

CONTENTS

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1.0	INTRODUCTION	4	5.3.	BUILDING PARTI AND LEGIBILITY	45	7.15.	BREEAM CREDITS	112
1.1.	OVERVIEW	4	5.4.	GROUND FLOOR LAYOUT	47	7.14.	MAINTENANCE AND MANAGEMENT PRINCIPLES	112
1.2.	INTRODUCTION TO LVRPA	5	5.5.	FIRST FLOOR LAYOUT	51	8.0	APPEARANCE	113
2.0	THE PROCESS	6	5.6.	PHASING	53	8.1.	MATERIALITY AND MASSING	113
2.1.	ASSESSMENT	6	6.0	SCALE	59	8.2.	THE PLINTH	113
2.2.	INVOLVEMENT	20	6.1.	MINIMISING FOOTPRINT	59	8.3.	THE "BAND"	114
2.3.	EVALUATION	24	6.2.	BUILDING HEIGHT	60	8.4.	THE FRIDGES	115
2.4.	DESIGN	30	6.3.	CONCEPT MASSING STUDIES	61	8.5.	BUILDING SYMMETRY	116
3.0	USE	35	6.4.	LVIA VIEWS	64	9.0	ACCESS	123
3.1.	EXISTING USE	35	7.0	LANDSCAPE AND ECOLOGY	67	9.1.	PEDESTRIAN, VEHICULAR AND TRANSPORT LINKS	123
3.2.	THE BRIEF	36	7.1.	EXECUTIVE SUMMARY	67	9.2.	SERVICE ACCESS	125
3.3.	PLANNING POLICY CONTEXT	37	7.2.	INTRODUCTION	68	9.3.	MAINTENANCE ACCESS	126
3.4.	SOCIAL AND ECONOMIC BENEFITS	38	7.3.	DESIGN DEVELOPMENT	69	9.4.	INCLUSIVE ACCESS	127
4.0	AMOUNT	39	7.4.	LANDSCAPE STRATEGY - KEY PRINCIPLES	70	10.0	APPENDICES	131
4.1.	WHY IS A TWIN PAD REQUIRED AT LVIC?	39	7.5.	ECOLOGY STRATEGY - KEY PRINCIPLES	71	10.1.	APPENDIX A - RESPONSE TO PRE-APPLICATION FEEDBACK	131
4.2.	ACCOMMODATION SCHEDULE	41	7.6.	WATER STRATEGY - KEY PRINCIPLES	72	10.2.	APPENDIX C- CRIME PREVENTION STATEMENT	136
4.3.	GROSS AREA AND FOOTPRINT	42	7.7.	LANDSCAPE MASTERPLAN	73	10.3.	APPENDIX D - FULL RENDER AS REQUESTED BY GLA AT STAGE 1.	137
5.0	LAYOUT	43	7.8.	LANDSCAPE DESIGN COMPONENTS	75			
5.1.	BUILDING LOCATION AND ORIENTATION	43	7.9.	HARD LANDSCAPE MATERIALITY PALETTE	82			
5.2.	SITE LAYOUT	44	7.10.	SOFT LANDSCAPE MATERIALITY PALETTE	98			
			7.11.	BIODIVERSITY ENHANCEMENTS AND HABITAT CREATION	108			
			7.12.	EXISTING TREES, SCRUB AND GRASSLAND VEGETATION	110			
			7.13.	PROPOSED TREES	111			

1.0 INTRODUCTION

1.1. OVERVIEW

The Lee Valley Regional Park Authority (LVRPA) is seeking to redevelop the aging Lee Valley Ice Centre (LVIC) with a new twin Olympic pad facility, as part of its statutory role to deliver sport, leisure and nature conservation within The Lee Valley Regional Park (Regional Park).

LVIC is located on Lea Bridge Road, and operates 7 days a week, year round. In 2018 it attracted just under 279,000 visits, however it is approaching the end of its useful life. Unexpected shutdowns and unplanned maintenance issues have become more frequent in recent months.

In 2017, a £500,000 refurbishment was carried out to the ice pad, cooling and barrier systems, which were at a high risk of failure. Chillers, M&E plant and the buildings structure and fabric are identified as high risk items and will in high likelihood require further investment.

LVRPA has therefore decided to replace the building with a new facility, one with a regional catchment and capable of providing twice as much ice time, safeguarding the provision of ice sports within the Regional Park.

This Design and Access Statement forms part of the application submission to the London Borough of Waltham Forest (LBWF) for a full planning permission for a new facility.

A Design and Access Statement is a report that accompanies a planning application and seeks to encapsulate and explain the thinking behind the design proposals for which consent is being sought. A Design and Access Statement provides the opportunity for the design team to explain how the proposed development is a suitable response to the site, its location and its setting, and to demonstrate that prospective users can adequately access and use the completed scheme. Design and Access Statements can aid decision making by enabling the Local Planning Authority and third parties to better understand the analysis that has underpinned the design of the development proposal.

This document has been prepared following the structure and guidance set out in the document 'Design and Access Statements: How to read, write and use them' (CABE 2006) published by the Design Council.

The Design and Access Statement is organised as follows:

- The Process.
- Use.
- Amount.
- Layout.
- Scale.
- Landscaping.
- Appearance.
- Access.

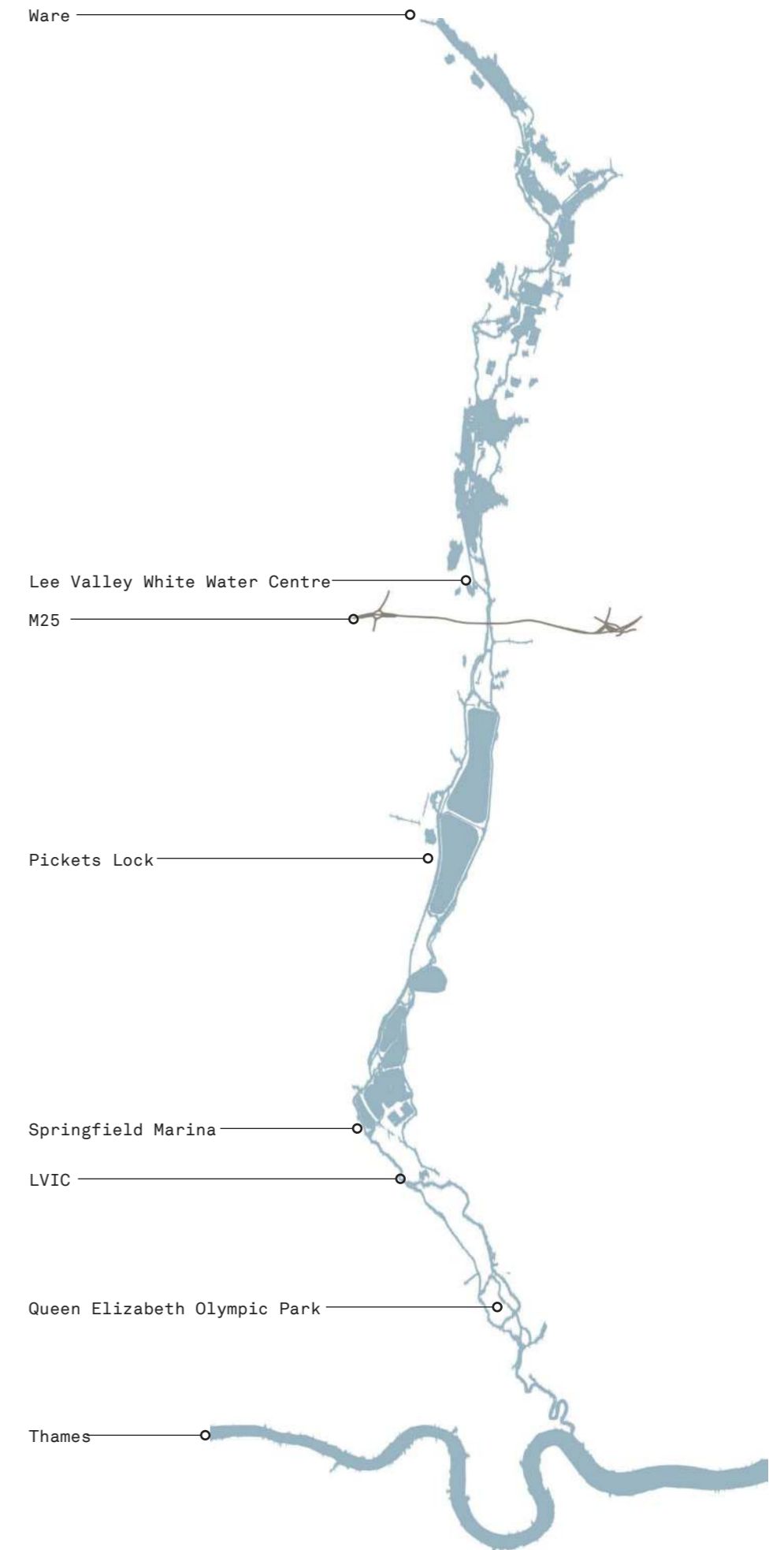


Figure 1 Lower Lea Valley Park context plan

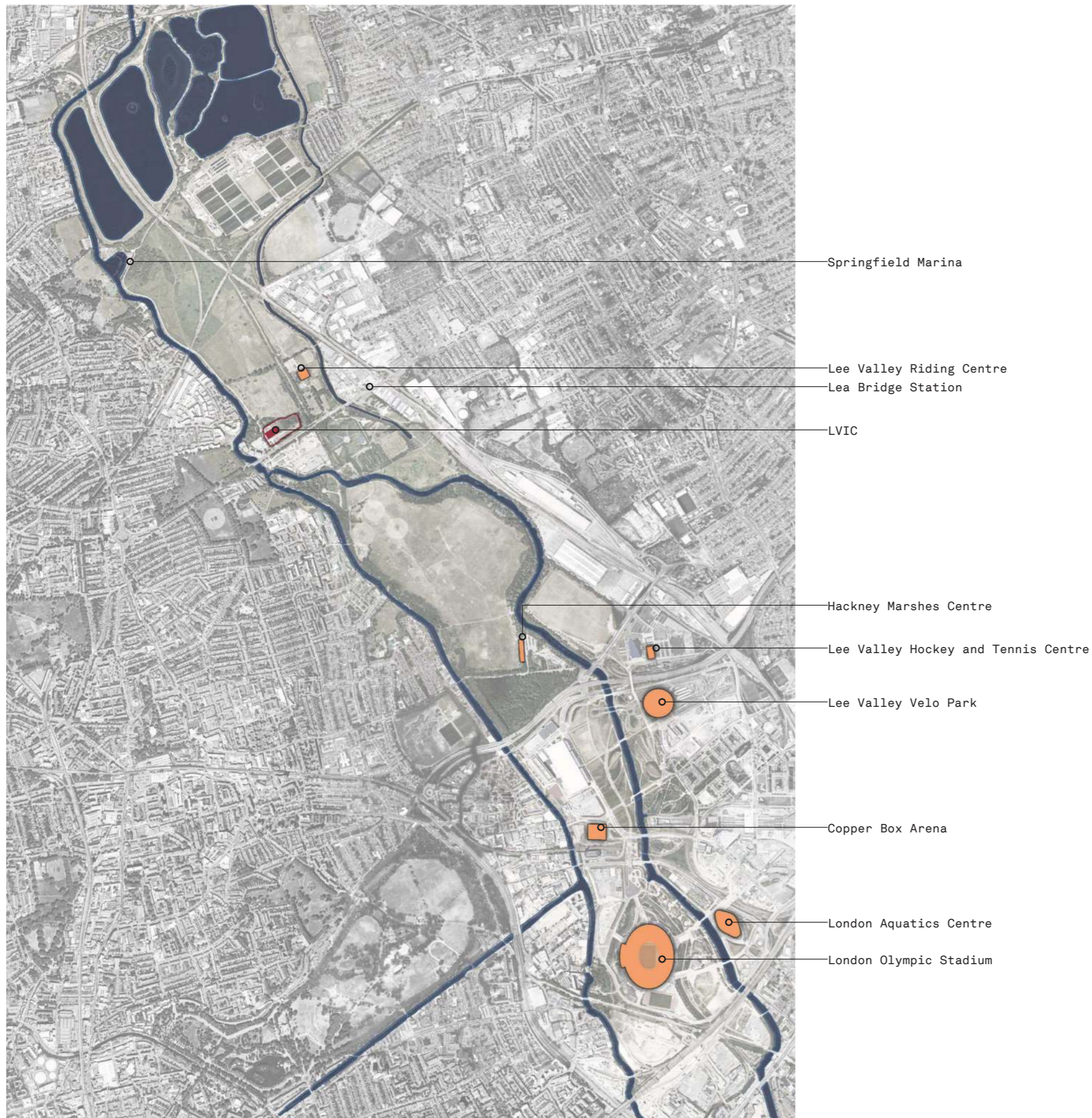


Figure 2 Lower Lea Valley Park, indicating sports developments

1.2. INTRODUCTION TO LVRPA

The Regional Park is a 26 mile long, 10,000 acre park, stretching from the River Thames to Ware in Hertfordshire. The park was created by a unique Act of Parliament as a Regional Park for London, Essex and Hertfordshire.

LVRPA was established by the Lee Valley Regional Park Act 1966. The act conferred wide powers on the Authority to regenerate the Lee Valley for sport, leisure and nature conservation. From inception the Authority has had a role in the delivery of major venues with a Regional catchment. LVRPA's approach is to be community focused and commercially driven, to work with partners to produce a unique combination of activities, sights and experiences.

LVRPA owns a number of world-class sporting and recreation facilities, including the Lee Valley VeloPark, the Lee Valley Hockey and Tennis Centre, and the Lee Valley White Water Centre as part of the London 2012 Olympic Legacy.

Additional facilities include centres for athletics, golf and horse riding, as well as the existing LVIC.

As part of its remit, LVRPA is creating a zone of sporting excellence throughout the park. LVRPA's Park Development Framework is comprised of the following documents:

- Vision, Strategic Aims and Principles document (2010).
- Thematic Proposals (2011).
- Detailed Area Proposals (2011).
- Strategic Policies (2019).

These documents define a long term vision to create the Regional Park into a World Class Leisure Destination. LVRPA's Vision is supported by 6 strategic aims:

- A Park that is a high quality and unique visitor destination.
- A Park that delivers a range of high quality opportunities for sport and recreation.
- A Park that delivers a high quality biodiversity resource for the Region.
- A Park that helps local people improve their wellbeing.
- Landscape that embraces the physical, cultural and social heritage of the area.
- Recognition of the Regional Park's contribution to Landscape and Heritage values.

96% of the 10,000 acre park consists of Green Belt or Metropolitan Open Land (MOL). LVRPA has a track record of delivering successful sporting facilities of regional and national importance within the context of this valuable open space, in support of the authority's statutory remit.

2.0 THE PROCESS

The purpose of this section is to explain the process that LVRPA and their design team have undertaken during the development of the design proposals. Reference has been made to the guidance in CABE's 'Design and Access Statements: How to write, read and use them',

The development of this detailed application has been the product of several years' work, during which time the emerging design and brief has been challenged and refined. The design team have followed an assessment-involvement-evaluation-design process.

Section 2.1 (Assessment) summarises the review of the local context that has been undertaken by the team prior to the preparation of the proposals.

Section 2.2 (Involvement) describes the process of consultation and community involvement undertaken by the team.

Section 2.3 (Evaluation) reviews the process of identifying opportunities and constraints that have been identified through the Assessment and Involvement stages, and informed the emerging proposals.

Section 2.4 (Design) summarises the key design decisions and iterations that have been undertaken by the team to develop the final design proposals.

2.1. ASSESSMENT

The Lee Valley Regional Park

The Lee Valley was once home to a wide range of industries, gravel pits, waterworks sites, distilleries and munitions factories. Over the years much of the land across the Valley became neglected and derelict. Sir Patrick Abercrombie's Greater London Plan suggested in 1944 that 'the Valley gives the opportunity for a great piece of regenerative planning.....every piece of land welded into a great regional reservation'.

During the post-war period this idea was not enacted, until 1961 when Alderman Lou Sherman, Mayor of Hackney, persuaded seventeen other local authorities to support him in regenerating the valley and in 1963 the Civic Trust was invited to undertake an appraisal of the Valley's potential as a vast leisure and recreational resource.

The Civic Trust report was extremely positive and a Bill was promoted in Parliament to establish the Lee Valley Regional Park Authority as the development body with the responsibility and the powers to deliver the vision. Following Royal Assent to the Lee Valley Regional Park Bill in December 1966, the Lee Valley Regional Park Authority was formally constituted on 1 January 1967.



Figure 3 Lee Valley Ice Centre - Aerial View

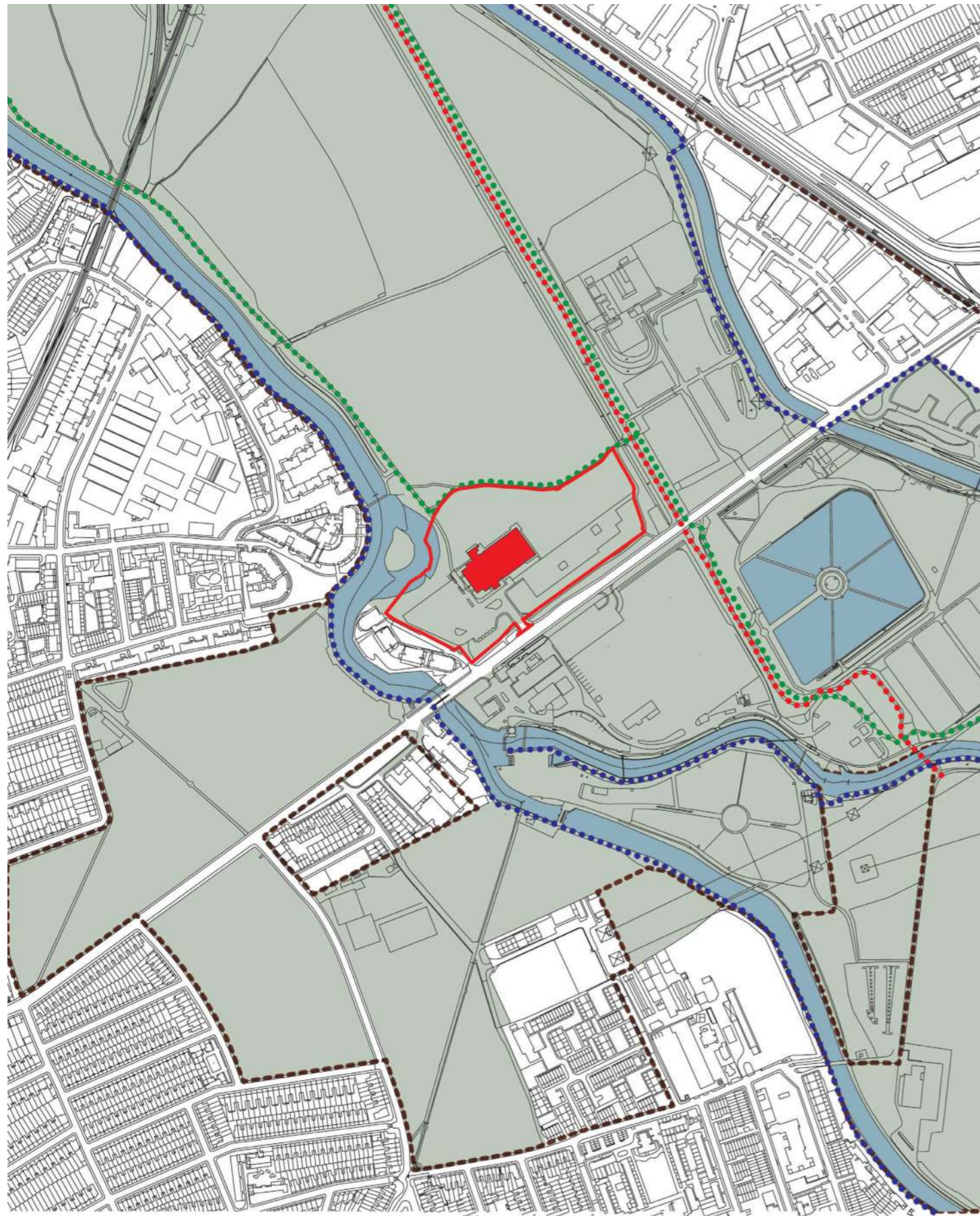


Figure 4 Lee Valley Ice Centre - Extent of MOL

- Application Boundary
- Lee Valley Regional Park
- Metropolitan Open Land
- National Cycle Route N1
- Green Corridor
- Lee Valley Pathway Corridor / Capital Ring

Site location

The proposed LVIC is located within the Regional Park, north of Lea Bridge Road, with the River Lea and Essex Wharf to the west, and the Sustrans Cycle Route to the east, with the Lee Valley Riding Centre beyond. The northern edge of the site faces onto Leyton Marshes, and is defined by a tarmacadam footpath which form part of an existing Greenway route. The proposed site is currently occupied by the existing Ice Centre and its associated car parking.

The entire site is within MOL. The north west corner of the site is designated as a Site of Metropolitan Importance to Nature Conservation (SMINC), which extends along the edge of the River Lea to the north. The corner of the SMINC is currently occupied by some ancillary accommodation associated with the existing Ice Centre, including an external plant compound and some storage containers.

The site is substantially flat and level. The topographical survey shows a nominal fall of approximately 0.8m from north to south, and 0.5m from west to east. The Ice Centre site and Leyton Marshes are between 1 and 2m higher than the adjacent Walthamstow Marshes to the north, having previously being used for land fill following WW2. The site falls within Flood Zone 2.

The existing LVIC

The existing LVIC was constructed in the 1980's and is a simple barrel vaulted form in a painted steel profiled cladding, approximately 12m high to the ridge. The building also has single story flat roofed annexes to the north, west and south elevations containing plant, skate change and an entrance foyer. The building is approximately 40m wide by 85m long with a footprint of 3,591m².

The existing building is located parallel to, and set back from Lea Bridge Road, and has a service area to the north with a number of storage containers, waste compactors and ice chillers sitting on the edge of the marshes and partially extending into the SMINC. The building is served by its own electrical substation and switch room contained within the northern annexe.

To the south of the building is an informal outdoor seating area, and a large expanse of grasscrete used for overflow parking, which extends through the site to the eastern boundary.

The western portion of the Ice Centre site consists of a tarmac car park adjacent to Essex Wharf, and accessed directly from Lea Bridge Road. The car park provides vehicular access to the north of the site.

LVIC is a successful, well used sports and leisure facility, and is operating at 100% capacity. However, the building is tired and suffers from frequent unplanned and unexpected closures for maintenance. Recent investments in the new ice pad, ice cooling and barrier system have prolonged its operational life however, there are problems with the building fabric, M&E Systems and below ground drainage, which will require significant investment in order to maintain the building in a usable condition. The building is now at the end of its economic life span and in poor condition, and it is no longer viable or sustainable to maintain the existing operations.

The current Ice Centre does not contribute positively to the local built environment, being somewhat dilapidated and outdated in appearance. It is out of keeping with its surrounding landscape and ecological context.

The position of the building creates a visual barrier between Lea Bridge Road and Leyton Marshes and Sandy Lane to the north. It blocks views along Sandy Lane resulting in a lack of legibility, and a poor sense of arrival when entering the marshes. The quality of the access to the Marshes is further diminished by the poor appearance of the plant annexe and outbuildings and containers to the north of the building. There is, therefore, an opportunity to improve the legibility of this important gateway site, and create an improved experience for ice users and the public alike.



Figure 5 Existing LVIC Interior



Figure 6 Existing LVIC entrance



Figure 7 Existing LVIC from Lea Bridge Road looking north



Figure 8 Existing LVIC access from Lea Bridge Road



Figure 9 Existing LVIC plant area looking east from Sandy Lane



Figure 10 Existing LVIC service area to north



Figure 11 Approach to LVIC from Sandy Lane looking south



Figure 12 Existing LVIC from Greenway to north boundary of site



Figure 13 Existing LVIC from Leyton Marshes



Figure 14 Existing trees to north edge of site



Figure 15 Existing grasscrete to Lea Bridge Road



Figure 16 View of LVIC from Lea Bridge Road

Landscape and ecological context

The site lies within the boundary of the Regional Park and the MOL.

