; winters will become wetter, and summers will become drier. Adapting to this changing climate will impact on the design, construction, location, cost and operation of all buildings over the next few decades. One of the NPPF's core planning principles is to encourage development to consider climate change adaptation and mitigation during the planning process.

In this context the following sections outline the key climate change mitigation and adaptation measures considered appropriate for this development based on the latest national guidance.

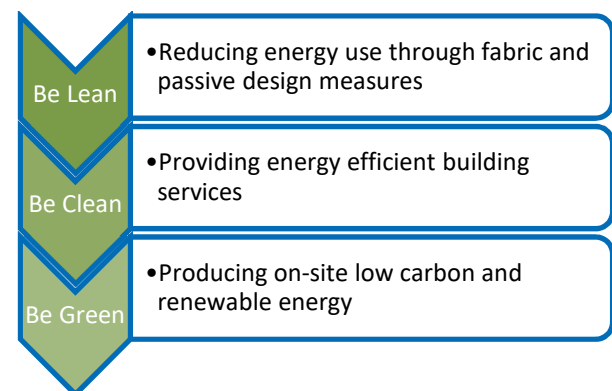
Developing energy efficient, low carbon buildings is a key objective of national policy and recent changes to the Building Regulations support the reduction of energy demand through efficient building design.

### 4.2.1 Energy Strategy

Policy HD21 within the adopted UDP requires development proposals to take into account energy efficiency, looking at site and orientation. As this scheme comprises of an extension to a set stand, there are limited opportunities to

minimise energy demand through site and orientation. However, regulated energy demand will be reduced through implementation of a 'fabric-first' approach, as set out within the stages of the energy hierarchy (**Figure 3**).

Figure 3: The Energy Hierarchy



The following sections outline the strategy for each stage within the energy hierarchy.

### Be Lean

Central to the delivery of low carbon and energy efficient buildings is the 'Fabric First' principle which recognises the most effective way to minimise carbon emissions is to reduce the demand for heat and power through a well-insulated, energy efficient building fabric and services.

Reducing the primary energy demand of a building through the use of an efficient fabric and services is widely regarded as best practice and is therefore the first and most important step to reducing carbon emissions.

This 'fabric first' approach has a number of distinct benefits including:

- Carbon savings delivered are 'locked-in' for the lifetime of the building (50 years or more) rather than the much shorter lifespan (around 25 years) of a renewable energy technology;

- Virtually no maintenance and/or replacement costs to maintain carbon reductions through improved fabric; and,
- No reliance on an occupier's behaviour to deliver carbon reductions. Achieving carbon savings from renewable energy technologies require education, awareness and often, behavioural changes from occupants.

The following measures to reduce energy use and carbon emissions have been considered within the design:

- Material selection which will balance the aesthetics, robustness and durability with optimal thermal benefits;
- Natural ventilation to Levels 0 and 2 to reduce energy consumption from mechanical systems;
- High performance glazing with appropriate window u-values and g-values to reduce heat loss and optimise positive solar gain while reducing the potential for overheating;
- High efficiency LED lighting and controls to all light fittings;
- Incorporation of Building Management System (BMS) to provide optimised and automatic control of mechanical plant;
- Use of high efficiency heating systems to reduce energy consumption; and,
- Specification of high energy efficient rated appliances that use less energy and water.

Through the provision of fabric and energy efficiency measures the development will meet the requirements of the current Building Regulations (Part L 2013).

### Be Clean

The next stage of the Energy Hierarchy is the provision of energy efficiently, i.e. from a decentralised energy system such as a Heat Network.

District Heat Networks (DHN) comprise a centralised heat generator, typically a gas fired Combined Heat and Power (CHP) engine. CHP systems generate electricity and waste heat which can be fed into a network of insulated pipes, delivering low carbon heat to buildings to

provide heating and hot water via individual heat transfer units.

DHNs are suited to development with high thermal demand, typically provided by sufficient density or a large anchor load, i.e. high density flats, leisure centres and industrial process.

