BLACKPOOL F.C. COMMUNITY TRUST PROPOSED AGP, ASSOCIATED PITCHES & PAVILION.

Flood Risk Assessment

Date 15.04.21

Notice

This report was produced by Lynas Engineers for Steve Wells Associates for the specific purpose of assessing the risk of flooding along with the strategy for draining the proposed development at Blackpool F.C. Community Trust.

This report may not be used by any person other than Steve Wells Associates without Steve Wells Associates express permission. In any event, Lynas Engineers accepts no liability for any costs, liabilities or losses arising as a result of the use of or reliance upon the contents of this report by any person other than Steve Wells Associates.

Document History

Job No. – 21019		Document No. - 21019-LE-ZZ-05-RP-D-0001				
Rev.	Status	Purpose Description	Orig.	Check	Auth.	Date
P01	S2	First Issue – For Information	SJD	WF	RL	15.04.21

Contents

Summary 2
Introduction 3
Background 3
Development Proposal 4
Purpose 5
Legislation, Policy and Guidance 6
National Planning Policy Framework 6
Development Site 11
General 11
Topography 14
Hydrological Setting 14
Historical Flooding 17
Surface Water Flooding 18
Fluvial Flooding 19
Reservoir Flooding 20
Existing Drainage 21
Surface Water Drainage 21
Proposed Drainage Strategy 22
Surface Water Runoff 22
MicroDrainage Calculations – 50% Betterment 23
Conclusion 26
Flood Risk Assessment 26
Appendices 28
Appendix A – Location Plan 29
Appendix B – Proposed Site Layout 30
Appendix C – Topographical Survey 31
Appendix D – Existing Drainage Records 32
Appendix E – Proposed Drainage Layout 33

Summary

1. Lynas Engineers was commissioned by Steve Wells Associates to undertake a Flood Risk Assessment (FRA) report in respect of the proposed AGP, changing pavilion, car parking facilities and additional works associated with the development.

2. The FRA has been produced in accordance with the National Planning Policy Framework (NPPF), standing advice and general requirements of the Environment Agency (EA), and the Blackpool Council Local Plan.

3. The FRA demonstrates the following:

    - The specific location designated for the surface water drainage system is located within Flood Zone 1 and is at a very low probability of fluvial flooding.
    - The proposed site is generally at a very low risk of flooding from surface water, although some areas of the site are designated as having a low to high risk of flooding from surface water.
    - The proposed site is not at risk of flooding from a reservoir failure.
    - The risk of flooding elsewhere from all sources of flooding will not change from the existing situation.

4. The Outline DS demonstrates the following:

    - The outline flow rates, capacities and means of disposal of the surface water runoff from the existing site.
    - The potential solutions for the attenuation/disposal of surface water runoff from the proposed site.
    - The outline surface water drainage philosophy for the proposed development.

Introduction

Background

1. Lynas Engineers have been appointed by Steve Wells Associates Ltd, to undertake an FRA in support of a planning application for the proposed development works on the site of the former Sands Way Coach Park; which is located to the north of Blackpool F.C.'s Bloomfield Road football stadium. A location plan of this area can be found in Appendix A.

2. This flood risk assessment accompanies the planning application to construct a new AGP, three 5-a-side pitches, a MUGA and Cruyff Court as well as changing facilities and associated car parking. The plan in Appendix B shows the layout of the proposed development.

3. Working in partnership with Blackpool Council, Blackpool FC Community Trust has identified a site in the Foxhall Village housing project to be developed as a "Sports Hub". At the heart of this vision is the need for facilities to support the delivery of Community Trust programmes which help change people's lives.

4. The Foxhall Village Sports Hub will be part of a larger facility campus managed by Blackpool FC Community Trust. The site is adjacent to the North Stand of the Bloomfield Road Stadium which houses the Trust Education and Community Centre, which was opened in 2018. The Trust proposes to further develop space in the East stand to host Further Education programmes.

5. This is an open site, and while some of the specialist football facilities might be enclosed and controlled, part of the site will remain open and accessible for informal sporting activity, play and casual recreation.

6. The site of the development occupies the site of a former coach park and is bordered by:

    - Seasiders Way and coach parking to the west;
    - the new Foxhall Village housing development to the west and north-west;
    - Rigby Road to the north;
    - Central Drive to the east; and
    - the football stadium and associated car parking to the south.

Development Proposal

1. The scope of the proposed development and the subject of this application is centred on the construction of a full sized fenced and floodlit Youth 11v11 grass pitch (91m x 55m), three 5-a-side 3G pitches, a 7-a-side Cruyff Court for informal football and a macadam MUGA. All floodlit artificial grass surfaces offer continued use during all but the most inclement weather.

2. In addition, the development of a new stand-alone single storey, traditionally constructed pavilion will provide a two-team changing facility plus officials' and accessible changing.

3. Lastly, the development will be supported by improvements to the highway access and an additional metalled car park providing 101 car park spaces plus 10 spaces dedicated to disabled users, along with provision for electric vehicle charging.

Purpose

1. A preliminary review of the flood maps for the area indicates that the site is located wholly within Zone 1 of the Environment Agency Flood Map, which is defined as land assessed as having a less than 1 in 1000 years (<0.1% AEP) annual probability of river or sea flooding in any one year.

2. The report is intended to provide an understanding of the flood risk associated with the existing site, assess whether the proposed development would be susceptible to flood risk and, if so, consider whether and how that flood risk can be managed in an acceptable manner, whilst also allowing for any climate change.

3. To assess whether the proposed development would increase the risk of flooding elsewhere.

4. Assess how surface water run-off from the existing site is disposed.

5. Assess the potential solutions for the disposal of surface water run-off from the proposed development site against relevant standards.

6. Identify any constraints associated with the potential solutions and identify the preferred solution for the discharge of surface water runoff from the proposed development.

7. Outline the surface water drainage philosophy for the proposed development site.

Legislation, Policy and Guidance

National Planning Policy Framework

1. NPPF sets out the Government's national policies on different aspects of land use planning in England.

2. Section 14: Meeting the challenge of Climate Change, Flooding and Coastal Change, states that "Planning plays a key role in helping shape places to secure radical reductions in greenhouse gas emissions, minimising vulnerability and providing resilience to the impacts of climate change, and supporting the delivery of renewable and low carbon energy and associated infrastructure. This is central to the economic, social and environmental dimensions of sustainable development".

3. NPPF provides the following guidance in respect of Planning and Flood Risk:

   155. Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

   156. Strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.

   157. All plans should apply a sequential, risk-based approach to the location of development – taking into account the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:

   a) applying the sequential test and then, if necessary, the exception test as set out below;
   b) safeguarding land from development that is required, or likely to be required, for current or future flood management;
   c) using opportunities provided by new development to reduce the causes and impacts of flooding (where appropriate through the use of natural flood management techniques); and
   d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.

158. The aim of the sequential test is to steer new development to areas with the lowest risk of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding.

159. If it is not possible for development to be located in zones with a lower risk of flooding (taking into account wider sustainable development objectives), the exception test may have to be applied. The need for the exception test will depend on the potential vulnerability of the site and of the development proposed, in line with the Flood Risk Vulnerability Classification set out in national planning guidance.

160. The application of the exception test should be informed by a strategic or site-specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. For the exception test to be passed it should be demonstrated that:

a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and
b) the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall.