The closest statutory designated site is Walthamstow Marshes Site of Special Scientific Interest, located 0.23 km north of LVIC.

There are 16 non-statutory designated Sites of Importance for Nature Conservation (SINCs) within 2 km of the Site. The Lea Valley SMINC is located adjacent to the site to the north west.

The site currently supports largely common habitats of generally low ecological value. It is dominated by amenity grassland and hard standing with the existing building near the centre of the site. An area of dense scrub and broad-leaved woodland is also present, with an Oxbow lake and the River Lea to the west of the site (adjacent to the site boundary). The land between the Ice Centre and Lea Bridge Road supports mown amenity grassland with large patches of plastic and concrete grasscrete and scattered mature and semi-mature trees.

The remaining site consists largely of amenity grassland, dense scrub and tree cover. While this provides a degree of landscape amenity, and partial screening of the existing Ice Centre building, the overall landscape and arboricultural quality is poor. Beyond the boundary, to the north of the Ice Centre lies Leyton Marshes which comprises of a large open area of grassland.

The invasive plant species giant hogweed is present adjacent to the Oxbow lake (just outside the western boundary of the Site).

The following surveys and studies have been undertaken, in order to ensure the highest quality of environmental enhancements are delivered. These have been carried out to fulfil the statutory planning system requirements as well as additional studies to go beyond those requirements:

- Full topographical survey.
- Comprehensive arboricultural survey of all the vegetation within the development boundary.
- Arboricultural Impact Assessment.
- Extended Phase 1 surveys in 2017 and 2019.
- Bat activity surveys.
- Bat re-emergence surveys.
- Water vole survey.
- Otter survey.
- BREEAM Assessment.
- Appraisal of opportunities for the enhancement of hedgehog habitat.
- Biodiversity Impact Assessment (BIA), to provide objective measurement of net gain values.

Surveys for otter and water vole found habitats on and immediately adjacent to the site are largely unsuitable for these species and no evidence of their presence was found. Bat activity was very low and restricted to common and widespread species. A common pipistrelle roost was recorded within a crack willow to the south of the site.





No signs of badgers were recorded. A possible single entrance to a disused badger sett was noted adjacent to the site. The proposed development will not impact this area.

There are nesting opportunities for a range of terrestrial bird species. Species noted on site were common and widespread.

The site provides minimal suitable habitat for reptiles and amphibians. The limited habitats present are restricted to areas of less managed grassland and dense scrub, as well as offsite around the Oxbow lake (although suitability in these locations is also low).

The proposed development plans will result in the loss of habitats immediately surrounding the current Ice Centre. This is predominantly amenity grassland and dense scrub as well as the loss of 20 trees. Outside of this area much of the current habitats will be retained and enhanced.

For full details of the existing ecological and landscape condition, please refer to Section 7.0 - Landscape Design Proposals.

- Application Boundary 
- Lee Valley Regional Park 
- Site of Metropolitan Importance to Nature Conservation (SMINC) 
- Site of Special Scientific Interest 

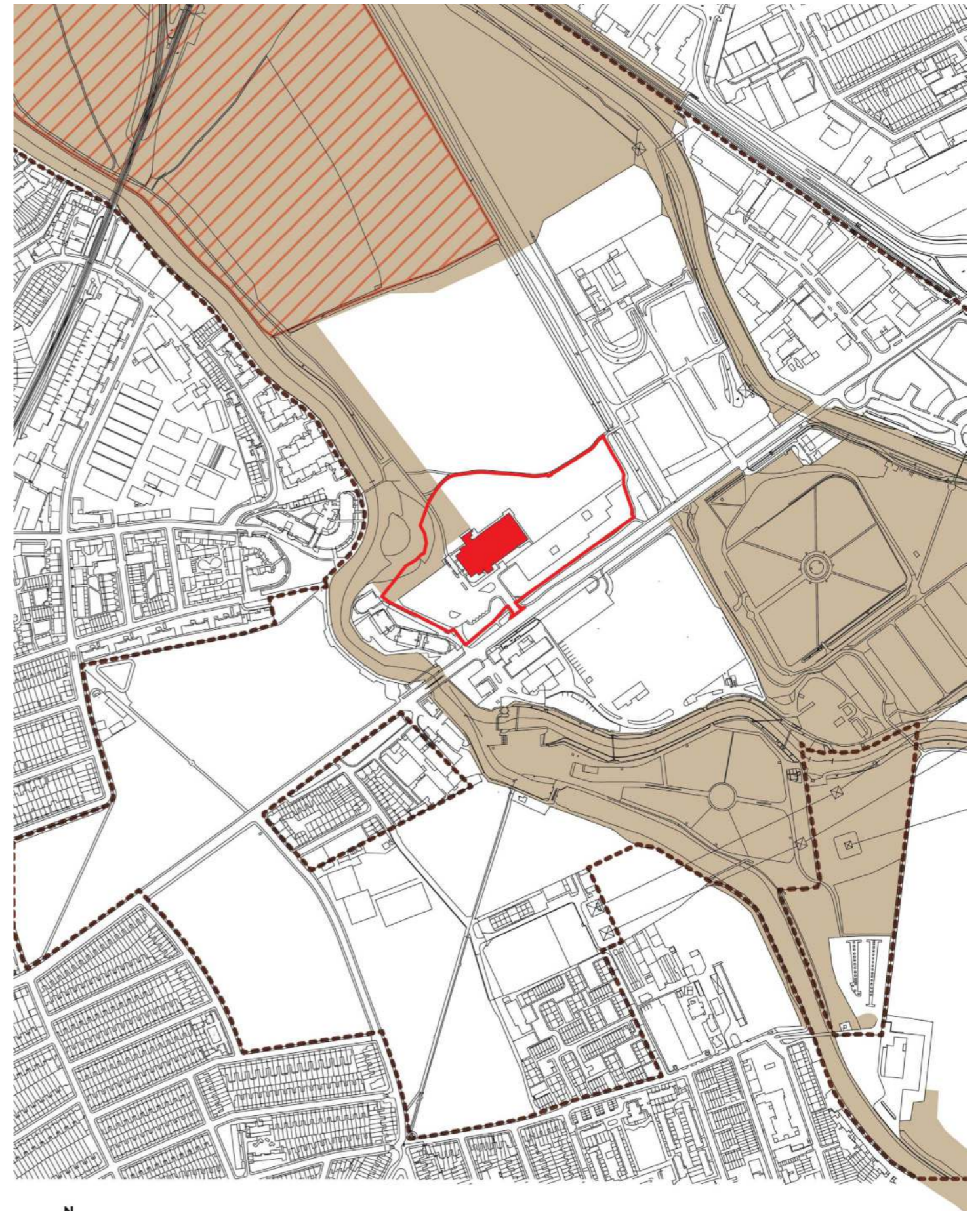


Figure 17 Ecological Context Map



Figure 19 Existing tree cover along north edge of site



Figure 20 Existing tree group and grasscrete to east of site

Existing trees

The site is characterised by a number of individual trees and tree groups. Several large groups are situated to the north and east of the existing LVIC, comprising multiple species of varying condition and maturity with a height of less than 20m. The dense under-canopy and ground level planting results in these groups creating a visual barrier between the marshes and Lea Bridge Road, although a view corridor is offered by a break in the trees to the east of the existing ice rink. The tree group to the north of the existing LVIC is partially contained within the boundary of the SMINC.

A number of smaller groups and individual trees are situated within the car park and along the edge of Lea Bridge Road. An arboricultural survey was carried out of the trees within the site boundary in May 2017, and was updated in 2019. There are no Tree Preservation Orders in place within the site, however it is acknowledged that the trees contribute towards the current setting of the Ice Centre.

The design proposals aim to maintain so far as possible the existing trees, with suitable new planting to mitigate loss of existing trees and maximise the landscape quality and biodiversity of the whole site.

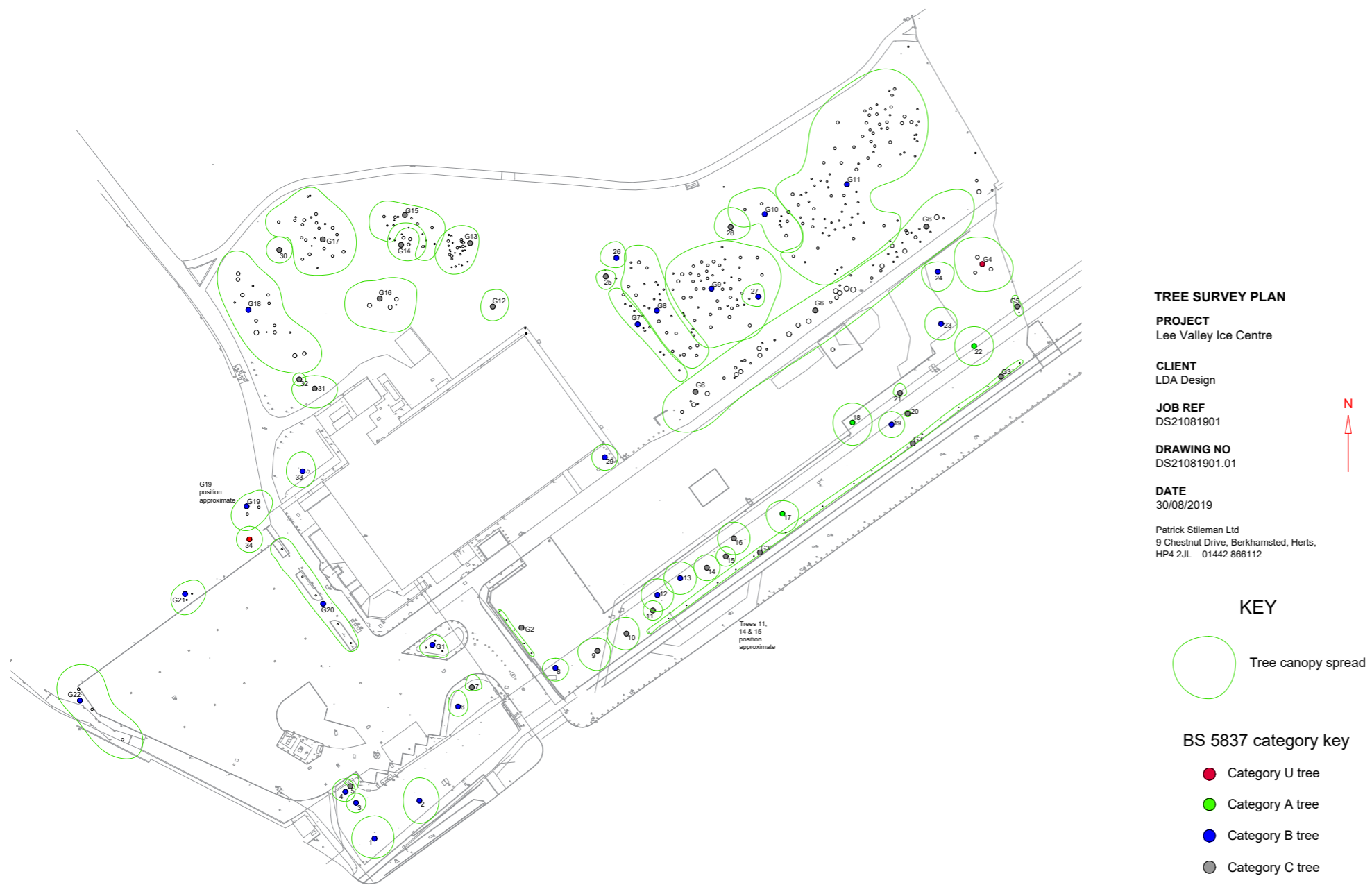


Figure 18 Tree Survey

Physical and visual connectivity

The site of the LVIC forms an important entry point into the Regional Park, and is situated on Lea Bridge Road; a key crossing point across the River Lea and a gateway between LBWF and Hackney.

At a macro level, Lea Bridge Road forms a barrier between Leyton and Walthamstow Marshes to the north, and Hackney Marshes to the south, and limits the connectivity of the Regional Park as a whole. This busy route can only safely be crossed at a limited number of locations. Underpasses on the Capital Ring route on the west bank of the River Lea, and the Sustrans National Cycle Route 1 between the current Ice Centre and Riding Centre provide some connectivity. A pelican crossing is located just west of the site entrance, with a second to the west of the entrance to the riding centre.

The physical barrier of Lea Bridge Road is exacerbated by the lack of permeability and views to connect the Park to both sides of the road. The Lee Valley Riding Centre has a positive relationship between the road and the Park, with an open boundary condition offering views and glimpses through to the wider landscape beyond. However, the southern boundary along Lea Bridge Road is by comparison closed and unwelcoming. Fencing and dense tree lines offer limited views or physical routes into or through the site. Access to the Waterworks nature Reserve site is limited to the road access at Lammas Road at the far eastern edge of the Park. Gate access at Connaught Close to the west is limited to authorised vehicles only. The only pedestrian access to the south at street level is through the Sustrans Cycle route. To the east of this point, the Thames Water Depot opposite the existing LVIC presents a significant barrier to the continuity of the Park.

It has been acknowledged that the visual links between Lea Bridge Road and Leyton Marshes are limited along the boundary of the LVIC. A combination of the existing dense trees and ground cover, and the presence of the Ice Centre building mean that views of Leyton Marsh are intermittent, and the entrance at Sandy Lane is obscured. An opportunity exists therefore to create a gateway site, both for the Regional Park and LBWF, and to improve the permeability and connectivity to the north of Lea Bridge Road.

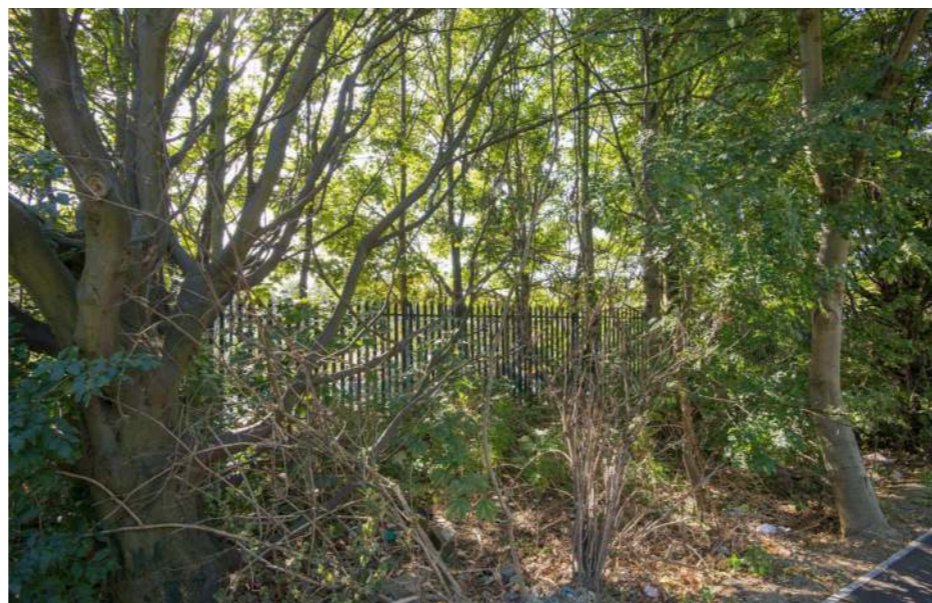


Figure 21 Edge Condition to Lea Bridge Road - Waterworks

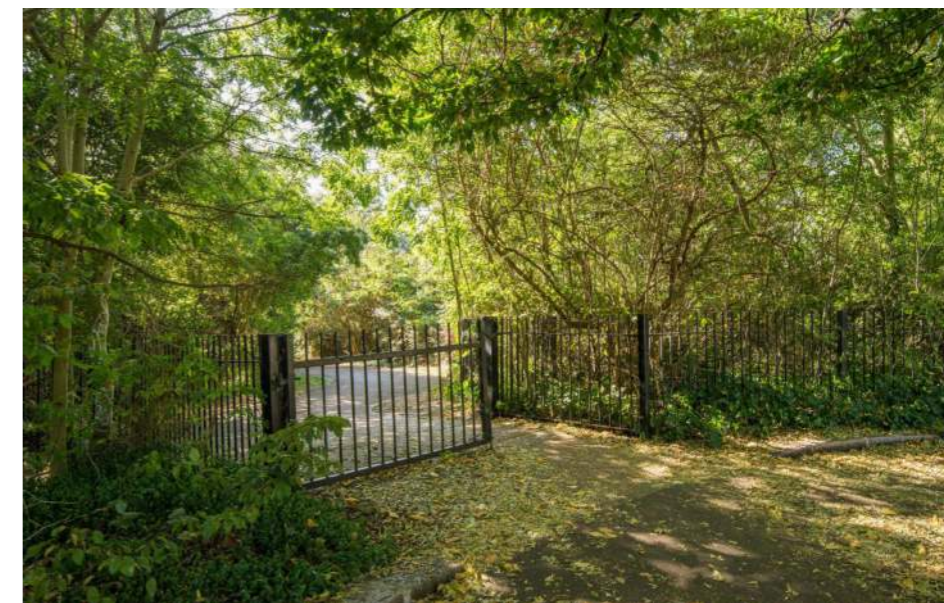


Figure 22 Edge Condition to Lea Bridge Road - Access to NCR1



Figure 23 National Cycle Route 1 underpass below Lea Bridge Road



Figure 24 Edge Condition to Lea Bridge Road - Thames Water Site



Figure 25 Edge Condition - Open aspect to Lee Valley Riding Centre



Figure 26 Existing LVIC blocks views through Sandy Lane

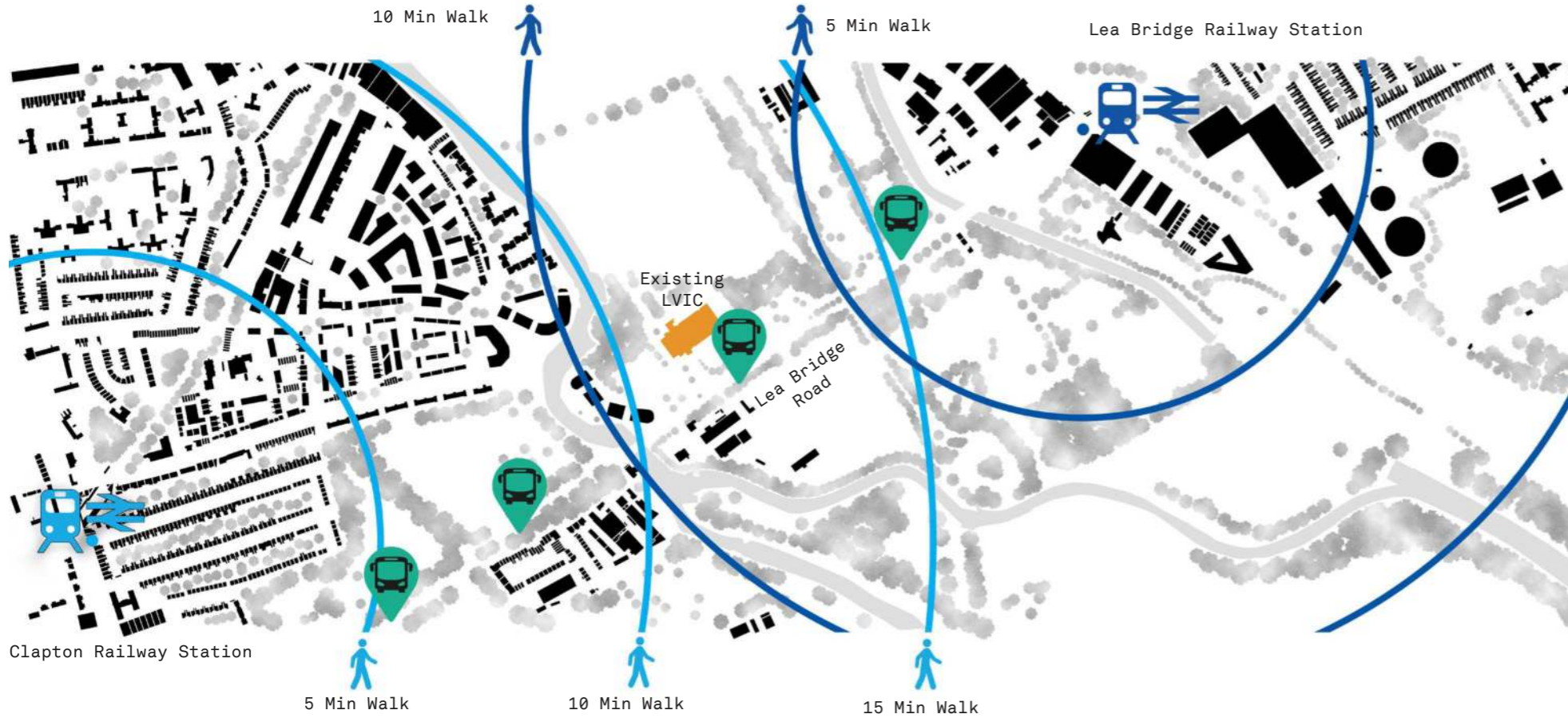


Figure 27 Public Transport Connections

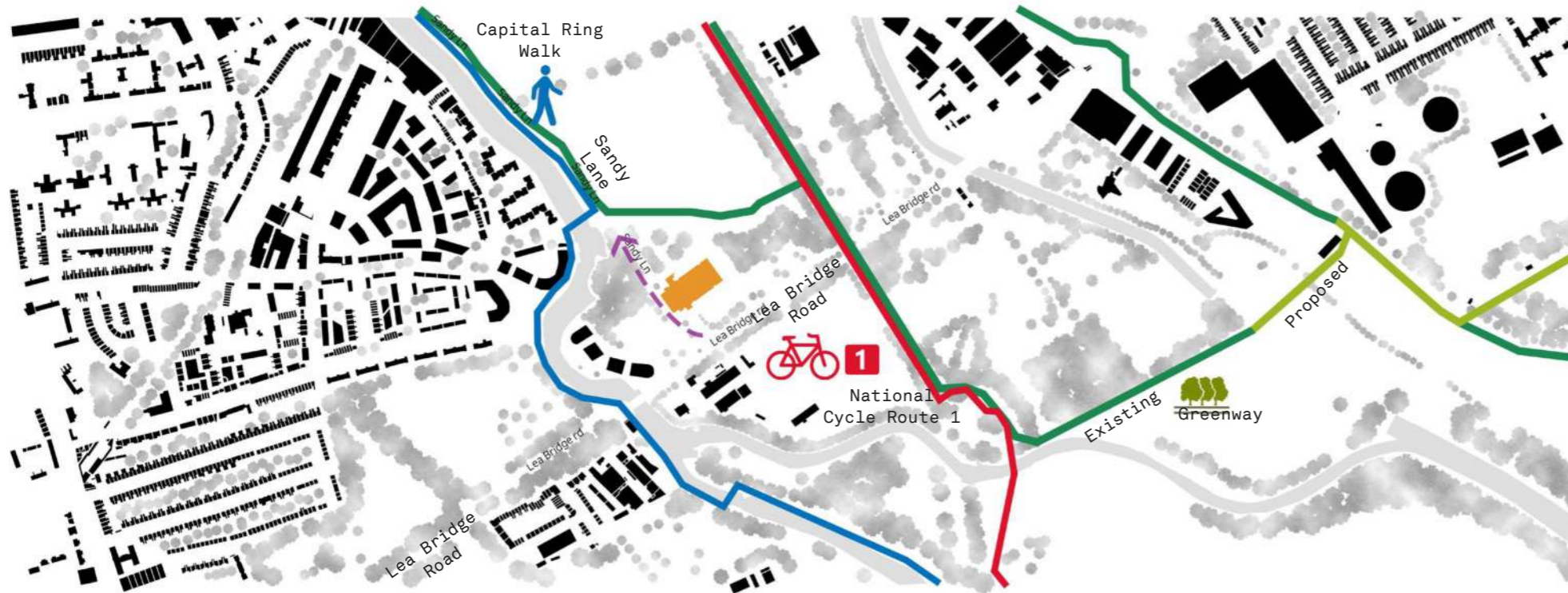


Figure 28 Pedestrian and Cycle Routes

Existing transport connections

The A104 Lea Bridge Road is one of the primary east – west connection routes across the Lee Valley Regional Park, linking Hackney to the west with Leyton in the east. The route is served by a number of public transport services, with the Number 48, 55, 56 N38 and N55 busses stopping directly opposite the site.