'Be Clean' was not feasible for this development, as there are no existing or proposed district heat networks near to Anfield, the closest being approximately 2.4km away at the Royal Liverpool University Hospital. Furthermore, the nature of football stadia, with intermittent full occupancy and heating demands, is unlikely to be best suited to a DHN.

Gas powered systems are not in alignment with the UK's ambitions to become zero carbon. The continued decarbonisation of the national electricity grid as acknowledged by the draft SAP10.1 document published in October 2019, is reducing the carbon benefit of gas CHP systems, and new development is better placed to take advantage of decarbonising electricity.

The benefit of connecting to the decarbonising electricity grid is recognised within emerging Local Plan Policy R10: Non-Fossil Fuel Energy Sources, which confirms that transition to renewable fuels will be supported. Therefore, the proposed development will incorporate electric space heating and hot water systems where possible.

### Be Green

The final stage of the energy hierarchy is the generation of on-site low carbon renewable energy. Draft Local Plan Policy R7: Renewable Energy sets out an expectation that development proposals will integrate low carbon energy into the design. Therefore, a brief feasibility study of renewable and low carbon technology has been completed and is summarised below:

**Heat Pumps** – Heat pumps provide low grade heat from the ground (Ground Source Heat Pumps, GSHP) or air (Air Source Heat Pumps, ASHP) and are suited to fabric efficient buildings.

GHSPs are subject to specific ground constraints and their capital cost is very high compared to carbon savings and this technology has therefore been discounted.

Air Source Heat pump (ASHP) are technically feasible and could deliver carbon savings as the national grid continues to decarbonise. This technology will be considered further at detailed design to assess potential carbon savings.



**Biomass** – Biomass boilers can provide hot water and space heating using wood pellets or logwood. Generally the plant is larger than for a gas boiler, and an additional dry store is required to store the fuel.

Biomass has lower emissions than gas, but should not be seen as a zero-pollution option. Greenhouse gases are generated to cut, transport and burn the fuel, with some debate over how long it takes for trees to re-absorb the carbon emitted. The burning of the fuel also contributes to local air quality issues and is currently being discouraged in other major cities such as London for this reason. Biomass is therefore not considered appropriate.

**Hydro Power** – No suitable water sources are located within the vicinity of the stadium, therefore this technology is discounted.

**Wind** – The predicted wind speed for this location is on average 5.6 m/s at 10m<sup>1</sup>. This technology could therefore be technically feasible. However, due to the location of the stadium adjacent to designated heritage assets, installation of a wind turbine may have negative impacts on built heritage. Therefore this technology is not considered further.

**Solar Photovoltaics** – Photovoltaic (PV) Cells convert solar radiation into electrical energy. They are feasible on roofs orientated within 30 degrees of south on pitched or flat roofs and

must not be overshadowed by other buildings or natural features such as trees.



**Solar Thermal** – Solar Thermal Hot Water systems convert radiant energy from the sun into thermal energy for water heating. Systems require orientation within 30 degrees of south and internal space for a hot water storage tank. Solar thermal can be less efficient in winter and tend to require more area than solar PV to produce similar savings in carbon emissions.

It is considered that solar PV would be more appropriate than solar thermal as it is more effective in winter months.

Following a review of feasible low carbon and renewable technologies, it has been determined that ASHP and solar PV are the most appropriate for the proposed stand expansion.

### Energy Summary

The proposed expansion will meet the requirements of Part L 2013 Building Regulations through the application of the 'fabric first' approach and the implementation of energy efficiency measures described within this section.

The proposed building services strategy includes natural ventilation in areas where this is possible, and electric systems which will future proof the development as the national grid increasingly decarbonises, resulting in greater carbon emission savings from the development's operation.

ASHPs and approximately 100m<sup>2</sup> of solar PV are proposed as part of the 'Be Green' stage of the

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<sup>1</sup> <https://www.rensmart.com/RenSMARTWindReport#report>

energy hierarchy, which reflects emerging Liverpool Local Plan requirements.