161. Both elements of the exception test should be satisfied for development to be allocated or permitted.

162. Where planning applications come forward on sites allocated in the development plan through the sequential test, applicants need not apply the sequential test again. However, the exception test may need to be reapplied if relevant aspects of the proposal had not been considered when the test was applied at the plan making stage, or if more recent information about existing or potential flood risk should be taken into account.

163. When determining any planning applications, local planning authorities should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific flood-risk assessment. Development should only be allowed in areas at risk of flooding where, in the light of this assessment (and the sequential and exception tests, as applicable) it can be demonstrated that:

a) within the site, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;
b) the development is appropriately flood resistant and resilient;
c) it incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate;
d) any residual risk can be safely managed; and e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

164. Applications for some minor development and changes of use should not be subject to the sequential or exception tests but should still meet the requirements for site-specific flood risk assessments.

165. Major developments should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems used should:

a) take account of advice from the lead local flood authority;
b) have appropriate proposed minimum operational standards;
c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and
d) where possible, provide multifunctional benefits.

4. Using Table 2 from NPPF Technical Guidance (see Table 1), this site's Flood Risk Vulnerability classification is: Water-compatible (outdoor sports and recreation).

5. Using NPPF Technical Guidance Table 3 (see Table 2), as a simple chart, it shows whether the development should or should not be permitted and whether further information will be required for the planning application.

6. The site is located within Zone 1 and is therefore seen as appropriate.

Table 1: NPPF Technical Guidance Table 2

Vulnerability Classification	
Water-compatible Development	• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Table 2: NPPF Technical Guidance Table 3

Flood Zones	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test Required	✓	✓	✓
Zone 3a	Exception Test Required	×	Exception Test Required	✓	✓
Zone 3b	Exception Test Required	×	×	×	✓

Key:

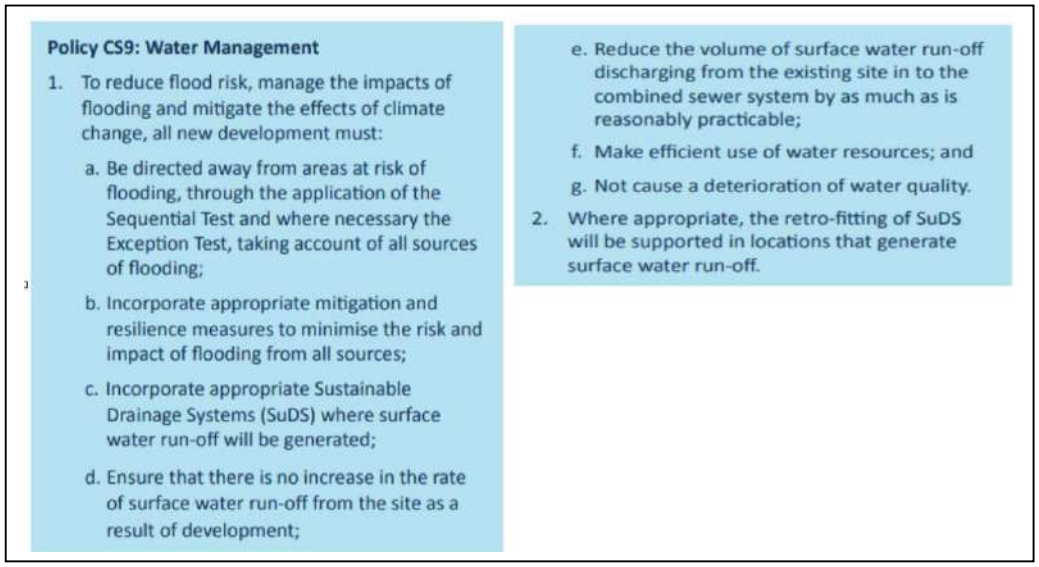
✓ Development is appropriate.

× Development should not be permitted.

Local Policy – Blackpool Council

1. At the time of producing this FRA the current development plan for the area is 'Blackpool Local Plan – Part 1: Core Strategy – Proposed Submission, June 2014.

2. Policy CS9: Water Management provides the following guidance for developers within Chapter 5 of the document.



Policy CS9: Water Management

1. To reduce flood risk, manage the impacts of flooding and mitigate the effects of climate change, all new development must:
   a. Be directed away from areas at risk of flooding, through the application of the Sequential Test and where necessary the Exception Test, taking account of all sources of flooding;
   b. Incorporate appropriate mitigation and resilience measures to minimise the risk and impact of flooding from all sources;
   c. Incorporate appropriate Sustainable Drainage Systems (SuDS) where surface water run-off will be generated;
   d. Ensure that there is no increase in the rate of surface water run-off from the site as a result of development;
   e. Reduce the volume of surface water run-off discharging from the existing site in to the combined sewer system by as much as is reasonably practicable;
   f. Make efficient use of water resources; and
   g. Not cause a deterioration of water quality.
2. Where appropriate, the retro-fitting of SuDS will be supported in locations that generate surface water run-off.

3. Chapter 5, Point 5.130 to Point 5.145 inclusive, provides guidance to landowners and developers with regards to SuDS, flooding and groundwater issues within Blackpool. The report can be seen by following the link below:

   https://www.blackpool.gov.uk/Residents/Planning-environment-and-community/Documents/Proposed-Submission-Core-Strategy.pdf

4. Local Planning Authorities are required to undertake a Strategic Flood Risk Assessment (SFRA). Such assessments will identify areas that are at risk from flooding and will also identify factors that influence both the current and future flood risk.

5. In October 2013, Lancashire County Council and Blackpool Council jointly produced the Lancashire and Blackpool Flood Management Strategy. Where appropriate, evidence and recommendations from this report have been incorporated into the FRA, prepared by Lynas Engineers, for the proposed development.

6. The flood management strategy can be found using the following link:

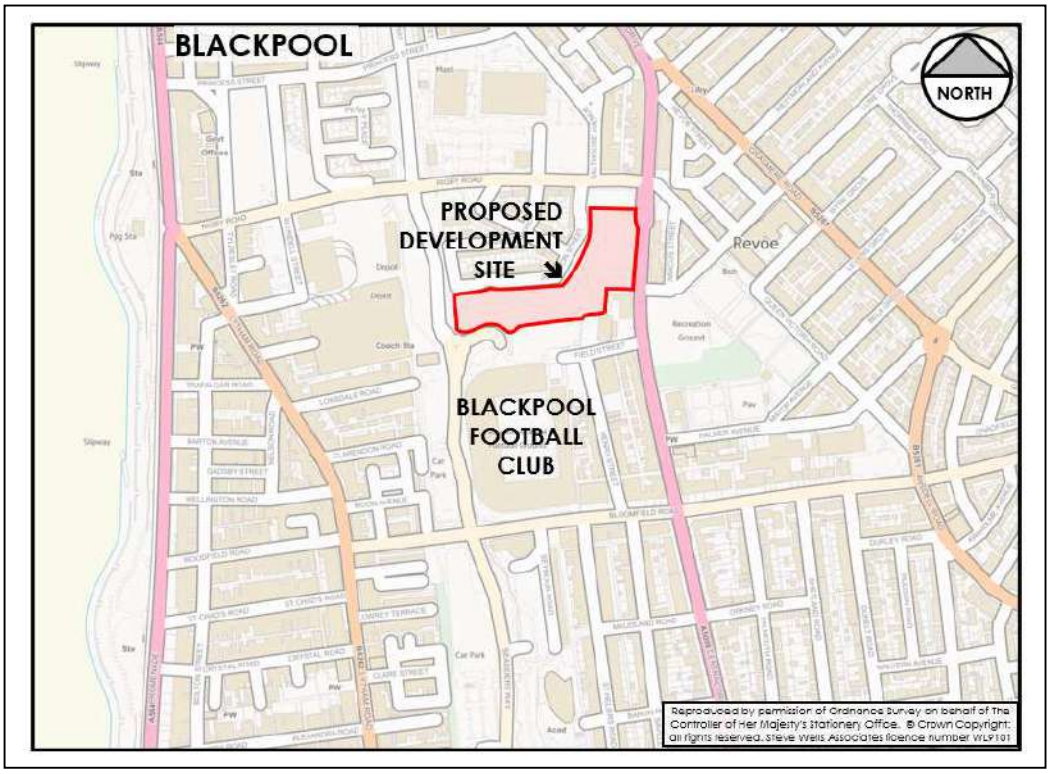
   https://www.lancashire.gov.uk/media/900474/lancashire-and-blackpool-local-flood-risk-management-strategy-consultation-draft.pdf