Lea Bridge Road has recently been upgraded, with the "Mini Holland" segregated cycleway and footpaths improving cyclist and pedestrian access to the site. TFL has recently been consulting on proposals for a new cycle route connecting Lea Bridge Road with Dalston and the CS1 Cycle Superhighway into central London. National Cycle Route 1 runs along the eastern edge of the site, and links the north and south of Lea Bridge Road through an underpass. This is continuous signed cycle route on traffic-free and on-road surfaces, connecting the major towns and cities along the east coast of the British Isles.

An existing tarmac car park is located to the west of the site, accessed from Lea Bridge Road. This contains approximately 177 parking spaces, with users including people accessing the marshes as well as users of the Ice Centre. The car park also provides access to Sandy Lane via a timber gate. This gives vehicular access to the Springfield Marina and the towpath and moorings along the east bank of the River Lea. It is noted that the existing Ice Centre blocks the view of Lea Bridge Road from Sandy Lane and the marshes, and also obscures the route into the marshes from the road. There is an opportunity therefore to create a gateway into the marshes at this point.

The site is approximately 750m from the recently re-opened Lea Bridge Railway Station with 2 services per hour currently operated by Greater Anglia, connecting the site with Bishop Stortford, Hertford East, Broxbourne, Stratford, Tottenham Hale and Liverpool Street. The services will be increasing to 4 an hour in the near future. The western bank of the River Lea at Lea Bridge forms part of the Capital Ring Walk. This is a circular route covering 78 miles of open space, nature reserves and Sites of Specific Scientific Interest and more.

Historical context

LVIC sits within Leyton Marsh, (sometimes referred to as Porter's Field Meadow), which once extended across both sides of Lea Bridge Road, into the area currently occupied by the Thames Water Works. The Marsh is former Lammas Land, over which parishioners could freely graze cattle and horses between 1st August and 25th March.

Originally called Low-Leyton, due to its low lying topography and 'tun' (settlement) on the River Lea, the area was characterised in pre-industrial times by agricultural pastures, meadows, forest and marshland. Farming in common prevailed in the middle ages, but by the 15th century much of the arable land was turned into crofts, with the exception of marshland and forest which continued to be held in common.

Development encroached onto the marshes through the 19th Century, with the development of the railways, gas and sewage works, and the East London Waterworks Company, who attempted to acquire land and restrict access. On Lammas day (August 1st) 1892, the people of Leyton gathered in protest and successfully resisted the encroachment onto and closure by the Waterworks company of 12 acres of Lammas Land within the marshes.

Lammas rights on the common marshland were exercised until the area became suburbanised and it became uneconomical to do so. Regardless, the commoner's committee campaigned tirelessly for the openness of the remaining Lammas lands, up until 1904 and the Leyton U.D.C act when the council was empowered to acquire the remaining common land as open spaces and recreation ground, provided that the commoners accepted extinguishment of their rights and compensation claims were settled.

Rubble from buildings destroyed during the Blitz was dumped on Leyton Marshes during World War II which has raised the ground level of the site above the natural flood plain. The extent of the raised ground can be seen at the north of Leyton Marsh at the Boundary with Walthamstow Marshes. Porter's Field contained an estate of prefabricated houses, constructed to provide temporary accommodation to replace bomb damaged housing. This existed into the 1970's, on the site currently occupied by the Lea Valley Riding Centre.

The Marshes were home to a small permanent funfair, located on the site of the Ice Centre. On bank holidays this was joined by a "Magnificent Fair" and travelling circuses. The site has also been used for playing fields and football pitches, with the footprint of changing rooms still visible along Lea Bridge Road to the east of the existing Ice Centre.

Essex Wharf to the west of the existing car park, once contained a number of buildings including a boat yard and workshop and a number of cottages. The site has been recently redeveloped by the Dominion Housing Group.

The Marshes were compulsory purchased by LVRPA in 1971 under the terms of the Lee Valley Regional Park Bill. The Existing Lee Valley Ice Centre was officially opened in 1984 by Jayne Torvill and Christopher Dean.

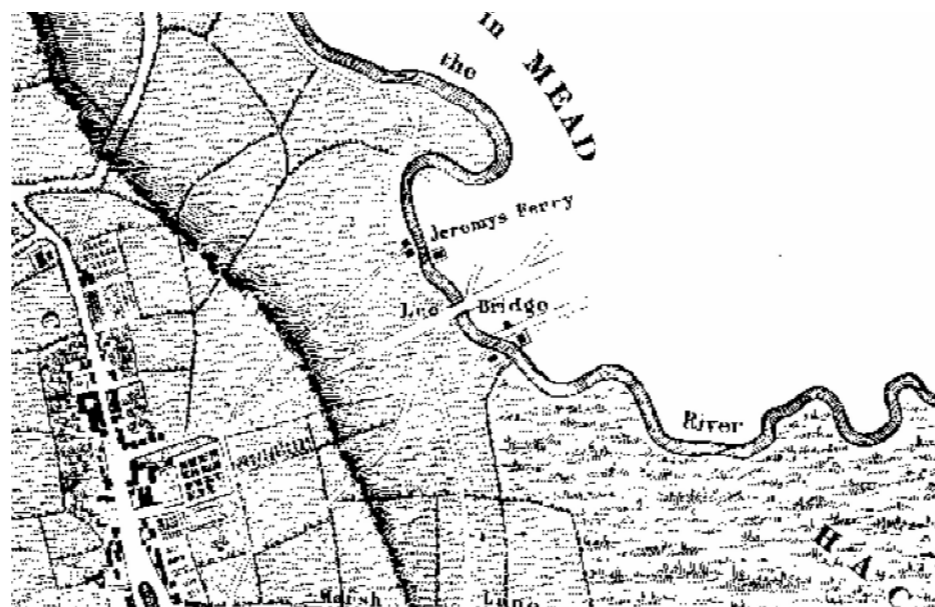


Figure 29 Map of 1745



Figure 30 Map of 1869



Figure 31 Map of 1899



Figure 32 Map of 1950



Figure 33 Aerial Photograph 1945

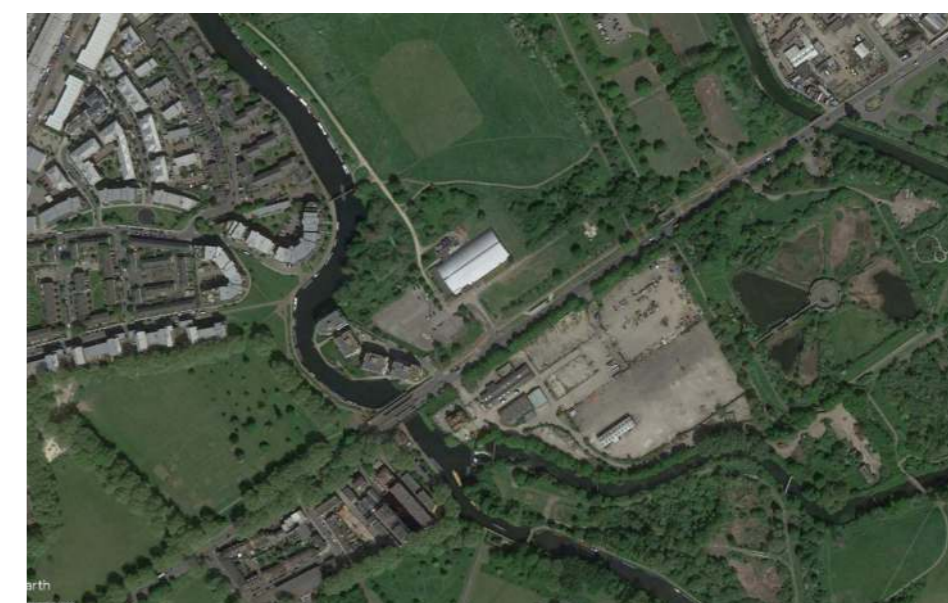


Figure 34 Aerial Photograph 2019

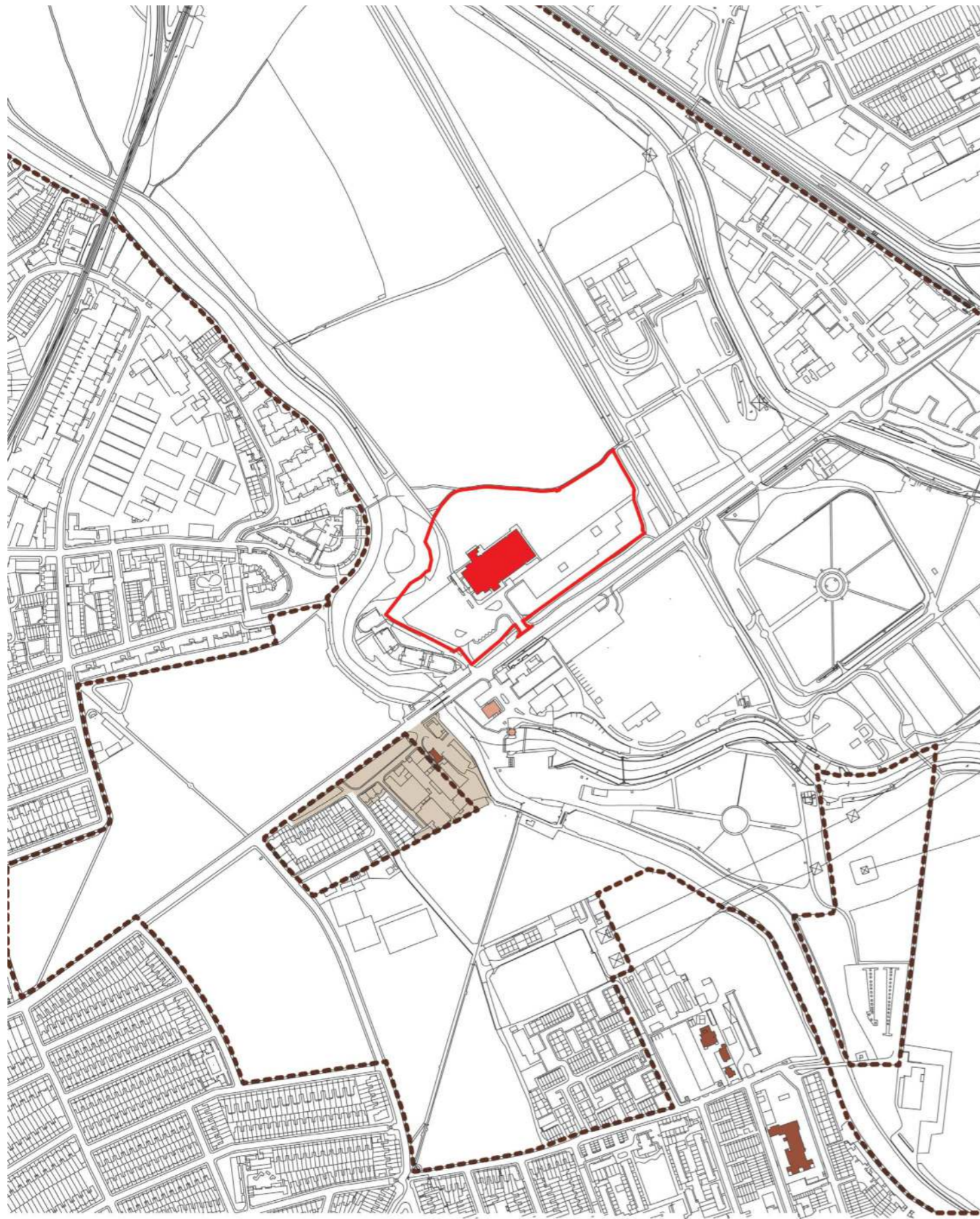


Figure 35 Historical Context Map

Architectural context

To the south of Lea Bridge Road, the Thames Water site consists of several brick warehouse and industrial buildings and a large area of concrete hardstanding, currently used as a storage depot. The site is separated from Lea Bridge Road by a palisade fence and an avenue of trees, and forms a significant barrier to both the visual and physical connectivity of the Regional Park between Leyton and Walthamstow Marshes.

A planning application for new academy primary and secondary schools has been submitted on the Thames Water site by the Lion and REAch2 Academy Trusts. The application has been refused by LBWF.

To the east of the Thames Water site, separated by the Sustrans Cycle route, is the WaterWorks Wildlife Centre and Nature Reserve, owned by LVRPA and built on the site of the Essex Filter Beds. This site is designated as a SMINC.

The Ice Centre site and its immediate surroundings do not contain any listed buildings. The nearest listed building is the Premises of Testi and Sons on Waterworks Lane to the south west of the River Lea. This is a Grade II mid 19th century school in a Tudor style, however it is screened from the Ice Centre site by the Princess of Wales public house. It is situated within the London Borough of Hackney in the Lea Bridge Conservation Area, which comprises a core of C19th buildings reflecting the historic uses of the River Lea. The outline of the Lea Bridge / Paradise Dock is evident within the conservation area. Several Victorian buildings have been renovated and repurposed, including a former carbonic acid factory.

The Ice Centre site is not within a conservation area, however LBWF maintain a number of nearby structures on their local list. These include the former Thames Water Engineer's House building, a late Victorian red brick building within the Thames Water depot site; and the former Turbine house at Lea Bridge Weir, a hexagonal brick and slate building dating to 1895.

Between Essex Wharf and the River Lea are a series of residential blocks between 5 and 7 storeys high, constructed of buff brick with a gabion podium. The blocks have been designed with gaps to allow views between the site and Millfields Park, but still create a significant physical barrier between the west of the site and the River Lea, and dominate the view on the approach across Lea Bridge.

- Application Boundary
- Lee Valley Regional Park
- Conservation Area
- Listed Structure
- Locally Listed Structure



Figure 36 Lea Bridge Road Conservation Area - Grade II Listed Schoolhouse



Figure 37 Lea Bridge Road Conservation Area - Grade II Listed Schoolhouse



Figure 38 Lea Bridge Road Conservation Area - Lea Bridge / Paradise Dock



Figure 39 Lea Bridge Road Conservation Area

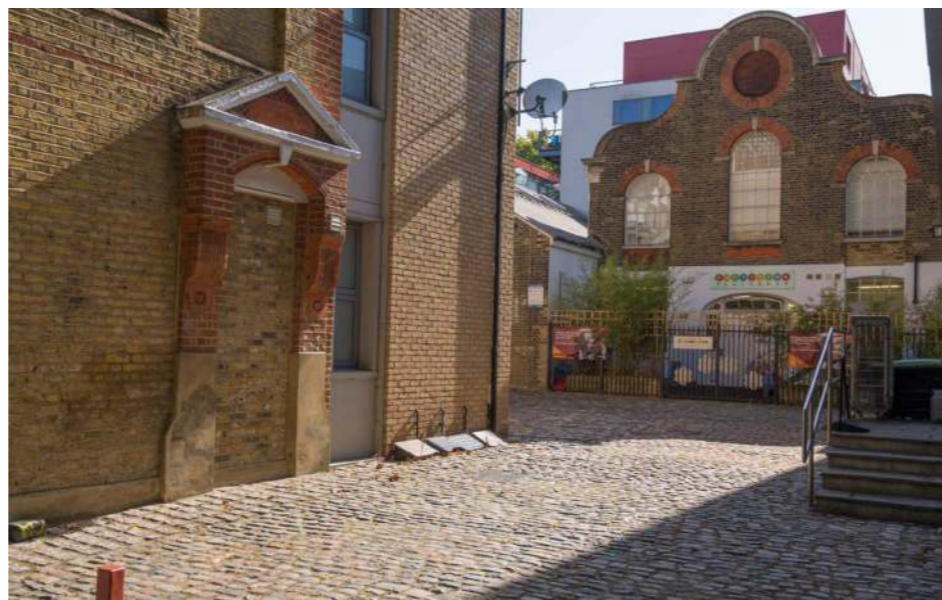


Figure 40 Lea Bridge Road Conservation Area



Figure 41 Lea Bridge Road Conservation Area



Figure 42 Essex Wharf



Figure 43 Essex Wharf



Figure 44 Thames Water Site



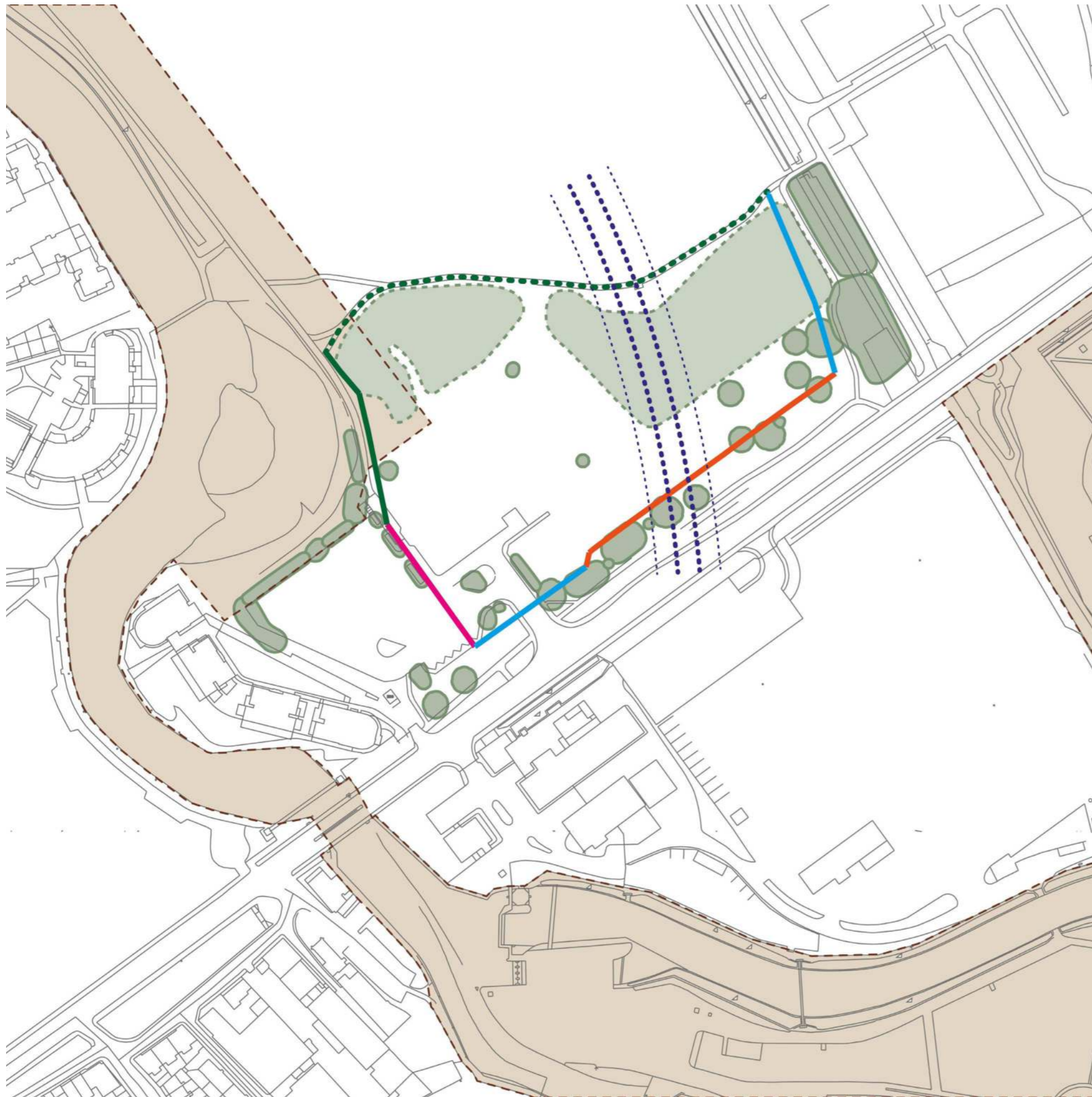
Figure 45 Thames Water Site - Engineer's House



Figure 46 Thames Water Site - Pumping House



Figure 47 Princess of Wales Pub from Lea Bridge Road












-  Combined rising main
-  Sludge rising main
-  HV cable
-  Water main
-  National grid plug tunnel easement
-  National Grid plug tunnel zone of influence
-  Site of Metropolitan Importance to Nature Conservation
-  Existing Greenway
-  Tree groups screen existing Ice centre. This may help to minimise light spills and noise breakout.

Figure 48 Site Constraints

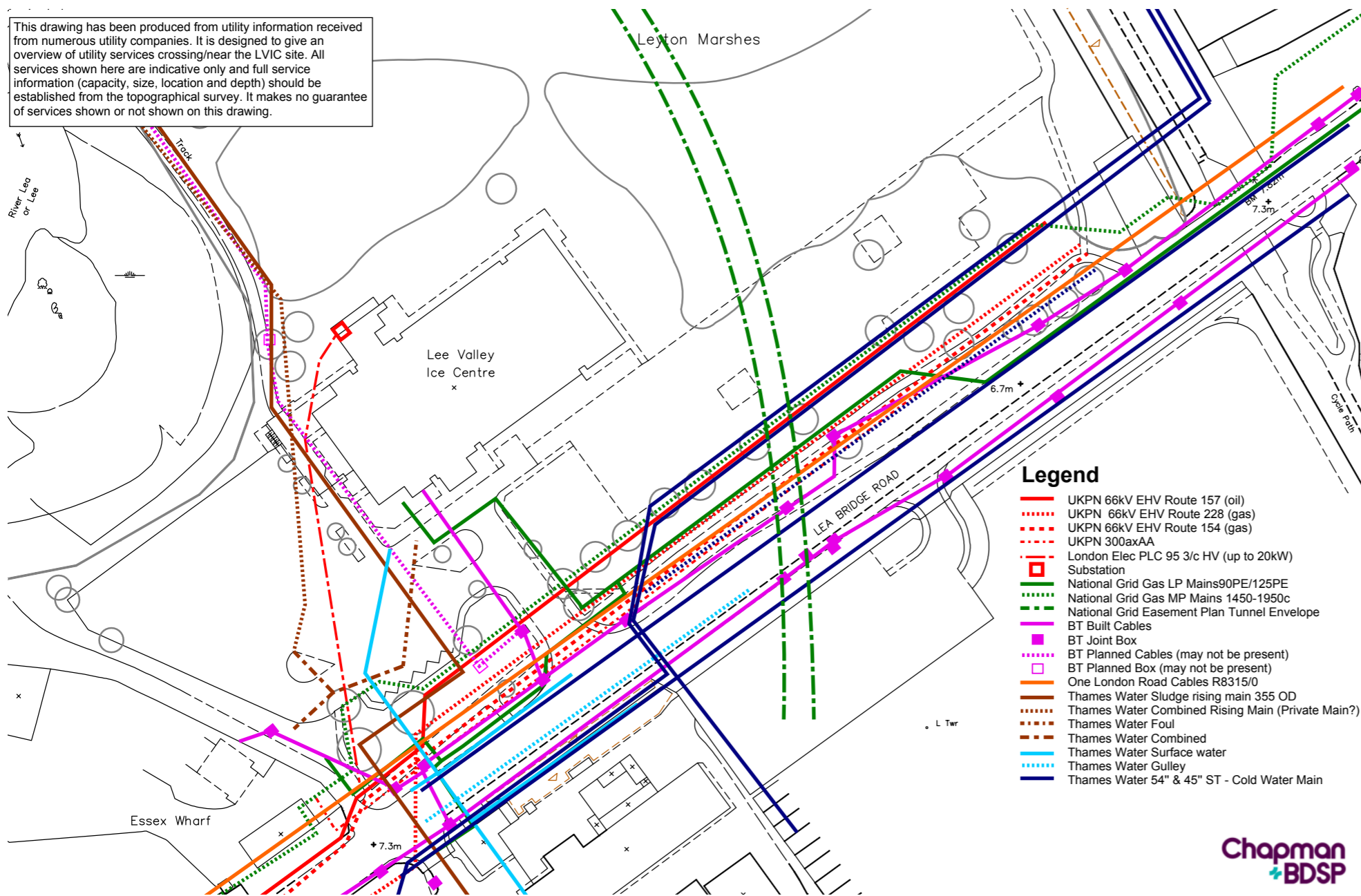


Figure 49 Site Utilities Survey

Site constraints

The site has a number of physical constraints which limit the location of the building. Topographical and Utilities surveys were carried out in 2017 which confirm the presence of a number of below ground services, with associated wayleaves and easements effectively constraining the footprint of the building. The majority of these lie between Lea Bridge Road and the existing Ice Centre and include:

- UKPN 66kV electrical main.
- National Grid LP Gas main.
- BT and One London cables.
- Thames Water 54" and 45" cold water mains.
- To the west, below the existing car park are a Thames Water sludge rising main and Combined Rising Main. A pumping station is located within the curtilage below the car park and will be retained.