#### 4.2.2 Unregulated Energy

Unregulated energy represents energy consumption which is not controlled by Building Regulations and includes operational-related equipment such as kitchen appliances, computers, lifts and concession bars. To truly mitigate climate change, all energy demands within a building must be considered and reduced where feasible.

As outlined within **Chapter 3**, Liverpool FC implements a number of measures to reduce operational energy across their assets, through delivery of the successful Reds Going Green campaign. Measures which are currently implemented at Anfield and will be extended to the proposed expansion are summarised below:

**Smart Metering** – the proposed smart metering system and BMS enables facilities management to understand and determine energy ‘hotspots’ within specific departments. Areas closely monitored include kitchens, conferences rooms and pitch heating, and this ongoing monitoring allows management to take action and reduce energy consumption where possible.

**Management System** – hospitality areas have a management system which enables staff to turn off fridges and bar front heads in between conferences and football games.

**Operational Procedures** – energy shut-down procedures have been implemented throughout the Club. The presence of environmental posters provide staff with visual reminders to consider the environment, and a checklist of systems to be switched off at the end of each day.

Cumulative energy savings from the campaign to date have exceeded 18,449,000kWh and Liverpool FC now have a strategic plan to achieve a 5% saving year on year in carbon emissions, which will include reductions in both regulated and unregulated energy.

#### 4.2.3 Embodied Carbon

Embodied carbon is the total GHG emissions generated to produce a built asset. This includes emissions caused by extraction,

manufacture/processing, transportation and assembly of each product and element in an asset. In some cases, (depending on the boundary of the assessment), it may also include maintenance, replacement, deconstruction, disposal and end-of-life aspects. It excludes operational emissions of the asset.

The RICS Professional Guidance: Methodology to Calculate Embodied Carbon (2014)<sup>2</sup> defines embodied carbon as:

*“Carbon emissions associated with energy consumption (embodied energy) and chemical processes during the extraction, manufacture, transportation, assembly, replacement and deconstruction of construction materials or products. Embodied carbon can be measured from cradle-to-gate, cradle-to-site, cradle-to-end of construction, cradle-to-grave, or even cradle-to-cradle. The typical embodied carbon datasets are cradle-to-gate. Embodied carbon is usually expressed in kilograms of CO<sub>2</sub>e per kilogram of product or material.”*

Depending on building type, up to 70% of carbon emissions over its lifetime may have already been accounted for by the time it is occupied. Therefore, there needs to be consideration of embodied carbon for all building projects to achieve climate change mitigation.

The RICS guidance contains benchmarks for a number of building types, including stadia and other specialist leisure facilities. There is a broad benchmark for stadia, ranging from 3,000kgCO<sub>2</sub>e/m<sup>2</sup> to 5,000kgCO<sub>2</sub>e/m<sup>2</sup>. The single point benchmark is reported within the guidance as 3,250kgCO<sub>2</sub>e/m<sup>2</sup>.

Using this single point benchmark, it is possible to estimate the total embodied carbon associated with the proposed expansion. Based on the internal floor area of 3,680m<sup>2</sup>, the approximate embodied carbon produced throughout the lifetime of the proposed Anfield

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<sup>2</sup> RICS Professional Guidance, Global Methodology to calculate embodied carbon 1st Edition (2014)



Road Stand expansion would be 11,960,000 kgCO<sub>2</sub>e/m<sup>2</sup> (or 11,960 tonnesCO<sub>2</sub>e).

Based on Liverpool's carbon emissions in 2017<sup>3</sup>, this embodied carbon estimate of the proposed expansion accounts for less than 1% (0.7%) of the city of Liverpool's emissions, and is therefore not significant.

The embodied carbon reported above is likely to be a worse case estimate, due to improvements in best practice within the construction industry since 2014. Furthermore, the estimate assumes that the project is entirely new build, which in this case it is not and makes use of the existing structure.