Development Site

General

1. Figure 1 (shown below) is an OS extract illustrating the location of the development site in context of the wider conurbation. The grid reference for the site is SD311349. The coordinates are centred on the proposed pavilion X: 331147 Y: 434982). The nearest post code for the development site is FY1 5FL. A location plan can be seen in Appendix A.

Figure 1



2. Information from historical maps (circa 1895) records the site as an open field. To the west of the development site, which is currently the site of the Seasiders Way Car Park, was a series of sidings belonging to the Lancashire and Yorkshire Railway.

3. In 1899, a stadium was built to the east of the railway sidings, with the main entrance to the stadium located on Bloomfield Road. Figure 2 (shown on the next page) is an aerial photograph of the stadium, taken in 1951. To the north-east of the photograph is a large car park, this parcel of land is the proposed development site.

Figure 2 – Bloomfield Road Stadium

4. Currently, the site of the proposed development occupies a redundant coach park to the south of the Foxhall Village housing development, which is being delivered as a part of the masterplan for Revoe.

5. Blackpool Council has developed proposals with Blackpool FC and Blackpool FC Community Trust to harness the opportunity of Town Deal Funding to kick start the Revoe Master Plan with a Revoe Sports Hub development to complete the Foxhall Village site.

6. The Sports Hub plans include the development of a new East Stand at Blackpool Football Club as well as the proposed facilities which are the focus of the planning application. This FRA has been produced to accompany the planning application.

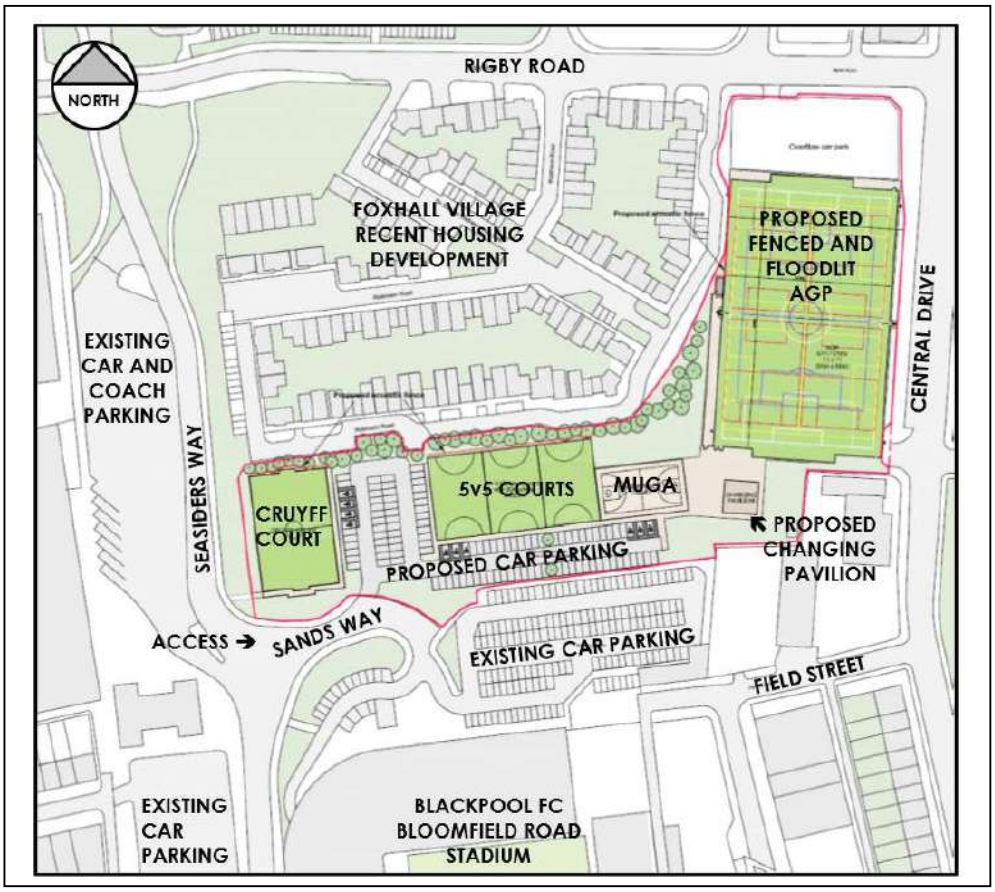
7. The proposed facilities include the construction of a full sized fenced and floodlit Youth 11 v 11 grass pitch, three 5-a-side 3G pitches, a 7-a-side Cruyff court (for informal football games) and a macadam multi-use games area (MUGA).

8. A new stand-alone single storey pavilion will provide a two-team changing facility plus officials' and accessible changing rooms.

9. Proposals for additional parking will provide 111 new car parking spaces which include 8 spaces supported by EV changing points and 10 formally marked out for disabled badge holders. Additional parking will be accessed off Seasider's Way and the Sands Way highway entrance. Secure cycle parking will also be made through the provision of 12 'Sheffield' cycle hoops (for 24 cycles).

10. Figure 3 illustrates the general arrangements for the proposed development within the red line boundary of the site. A detailed plan of the proposed development can be viewed in Appendix B.

Figure 3



11. The proposed surface water drainage will convey run-off from the proposed AGP, MUGA, three 5-a-side pitches, Cruyff court, car park and changing pavilion. The surface water runoff will drain through a petrol interceptor prior to entering the existing combined sewer. The drainage network will provide adequate storage to attenuate the surface water volumes for a critical 1 in 100-year storm +40% climate change on site.

12. Ultimately, the surface water runoff will be discharge at a controlled rate into the existing United Utilities sewer, which is in the carriageway to the west of the site.

Topography

1. A topographical survey on the existing site was commissioned by Steve Wells Associates in October 2020. All information relating to levels presented in this report have been taken from this topographical survey. A copy of the survey is attached in Appendix C.

2. The topographical survey shows the extent of the existing site along with the current boundary treatments. The survey indicates that there are several extensive spoil heaps occupying the site, which are made up of topsoil, sub-soil, tarmac and mixed materials.

3. The area to the west of the site, which is adjacent to Seasiders Way, is mainly laid to macadam and concrete. There is an informal route across the development plot. In the south-east corner of the site is an existing electrical substation.