A number of Thames Water sewers serving developments outside the site are located below the car park, together with a pumping station. Relocating these services would be prohibitively expensive, and rule out built development on the western edge of the site.

The National Grid Plug Tunnel runs through the centre of the site. A 10.5m wide exclusion zone exists around the tunnel, some estimated 15m below the ground, through which piling is not permitted. Piling over the exclusion zone may be permitted depending on the surcharge allowed in the tunnel design. A zone of influence extends at 45° from the exclusion zone, consultation will be required should the building extend into the zone of influence.

The footpath to the north is a designated Greenway. The footpath and Leyton Marshes effectively define the northern boundary of the site.

The boundary of the SMINC extends into the north western corner of the site. It is proposed that the building and any hard landscaping will maintain a clear distance from the SMINC to minimise any potential impact from the development.

The two large groups of trees to the north and east of the site define a natural edge to the development plot. Although these groups are identified on the arboricultural survey as being of moderate or low quality, it is recognised that they contribute towards the character of the site.

The existing access to Sandy Lane will need to remain open to provide access to the Marina, towpath and moorings.

The physical constraints of the SMINC and the easements and wayleaves for the below ground services are "hard" constraints, and define the developable area, within which the building footprint can be placed. This is a smaller area than the application boundary, and landscaping works can take place outside this developable area.

The Plug tunnel and tree groups are a "soft" constraint; the building can overlap these areas subject to engineering design and agreement with National Grid, however, the effect on existing trees and tree groups should be minimised where possible.

2.2. INVOLVEMENT

Consultation process

LVRPA appointed Grayling to implement a consultation and community engagement programme for its proposals for a new twin pad centre next to the current Lee LVIC. Grayling is one of the country's leading communications consultancies with more than 30 years' experience delivering consultation and engagement programmes for a range of clients.

Following an extensive three-stage feasibility process, which ran from April 2013 to December 2015 (please see Feasibility Study Report produced by IPW for full details), LVRPA developed plans to provide a sustainably designed new twin pad Ice Centre to replace the existing LVIC on its current site.

To inform stakeholders about the need for a new twin pad Ice Centre and to ensure the plans reflect the needs of LVIC visitors and the local community, LVRPA has engaged and shared information about the project at three stages throughout the project. The pre-submission public consultation process, which launched on 26 June 2019 and concluded on 1 September 2019, received an overwhelmingly positive response. Over 80% of responses to the consultation positively supported the plans for the new twin pad Ice Centre. A total of 1,360 contributions were received on the dedicated digital engagement platform, which asked users for their views on the proposals, as well as what areas should be prioritised for the new twin pad Ice Centre as the plans progress.

The earlier phases were an opportunity for LVRPA to receive feedback on some initial ideas and understand ice users and the local community's priorities for the twin pad Ice Centre before commencing on a full consultation in 2019.

Phase 1 – Informing stakeholders and the public of the need for a new ice centre, 2016

Following the completion of the three-stage feasibility study, LVRPA undertook a series of information sessions to inform stakeholders and the community of the need for a new twin pad Ice Centre and communicate the detailed process of the study and outcome to date. These sessions were an opportunity for LVRPA to receive early views from local councillors, members of the community and regular ice users on the new twin pad Ice Centre.

During these sessions the key areas of discussion were:

- The site selection process, with a number of questions being raised around the process, scoring and the site chosen.
- Design of the building, with some attendees raising concerns about the potential height of the building.
- Community facilities, with some asking questions about what additional sporting facilities would be included in the new centre.
- The environment, including ensuring the new centre would integrate into the surrounding landscape of Leyton Marsh.
- Some raised concerns about the potential size of the building and the possibility of it encroaching into the green space.

- Car parking, with questions raised about the number of car parking spaces that would be included.
- Timescales, with attendees interested in understanding the potential programme for development.
- Engagement, with those attending expressing that ensuring a wide range of groups and voices were included would be important.

In response to feedback received in this phase LVRPA committed to:

- Consider how the exterior of the twin pad Ice Centre could be designed to respond to the natural environment of Leyton Marsh and how the surrounding landscaping would enhance the setting of both the ice centre and the marshes.
- Consider how additional community and sport facilities could be incorporated into the design of the twin pad Ice Centre.
- Consider how the twin pad Ice Centre could be delivered as compactly as possible in response to concerns about potential height and density of the building as well as possibility of encroaching onto the green space.
- Involving the community as the plans for the twin pad Ice Centre developed and to deliver a comprehensive public consultation ahead of the final plans being submitted for planning.
- Ensuring that adequate accessible car parking would be included in the plans for the new Ice Centre and carefully considering the best approach to car parking. Some attendees wanted to see car parking reduced and preferred the promotion of more sustainable modes of transport. It was important for LVRPA to balance the needs of ice users, while encouraging more environmentally friendly journeys.

Phase 2: Sharing emerging designs and understanding priorities, 2017

In 2017, LVRPA carried out a second stage of engagement with the community and stakeholders about its plans to redevelop the Ice Centre.

To ensure a new LVIC would meet the needs of ice users and the community, a programme of engagement activity was delivered to share emerging designs and seek feedback on what the community felt was important to be included in the new twin pad Ice Centre. This included the launch of a dedicated online platform (www.icecentreredevelopment.com), a Family Open Day at LVIC and two workshops for regular ice users.

The online platform enabled individuals from different demographics to provide their feedback on the early proposals, while the public events provided individuals with an opportunity to meet the project team. The platform provided respondents an opportunity to share what they liked about the current Ice Centre, as well as areas that they felt should be improved.

A Family Open Day at LVIC was held on Saturday 30 September 2017, where members of the local community and regular visitors to the centre were encouraged to attend, to learn more about ice sports and LVRPA's plans to create a new twin pad Ice Centre. On the same day, an information stand was in place at the Countryside Live event which took place on Leyton Marsh. The events were staffed on the Saturday, while the information boards remained on display for Sunday 1 October 2017.

Overall the sentiment from attendees to these events was positive, with families, ice users and wider members of the community supportive of the plans to provide a new twin pad Ice Centre. Many attendees were not aware of the plans to develop a new twin pad Ice Centre and used the opportunity to ask questions about feasibility, additional facilities and other elements that they would like to see in the new centre. A small number of attendees at Countryside Live expressed their opposition to the plans, citing concern for the environment and encroachment onto nearby green space, as their primary concerns. Of these attendees, some wanted to understand how the twin pad Ice Centre would be designed and how sustainable the building would be.

Throughout the Family Open Day, attendees were encouraged to visit the dedicated engagement website to provide their feedback.

Two workshops were held with regular ice users and ice skating group representatives at LVIC on Wednesday 1 March and Saturday 4 March 2017. LVRPA provided an overview of the emerging designs before engaging in discussion with attendees about priorities for the new Ice Centre, what they felt were the best things about the centre and what they would change. Key areas of discussion included the need for more and better quality ice, keeping the Ice Centre open during building works, accessibility, changing facilities, storage, location, design improvements, additional facilities and environment.

For this engagement phase, 39 feedback responses were received for the two questions on the dedicated online platform. In addition, there were 131 visitors to the site, who read the content in depth. This included those who visited four or more pages on the platform. For this phase, 74% of feedback received was positive, 23% was neutral, while 3% provided comments where issues or concerns were raised.

As a result of feedback received in this phase LVRPA:

- Committed to further enhancing the sustainability of the building and biodiversity plans.
- Decided to reduce the overall footprint of the then proposed building from accommodating 2,500 spectators to accommodating 800 spectators, and to reduce the amount of green space utilised as well as ensuring value for money and deliverability.
- Made a number of changes to enhance the provision of ice sports, including more seating, better quality ice, better changing facilities, as well as having more space for storage.
- Aligned the twin pad Ice Centre north to south as the best way to integrate it into the site and to deliver near-continuous ice provision during construction work. This was in response to engagement with skaters who told us minimising closure would be essential to ensuring the long-term success of the future centre.

Phase 3 – Pre-submission consultation, 2019

During the period from the end of engagement in 2017 to 2019, LVRPA progressed plans for a new twin pad Ice Centre. To ensure the final designs submitted for planning met the needs of users and the community, LVRPA undertook pre-submission consultation from 26 June 2019 to 1 September 2019, where the scope of activity increased from the earlier phases. The response to the consultation was overwhelmingly positive, attracting 1,360 contributions by 475 individuals. In total 85% of responses were positive, 5% were neutral, while 10% of responses were negative. More specifically:

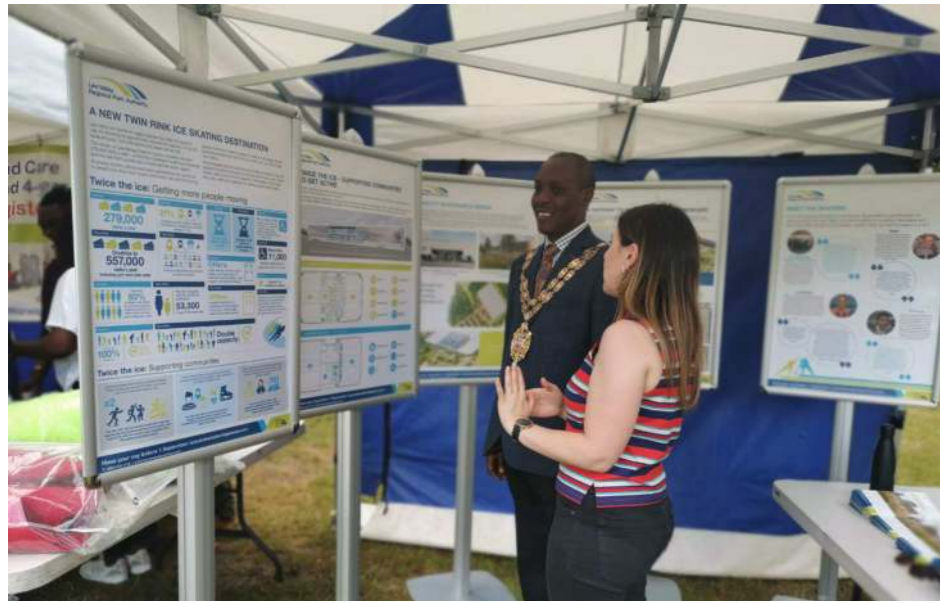


Figure 50 Millfields Park Family Fun Day - 20 July



Figure 51 Waltham Forest Mela - 4 August



Figure 52 Chingfest - 31 August

- Of the 408 responses received for sentiments about the new twin pad Ice Centre, the majority (89%) felt positive about the plans, with many highlighting the quality and continuity of ice, access for elite athletes, and cafes and spaces to relax as their top priorities for the new centre.
- Of the 146 responses received for thoughts about the landscape plans, the majority (84%) felt positively about the plans while 11% felt negatively about them.
- Of the 116 responses received for stances on the emerging designs of the new ice centre, three quarters (76%) felt positively about the design features while 14% expressed negative views.
- Of the 81 responses received for sentiments about the plans encouraging communities to become more active, the majority (82%) felt positively about the proposals while less than 15% were negative about the proposals.

This phase of activity included a mix of online and face to face engagement activity. The dedicated engagement website (www.icecentreredevelopment.com) was updated with information on the latest designs. The website also included functionality that enabled individuals to submit their feedback on the proposals for the new ice centre. The online platform enabled LVRPA to reach a wider demographic including younger people, a greater proportion of working professionals and those that were unable to attend the physical events.

In addition to the online platform, five public drop-in sessions were held in Waltham Forest and Hackney. One of these was targeted towards the ice skating community, the National Team Challenge, which was held at LVIC, while the other four events were free-entry, public events. The consultation team worked closely with the local authorities to select local events taking place over the summer which were expected to attract high footfall and diverse audiences. As a result, a local community sports day, festivals and a daily food market were chosen, covering a cross-section of the boroughs. The chosen events took place on the following dates and times:

- National Team Challenge, Lea Bridge Rd, London E10 7QL, Sunday 14 July 2019, 11.00 until 17.00 (475 attendees).
- Access to Sport Millfields Fun Day, Millfields Park, Chatsworth Rd, Lower Clapton, London E5 0AR, Saturday 20 July, 12.00 - 16.30 (500 attendees).
- Waltham Forest Mela, Leyton Jubilee Park, Seymour Road, London E10 7BL, Sunday 4 August, 14.00 - 21.00 (12,000 attendees).
- Ridley Road Market, Ridley Rd, Dalston, London E8 2NP, Thursday 15 August, 09.00 - 17.00 (109 pitches).
- Chingfest, Ridgeway Park, Old Church Rd, London E4 6RS, Saturday 31 August, 13.00 - 19.00 (15,000 attendees).

At these public events, the consultation team directly engaged with a total of 642 individuals. Visitors, in terms of demographics, varied as each event was targeted to a different audience. This was beneficial as it widened the scope of people who were engaged about the plans and allowed LVRPA to get feedback on the plans from people outside the core ice user base. Throughout the five events, attendees were encouraged to visit the LVIC online platform to provide their feedback.

In addition to the public events and online platform, the LVIC also undertook a range of meetings and briefings with political and community stakeholders and held two drop in sessions for close neighbours of the site.

Locally community group, Save Lea Marshes (SLM), was also engaged via an early briefing and a subsequent site visit. Save Lea Marshes representatives wrote to LVIC to express their opposition to the plans and raised concerns specifically about LVRPA's commitments to the safeguarding of green spaces around the site; design aspects of the twin pad Ice Centre including its size and where the additional footprint would be and potential impacts to biodiversity including the impact of noise and wildlife. SLM also queried whether it would be possible to include green rooms or a green wall as part of the design, to further ensure it was complementary to its green surroundings.

Regular skaters were also engaged in two design workshops, in addition to the workshops conducted during phase 2 of the engagement. The ice community responded positively to the plans and helped to shape and refine the final designs. During the pre-submission consultation stage, LVRPA also sought to explain how comments and feedback from the initial round of consultation had been used to improve the design, sustainability and leisure aspects of the proposals.

As a result of feedback received in this phase LVRPA:

- Made a number of changes to refine the design based on feedback from the ice community including incorporating a dedicated and secure coaches' room, increasing flexibility in changing facilities, incorporating specialist equipment, increasing ice skating pad and rink-side seating, and increasing equipment storage.
- Reduced the car parking from 170 to 155.
- Further refined the design of the building to make it more sympathetic to its environment. For example, the overall building height has been lowered from the original design – and the current building – and where possible elements of glass have been incorporated into the façade to enhance the connection between the inside of the building and its external environment. Energy efficiency in the new Ice Centre will be maximised through excellent insulation and highly efficient air source heat pumps. Roof mounted photovoltaic panels have also been incorporated to generate energy for the new centre. Melted ice will be filtered through reed beds and then used to create new wetland habitats on site with an emphasis on biodiversity enhancement.

All feedback received throughout the project has been shared with the design team and has been considered in developing the final designs of the building and the preparation of the planning application. The feedback has also been used to help shape the detailed design process and LVRPA will continue to keep the local community, ice users, and other groups from further afield involved and updated as the project develops.

Feedback	Project team response
DESIGN	
To have permanent and secure spaces for coaches, as well as office space for team administrators	Provided dedicated and secure coaches room, with equipment lockers, and space for 2 workstations
More changing rooms for competitions	Maximised changing room efficiency and space within available floor area
Larger changing spaces for ice hockey games	Reviewed changing room layouts to maximise available bench space, and ensure rooms are capable of accommodating teams
Separated home and away changing rooms	Ensured home and away teams can use separate routes to the ice without meeting within corridors
Specialist training equipment to be provided	Static jump harness to be provided within rink, while space provision for jump rotation device is being reviewed.
Separate dry area for warm-up and training including protected areas for ice hockey	Exercise studio available at first floor for warm up and training. The project explained to ice users that no suitable indoor area available for dry hockey due to area constraints
Increased spectator seating	<ul style="list-style-type: none"> • Increased Pad B seating to 505 seating spaces (from c. 450) • Includes 24 seats at rink-side in pad B • Retained rink-side spectator seats in Pad A, in addition to seating within skate café.
Secure storage for competition equipment	Provided ample lockable equipment storage
Secure lockers for skaters	Provided a variety of lockers in different sizes, including ventilated lockers for hockey equipment. Equipment lockers are in addition to dedicated staff and coaches' lockers
LANDSCAPE	
Ensure minimal loss of trees	LVRPA reassured the community that loss of trees will be minimal. The project team has identified a number of trees that will be lost; however, these are of poor ecological value. As part of the development, there will be a significant native planting programme incorporating a number of high-quality saplings.
Ensure protection of hedgehogs	<p>A Biodiversity Impact Assessment will be produced to calculate the biodiversity value of the site before and after development. A BREEAM Ecology Assessment and Letter Report will also be produced on all updated surveys.</p> <p>The Report will set out measures to ensure hedgehogs are protected both during construction and once the new twin pad Ice Centre is operational. This will include precautions during construction and provision of habitat suitable for hedgehogs.</p>

Figure 53 Feedback from Public Consultation



Figure 54 Millfields Park Family Fun Day - 20 July



Figure 55 Ridley Road Market - 15 August



Figure 56 Ice Users consultation event no. 2 - 28 August

Pre-Application consultation and feedback.

LVRPA have undertaken a number of pre-application meetings with the following authorities:

LBWF :

- 23rd January 2019.
- 4th June 2019.
- 31st July 2019.
- 8th August 2019 - Technical meeting: drainage.
- 8th August 2019 - Technical meeting: noise.
- 13th August 2019 - Technical meeting: ecology & trees.
- 15th August 2019.
- 23rd October 2019.

Greater London Authority :

- 11th June 2019.
- 28th August 2019.
- Transport for London - 12th June 2019.

It was agreed with LBWF on 23rd Jan 2019 that the project would undergo a Design Council Design Review Panel (DRP) review at an early stage in order that the advice could be incorporated in the emerging design. This review took place on 19th June 2019.

A large proportion of the pre-application discussions were related to planning policy and suitability of the development, in particular with regard to its location in MOL, which is afforded the same level of protection from development as Green Belt. The proposed footprint is materially larger than that of the existing building, therefore the proposals are defined as "inappropriate development". As set out in Paragraph 143 of the National Planning Policy Framework, inappropriate development in MOL should not be approved, except in "very special circumstances".

LVRPA believe that in this case very special circumstances exist, which will mitigate the harm done to the MOL, namely:

- The urgent need to replace the existing Ice Centre.
- The Role of LVRPA in developing facilities for Sports and Leisure within the context of the Lea Valley Regional Park.
- The selection of the most appropriate location for the proposed Ice Centre.
- Community benefits offered by the new, enlarged Ice Centre.
- Health benefits.
- Improvements to the visual and ecological quality of MOL and the Park surrounding the existing LVIC.

For further information, please refer to the Very Special Circumstances Statement accompanying this application.

For further details of the Transport proposals incorporating the advice from TFL, please refer to Section 9.0, and the accompanying Transport Assessment (incl. Car Parking Management Plan and Delivering and Servicing Plan).

Section 2.4 describes how the feedback received through the pre-application and public consultation process has influenced the final proposed design, and provides a summary of the design team's response to the comments.

2.3. EVALUATION

Spatial Hierarchies and Relationships

In order to explore the relationship of the building with the site, it was first necessary to define the approximate size and shape of the building footprint. This was based upon a schedule of areas developed from the operational business plan. The type and scale of each space within the brief has been defined with reference to the design team's collective experience in sports and leisure, and in particular, ice rink development.

The areas of key spaces have been tested through benchmarking of other recent Ice Centres (in particular other twin pad facilities) taking into account feedback and lessons learned from their operation. The following schemes have been used as reference:

- National Ice Centre Nottingham (twin pad).
- Ice Sheffield (twin pad).
- Ice Arena Wales – Cardiff (twin pad).
- Streatham Ice and Leisure Centre (single pad).
- Sapphire Ice and Leisure Centre – Romford (single pad).
- Cambridge Ice Arena (single pad).

The brief has been tested against Sport England guidance, and the requirements of the individual ice sports federations and associations.

After reviewing the brief areas, and applying an allowance for partitions and structure etc., a gross internal area of approximately 8,650m² was defined. Within this area, the size of the 60 x 30m Ice pads and associated benches, sin bins etc. is defined and fixed by the functional requirements of the field of play.

Initial conceptual layouts and the relationships between the key building volumes were tested on the site with physical and digital models to produce as tight and efficient a plan as possible, and to ensure the site could accommodate the scale of development within the constraints described in Section 2.1. FaulknerBrowns sought to minimise the building footprint to reduce the resulting net loss of MOL compared with the existing Ice Centre.

The functional relationships between individual spaces were analysed and tested. It was apparent that the majority of the internal floor area was associated with the ice rinks and support functions (including the changing areas, ice making plant, garage etc.) and this would be most appropriately located at ground level. Of the 8,650m² of accommodation in the brief, only 1,700m² could practically be located at first floor, including 500m² of plant.