The design team will also consider options at detailed design, alongside the main contractor once appointed, to reduce the embodied carbon of the proposed development. Such measures may include:

- Cement alternatives such as Ground Granulated Blast-furnace Slag (GGBS) and fly ash within concrete;
- Re-use of material on site where in good condition, such as structural steel;
- Re-use of material on site through reprocessing, for example crushing existing bricks and concrete to be used as sub-base or melting existing tarmac to be re-used within the proposed hard landscaping scheme;
- Moving existing electrical equipment from the existing stand to the proposed expansion where feasible; and,
- Procuring materials from local suppliers to reduce transport emissions.

#### **4.2.4 Climate Change Adaptation**

To ensure the proposed expansion is resilient to the effects of climate change, a number of key design measures will be incorporated in response to the climate predictions set out in the UKCP18 projections.

The UKCP18 projections demonstrate that the UK will experience increased summer and winter temperatures, reduced summer rainfall,

increased winter rainfall, and an increase in extreme weather events.

The UK Climate Change Risk Assessment updated in 2017 identifies key risks associated with the effects of climate change in relation to the built environment. For the proposed development these risks include reduced summer water availability, increased winter rainfall and increased summer temperatures.

This section identifies key measures which have been incorporated into the design of the expansion to adapt to climate change.

##### **4.2.4.1 Flood Risk and Sustainable Drainage**

A Flood Risk Assessment and Drainage Strategy has been prepared by Mott Macdonald and submitted as part of the planning application.

##### **Flood Risk**

Anfield Stadium is located within Flood Zone 1 and is therefore at low risk of flooding. There are no watercourses within the vicinity of the site, the closest being a pond (Stanley Park Lake) situated to the north. The River Mersey flows approximately 2.5km to the east of site, and the Leeds and Liverpool Canal is located 1.8km to the west.

The majority of the site is located within an area of very low risk of surface water flooding as indicated by the Environmental Agency (EA) flood maps. However, some of Anfield Road is shown to be at low risk of flooding. It should be noted that the EA Risk of Flooding from Surface Water Flood Map does not take the local drainage system currently in place into consideration. As the road currently benefits from a positive drainage system the risk of flooding to the site from pluvial flooding is low and acceptable.

Due to the urban nature of the area and absence of any recorded flood risk or existing ground water features on site, it has been concluded that the site is not at risk from groundwater flooding. Furthermore, the site is not within the

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<sup>3</sup> Department for Business, Energy and Industrial Strategy – Emissions of Carbon Dioxide for Local Authority Areas (2017 estimates)



envelope for reservoir flooding and therefore not at risk.

### Drainage Strategy

The proposed drainage strategy will be designed to reduce surface water discharge rates by 30% of existing rates, with a 20% additional allowance in rainfall intensity due to climate change.

Discharging surface water directly to a watercourse by gravity is not considered feasible as it is unlikely that infiltration is possible as there are no watercourses within the vicinity of the site. It is therefore proposed that surface water from the site discharges into the public sewer network.

It is proposed that the surface water discharge rate will be limited to 95.1l/s, which provides a 30% reduction in the existing surface water discharge rate. A total attenuation volume of 430m<sup>3</sup> will be required to ensure no flooding from the surface water drainage system for events up to and including the 1 in 100 year event including 20% for climate change.

Due to the limited available space on site it is proposed that the majority of the required attenuation volume is provided in the form of geo-cellular storage. The potential use of permeable paving and bio-retention areas will be explored at detailed design to reduce the required amount of geo-cellular storage.

For further information, refer to the FRA and Drainage Strategy submitted to support the planning application.

#### 4.2.2.2 Water Efficiency

Potable water is an increasingly important natural resource and with the majority of the UK classed as being in an area of moderate or severe water stress the conservation of water is becoming a more significant sustainability metric as the climate changes.