4. The site has served as the site compound for the Foxhall Village housing development.

5. The general topography of the site falls from west to the east and south to north. The surface of the site is relatively flat with areas of unevenness due to the varying surfaces and spoil. The highest point on the proposed development site is located on the western edge of the site in front of the site hoarding, at 6.93m AOD, with the lowest point located in the north-eastern corner of the site at 4.04m AOD.

6. A shallow gradient, from the south of the plot (in front of the electrical substation) to the north of the site, equates to approximately 1 in 172.6.

7. The northern boundary line along Rigby Road runs from 4.53m AOD to 4.27m AOD in an easterly direction.

8. The southern boundary line runs from 6.22m AOD to 5.16m AOD, west to east.

Hydrological Setting

1. The nearest water body to the site is the Irish Sea, which is located to the approximately 505m to the west of the site.

2. The nearest statutory river is the River Wyre which is located approximately 5.0km north-east of the site.

Hydrogeological Setting

1. The specific location of the proposed development has not been identified within the Blackpool Council Level 1 Strategic Flood Risk Assessment. The document can be found using the following link:

   https://www.blackpool.gov.uk/Residents/Planning-environment-and-community/Documents/Local-plan-2021/FINAL-Blackpool-SFRA-Update-December-2020-Accessible.pdf

2. Figure 4 is a screenshot taken from the British Geological Survey. The superficial deposits across the development site consists of peat and the bedrock geology is Singleton Mudstone Member from the Triassic period. The position of the development site in relation to the geological information is indicated by the red outline.

   Figure 4

3. The green square in the north-eastern corner of Figure 4 indicates a historical borehole location. The data for borehole number SD33NW317 is held by the BGS. The borehole was sunk to a depth of 10.7m and indicates that:

   - The initial 1.2m consists of made-ground;
   - The next layers are 4.6m deep in total and are made up of various layers containing peat with rootlets;
   - The next layer is only 0.3m deep and is made up of coarse sand and gravel;
   - The final 5.10m of the borehole records a stiff to very stiff, brown silty and sandy clay containing fine to medium sub angular to sub round gravel.

4. Given the geology recorded in the borehole, infiltration would be an unsuitable drainage solution for the site.

5. The Groundwater Vulnerability Map on Defra's Magic classifies most of Blackpool as having a medium, medium to low or low vulnerability to ground water. There is no identified flood risk at the development site relating to ground water flooding and the mapping system records the proposed development site as having a low vulnerability to groundwater flooding.

Historical Flooding

1. Blackpool Council's Level 1 Strategic Flood Risk Assessment, dated December 2020, states that the Authority holds historical flooding records on their database, as does the Environment Agency, United Utilities, and the Lancashire Resilience Forum.

2. The strategy can be viewed using this link:

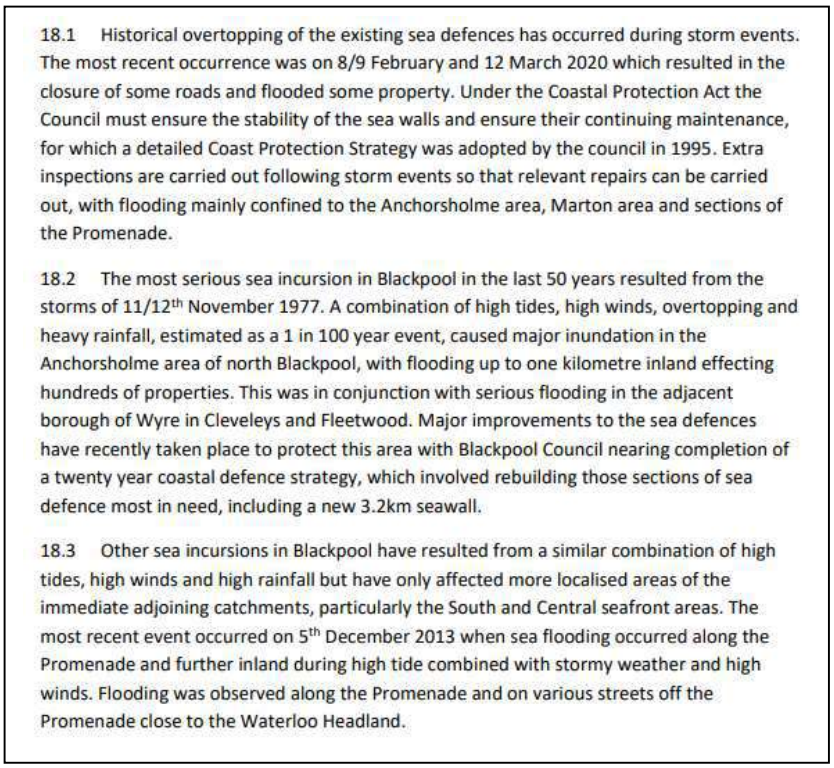
   https://www.blackpool.gov.uk/Residents/Planning-environment-and-community/Documents/Local-plan-2021/FINAL-Blackpool-SFRA-Update-December-2020-Accessible.pdf

3. Blackpool is an area of relatively flat, low lying land that is protected from coastal erosion and tidal inundation by modern sea defences. In general, the risk of fluvial and coastal flooding is relatively low.

4. The main risks of flooding in Blackpool are from surface water and capacity constraints in the combined sewer network.

5. Section 18 in Blackpool Council's SFRA describes some of the most significant flooding events that have occurred in the town. A number of these storm events have led to the overtopping of the existing sea defences due to a combination of high tides, high winds, and heavy rainfall. These storms have resulted in various areas of the promenade and beyond suffering from flooding. Figure 5 is a screenshot taken from section 18 of the SFRA and describes in more detail the effects of the flooding.

   Figure 5



18.1 Historical overtopping of the existing sea defences has occurred during storm events. The most recent occurrence was on 8/9 February and 12 March 2020 which resulted in the closure of some roads and flooded some property. Under the Coastal Protection Act the Council must ensure the stability of the sea walls and ensure their continuing maintenance, for which a detailed Coast Protection Strategy was adopted by the council in 1995. Extra inspections are carried out following storm events so that relevant repairs can be carried out, with flooding mainly confined to the Anchorsholme area, Marton area and sections of the Promenade.

18.2 The most serious sea incursion in Blackpool in the last 50 years resulted from the storms of 11/12th November 1977. A combination of high tides, high winds, overtopping and heavy rainfall, estimated as a 1 in 100 year event, caused major inundation in the Anchorsholme area of north Blackpool, with flooding up to one kilometre inland effecting hundreds of properties. This was in conjunction with serious flooding in the adjacent borough of Wyre in Cleveleys and Fleetwood. Major improvements to the sea defences have recently taken place to protect this area with Blackpool Council nearing completion of a twenty year coastal defence strategy, which involved rebuilding those sections of sea defence most in need, including a new 3.2km seawall.

18.3 Other sea incursions in Blackpool have resulted from a similar combination of high tides, high winds and high rainfall but have only affected more localised areas of the immediate adjoining catchments, particularly the South and Central seafront areas. The most recent event occurred on 5th December 2013 when sea flooding occurred along the Promenade and further inland during high tide combined with stormy weather and high winds. Flooding was observed along the Promenade and on various streets off the Promenade close to the Waterloo Headland.