Having tested multiple iterations, the preferred plan was conceived as a simple block of core accommodation over two storeys, flanked on each side with the clear span volumes of the ice halls. This arrangement resulted in a compact plan, efficient building services and structural arrangements, and minimised the external envelope and surface area of the building. To maximise efficiency and reduce circulation area, this would naturally place the main public entrance to the building at the centre of the longest elevation (between the two ice pads)

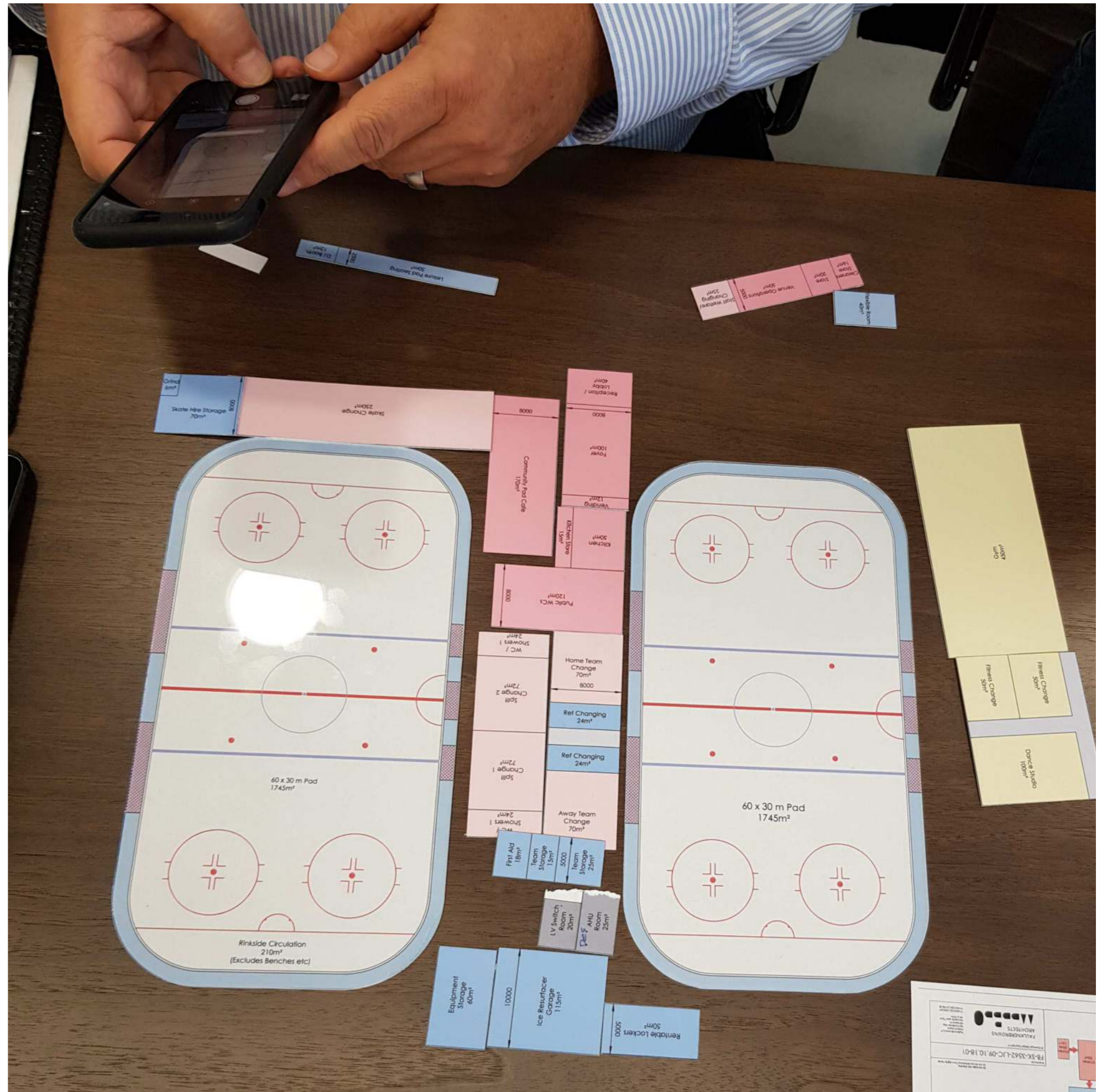


Figure 57 Testing spatial layouts with 2D models

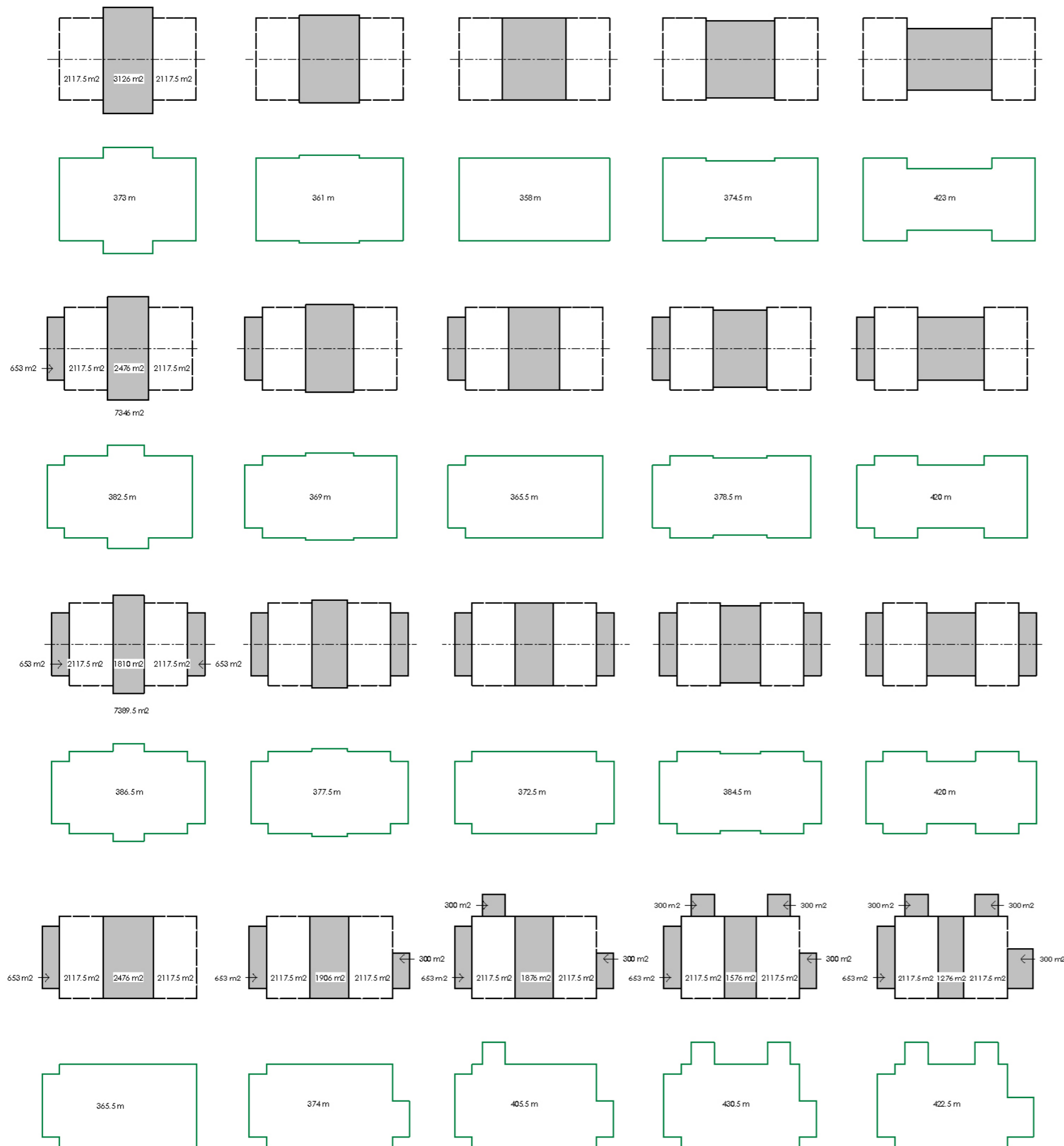


Figure 58 Testing efficiency of building envelope for different plan configurations

Within this basic plan form, a hierarchy of spaces was defined, with the ground floor progressing from the public front of house facilities (entrance foyer, café, reception), through skaters accommodation (Skate change and group / team change) to service spaces (plant, storage, ice garage) at the rear. The fitness suite and dance studio was located at first floor, with the balance being occupied by a mixture of internal and external plant areas.

The resulting footprint area was approximately 112 x 65m, or 7,280m². This was subsequently reviewed and circulation areas further optimised to reduce the footprint to 110m x 65m.

Site location and orientation

Having defined the site constraints and tested the size of the building footprint, FaulknerBrowns began to test the possible location and orientation of the building within the site. A number of iterations were tested (see Figure 59 to Figure 70 overleaf), but these fit into 2 general approaches:

Option 1:

Building aligned perpendicular to Lea Bridge Road, with the narrowest elevations addressing the road and the marshes, and the main entrance facing the existing car park.

Option 2:

Building aligned parallel to Lea Bridge Road, with the longest elevations addressing the road and the marshes, and the main entrance facing the road.

Permutations of these 2 basic options were tested in plan, and in 3D by importing block models into Google Earth to review street level and aerial views of the massing in context. Key viewpoints along Lea Bridge Road and Leyton Marshes were identified and accurately photographed on site with their locations defined by GPS. The mass model was then montaged into these photographs to assess how the visual impact of the building was affected by its position and orientation.

The options were assessed against the following criteria:

- Visual impact on and proximity to Leyton Marshes.
- Impact on existing tree groups.
- Legibility and accessibility of entrance.
- Impact on axial views along the Lea Bridge Road movement corridor, particularly the approach across the bridge.
- Effect on permeability, legibility and connectivity between Lea Bridge Road and Leyton Marshes.
- Ability to accommodate continuity of ice provision (either temporary or through phased construction).

When tested against all the criteria, it was evident that Option 2 allowed a greater setback from the boundary with Leyton Marshes, which when looked at 2-Dimensionally in plan would appear to reduce its visual impact. However once reviewed in the 3-Dimensional massing studies, it was clear that by presenting the longer elevations to the road and the marshes, the visual impact was exacerbated. The width of the building would potentially result in further tree loss to the east, and would close up the existing view corridor between the current Ice Centre and the eastern tree group.

By presenting the shorter edge to the road and the marshes, Option 1 increases the potential to improve visual and physical connectivity through the site. The legibility of the interface between Lea Bridge Road and Leyton Marshes would be improved through this orientation by moving the west elevation facing the car park further towards the east. This opens up a direct line of sight both to and from Sandy Lane through an area currently occupied by the existing Ice Centre.

It was proposed that Option 1 would better meet the aims of the Lea Bridge and Leyton Vision (published by LBWF in 2017), by enhancing the interface with Lea Bridge Road and the Park, and maximising permeability.

Both Options 1 and 2 would require the building footprint to overlap the National Grid Tunnel zone of influence, however significantly more of Option 2 would sit within this zone.

It was acknowledged that both options would have an impact on the existing tree groups to the north and east of the site. Option 1 would result in some loss of trees within the group to the north of the site, while Option 2 would result in some loss within the east group.

In all possible permutations of Option 2, both new ice rinks would overlap the footprint of the existing Ice Centre. This option could not provide ice continuity as it would require full demolition of the existing Ice Centre prior to starting construction.

Option 1 offered the opportunity for a phased construction and sectional handover of the new facilities by constructing Pad A to the north of the existing building, prior to demolition. This could therefore provide continuity of ice by avoiding a protracted closure during demolition and construction. This would have benefits, not only to the business case by minimising the disruption to revenue, but also to the socio-economic impact by maintaining the provision of ice facilities to the residents of LBWF and other local boroughs. Refer to the Socio-Economic Statement accompanying the application for further details.

In both Options, the optimum location for the main building entrance and the public facing café were considered. A first there was an inclination towards placing the café space on the north facing the marshes, in order to take advantage of the views, and to offer a facility for park users. Option 2 would allow this approach, however, functional requirements necessitated the café being located adjacent to the entrance. This layout would not provide a clear and legible approach for users arriving by car, by public transport and on foot, who would be approaching from Lea Bridge Road. The ecological impact of light spill onto the marshes ruled out this arrangement.

Option 2 would give an opportunity to place the entrance on Lea Bridge Road, giving a far clearer approach to the building from Lea Bridge Road, however the distance from the car park would not be optimal.



Figure 59 Google Earth Massing Model - Existing



Figure 60 Google Earth Massing Model - Options Studies



Figure 61 Google Earth Massing Model - Options Studies



Figure 62 Google Earth Massing Model - Options Studies



Figure 63 Google Earth Massing Model - Options Studies



Figure 64 Google Earth Massing Model - Options Studies



Figure 65 Option 1 - Photomontage massing study - view from Sandy Lane



Figure 66 Option 2 - Photomontage massing study - view from Sandy Lane

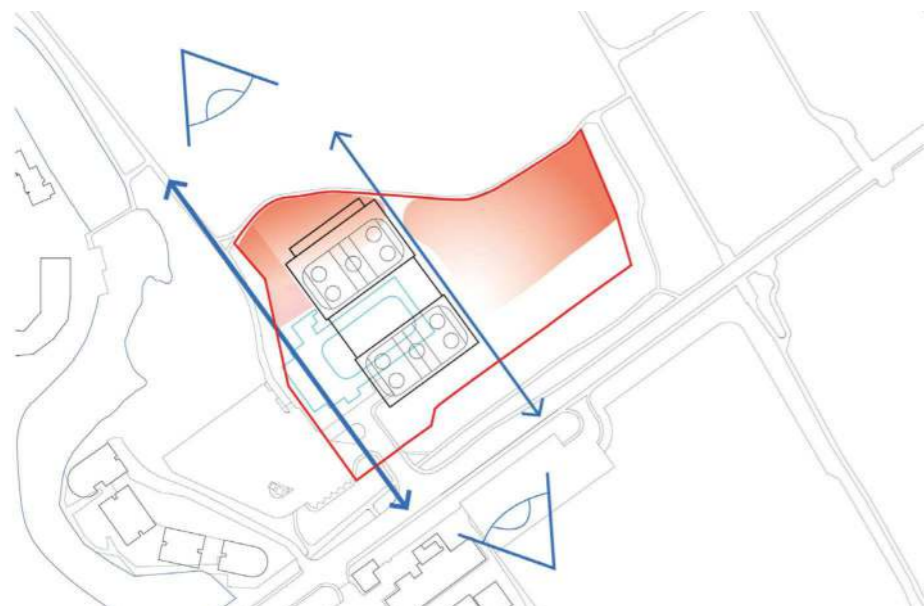


Figure 67 Option 1 - Visual Connectivity

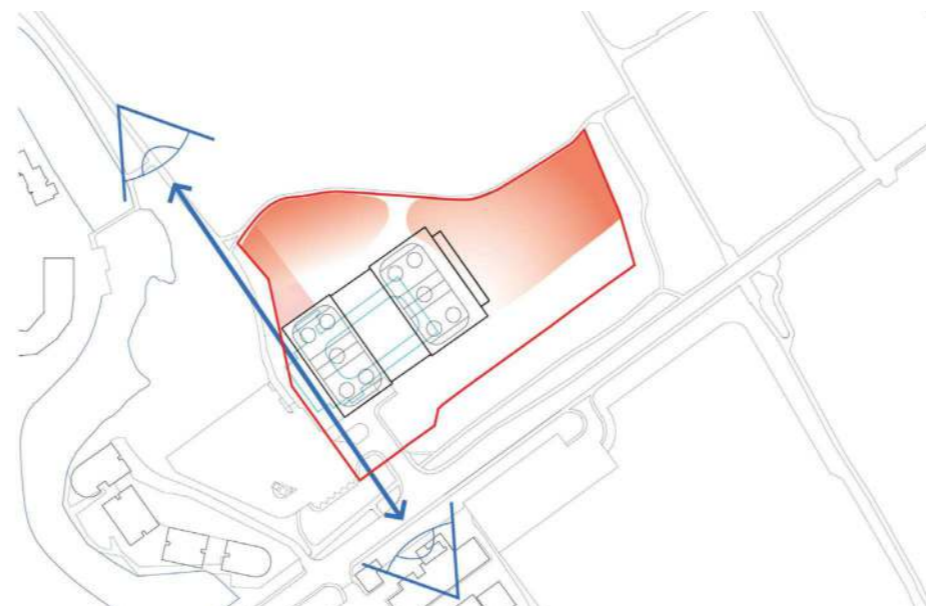


Figure 68 Option 2 - Visual Connectivity

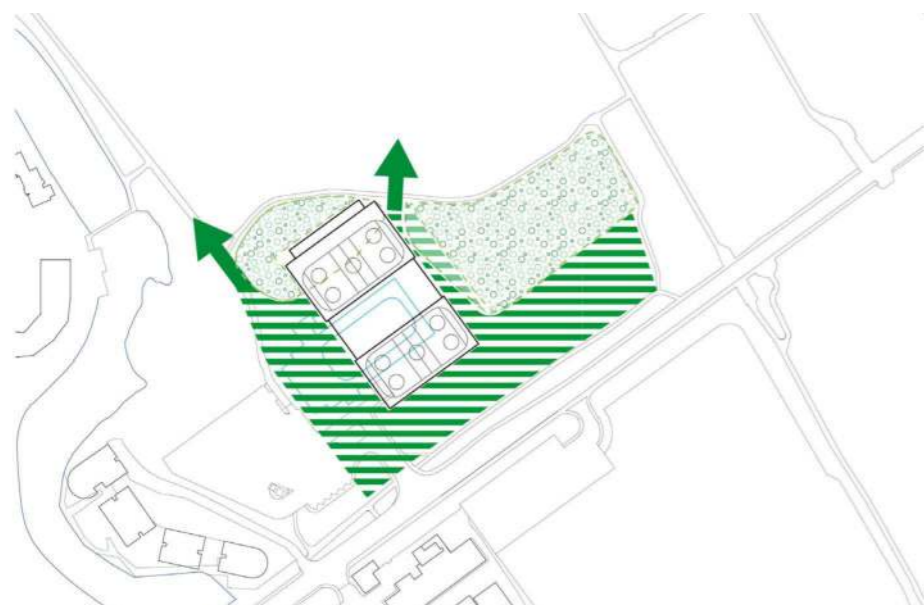


Figure 69 Option 1 - Landscape Connections

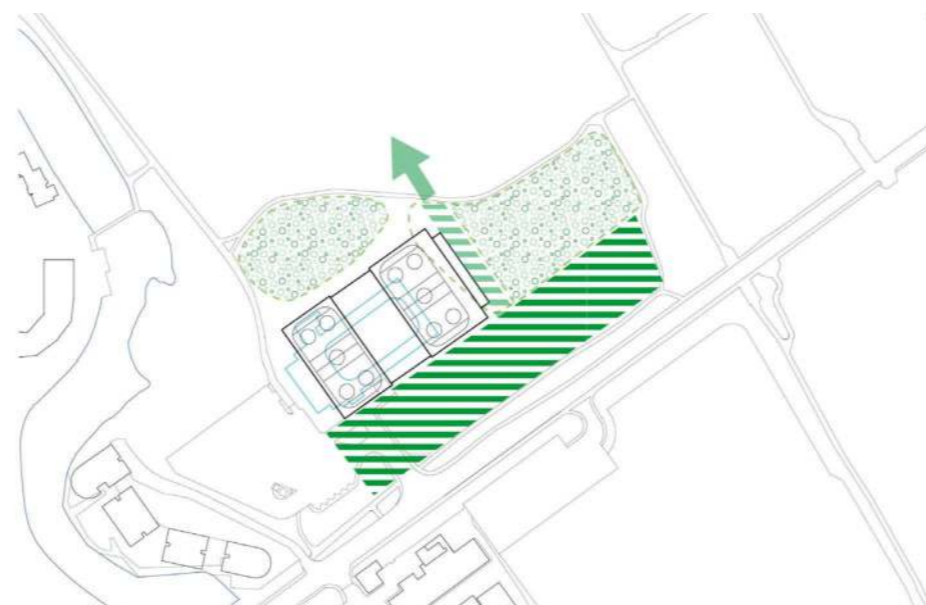


Figure 70 Option 2 - Landscape Connections

Option 1 would place the entrance on the west facing the car park at the point at which the routes from the car park, Lea Bridge Road and Sandy Lane cross. This would define a clear nodal point and create the opportunity for a new arrival space at the entrance to both the building and the Marshes. Placing the café on this node would allow it to be used by passers-by on Lea Bridge Road as well as those arriving at Leyton Marshes.

Following testing of a number of permutations of positions and orientations, Option 1 was selected as the preferred approach due to it offering the following benefits:

- Greater visual connection and permeability between Lea Bridge Road and Leyton Marshes.
- Reduced impact of the building massing on the views from Leyton Marshes.
- The ability to create a new public arrival space between the existing car park, the new building entrance and Sandy Lane.
- The ability to provide continuity of ice facilities throughout the construction programme.

The Design Team agreed that this orientation would greatly increase site legibility and offer opportunities for the reception, public café and gym to engage with the marshes. Within the landscape masterplan the concept of extending the natural environment of the marshes past the main entrance of the Ice Centre and towards Lea Bridge Road was established, thus contributing to a more permeable edge and a gateway into the northern marshes.

The site strategy and orientation was presented to the LVRPA Members Group on 13th December 2018. A clear preference for Option 1 was expressed, giving FaulknerBrowns and LDA the confidence to progress the Stage 2 Design on this basis. The strategy was presented to LBWF's Planners during a Pre-Application meeting on 23rd January 2019. The orientation was also discussed in the GLA pre-application meeting on 11th June 2019.

During RIBA Stage 3 design, the position of the building was reviewed again in detail, once the internal layout was more developed and the footprint confirmed. The Design Team held workshops to test and refine the assumptions made around phasing and buildability, and ensuring sufficient working space for construction around the existing Ice Centre. The building position was also reviewed with respect to its proximity to the SMINC, and it was decided to move the building slightly further to the north and east to ensure that the construction works and access, and any hard landscaping to the building perimeter would not encroach into the SMINC.

Massing Studies

The studies described above determined the most appropriate location and orientation for the building footprint, based upon a simple, efficient block massing. These studies took into account the volumetric requirements of each space, and their basic strategic relationships, but did not attempt to define an architectural style until the principles of orientation had been agreed in principle.

Early explorations of the building form were carried out in parallel with the orientation studies. The initial concepts were based upon each major building volume (the two ice halls and the core) being expressed as distinct elements. This approach enabled the overall building mass to be broken up into smaller elements and for the internal spatial arrangement to be understood externally. From this basic architectural diagram, a variety of options for the ice hall roof forms were tested, as well as methods for articulation the central core area and the main entrance.

These options were tested within the context through 3D modelling, and several shortcomings were identified:

The massing was not responding to the surrounding park setting. The resulting forms were very "boxy"; while separating the plan into 3 elements reduced the mass of the whole, the individual elements were still large, with large expanses of blank façade as a result of the environmental control required within the ice halls. The square corners of the halls were very dominant in the key views of the building available through the existing tree cover.

The design team looked at the recent precedent for development within the lower Lea Valley, including:

- The Lee Valley Velo Park.
- London Olympic Stadium.
- London Aquatics Centre.
- Copper Box multi-sport arena .
- Lee Valley Hockey and Tennis Centre.
- Lee Valley Riding Centre.
- Hackney Marshes Centre.

These schemes are of varying scale, form and materiality, but many have the common characteristic of being a pavilion within the context of the Park. This pavilion typology became an important concept for the LVIC proposals. The building will be surrounded by the landscape setting of the Regional Park on all sides, therefore FaulknerBrowns determined that the building should respond to each aspect equally, with a consistent elevational design and materiality. While a hierarchy of elevational treatment might be appropriate to place an emphasis on the entrance, there should be no front or back to the building, with the back of house and service areas presenting a consistent quality and architectural language to the Regional Park as the front of house.