In this context the proposed expansion will reduce water consumption through a range of water efficiency measures within the sanitary areas which include:

- Dual flush WCs;
- Reduced 4.5 litres flush WCs;

- Aerated mixer taps;
- Non-concussive taps; and
- Waterless urinals.

At detailed design, the project team will also consider ways to reduce the commercial kitchen water consumption, which could include:

- Low flow pre-rinse spray nozzles; and,
- Water efficient dishwashers.

The project team will determine which sanitary fittings and kitchen equipment can be reduced in terms of water consumption without effecting functionality and/or maintenance requirements.

#### 4.2.4.2 Building Overheating

With increasing summer temperatures there is a risk of overheating in buildings which could adversely affect building occupants.

In recognition of this, Part L 'Conservation of Fuel & Power' of the Building Regulations are scheduled to be updated in 2020 to take better account of potential summertime overheating risks as a result of climate change.

Although Levels 0 and 2 are naturally ventilated, hospitality areas will include mechanical cooling to mitigate the risk of overheating.

### 4.3 Sustainable Transport

A Transport Strategy has been prepared by Mott MacDonald to support the planning application. The Strategy provides details of how supporters will be able to travel to and from Anfield on match and event days.

#### 4.3.1 Current Travel Patterns

The results of the 2019 Supporter Travel Surveys demonstrated that car travel is the dominant mode of transport for supporters (41.0% weekdays and 38.2% weekends), although this has fallen by 14.9% on weekdays since 2018.

**Table 1** overleaf shows the weekday and weekend modal splits for home supporters (all ticket types).

**Table 1: 2019 Modal Split [Mott Macdonald]**

Mode	% Weekday	% Weekend
Bus	14.26%	11.07%
Car (Passenger & Driver Combined)	41.01%	38.19%
Coach and Minibus	1.55%	1.94%
Motorcycle	0.03%	0.00%
Soccer Bus	4.87%	7.40%
Taxi	27.88%	29.96%
Train	0.95%	1.35%
Walk	6.61%	5.76%
Dropped Off	2.85%	4.26%
Bicycle	0.00%	0.07%
<b>Total</b>	<b>100%</b>	<b>100%</b>

The Transport Strategy concludes that Soccerbus 2019 results are likely to be an overrepresentation and should be more in line with the 2018 results. Furthermore cycling observations at the stadium would suggest that the survey does not represent these numbers correctly and the proportion is likely to be higher. For supporters travelling via train, they are likely to report their mode of transport from the station to the stadium (such as taxi) rather than reporting their train journey.

#### 4.3.2 Proposed Strategy

Due to the increase in supporters anticipated on match days and for events, additional capacity is likely to be required to support the expansion.

**Bus** – Discussions have been held with the current operators of the routes serving the stadium on match days. Stagecoach, Peoplesbus and Soccerbus have all confirmed that additional capacity can be provided in the near future. Furthermore, the use of double decker buses could provide additional capacity on regular bus services.

**Coach** – Increasing coach number would help to support greater future sustainable movement of supporters. This increase could be facilitated by providing additional coach parking on site.

**Taxi** – Discussions with local taxi firms has confirmed that they are able to continue to provide capacity to meet match day travel demand.

**Car** – No additional parking spaces are to be provided as part of the stadium expansion, however the existing parking facilities will be reviewed to determine more efficient use of existing spaces. A target of 38% has been set for future car use to encourage more sustainable modes of transport.

**Drop Off** – This mode of transport is less sustainable than taxis and private car travel (given that they rarely undertake multiple trips), however it is a form of transport that could be formally managed and prevents vehicles parking in nearby residential zones.

**Cycle** – Cycle stands are provided at several locations around the stadium and are well used on match days according to observations (which conflicts with the survey results). The aim is to double the usage of cycles on match days to support healthier staff and supporter travel choices. A new cycle hub is proposed as part of the proposed expansion.

**Walking** – Walking has seen an increase as a mode of transport to the stadium in recent years, and poses no capacity issues.

Improvements in wayfinding and information on walking routes could support pedestrians from the city centre.