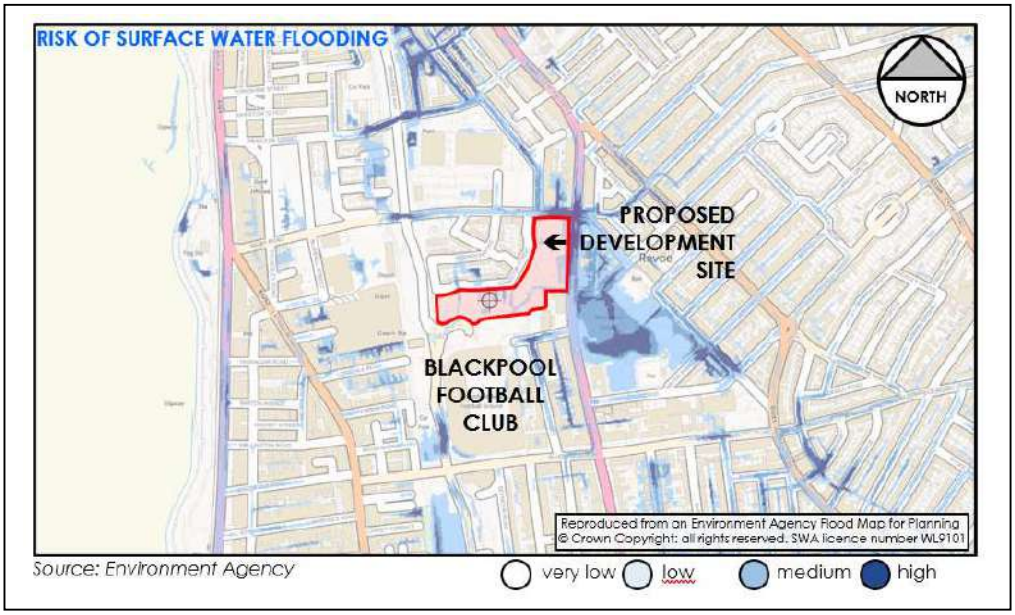
Surface Water Flooding

1. Figure 6 shows the proposed site, within the red line boundary, in relation to the EA's surface water flooding records.

2. The majority of the site is in a very low risk area of surface water flooding. The map indicates various areas of surface water flooding concentrated along the eastern boundary of the site, as well as localised ponding to the northern boundary of the site, which runs adjacent to Johnston Street. The surface water flooding in these areas should not reach depths of more than 300mm. The remainder of the site is in a very low risk area of surface water flooding.

3. Once the site is cleared and levelled, the areas prone to surface water flooding and localised ponding will be addressed by the installation of the surface water drainage network.

Figure 6 - Flood Risk from Surface Water



Fluvial Flooding

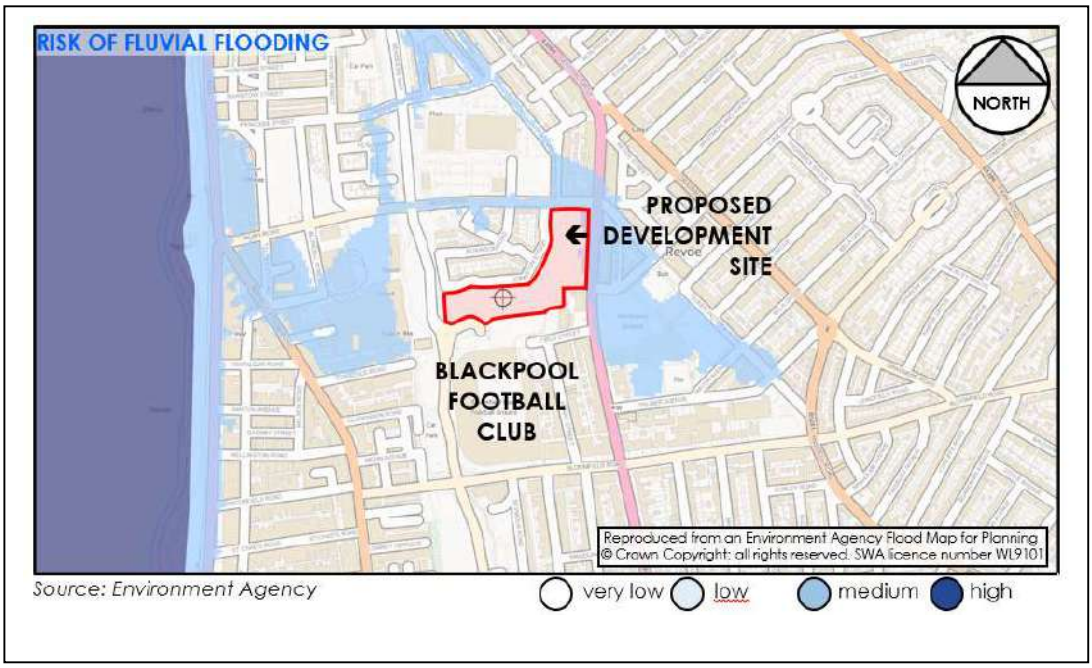
1. The nearest water body to the site is the Irish Sea, which is located approximately 505m to the west of the site.

2. Figure 7 shows the proposed site, the location is indicated by the crosshairs, in relation to the EA's river and sea flooding records.

3. The closest main river to the development site is the River Wyre, which is approximately 5.0km north-east of the site.

4. The site is in a low-risk area of fluvial flooding.

Figure 7 Flood Risk from Rivers or the Sea



Reservoir Flooding

1. There are two reservoirs in Blackpool. There is a covered reservoir adjacent the water tower on Leys Road in Bispham. This reservoir has a capacity of 114,000m3 of water and is owned and managed by United Utilities.

2. Marton Mere is an open reservoir with a capacity of 205,5774m3 of water and is managed by Blackpool Council.

3. Although not classified as a reservoir, Stanley Park Lake was created by impounding the Layton Brook and covers 22 acres (8.9 hectares) and holds approximately 127,300m3 of water. The Lake is connected to Whinney Heys Dyke and Marton Mere and forms part of the Main Dyke system that discharges into the River Wyre at Poulton Le Fylde.

4. Marton Mere Reservoir is the closest reservoir to the development site and is located approximately 3.2km to the east of the site. The development would not be affected if a reservoir breach occurred.

Existing Drainage

Surface Water Drainage

1. Factors influencing the amount of runoff generated from the site include its extent and type of surface cover.

2. The total area to be drained is 2.005 hectares which includes the AGP, MUGA, the three 5-a-side courts, the Cruyff court, associated parking as well as the area surrounding the changing pavilion.

3. The existing sewer information, which can be viewed in Appendix D, indicates that a 1275mm Ø combined sewer runs in a southerly direction adjacent to the western boundary of the site. There are no manhole chambers or gullies within the site extents. Though it is anticipated previous site flows entered this existing system.

4. Part 1 of Blackpool Council's Local Plan states that developers should aim to reduce the surface water discharge from previously developed sites by a minimum of 30%. Figure 8 shows Point 5.141 from the Local Plan. The document can be viewed using the following link:

   https://www.blackpool.gov.uk/Residents/Planning-environment-and-community/Documents/Proposed-Submission-Core-Strategy.pdf

   Figure 8 – Excerpt from Part 1 of Blackpool Council's Local Plan

> 5.141 To reduce the risk of flooding it is important that new development does not add more surface water to the sewer network. Where possible, developers are also encouraged to go further by taking opportunities to reduce surface water run-off rates from previously developed sites by as much as is reasonably practicable. On greenfield sites, applicants will be expected to demonstrate that the current natural discharge solution from the site is at least replicated. On previously developed sites, applicants should target a reduction of at least 30% in surface water discharge, rising to a target of 50% in critical drainage areas.