To address the scale and height of the proposed building, and to better sit within the Park, FaulknerBrowns proposed dividing the elevation horizontally by adding a plinth element. This provided a number of benefits:



Figure 71 Concept Masterplan - Visual Connections

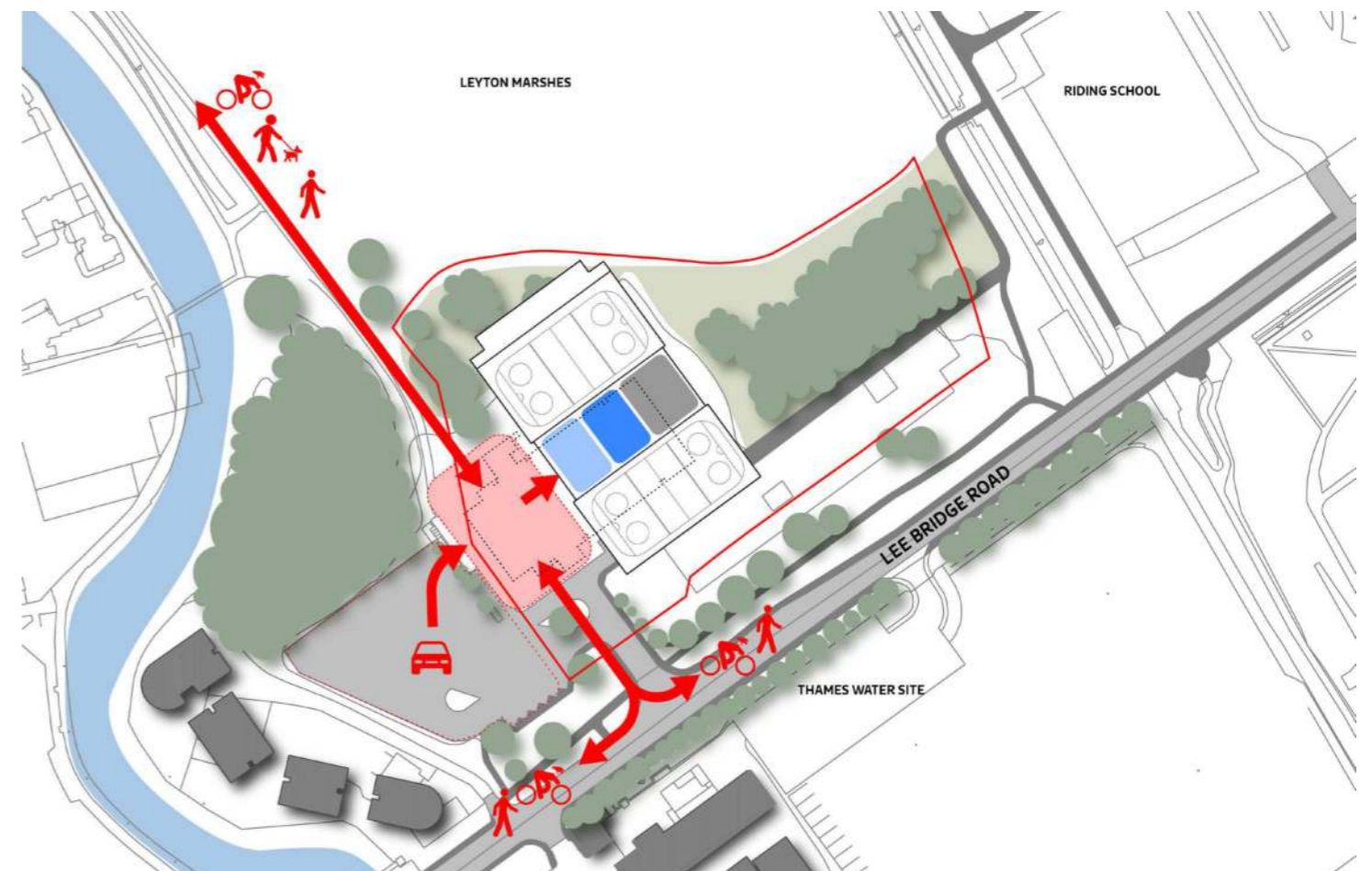


Figure 72 Concept Masterplan - Access and Movement Strategy

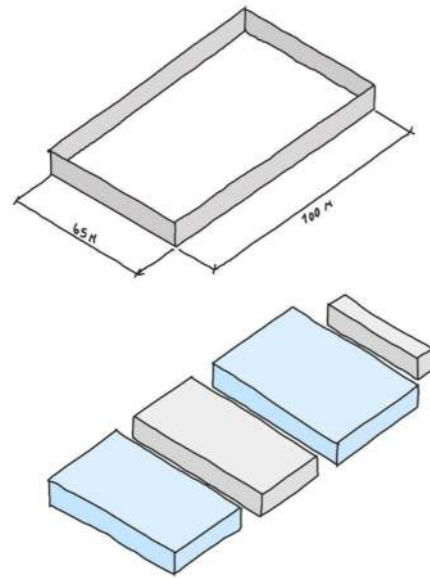


Figure 73 30.10.18 - Initial Concept Massing - Volume Study

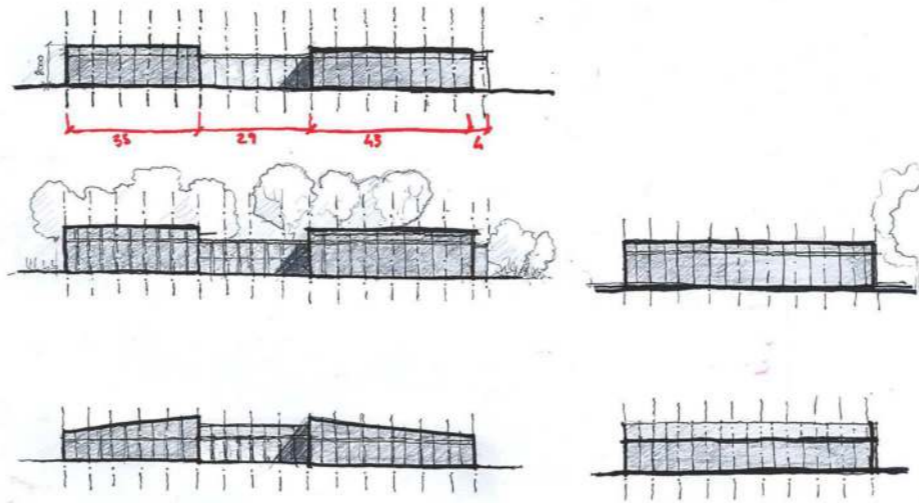


Figure 74 31.10.18 - Initial Concept Massing - Roof Forms



Figure 75 05.11.18 - Initial Concept Massing - Roof Forms

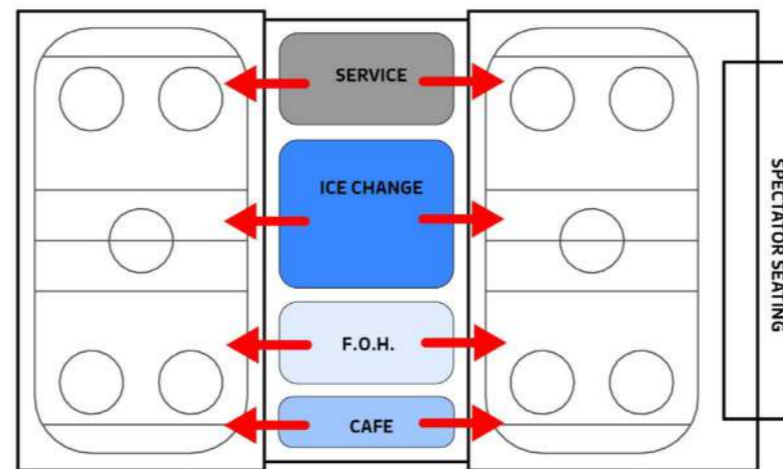


Figure 76 04.12.18 - Concept plan

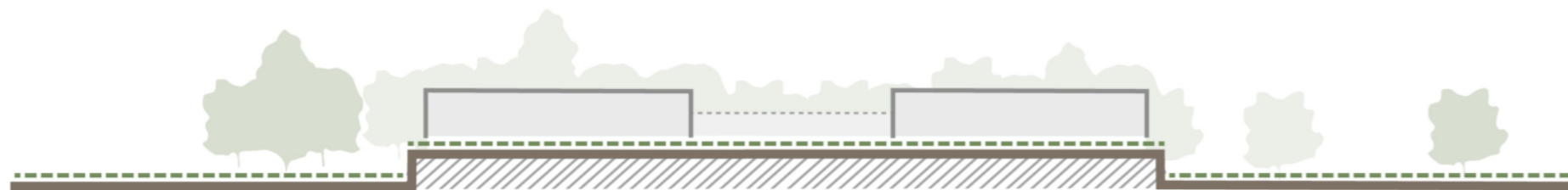


Figure 77 19.12.18 - Sectional Parti - Introduction of Plinth

The division of the façade helps reduce the apparent height of the building, creating a horizontal emphasis and a longer, lower proportion which better responds to the flat landscape of the marshes and the Regional Park.

The plinth "grounds" the building, creating the opportunity for mass at low level, and the introduction of a change in materiality between the ground plane and the lightweight structure above.

The introduction of mass at the ground level serves a practical function, creating a robust base. This is particularly appropriate within the ice halls, where wall finishes are required to withstand impact and abrasion from ice skates.

Once the principle of a horizontal order of plinth and "top" was established, further massing studies were carried out to test the elevational hierarchy. The idea of using the plinth as a unifying element presenting a consistent elevational approach to each façade was tested. At this point, the twin ice halls and the separating core were still expressed as individual masses, sitting above the plinth.

The next step in the concept massing development arose from the desire to express the internal function of the ice pads externally, given that the need to control internal climatic conditions and energy use would limit the opportunity for expansive glazing to offer uninterrupted views into the building.

The curved corners of the ice hockey field of play are unique with no comparable form in other indoor sports, therefore FaulknerBrowns looked to exploit this shape to create an external form generated by the function within. To this end, we looked to extrude the plan shape of the pad within the enclosure of the ice halls, to create a tight and efficient wrapper, giving a suggestion of the form and function within.

3D massing studies demonstrated that the introduction of the curves to the ice hall volumes would help to minimise the mass of the building, by softening the form.

The 3 key principles of the pavilion, the plinth and top, and the curved corners of the ice halls were established by the end of 2018, and further refined and developed within the RIBA Stage 2 design proposals, which later formed the basis of the scheme presented to the DRP in June 2019.

Inclusive Design

Throughout the development of the proposals, inclusivity has been a central part of the design. The existing LVIC serves a high proportion of women, girls and Black, Asian and minority ethnic people (BAME), and the development of the new twin pad Ice Centre aims to extend the social benefits offered by the current facility. (For more details, refer to the Socio-economic Impact Report submitted in support of the application). The new twin pad facility provides the opportunity to increase the participation in ice sports for people with physical disabilities and people with mental health problems or learning disabilities. The proposals also promote the use of the building by non-ice users and members of the public through the inclusion of the public café.

The design and layout of the scheme has been developed in compliance with current best practice for inclusive access. For details of the physical access strategy, refer to Section 9.4.

2.4. DESIGN

Design Development

Having established the principle massing concepts, the architectural language was developed and refined during early 2019. During this crucial time, the design was subject to regular challenge and review, through internal FaulknerBrowns peer reviews, and presentations to the LVRPA board.

Once the building orientation was established, a number of concepts were developed for the Landscape Masterplan:

- Extending the Marshes – creating a link between Lea Bridge Road and Leyton Marshes by the use of appropriate native planting.
- Creating visual links between the marshes and Lea Bridge Road to increase permeability.
- Introducing permanent and temporary wetland habitat through the site, both through the use of ponds and reed beds, and swales within the car park.
- Creating a series of “bridges” parallel to Lea Bridge Road to cross these wetlands and reflect Lea Bridge Road’s importance as a crossing point through the marshes.

The Landscape Masterplan proposed retaining the car park in its existing location, but re-planning and rationalising the lane layout to run perpendicular to Lea Bridge Road. This had the advantages of:

- Creating views along the car park lanes from Lea Bridge Road, instead of views perpendicular to rows of parking bays.
- Introducing swales between the rows of cars to provide a SUDs strategy and enhance the appearance of the car park.

The existing road junction was retained, and the access route straightened to create a direct line of sight through to Sandy Lane and the Marshes beyond. To the east of the access road, a paved terrace was created along the elevation of the proposed building, to create an external space for use by the public, and served by the proposed café. To celebrate and create a signpost for the Marshes beyond, wetland areas with reed beds were created along the northern edge of the terrace, further reinforcing the concept of extending the Marshes towards the road.

As well as providing additional biodiversity and an attractive outlook for the terrace area, the water features form an important part of the SUDs drainage strategy, creating an attenuation basin for roof drainage, and providing a unique method of disposing of ice melt. A significant part of the water outflow from an ice pad comes from the ice cut from the surface of the pads by the ice re-surfacing machine or Zamboni. This ice is melted within a pit before discharging to the drain. At LVIC it is proposed to treat this melt water by passing it firstly through a filter to remove particulates, then through a series of reed beds to naturally clean and decontaminate the water. At the end of this cycle the water discharges to the existing oxbow lake to the north west of the site, helping to oxygenate the lake and benefitting aquatic life. Celebrating this water cycle by making it a key feature of the proposals became a fundamental part of the landscape strategy.



Figure 78 19.12.18 - Massing Study - No Plinth



Figure 79 19.12.18 - Massing Study - Addition of Plinth



Figure 80 19.12.18 - Massing Study - Curved corners to upper volume

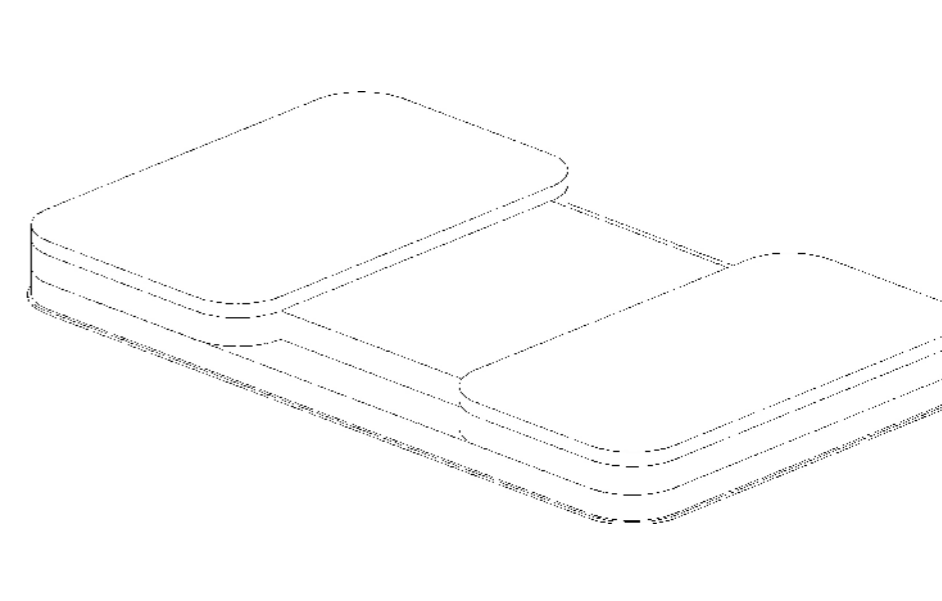


Figure 81 21.01.18 - Massing Study - Curved corners extend to ground



Figure 82 22.01.18 - Massing Study - Testing options for entrance



Figure 83 22.01.18 - Massing Study - Testing options for entrance

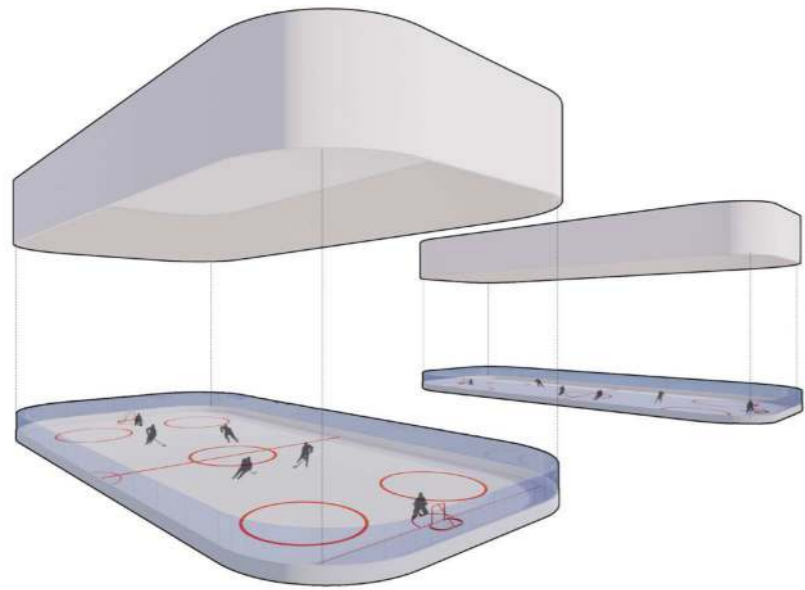


Figure 84 05.02.18 - Massing Concept - Reflecting ice pad geometry

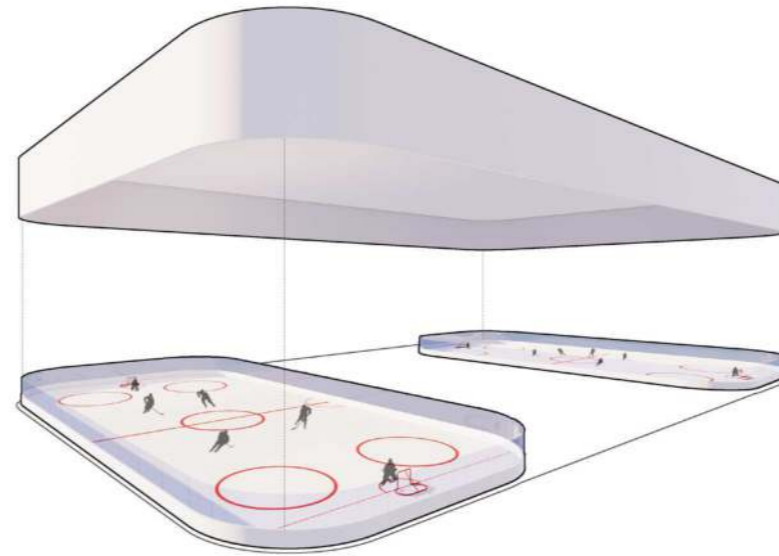


Figure 85 06.02.18 - Massing Concept - Single unifying volume



Figure 86 13.02.18 - Massing model - simple curve to reveal entrance

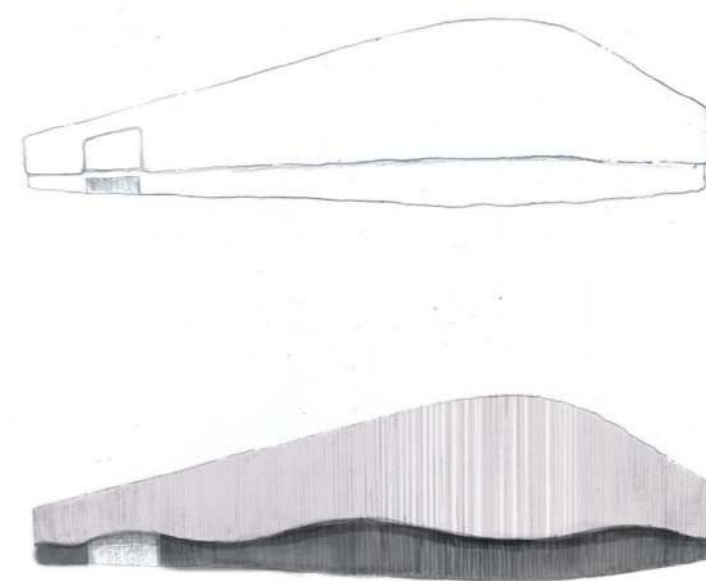


Figure 87 18.02.18 - Massing sketch - testing geometry of Band

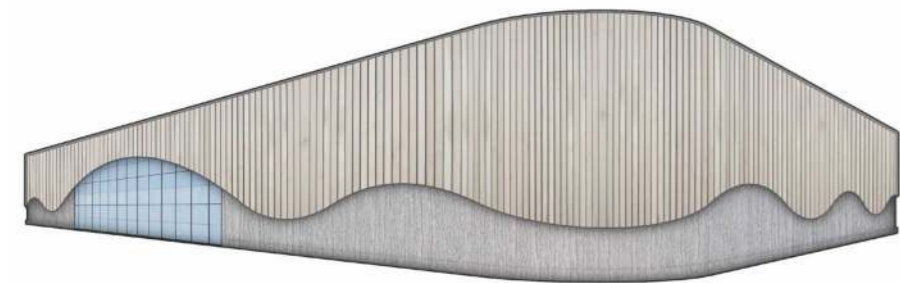


Figure 88 18.02.18 - Massing sketch - undulating base to Band



Figure 89 22.02.18 - Massing Model - Simplified curve to base of Band

The soft landscaping proposals were based upon the principle of maximising biodiversity, through the introduction of native meadow and wetland habitat, and native tree and shrub planting to mitigate any loss of trees and habitat by the larger building footprint.

The previous massing studies described in Section 2.3 above, resulted in the curved-cornered forms of the ice halls, sitting above a rectangular plinth. The centre of the curves was dictated by the structural grid, to ensure the quadrant points on the curve occurred on column lines. However, the resulting curve was not parallel to that of the rinks. The first floor accommodation of the gym was stepped back to these quadrant points, so that each curved corner of the ice hall was expressed, and the upper element resembled a dumbbell in plan. The central gym and core volume was defined as a separate element by reducing its height relative to the adjacent ice halls.

The internal review process challenged this arrangement. The transition from the rectangular plinth to the curved top created some awkward internal relationships, unnecessary structural complexity, and a lack of clarity in the composition. The following refinements were carried out:

The curved corners were placed on the four outer corners of the building only. The curved corners were extended through the full height of the building, including the plinth.

These refinements resulted in a more compact unified building form, with fewer complex junctions. The massing concept was then revisited, and the concept of a continuous, tight band, wrapping the whole building was introduced. The band reinforced the concept of a pavilion within the landscape, by providing a consistent architectural form and language to each elevation of the building, and strengthened the horizontal proportion created by the plinth.

Developments in the internal layout aimed to clarify the architectural organisational concept of the central core flanked by the two ice hall volumes. Internal voids were created over two storeys to the front and back of house areas. This created the opportunity for a generous double height atrium across the full width of the core behind the main entrance. The gym at first floor was pushed back to rear of the foyer, with glazed openings through the foyer and to the landscape beyond. To the back of house area, an external service yard was created, to provide area for deliveries, refuse storage and external building services to be contained within the building footprint and not spill out into the surrounding landscape.

Early materiality options for the band sought to contrast the conceptually and functionally heavyweight plinth, through the use of a lightweight material. The strength of the concept of the band lay in it being a continuous form. In contrast, the plinth could be broken to create a natural opening around the entrance foyer. It was apparent that continuing the band across the opening and in front of the double height foyer would unify both sides of the core, but would reduce the availability of natural daylight and views into the gym and the foyer, and could also reduce the presence of the gym from outside the building. In order to address this, the bottom edge of the band was "stretched up" to reveal the double height foyer within and to place an emphasis on the entrance.

Further studies of the relationship between the plinth and the band introduced further curvature to the base of the band. This was simplified in the final RIBA Stage 2 proposals to a single symmetrical curve to each elevation. On the east elevation the band would over-sail the service yard with a similar height to the curve over the entrance. On the shorter north and south elevations the curve was lower. Full height breaks were introduced in the plinth to the north and south elevations to provide a panel of glazing into each ice hall.

Following the commencement of Stage 3 design in May 2019, further internal peer reviews were carried out. It was noted that the curved transition at the base of the band could only be achieved by fixing the cladding of the band onto the masonry of the plinth, creating an overlap. This resulted in a lack of clarity between the internal form and the external architectural expression. As a result, the articulation of the band was simplified, with the curved lift expressed on the entrance elevation only. To the remaining elevations, a narrow shadow gap articulated the junction between the plinth and the band.

The plinth was rationalised to follow a consistent horizontal datum. Where the band was lifted to the entrance elevation, a slender "reveal" of the insulated cladding of the ice hall box occurred between the band and the plinth. Numerous iterations of this elevation were produced, to test alternatives to the lift, including cut-outs and slices within the band. Further studies tested the proportion and curvature of the lift.

The materiality of the plinth was considered in further detail, and a brick cavity wall construction proposed. Within the plinth, a rhythm of piers and infill panels was explored, to allow escape doors, glazing and other openings to be integrated with a common composition. Within this framework, differing textured brickwork, including open perforated panels would add visual interest, break down the scale and create opportunities for wildlife and planting to inhabit the wall.

The proposals for the band were developed, and a vertical lightweight metal standing seam cladding was proposed, creating a contrast with the masonry plinth. For both the plinth and band elements, a palette of warm earthy tones including London Stock brick, and copper or copper hued cladding was preferred, to respond to the natural context of the park through the changing seasons.

The proposals resulting from these early Stage 3 design developments were presented to the DRP, GLA and LBWF, and were published as part of the Public and Stakeholder Consultation through July and August 2019.