The Transport Strategy demonstrates that even the maximum increases anticipated for each mode of transport can be supported through increased capacity.

#### 4.3.3 Travel Plan

A Travel Plan has been produced by Mott MacDonald to provide a package of measures designed to reduce the number and length of car trip generated by stadium staff. The targets set out by the Travel Plan are:

1. Reduce the number of staff driving to the stadium alone.
2. Increase the number of staff travelling to the stadium by active travel modes (walking and cycling).
3. Increase the number of staff travelling by public transport (bus/train) or taxi.
4. Increase the number of staff car sharing to the stadium (car share).

The Travel Plan provides an Action Plan which sets out a number of measures and assigns responsibilities to achieve the above targets. A selection of these measures are outlined below:

- Use the website and staff intranet to promote sustainable modes of transport;
- Provide new employees with starter manual travel information;
- Continue to work in partnership with Merseytravel and investigate opportunities for staff discounts;
- Work with Liverpool City Council and Merseytravel to improve cycle/pedestrian links to the stadium;
- Promote shower, locker and changing facilities to staff;
- Monitor usage of cycle parking at the stadium and provide additional cycle parking where required;
- Encourage staff to car share to meetings and training;

- Promote the use of conference calls and video calling to reduce the need to travel to meetings; and
- Undertake a staff travel survey to support the monitoring process of the Travel Plan.

For further information, please refer to the Transport Assessment, Transport Strategy and Travel Plan submitted to support the planning application.

#### 4.4 Natural Environment

The proposed expansion will incorporate measures to support and enhance the environment through consideration of the existing site ecology, including measures to mitigate the impact of the development, as well as incorporate measures to reduce pollution from the site.

##### 4.4.1 Ecology

An Ecological Appraisal of the site has been undertaken by Mott Macdonald to determine features of ecological value and suggest measures for mitigation and compensation.

The majority of habitats within the site boundary have been assessed as having negligible ecological importance. These include:

- Amenity grassland;
- Species-poor defunct hedge;
- Introduced shrub; and,
- Hardstanding.

There is potential for roosting bats within buildings and scattered parkland trees, which has been assessed within the Potential Roost Assessment (PRA) for Trees and Structures.

The PRA classified the Main and Sir Kenny Dalglish stands as having negligible suitability to support roosting bats. Two common pipistrelle bats were found to be hibernating within the Kop stand, which led to the conclusion that the roosting bats are adapted to endure high levels of disturbance when the stadium is in use. The Anfield Road Stand was assessed as having low suitability to support roosting bats; further surveys will be carried out as a precautionary measure between May and September to check for seasonal roosting.

The site has low suitability for foraging and commuting bats due to minimal amount of suitable habitats and the urban location of the site.

Five trees were found to have low roosting suitability for bats and could be impacted through felling or new lighting. If removal is necessary, trees should be 'soft felled' with brash from the canopy removed first. Where trees are retained and new lighting installed, a nocturnal survey may be required to assess whether bats are still roosting.

Trees on site will be retained where possible and protected in accordance with British Standard BS5837:2012. The Appraisal recommends that trees which can't be retained are replaced with native species of local provenance with the long-term objective that there is potential for suitable bat roost features to develop and to provide habitat for nesting birds.

Further mitigation measures include:

- Replacement of trees if removed as necessary;
- Secure open areas of the site and routinely checked for fly-tipped waste to ensure that invasive species do not get transported on to the site and establish;
- Install bat boxes on site boundary trees if a roost is found within the Anfield Road Stand following surveys;
- Undertake vegetation clearance or building demolition outside of the bird breeding season (September and February inclusive), where possible;
- Where works cannot avoid the bird breeding season, ensure a suitably experienced ecologist provides a nesting bird check immediately prior to vegetation clearance and building demolition activities; and,
- Retain any active birds nest with a 5m buffer, until the ecologist deems the nest to be inactive.