Proposed Drainage Strategy

Surface Water Runoff

1. Surface water runoff from the proposed development will be attenuated within the construction layers of the AGP and MUGA.

2. Once the site of each footprint is excavated to a depth of around 300mm below finished levels, a formal piped drainage system is installed below this formation. This system will be constructed with laterals at 10m and 5m centres connecting to a main carrier drain running the length of the AGP and smaller areas. The AGP will connect to a flow restrictor chamber. This method of drainage will be repeated for the other pitch areas.

3. Above the drainage layer, the formation is covered by a geotextile and a compacted Type 3 (reduced fines) stone sub-base at generally 250mm compacted thickness over which a level open textured porous macadam base is laid to support the artificial grass playing surface.

4. The artificial grass carpet, its backing, the macadam base, the stone sub-base and the geotextile are all porous. Rainwater falling onto the AGP will percolate down through the sub-base to the formation level below, to the piped land drainage system, and then to the outfall.

5. Surface water runoff from the changing pavilion surrounds and the macadam car park will be directed via road gullies in the surface water drainage network.

6. The surface water run-off from the entire site will pass through a petrol interceptor before being discharged at a controlled rate, via a flow control chamber. Ultimately the proposed surface water drainage system will connect into United Utilities combined sewer.

7. The runoff rate for the proposed development will be calculated using the Modified Rational Method at a rate of 50% betterment, in accordance with Blackpool Council's Local Plan and NPPF Guidance.

8. Within the permeable layers of the proposed AGP and smaller pitches there is approximately 873m^3 of attenuation available.

MicroDrainage Calculations – 50% Betterment

1. Previously developed sites are sometimes referred to as brownfield sites. However, a brownfield site is also used to denote a polluted or contaminated site. The term "previously developed" is now being used to refer to non-greenfield sites and different hydraulic criterion are applied to specify the control of discharge from the site.

2. The current position on the redevelopment or improvement of a previously developed site is that surface water run-off management should provide "betterment", assuming there is little or no run-off control from the site.

3. A betterment of 50% is seen as being a reasonable target for a previously developed site.

4. Betterment is achieved by demonstrating that the proposed runoff from the site is less than the flow rate which was previously discharged from the site.

5. Taking this into account, the proposed development can be considered as being located on a previously developed site, as the site was once occupied by a coach park with associated highway drainage.

6. The proposed works are not increasing the amount of existing impermeable area and arguably the drainage network within the development will improve the quality of the water being discharged into the existing United Utilities system.

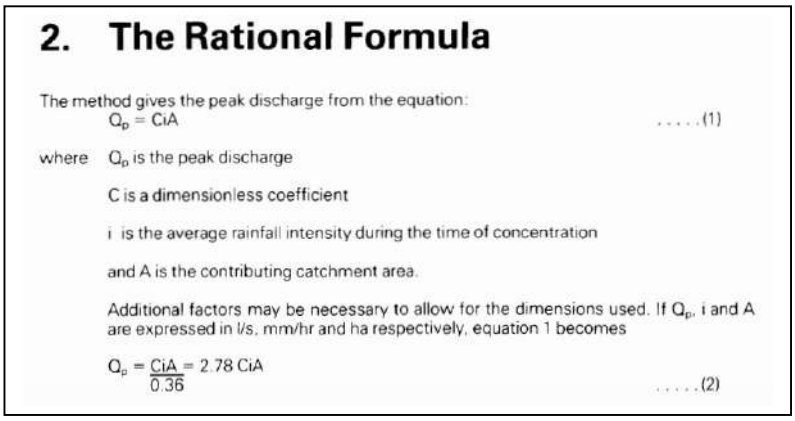
7. In order to calculate a 50% betterment flow rate for the proposed development, the original flow rate of the site was required. This was calculated using The Wallingford Modified Rational Method. Figure 9 shows an excerpt of the calculation taken from Volume 4 - The Modified Rational Method. This document can be viewed using the following link:

   https://eprints.hrwallingford.com/37/2/Volume4_Modified_Rational_Method.pdf

8. Figure 9 can be seen on the next page and accompanies the 50% Betterment calculation.

9. The calculation is based on treating the entire site as impermeable.

Figure 9 – The Rational Formula



2. The Rational Formula

The method gives the peak discharge from the equation:

$$Q_p = CiA \qquad \ldots\ldots(1)$$

where Q_p is the peak discharge

C is a dimensionless coefficient

i is the average rainfall intensity during the time of concentration

and A is the contributing catchment area.

Additional factors may be necessary to allow for the dimensions used. If Q_p, i and A are expressed in l/s, mm/hr and ha respectively, equation 1 becomes

$$Q_p = \frac{CiA}{0.36} = 2.78\,CiA \qquad \ldots\ldots(2)$$

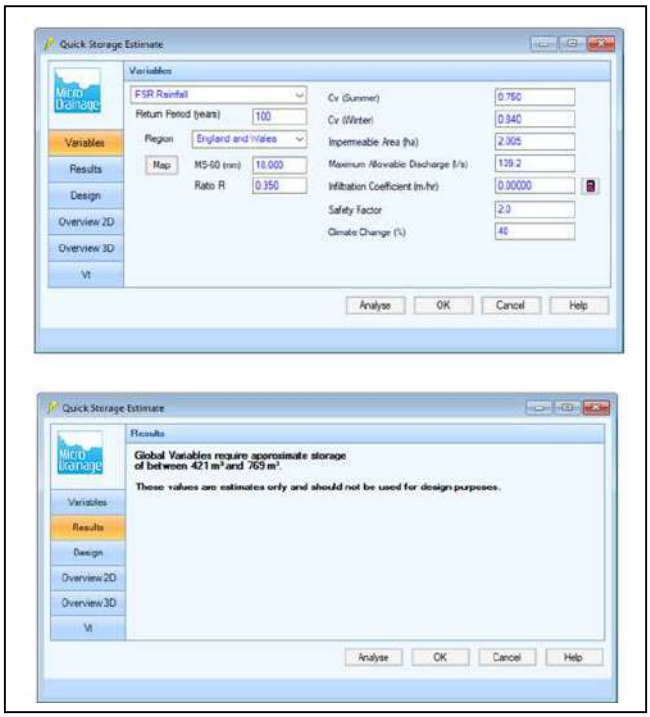
10. Using the Rational Formula, the discharge rate with 50% betterment has been calculated as 139.24l/s.

Original flow rate (50mm Rainfall Rate): 50mm x 2.005 hectares/0.36
100.26l/s / 0.36
= 278.49l/s

50% Betterment: 278.49l/s / 2
= 139.24l/s

11. Using MicroDrainage software and the calculated discharge rate of 139.24l/s, a quick storage estimate was produced to ascertain the amount of storage required to mitigate a critical 1 in 100-year storm + 40%. The results can be seen in Figure 10.

Figure 10 – Quick Storage Estimate 50% Betterment



12. The storage estimate results show that for a critical 1 in 100-year +40%CC the storage for the site will need to be between 421m^3 and 769m^3 of storage on site, as stated in Figure 10. The average amount of on-site storage required to mitigate a 1 in 100-year + 40% climate change storm event is 595m^3.