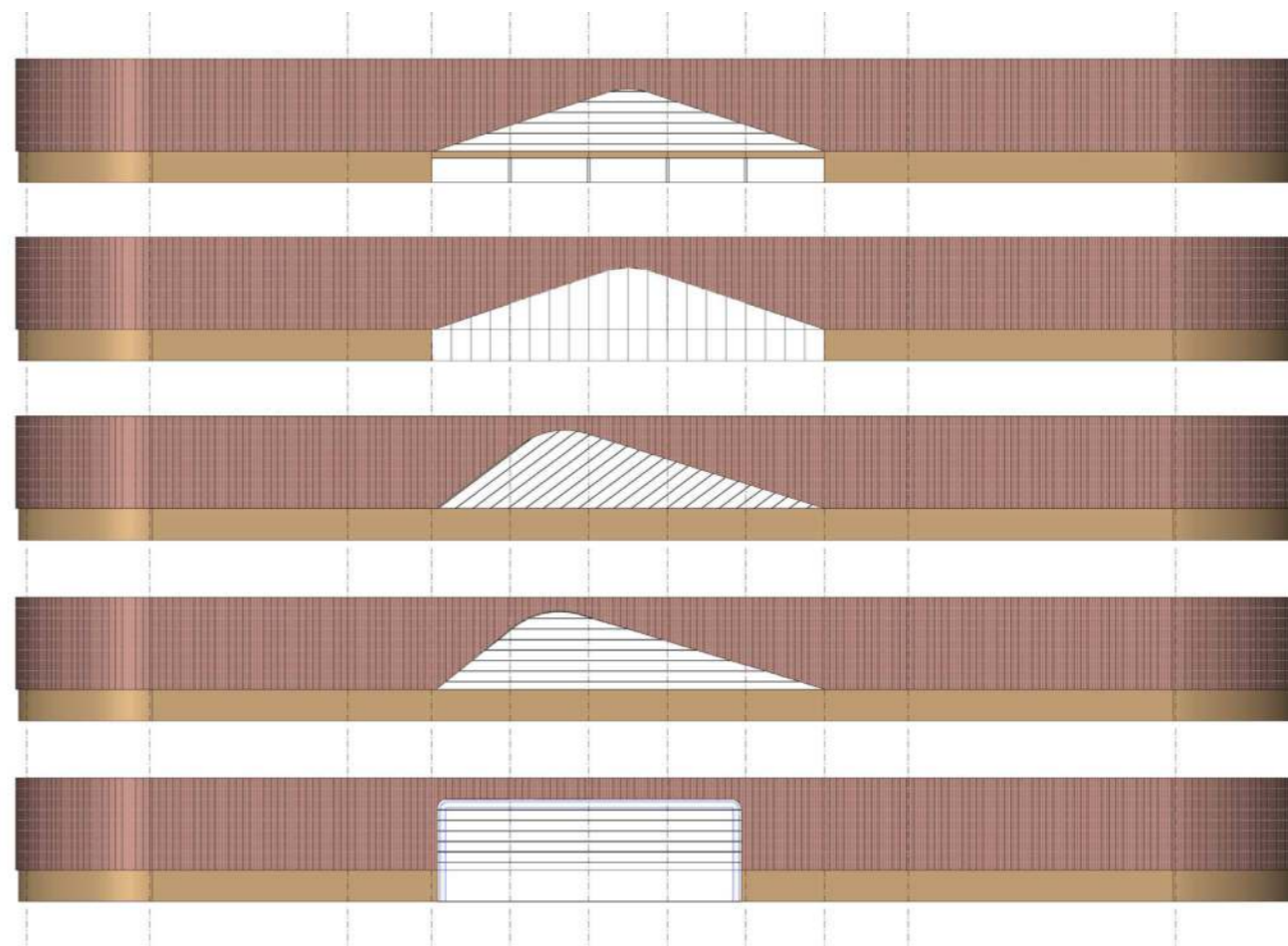


Figure 90 18.06.19 - Testing options for glazing to Entrance Foyer

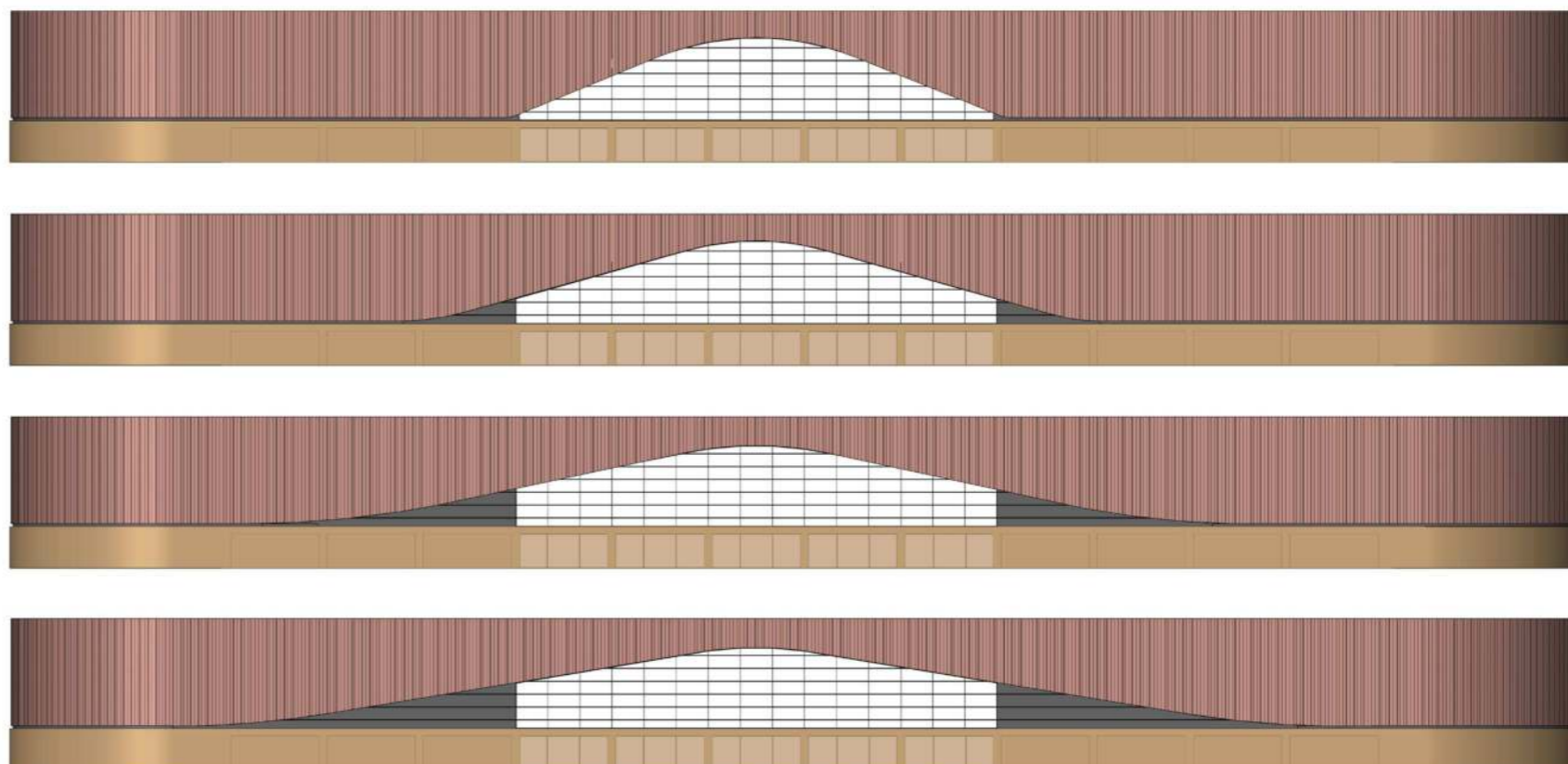


Figure 91 18.06.19 - Testing options for width of lift to Band



Figure 92 20.06.19 - Illustrative view of proposals presented to Design Review Panel - June 2019



Figure 93 27.06.19 - Revised Elevation - Initial response to Design Review Panel feedback

Summary of design response to pre- application feedback.

Following the DRP review, GLA and LBWF pre-application meetings, stakeholder consultation (See Section 2.2) and ongoing internal peer reviews, the team undertook a number of significant revisions and refinements to the design in order to respond to the feedback received.

The table in Appendix A, Section 10.1 summarises the main points from the pre application feedback which have influenced the development of the final design being submitted for approval, and where appropriate the design team's response to the comments. This list is chronological with respect to the date that the feedback was received, and does not necessarily reflect the stage of development of the design as presented (the GLA feedback reflects design proposals submitted prior to the DRP review). Public and pre-application consultation has continued in parallel to the ongoing design refinements.

The GLA response also set out requirements for site transport integration, car parking and cycle provision, which are considered within the Transport Assessment and Travel Plan submitted in support of this application.

Key changes undertaken to address the comments raised during the consultation process include the following:

- Reducing the proposed number of car parking spaces from 177 (plus overflow spaces) to 155, freeing up further site area for re-landscaping.
- Removing the existing blacktop from the car park, and introducing coloured asphalt in lieu, resulting in a less "urban" appearance.
- Realigning the access road between Lea Bridge Road and Sandy Lane to follow the existing curve. This has improved the views through the site, by filtering these views through the landscape rather than a direct line of sight along a road. It has also increased the area for the café terrace, and created a larger landscape buffer between the terrace and the car park.
- Adjusting the building structural grid and truss setting out, to allow the external curved corners to have the same centre-point as, and better reflect the curvature of the ice pads.
- Changing the proposed materiality for the plinth from brick to gabions, allowing the whole plinth to be planted and to naturally blend into the landscape over time and maximising the opportunities for biodiversity within the plinth.
- Comprehensively reviewing the articulation of the band, adding a 3-Dimensionality to the previously vertical façade, resulting in a more expressive and playful architectural form as well as a more refined proportion to the elevations.
- Reviewing feasibility of introducing passive design measures, and creating the opportunity for natural ventilation within the café and foyer space.
- Reviewing the internal layout, ensuring legibility and reinforcing the clarity of the original concept.
- Reviewing the relationship with the public café area and the external landscape.
- Revisiting the composition of glazed openings in the plinth, in order to co-ordinate with the mass and rhythm of the gabion cladding, articulate the elevation to Lee Bridge Road and allow opportunities for view both into and out of the ice hall. In reviewing the extent of glazing, the design team had to remain cognizant of the operational and environmental implications of glazing within the ice halls, as well as the need to carefully control light spill into the surrounding sensitive landscape.
- Reducing the overall building height.



Figure 94 17.06.19 - Landscape Masterplan presented to Design Review Panel



Figure 95 17.06.19 - Landscape Masterplan presented to Design Review Panel

3.0 USE

3.1. EXISTING USE

The site of the proposed LVIC is occupied by the existing ice rink and associated car parking, plant compounds and service areas.

In addition to users of the Ice Centre, the current car park is used by people walking within the marshes and commuters using Lea Bridge Station. It operates on a pay and display basis, currently managed under contract to a 3rd party car park operator. The car park is also used as a route to Sandy Lane providing HGV access to the Springfield Marina.

The site contains an area of grasscrete hardstanding which is used for access to temporary overflow and coach parking.

LVIC currently has a parking capacity of 307 spaces. The car park provides 177 permanent car parking spaces, with approximately 130 overflow spaces on the grass and grasscrete area alongside Lea Bridge Road.

The remaining site consists of open landscape, including areas of amenity grassland, but is of relatively low quality in terms of its visual landscape amenity and biodiversity. A picnic area runs along the southern edge of the Ice Centre, but is under utilised.

To the north of the site, a service area consisting of an external ice plant compound, waste compactors and storage containers sits within a strip of amenity grassland between the existing building and several groups of trees and scrub which enclose the northern edge of the site. A further large group of trees and scrub occupies the majority of the eastern side of the site. The tree groups are generally of low arboricultural quality, with numerous multi stemmed, and self-seeded specimens. The groups are dense and relatively impenetrable, offering little physical amenity, but effectively screening the Ice Centre from views. Full details can be found in the arboricultural survey and report submitted in support of this application.

The existing LVIC contains a single 26 x 56m International size rink, which was refurbished in 2017 to extend its life. The remaining facilities within the centre support the primary use of the ice pad. A skate café is situated at the ground floor, however it is located beyond the ticketing barrier and is therefore only usable by paying visitors. A first floor mezzanine contains a bar and function room and staff offices, with access to HVAC plant in the roof space above. The skate hire and skate change is located to the western end of the building in a single storey building. Team changing rooms are provided, however these are severely cramped and inadequate, and not capable of accommodating a full ice hockey team with equipment. The Ice Centre has seating for up to 760 spectators.

LVIC is home to the Lee Valley Lions, an amateur hockey team competing in the Second Tier National Ice Hockey League. The Lee Valley Lions operate a junior programme with 5 tiers of age groups in addition to the senior team. The London Dragons, the University of London ice hockey team competing in the British Universities Ice Hockey Association league are based at the centre. LVIC is also home to the Lee Valley London Skating Club, which incorporates 5 synchronised skating teams including 2 British Championship teams for 2019.

The centre offers public lessons, public skate sessions, patch ice sessions and a Saturday night ice disco. It is also used occasionally for Dancing on Ice rehearsals.

3.2. THE BRIEF

The scheme submitted by LVRPA proposes to replace the existing Ice Centre, which is at the end of its life and operating at full capacity, with a new twin 60 x 30m Olympic pad facility. The new building will have more than twice the ice area of the existing LVIC, offering the ability to double the available ice time.

London is currently underprovided in terms of ice rinks per capita, and the London and South East region does not currently have a twin pad facility, with the nearest twin pad centres located in Cardiff and Nottingham. The Proposed LVIC will therefore meet LVRPA's statutory remit by upgrading the current offer to a true Regional facility, while continuing to provide an important community asset to the local boroughs.

This will allow LVIC to operate with greater flexibility, providing public sessions at the same time as patch ice or team training and events, while greatly increasing the capacity for new clubs and teams which are currently subject to a waiting list.

The key elements of the brief include:

- 2 x 60m x 30m Olympic standard ice pads, with team benches, sin bins etc.
- One pad (Pad A) with seating for parents and guardians etc.
- Second pad (Pad B) with seating for 500 spectators, with standing capacity for a further 300 spectators.
- Skater's café adjacent to Pad A, with associated kitchen and storage.
- Public café with access to non-skaters and users of the wider Park.
- Bar and concessions areas for Pad B..
- Flexible "party" room for events and hire.
- 100 station fitness suite with dedicated changing facilities.
- Dance Studio.
- Public skate change and skate hire area, with vending and locker facilities.
- Home and Away team changing rooms.
- 2 x changing rooms, capable of being subdivided.
- 2 x referee / judges / officials changing rooms.
- Accessible changing facilities.
- Team equipment storage.
- General ice equipment storage.
- Administration office, venue operations room.
- Staff welfare facilities.
- Ice garage.
- Plant.

While Pad B is provided with spectator seating to accommodate events, competitions and tournaments, both pads will be available for public skating and community use.

During the stakeholder consultation process feedback has been received from coaches and regular users, which have been accommodated within the brief and the latest proposals. These included comments regarding the scale of changing facilities, the provision of specialist training equipment, and the need for a dedicated and secure coaches' common room and office.

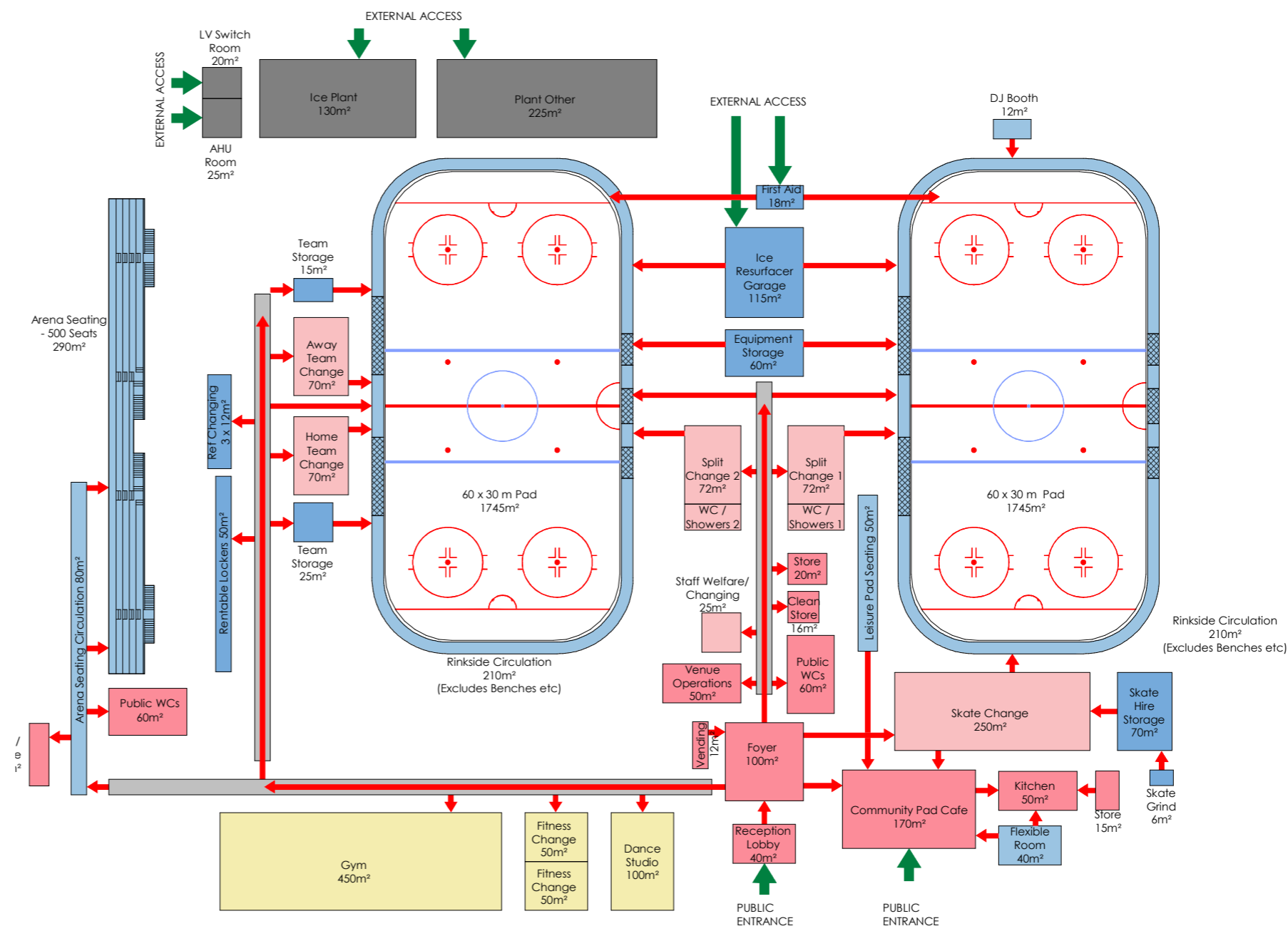


Figure 96 Brief - Adjacencies Analysis

3.3. PLANNING POLICY CONTEXT

The existing LVIC is now over 34 years old and has reached the end of its operational life. The infrastructure is dated, unsustainable and it no longer meets the need of its users and cannot deal with demand for Ice facilities. LVRPA is therefore proposing to redevelop the existing LVIC to provide a state-of-the-art twin-pad with enhanced facilities.

The site has a number of designations, of which the most critical to the principle of development is the land designation as Metropolitan Open Land (MOL). London Plan Policy 7.17 (Part B) attributes MOL as being equal in importance to Green Belt land in terms of the level of protection afforded to it. As such, reference to the Green Belt in National Policy can be read as applying equally to MOL. This is the key issue to be addressed in considering the acceptability of the principle of development on this site. Appropriate development in the Green Belt / on MOL as set out in the National Planning Policy Framework (2019) (NPPF) includes: buildings for agriculture and forestry (in all circumstances); facilities for outdoor sport, outdoor recreation and cemeteries; and infilling in villages and affordable housing (in certain circumstances), but these exceptions are irrelevant in this case. Although the site is previously developed land, the proposed Ice Centre is defined as 'inappropriate development' and so Paragraphs 143 and 144 of the NPPF apply. This is described as follows: Inappropriate development is, by definition, harmful to the Green Belt and should not be approved except in very special circumstances (paragraph 143).

When considering any planning application, local planning authorities should ensure that substantial weight is given to any harm to the Green Belt. 'Very special circumstances' will not exist unless the potential harm to the Green Belt by reason of inappropriateness, and any other harm resulting from the proposal, is clearly outweighed by other considerations (paragraph 144).

Therefore, to promote 'inappropriate' development, LVRPA must demonstrate 'Very

Special Circumstances' (VSC) exist that clearly outweigh the potential harm to the Green Belt by reason of inappropriateness, and any other harm.

The supporting Statement of Very Special Circumstances demonstrates why the role of the LVRPA, the need for a replacement facility and the demand for a twin-pad facility, along with the considerable community, health and environmental benefits that will accrue from the development, should be together considered Very Special Circumstances that clearly outweigh any harm to make the redevelopment of the LVIC to provide a new state-of-the-art, twin pad Ice Centre acceptable.

In addition to meeting the requirements of MOL policy, the application demonstrates that all other relevant local, regional and national planning policies are met, and has regard to any other material factors. These policies clearly recognise the part that LVRPA plays in delivering high-quality sports and leisure facilities. Notably, LVRPA's Park Development Framework which sets out the vision for the Park and specific proposals for its future use and development, is identified by LBWF within its Development Management Policies document as a significant material consideration in planning decisions. A full analysis of the scheme against the relevant policy context is included in the Planning Statement.

The proposals have been the subject of extensive pre-application discussions with LBWF, the GLA, and many other stakeholders including the neighbouring borough of Hackney, ice user groups, sporting bodies, local schools and local community groups. These discussions are documented in more detail within the accompanying Planning Statement and Statement of Community Engagement. The proposals were also presented to the Design Review Panel, whose comments have informed the final design.

3.4. SOCIAL AND ECONOMIC BENEFITS

The existing LVIC is an important community asset attracting 279,000 annual visits in 2018/19. It attracts a diverse group of visitors. A third are from the two nearest boroughs of LBWF and LBH, with the rest from all parts of the capital, the wider region and other parts of the country. They include high proportions of women and girls, Black, Asian and minority ethnic people (BAME) and young people, and strong local LBH and LBWF resident usage. However, the venue is at capacity, near the end of its operational life and does not meet the requirements of modern ice users and local residents.

The proposed twin pad Ice Centre is expected to build on the success of the existing LVIC, supporting significant local and regional socio-economic benefits. Primary research found that the majority of respondents were positive about the twin pad ice centre and there is significant demand for using the centre, even among non-users.

Residents of LBWF and LBH have higher rates of physical inactivity than the London and national averages. Inactivity is associated with increased risks of physical and mental health issues. The annual cost of this inactivity in LBWF and LBH is estimated to be £107m.

LVIC already attracts a wide range of users, and the new centre will increase this further through increased ice provision, extra facilities (such as a gym, community space, flexible exercise facilities and a public café) and a new, varied programme. LVRPA has a track record of increasing participation. This track record includes initiatives such as the Community Access Fund, an Authority-run and funded scheme which targets and engages community groups and individuals who are less likely to participate, overcoming barriers to participation. Increasing the physical activity of a diverse mix of local residents will result in positive health outcomes in LBWF and LBH where it is needed. Conservative estimates suggest this will be worth c. £10m each year in health

benefits over and above the existing ice centre.

Anti-social behaviour across the two boroughs is a major issue – anti-social behaviour is one of the most prevalent types of crime in the local area. Evidence shows that engaging community groups and team sports can reduce the likelihood of children and young people getting involved in anti-social behaviour. Local community stakeholders strongly support this. LVRPA has a track record of community programmes which help reduce crime and anti-social behaviour across the region, including the community diversionary partnership project with Broxbourne Borough Council, which aims to reduce the number of crimes taking places on the Holdbrook Estate through encouraging young people to participate in water-based activity at Lee Valley White Water Centre.

The existing centre is at capacity so the opportunities for providing additional activities are limited. The twin pad Ice Centre will significantly increase the number of ice activities and type of facilities available, creating opportunities for physical activity and youth programmes for local residents. The evidence suggests that this could assist in reducing crime in the two boroughs. Indeed, one programme in north London, called Kickz, reduced youth crime by up to 66% around nearby Elthorne Park, Islington. With the right resources and targeted engagement, the twin pad could be expected to have a similar impact as the Elthorne Park case study.

The existing centre provides poor access to Leyton Marsh, and acts as a barrier to nearby green space and communities on the other side of Leyton Marsh: only 2% of centre users are currently making use of the open space around the centre. Users were very positive about the proposals to improve the amenity and landscaping of the areas surrounding the Ice Centre, and the new connections to the Leyton Marsh. The respondents to the primary research cited this as the joint most important factor that could encourage use of the new centre, alongside "better ice facilities". Time spent in open spaces is shown to increase social activity, improve community cohesion, and

reduce crime levels.

The other facilities at the twin pad Ice Centre, such as the café, gym and community spaces, would provide further areas to encourage social interactions. These areas are likely to have a positive impact on the way in which workers, visitors and residents interact with each other and their environment, improving community cohesion. These benefits are particularly important in areas with pockets of deprivation, such as LBH and LBWF.

Sport has the power to unite communities and engender significant health benefits. There is a clear impetus from the Mayor of London to increase the provision of sports facilities and significant need for additional leisure facilities in London. The new twin pad Ice Centre would be the first twin-pad facility in the south of England. The regionally significant centre would double the ice provision on site, moving London up the table in terms of regional ice rink provision. The stakeholder interviews suggested that this will attract more organised groups and clubs and increase interest among casual visitors who are able to see more experts training and playing on the ice, thus providing inspiration for local young people and increasing community usage.