#### 4.4.2 Pollution

The proposed expansion will aim to minimise any negative impacts on the natural

environment considering the impacts of water use, materials, and air quality.

Construction works will be controlled through the implementation of a Construction Environmental Management Plan (CEMP) which will include measures to minimise noise and vibration, air pollution, water pollution, visual disturbance and impacts of traffic in accordance with Environment Agency Pollution Prevention Guidance (PPG) until superseded by an updated guide.

SuDS features will incorporate appropriate pollution prevention measures to maintain water quality, particularly under areas at risk from spillage such as car park and delivery areas.

Insulation materials containing substances known to contribute to stratospheric ozone depletion or with the potential to contribute to global warming will not be used. Natural insulation materials such as mineral wool, rock wool or cork board will be considered as they are amongst the lowest Global Warming Potential (GWP) rating. Furthermore, products with Environmental Product Declarations will be favoured over those which do not report environmental impacts such as embodied carbon, acidification and eutrophication.

#### 4.4.3 Air Quality

An Air Quality Assessment (AQA) has been undertaken by Mott MacDonald to support the planning application.

As the change in road traffic emissions is not expected to be significant, there has been no assessment of operational impacts. This approach has been agreed in advance with the Air Quality Support Officer at LCC. Furthermore, a Transport Strategy has been produced for the site which includes a number of soft measures such as preventing idling vehicles on match days and encouraging alternative modes of transport away from private car travel.

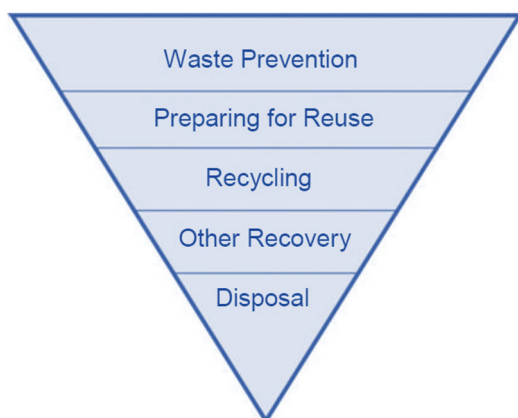
The AQA predicts that the construction activities will have a medium to high risk in terms of dust soiling and low risk in terms of PM<sub>10</sub> with no mitigation measures in place. A series of mitigation measures are recommended within the AQA including general site management measures, pollution prevention and management of delivery / collection vehicles.

Following these mitigation measures, air quality impacts are predicted not to be significant.

## 4.4 Waste Management

The proposed expansion will prioritise the minimisation of waste, and maximisation of recycling of any waste generated during demolition, construction and operation of the new stand. Where possible, materials will be diverted from landfill in line with the waste hierarchy shown in **Figure 4** below.

Figure 4: The Waste Hierarchy



### 4.4.1 Demolition Waste Management

It is recommended that a pre-demolition audit is undertaken to provide a quantifiable assessment of materials for reuse, recycling and energy recovery.

Possible measures for material use could include crushing existing bricks and concrete to be used as sub-base or melting existing tarmac to be reused within the proposed hard landscaping scheme. Where structural steel is removed in good condition, this could be re-used on site subject to structural integrity.

Where reuse on site is not possible, materials could be reused off site. Examples include donating carpet tiles for refurbishment, providing low-cost flooring to households and charities in the local area. Other items in good condition can either be donated to charities or sold on sites such as 'Globechain'; a broker service for unwanted resources.

Where assets cannot be reused, they should be diverted from landfill and recycled where feasible.

### 4.4.2 Construction Waste Management

Prior to the construction phase a CEMP will be developed to ensure the use of measures to minimise waste during the construction phase in line with the waste hierarchy.

The reduction, reuse and recycling of construction waste is to be prioritised through measures such as avoidance of over-ordering, supervision of deliveries, use of secure materials storage facilities and reuse of materials onsite where feasible.