13. Considering that there is approximately 873m^3 of available storage underneath the proposed pitches, there is more than enough storage volume to attenuate the surface water discharge produced by a 1 in 100-year storm event + 40% climate change. This removes the need for additional on site in the way of cellular attenuation.

14. A plan illustrating the proposed drainage strategy can be seen in Appendix E.

Conclusion

Flood Risk Assessment

1. The risk of river, reservoir, groundwater, and surface water runoff has been assessed and measures have been recommended to minimise this flood risk to/from the site.

2. In summary:
    - The site is located inside Flood Zone 1 and is therefore inside the currently defined as land having a less than 1 in 1,000 annual probability of river or sea flooding;
    - There are no records of fluvial flooding, or surface water flooding at the existing site;
    - There is no risk of a reservoir breach flooding the site;
    - The development site has not been identified as a Critical Drainage Area;
    - Surface water is proposed to be collected from proposed AGP, the smaller pitches, the area surrounding the changing pavilion and the associated car parking via the proposed surface water drainage system;
    - There is adequate storage available to mitigate the runoff created by a 1 in 100 year storm + 40% climate change within the layers beneath the proposed pitches;
    - Surface water runoff from the 11-a-side AGP will be attenuated within the construction layers beneath the surface of the pitch. The runoff will be discharged at a controlled rate into the surface water drainage network via a flow control. The drainage for the three 5-a-side pitches, Cruyff court and MUGA will follow this design;
    - The surface water runoff from the car parking and the area surrounding the changing pavilion will be collected by highway gullies. This runoff will be combined with the runoff from the pitches and conveyed through a petrol interceptor, which will mitigate the risk of any fuel or pollution entering the existing combined system.
    - Ultimately, the surface water runoff from the proposed development will be discharged into the existing United Utilities combined sewer at an agreed controlled rate.

3. The proposals for the site will not impact on the current flood risk.

4. The proposals have minimal impact on increasing the existing flood risk from any source, with minimal impact of causing flooding elsewhere.

5. Using the below table, Table 3, to determine the appropriateness of the land drainage, it is concluded that the development is appropriate. The table can be seen on the next page.

Table 3. Appropriateness of Development

Source/Pathway	Significant?	Comment/Reason
Tidal/Coastal	No	The Irish Sea is located approximately 505m west of the site therefore is the risk of tidal/coastal flooding is classified as very low risk.
Fluvial	No	Environment Agency Mapping indicates that flooding from the River Wyre, which is located 5km to the north east of the site, will not affect the site.
Infrastructure Failure: Reservoir	No	Environment Agency Mapping indicates that flooding from Marton Mere Reservoir, which is located 3.2km to the east of Blackpool FC Community Trust, will not affect the site.

Appendices

Appendix A – Location Plan

KEY:

PROPOSED DEVELOPMENT SITE

NOTES:

1. THE NEAREST POSTCODE TO THE PROPOSED SITE IS FY1 5FL.
2. SITE COORDINATES - X: 331147, Y: 434982 (CENTERED ON PROPOSED CHANGING PAVILION)
3. NATIONAL GRID REFERENCE FOR SITE - SD 311349

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS

S2	FOR INFORMATION	15.04.21	RSL
Stat	Purpose of Issue	Date	Auth

P01	FIRST ISSUE	SJD	15.04.21	WF	RSL
Rev	Description	By	Date	Chk'd	Auth

Lynas Engineers
Wilton Centre
Redcar
TS10 4RF
Tel: +44 (0)1642 438273
www.lynasengineers.com

Copyright © Lynas Engineers Limited (2020)

Client

STEVE WELLS ASSOCIATES

Project

BLACKPOOL F.C. COMMUNITY TRUST
PROPOSED SPORTS HUB

Title

LOCATION PLAN

Sheet Size	Original Scale	Designed/Drawn	Checked	Authorised
A1	NTS	SJD	WF	RSL
		Date 14.04.21	Date 15.04.21	Date 15.04.21

Status	Drawing Number	Rev
S2	21019-LE-ZZ-ZZ-DR-D-0001	P01

Appendix B – Proposed Site Layout

Copyright Notice:
This drawing is the copyright of Steve Wells Associates and shall not be reproduced without permission. © 2020

Dwg. Purpose **Feasibility**

No.	Revision / Issue	Date
C	AGP goal recesses amended	15.03.21
B	Basketball court position moved and site adjusted accordingly	02.03.21
A	Car park amended to improve green bank to north	02.03.21

Project
Proposed AGP and Associated Pitches and Pavilion at Blackpool F.C. Community Trust
Seasiders Way
Blackpool FY1 6JJ

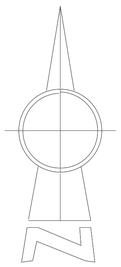
Client
Blackpool F.C. Community Trust

Dwg. Title
Proposed Site Plan
Option 2 - South Car Park

STEVE WELLS ASSOCIATES
Churchill House, Mill Hill, Pontefract, West Yorkshire, WF8 4HY t : 01977 797258 e: mail@stevewells-associates.com

Dwg. No. 205-068-0003
Rev. C
Scale 1:1250 @ A3
Date Janurary 2021
Drawn by JLR
Checked DKW

Appendix C – Topographical Survey



© Essential Construction Services Ltd 2020

Notes:

1. The accuracy and content of this drawing are dependent on the surveyed scale and survey specification, care should be taken when working with other plotted scales or from CAD.

2. ECS Ltd survey 23.10.2020 undertaken using GPS Smart Rover.

Survey Control Data:

Datum for Levels: OS GPS Datum (OSGM15)
Bench Mark:
Value:
Grid: OSGB36(15)

Rev	Description of revision	Date
A	Issued to Surfacing Standards for Review	25.10.20