Where waste cannot be avoided the development of a Site Waste Management Plan (SWMP) will outline the use of waste hierarchy to manage waste, minimise disposal and maximise reuse and recycling. Where waste must be taken to recycling/disposal facilities, these facilities must have the appropriate permits to ensure environmental risks are reduced.

Consideration will be made regarding transport of waste from site to avoid unnecessary emissions associated with vehicle movement.

### 4.4.3 Operational Waste Management

An Operational Waste Management Strategy will be developed, outlining how waste will be managed during operation of the new stand.

The Reds Going Green campaign already operates successful measures regarding waste management. Initiatives implemented so far by the Club, as outlined further within **Section 3**, include:

- Replacing plastic straws with paper;
- Replacing plastic cutlery with compostable cutlery;
- Fully recyclable drinking cups; and
- Biodegradable cornware food boxes.

These measures will be extended to the new stand to ensure continuity with the existing stadium and positive results already achieved.

A new waste storage area will be provided as part of the expansion, to enhance wider site operations. This area will provide a purpose built compound and 3 additional compactors to manage additional waste produced from the expansion. The location of this compound is



more efficient for stadium operators and reduces environmental and visual impact to the properties on Skerries Road.

For further information on the operational waste strategy, please refer to the Design and Access Statement submitted to support the planning application.

## 5. Summary & Conclusions

This Sustainability Statement has been prepared to demonstrate that the proposed Anfield Road Stand expansion responds positively in the state of climate emergency, by being resource and energy efficient, and resilient to the impacts of climate change.

The proposed expansion includes a range of sustainable design measures to respond positively to local and national Policy.

**Social and Economic Benefits** – The development aims to provide a range of social and economic benefits to supporters and the community, including:

- Continuation of the Reds Going Green Campaign including provision of an allotment to grow local produce for use within the hospitality areas and encouraging staff to volunteer at local charities and health services;
- Accommodation of approximately 7,000 more supporters within the stadium;
- Ability to host up to 12 entertainment events within the venue, providing a boost to local businesses and the city of Liverpool; and
- Encouragement of sustainable procurement practices to ensure that local, sustainably sourced materials and labour are prioritised.

**Environmental Protection and Enhancement** – Through a range of design measures the development aims to protect and enhance the local environment, through:

- Provision of measures to mitigate site biodiversity through replacement tree planting and protection measures for local wildlife;
- Creation of a new waste storage area with three additional compactors to manage waste;
- 

The use of measures to reduce pollution during construction and operation including measures related to air quality and water pollution; and,

- The specification of sustainable materials and construction methods which reduces resource use and reduces the environmental impact of development through good design.

**Mitigating and Adapting to Climate Change** – The development will incorporate a range of measures to reduce carbon emissions, mitigating the effects of climate change, and adaptation measures to ensure the long term resilience of the development to the effects of climate change.

Measures proposed at this stage include:

- A fabric first approach which adopts the energy hierarchy to reduce energy use and carbon emissions in line with Building Regulations Part L 2013;
- Building services strategy which provides energy through electricity to future proof the development for decarbonisation of the national grid;
- Use of renewable technology to generate energy on-site, in the form of ASHPs and solar PVs;
- Implementation of measures through the Reds Going Green campaign to reduce regulated and unregulated energy use during operation;
- Reducing energy demand through natural ventilation in areas where this is possible;
- Minimising overheating using mechanical cooling in hospitality areas;
- Reduce water consumption during occupation through a range of water efficiency measures including low flow sanitary fittings;
- Implementation of a Travel Plan to encourage staff to travel by sustainable modes of transport;

- Increasing cycle storage provision to encourage sustainable modes of transport by staff and visitors;
- Consideration of embodied carbon at construction stage, using lower impact materials and local suppliers where feasible; and
- Reducing existing surface water run-off rates by 30% using on-site SuDS, with a 20% allowance for climate change.

As such the proposed Anfield Stand expansion is clearly demonstrated to meet national and local planning policy regarding environmental aspects of sustainable development whilst at the same time supporting Liverpool Football Club's own sustainability objectives.

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