Site Name:
Surfacing Standards
Seasiders Way
Blackpool

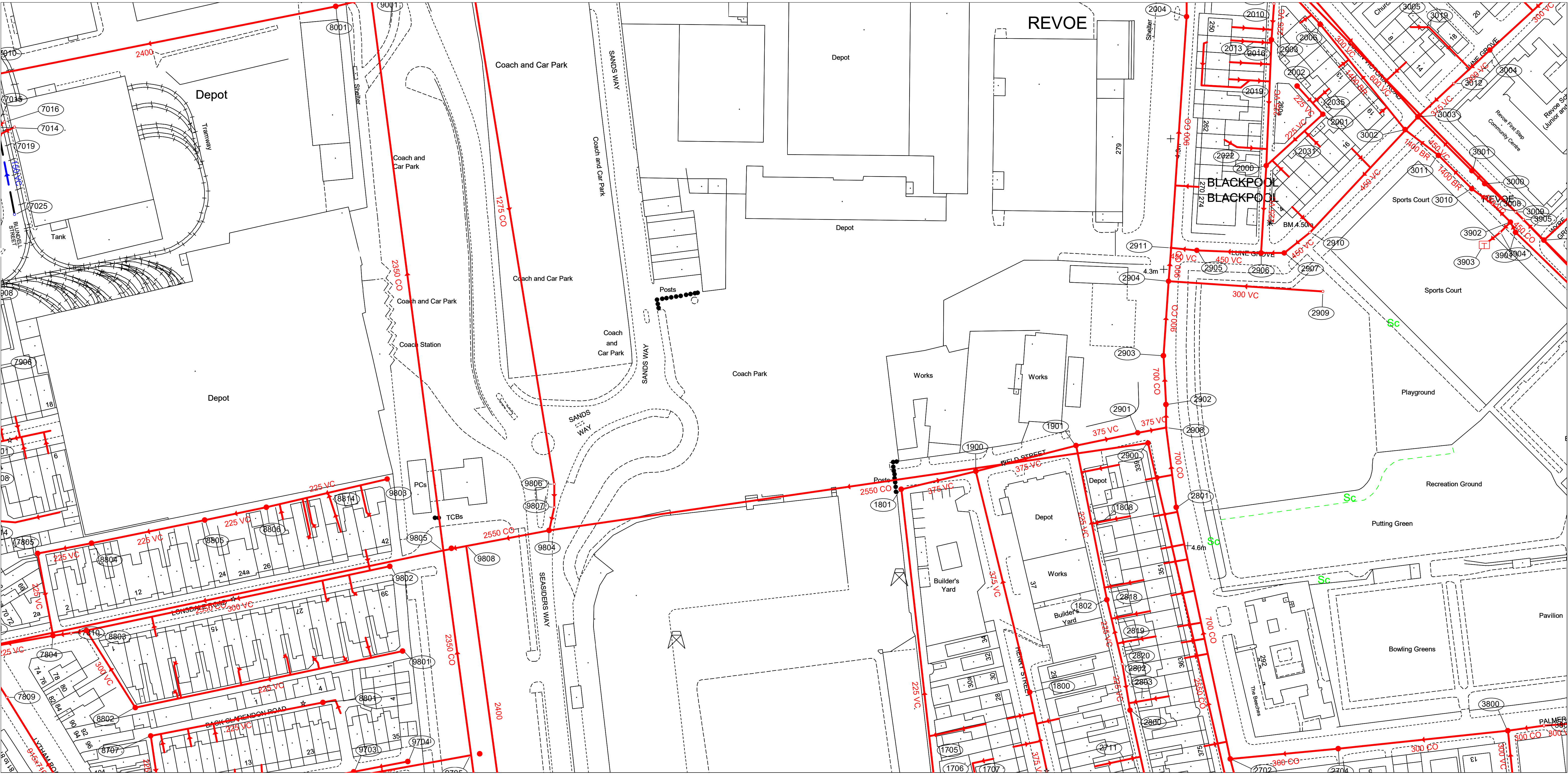
Surveyed:	Drawn:	Checked:
JG	JG	JR

Title
Topographic Survey

Plotted Scale:	Date:	Sheet Size:
1:500 @A1	25th Oct 2020	A1

Drawing No.	Revision
ECS1185~SS~SW~B~001	A

Appendix D – Existing Drainage Records


REVOE
BLACKPOOL
Depot
Coach and Car Park
Coach and Car Park
Coach and Car Park
Coach and Car Park
Coach Station
Coach and Car Park
Coach Park
Tramway
Shelter
Tank
BLUNDELL STREET
SANDS WAY
SANDS WAY
SANDS WAY
SEASIDERS WAY
Posts
PCs
TCBs
Works
Works
Builder's Yard
Builder's Yard
Depot
HENRY STREET
FIELD STREET
LONSDALE ROAD
BACK CLARENDON ROAD
LYTHAM ROAD
LUNE GROVE
Sports Court
Sports Court
Playground
Recreation Ground
Putting Green
Bowling Greens
Pavilion
The Beeches
Revoe First Step Community Centre
BM 4.50m
4.3m
4.6m
Sc
2400
2350 CO
1275 CO
2550 CO
225 VC
300 VC
375 VC
450 VC
600 VC
900 CO
700 CO
1400 BR
450 CO
300 CO
150 VC
915x710
2004
2010
2013
2016
2019
2022
2000
2003
2006
2002
2035
2001
2031
3002
3003
3005
3019
3012
3004
3001
3011
3000
3010
3008
3009
3905
3902
3903
3901
3904
2911
2905
2906
2907
2910
2904
2909
2903
2902
2901
2908
1901
1900
1801
2900
2801
1808
1802
2818
2819
2820
2802
2803
1800
2800
2711
1705
1706
1707
2702
2704
3800
8001
9001
7010
7015
7016
7014
7019
7025
7906
7805
8804
8805
8806
8814
9803
9805
9808
9806
9807
9804
9802
8803
7810
7804
7809
8802
8707
8801
9801
9703
9704

Appendix E – Proposed Drainage Layout

KEY:

- 160mm PERFORATED DRAIN PIPE
- 160mm PROPOSED SURFACE WATER PIPE
- 80mm LATERAL DRAINS (AGP @10m centres, others @ 5m centres)
- 100mm BUILDING DRAINAGE
- 100mm CAR PARK DRAINAGE
- MH — MANHOLE 900mm Ø
- HB — HYDRO BRAKE CHAMBER
- PI — PETROL INTERCEPTOR

NOTES:

1. THIS PLAN ILLUSTRATES THE PROPOSED SURFACE WATER DRAINAGE NETWORK THE PROPOSED DEVELOPMENT, LOCATED TO THE NORTH OF BLACKPOOL F.C.'S STADIUM, SEASIDERS WAY, BLACKPOOL, FY1 6JJ.
2. ATTENUATION FOR THE SURFACE WATER RUNOFF IS PROVIDED IN THE CONSTRUCTION LAYERS BENEATH THE AGP, 5-A-SIDE PITCHES, MUGA AND CRUYFF COURT. THE RUNOFF FROM THESE AREAS WILL BE DISCHARGED INTO SURFACE WATER DRAINAGE SYSTEM AT A CONTROLLED RATE VIA FLOW CONTROL DEVICES .
3. A BYPASS SEPARATOR WILL MITIGATE ANY FUEL OR POLLUTATNTS ENTERING THE EXISTING COMBINED SEWER. THE BYPASS SEPARATOR IS TO BE SPECIFIED DURING DETAILED DESIGN.
4. PROPOSED ROUTE OF SURFACE WATER DRAINAGE SYSTEM IS INDICATIVE. THE LOCATION OF THE CONNECTION TO THE EXISTING UNITED UTILITIES SEWER WILL NEED TO BE ESTABLISHED DURING DETAILED DESIGN ON RECEIPT OF FURTHER UTILITY INFORMATION.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS

Rev	Description	By	Date	Chk'd	Auth
S2	FOR INFORMATION		15.04.21		RSL
P01	FIRST ISSUE	SJD	15.04.21	WF	RSL

Lynas Engineers
Wilton Centre
Redcar
TS10 4RF
Tel: +44 (0)1642 438273
www.lynasengineers.com

Copyright © Lynas Engineers Limited (2020)

Client: STEVE WELLS ASSOCIATES

Project: BLACKPOOL F.C. COMMUNITY TRUST
PROPOSED SPORTS HUB

Title: PROPOSED SURFACE WATER DRAINAGE LAYOUT

Sheet Size	Original Scale	Designed/Drawn	Checked	Authorised
A1	NTS	SJD	WF	RSL
		Date 14.04.21	Date 15.04.21	Date 15.04.21

Status	Drawing Number	Rev
S2	21019-LE-ZZ-ZZ-DR-D-0001	P01

L:\12-21-Projects\21019-Steve Wells - Blackpool FCCT\04_Project Delivery\02_Drawings\DR_2D Drawing\21019-LE-ZZ-ZZ-DR-005-PROPOSED DRAINAGE LAYOUT.dwg