The proposals would support additional local jobs during construction and operation, as well as extra spending, output and tax revenues. The twin pad Ice Centre is estimated to support additional visitor spending of £1.5m and up to 45 additional operational jobs, of which around 50% are expected go to residents of LBWF and LBH (based on the proportion of local jobs at the existing centre)

For further details, please refer to the Socio-Economic Impact Report submitted in support of this application.

4.0 AMOUNT

4.1. WHY IS A TWIN PAD REQUIRED AT LVIC?

The LVIC is a hugely popular facility, attracting c280,000 visitors a year. For the past 34 years it has provided a space for young people to meet, socialise and participate in physical activity.

The LVIC is currently operating at capacity (open 17 hours a day), running a balanced programme across public skating, figure skating, ice hockey and patch ice for club users as well as experienced skaters and professionals based at the facility. A key feature of the programme is not just the number of hours, but the availability of ice time at core hours (evenings and weekends), when user groups seek ice time. As a result of this, the facility is unable to accommodate additional ice time for existing users, or take on additional skating and hockey clubs, or offer ice disciplines not currently provided for. It is only through the provision of a second ice pad that the Ice Centre can meet the latent demand.

The existing Ice Centre, is in poor condition, at the end of its economic lifespan, and it is no longer viable or sustainable to maintain the existing operations. The state of disrepair of the current facility has been well documented by the LVRPA. The closure of the Ice Centre would be a significant loss to the borough's community needs, leisure offer and local economy as it is a prominent visitor attraction.

Regional Needs

In recent years both the rinks in Streatham and Romford have been replaced. These facilities are primarily designed to cater for their local catchments, featuring single

ice pads.

There are only 3 facilities in the UK that might be termed twin pad Ice Centres, Sheffield, Nottingham and Cardiff. There are no twin pad Ice Centres in the South of the UK. Of the three current twin pads two, Nottingham and Cardiff are significantly constrained by programme (Nottingham also acts as a major entertainment arena) or pad size (Cardiff's second pad is undersized to a non-recognised international standard). Therefore, there is only one fully operational twin pad Ice Centre in the UK in Sheffield. It is a very important part of the British Ice Skating (BIS) facility requirements for there to be a twin pad facility in the South of England. It is a significant regional requirement to meet the demand and encourage the growth of all ice sports across the Country.

Figure 97 demonstrates the geographical spread of ice facilities in England, and the relative number of ice pads per million people. This data shows that London is below the national average provision for ice pads, and is ranked 5th nationally (out of 9 Sport England regions).

Given that London is the region with the fastest growing population this ratio will worsen over time and the region will continue to be under provided for in terms of ice sports.

Due to its balanced and thus constrained programme there is significantly less provision for public skating per capita than is offered at more-commercially focused single pad rinks elsewhere in the UK. On this basis LVRPA consider that there is significant potential latent demand for public skating at LVIC if more hours can be programmed. However, as the existing Ice Centre is operating at capacity, it is only through the provision of a second ice pad that the Ice Centre can meet the latent

demand.

With a single pad there is simply not enough ice time for the Ice Centre to accommodate other ice sports such as speed skating, sledge hockey and (recreational) curling. BIS and the English Ice Hockey Association (EIHA) have confirmed that there is significant latent demand for these uses, with potential for a new twin pad to meet a wider strategic need beyond London. Having a second pad will allow for more public skating hours at peak times, as well as the second pad also being available at peak times for hockey and skating clubs, or elite athletes.

Sheffield is a great example which shows the greater availability of ice time is a significant driver to grow demand. It has been able to grow its number of hockey teams to 44, and over 1,000 young people in its Learn to Skate/ Play development courses. Similarly, Nottingham attracts over 100,000 public skaters per annum, 15,000 attendances to school skating programmes, 21 hockey team, 6 synchronised skating teams as well as the Great Britain Speed Skating Squad and Nottinghamshire Ice Racing Club.

Delivering a twin-pad facility will enable LVIC to become a major regional training facility for ice sports, which is in line with the LVRPA sporting remit and the national need.

Sport England Region	Number of Ice Pads	Population (m)	Ice Pads per Million	Variation from Mean	Rank
West Midlands	7	5.9	1.19	0.44	1
Yorkshire & The Humber	6	5.5	1.09	0.34	2
South East	8	9.1	0.88	0.13	3
North East	2	2.7	0.75	0.00	4
London	6	8.9	0.67	-0.08	5
Eastern	4	6.2	0.65	-0.11	6
East Midlands	3	4.8	0.62	-0.13	7
North West	4	7.3	0.55	-0.20	8
South West	2	5.6	0.36	-0.39	9
		Average	0.75		

Figure 97 Distribution of existing ice facilities in England

Space	Measured Area
Ice Arena / Sport	
60 x 30m Pad A	1738 m ²
60 x 30m Pad B	1738 m ²
Team Bench	30 m ²
Team Bench	30 m ²
Penalty Box	12 m ²
Penalty Box	12 m ²
Scorekeepers Bench	8 m ²
Scorekeepers Bench	8 m ²
Rinkside Circulation	787 m ²
DJ Booth	0 m ² (inc. in benches)
Arena Seating	267 m ²
Leisure Pad Seating	0 m ² (inc. in circulation)
Seating Circulation	128 m ²
Flexible Room	73 m ²
Subtotal	4832 m ²
Ice Support	
Ice Resurfacing Machine Garage	90 m ²
Equipment Storage	47 m ²
First Aid	21 m ²
Ref Changing	53 m ²
Team Storage	39 m ²
Rentable Lockers	0 m ² (inc in circulation)
Skate Hire Storage Area	68 m ²
Skate Sharpening	6 m ²
Subtotal	324 m ²

Changing	
Staff Changing / Welfare	30 m ²
Skate Change	236 m ²
Home Team Ice Change	62 m ²
Away Team Ice Change	62 m ²
Split Change 1	79 m ²
WC / Showers	19 m ²
Split Change 2	79 m ²
WC / Showers	19 m ²
Subtotal	586 m ²
Health & Fitness	
Gym	455 m ²
Gym and Exercise Studio Change	144 m ²
Exercise Studio	105 m ²
Subtotal	704 m ²
Support	
Reception / Lobby	53 m ²
Foyer	133 m ²
Venue Operations	44 m ²
Bar / Cafe	17 m ²
Vending	9 m ²
Kitchen	89 m ²
Kitchen Storage	34 m ²
Cleaning Store	4 m ²
Community Pad Cafe	156 m ²
Toilets	230 m ²
Subtotal	770 m ²

Plant	
Ice Plant	90 m ²
LV Switch Room	0 m ² (inc in other plant)
AHU Room	32 m ²
Other Plant	232 m ²
Subtotal	354 m ²
Circulation	
Circulation - Ice Hall	204 m ²
Circulation - Other	253 m ²
Subtotal	458 m ²
Total	8027 m²

Figure 98 Proposed Schedule of Accommodation

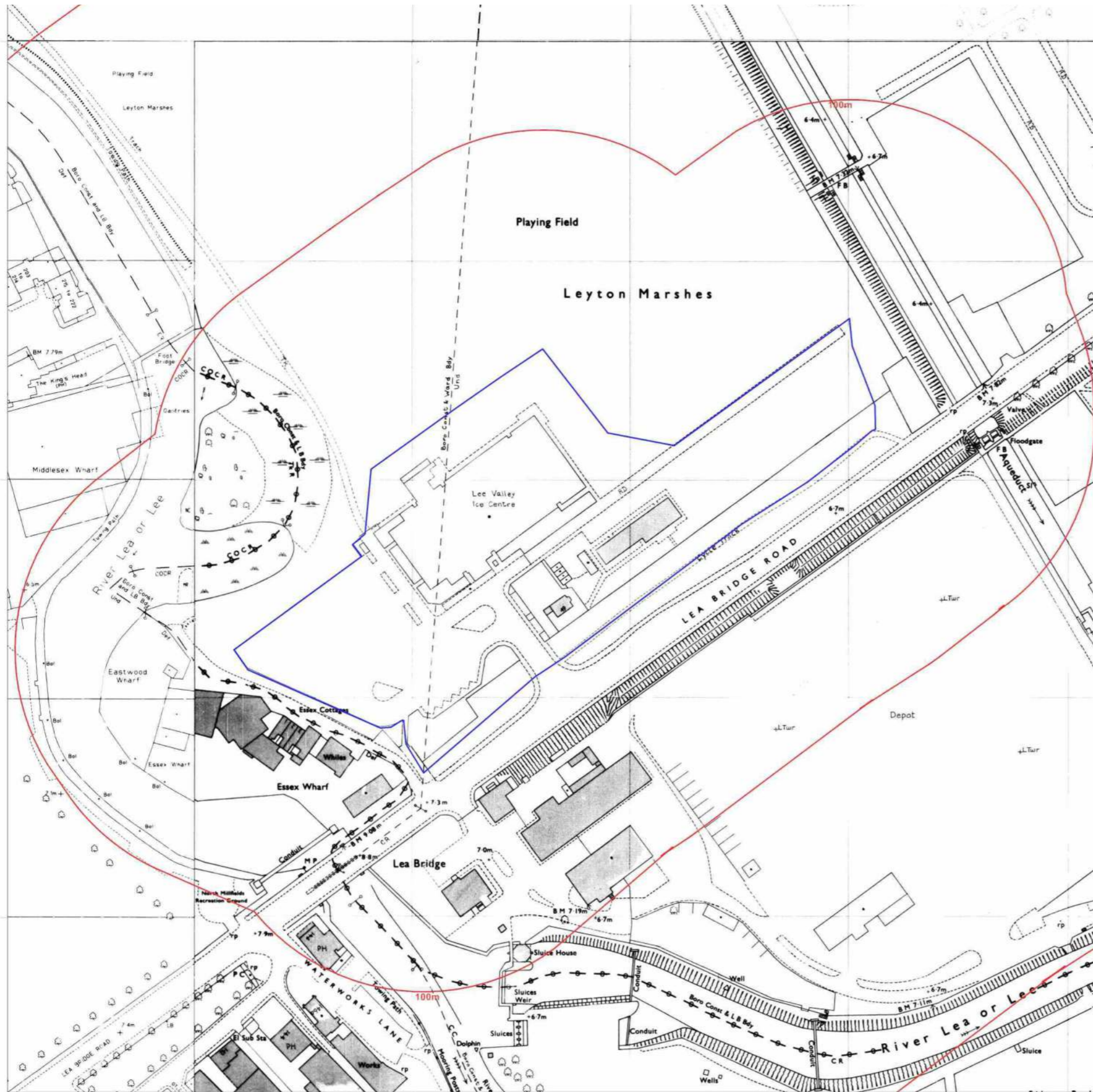


Figure 99 1987 - 1991 OS map showing then existing structures within the existing overflow parking area.

4.2. ACCOMMODATION SCHEDULE

The proposed development consists of 8,718m² Gross External Area (GEA) over two storeys. There are 155 proposed car parking spaces. The proposed building has an overall Gross Internal Floor Area (GIA) of 8,417m², compared with the existing building's GIA of 4,086m². The table in Figure 98 shows a breakdown of the internal usable floor space by function.

The development falls under Use Class D2 in the Town and Country Planning (Use Classes) Order 1987, as it is a community leisure facility.

As described in Section 2.3, the brief has been extensively benchmarked against other recent Ice Centre projects, to ensure that the scale of the proposed support accommodation is appropriate for the increased area of ice. At the same time, the design team have been acutely aware of the need to minimise the building footprint as far as practical, without compromising the building functionality and user experience.

The design described in this report has been generated from the principle of maximising efficiency. The conceptual plan arrangement described in Section 2.3 has enabled the team to minimise circulation by placing the accommodation core between the pads, instead of wrapping around the perimeter as is the case at some other similar schemes. Further design developments, including the introduction of the radiused corners to the ice halls, have trimmed further area from the footprint and tightened up the plans. Throughout the design process the Brief has been challenged and further efficiencies sought, which have resulted in a further 200 m² of area being

saved as the plans have developed.

4.3. GROSS AREA AND FOOTPRINT

Figure 101 shows the proposed footprint area of the proposed new LVIC, compared with the existing building. The proposals increases the overall ice area from the current 1,420m² to 3,476m², an increase of 2,056m² or 144%. The new facility is significantly larger than the existing, but the increase in building size is not proportionate to the increase in functional area.

The overall GEA is increased by 4,515m² or 107.4% compared with the existing building. However, the proposed scheme places more accommodation at first floor, so the increase in the building footprint is reduced in comparison to the overall gross area, with an increase of 3,433m² or 95%, mitigating the impact on the loss of MOL caused by the increased building programme.

The application site area measures 40,455m² (4.04 hectares). Currently the site is occupied by the existing LVIC building which has a footprint of 3,596m². As stated above, the proposed increase in the building footprint is 3,433m².

The Current site consists of 12,334m² of previously developed land as illustrated in Figure 103, comprising of the building footprint, car park and hard landscaping including the grasscrete.

The number of car parking spaces is reduced from the current 307 spaces (including overflow) to 155, which has resulted in a smaller car park area. The total area of the proposed development including the building footprint, car park and hard landscaping is 15,421m².

The increase in building footprint has been partially mitigated by a reduction in the extent of hard landscaping in the proposed scheme.

In addition to the previously developed land indicated in the diagrams, approximately 2690m² of the grassed area along Lea Bridge Road (indicated with a dotted line in Figure 103) has been previously used as overflow car parking.

OS mapping of the site shows this area occupied by a number of buildings, structures, footpaths and hard standing, dating back to the 1967 maps and predating the existing Ice Centre. The 1987 - 1991 and 1989 - 1994 Maps show these structures still existed after the development of the site (see Figure 99 on the preceding page). Evidence still exists of some structures in the landscape. However, this area is excluded from the figures for Previously Developed Land given above.

	Existing LVIC	Proposed LVIC	Difference	% Increase
Total Area of Hard Landscaping (m ²) - includes external storage containers, compactors and plant, but excludes grasscrete.	7991	8392	401	5.01%
Grasscrete	747	0	-747	-100.00%
Total Area of Hard Landscaping (m ²) - including grasscrete	8738	8392	-347	-3.97%
Building Footprint (m ²)	3596	7029	3433	95.47%
Total Developed Land (m ²)	12334	15421	3087	25.02%
Overflow Parking	2690	0	-2690	-100.00%

Figure 100 Proposed increase in footprint and developed land

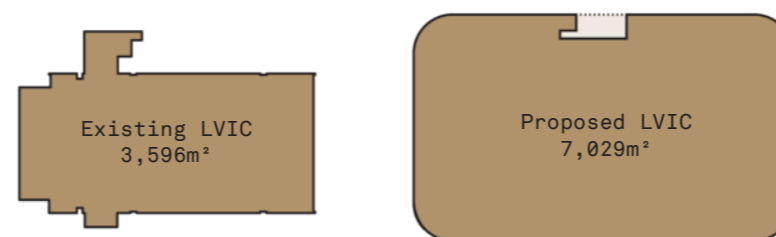


Figure 101 Comparison of existing and proposed building footprints

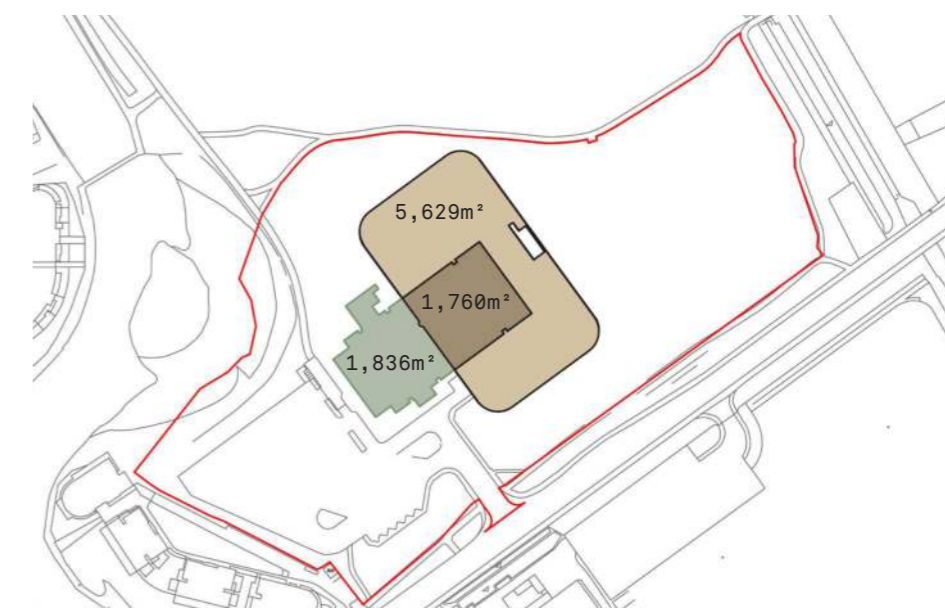


Figure 102 Comparison of existing and proposed building footprints

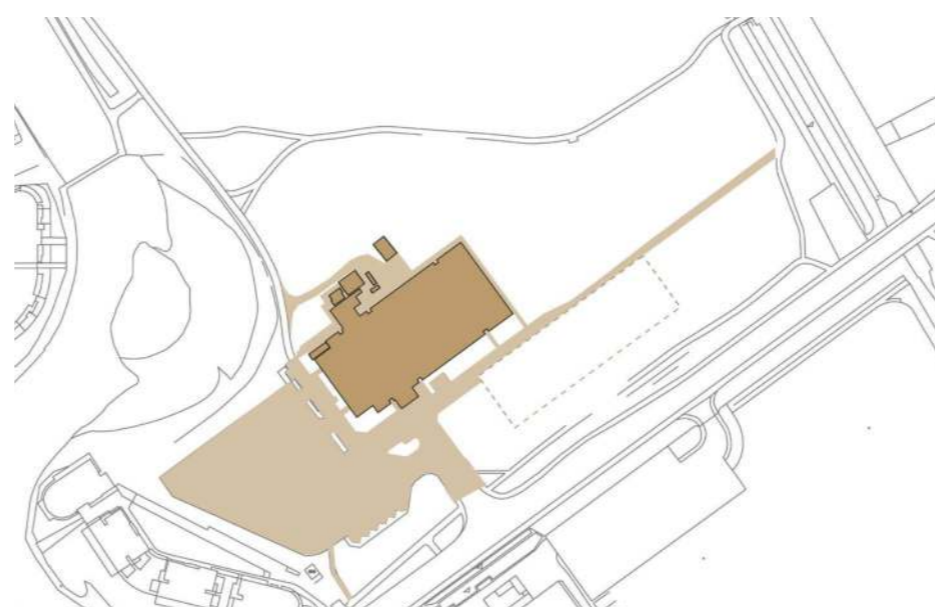


Figure 103 Existing extent of developed land (building & hard landscape)

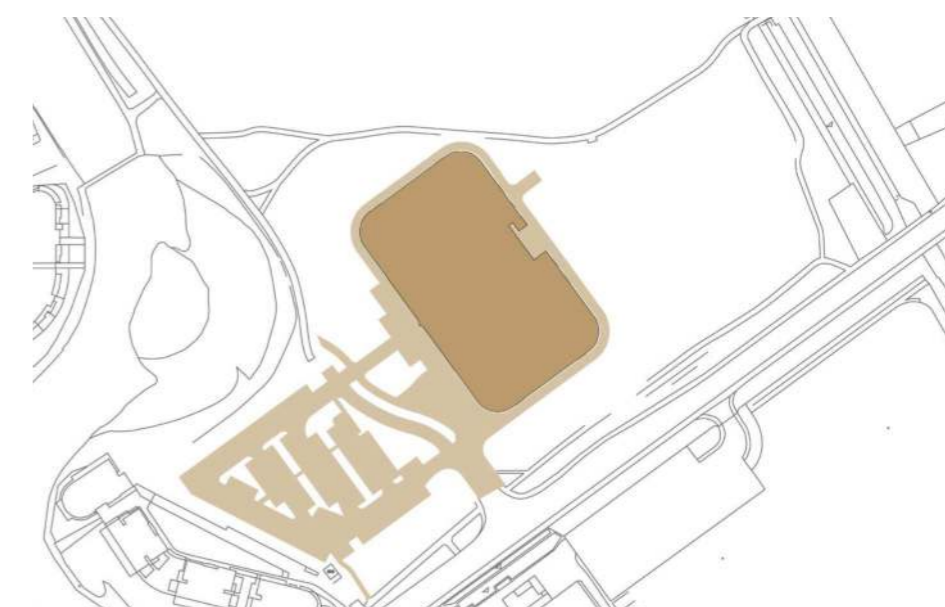


Figure 104 Proposed extent of developed land (building & hard landscape)

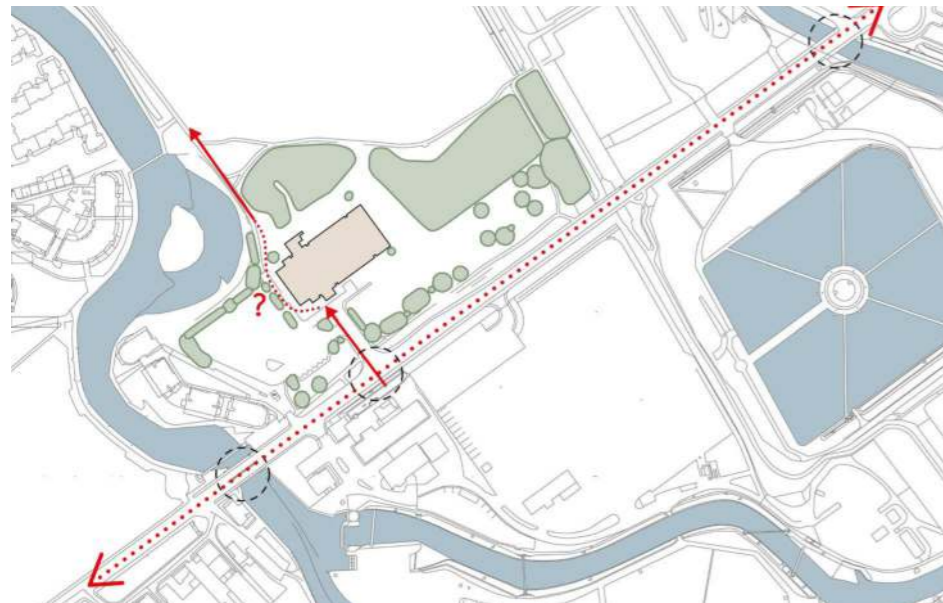


Figure 105 Site Concept Development - Existing Condition

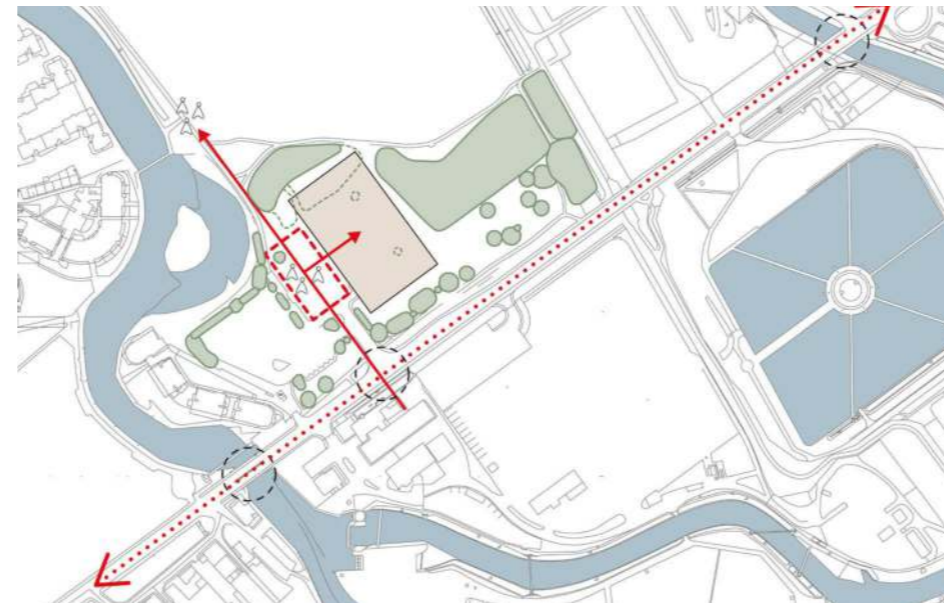


Figure 106 Site Concept Development - Proposed Layout

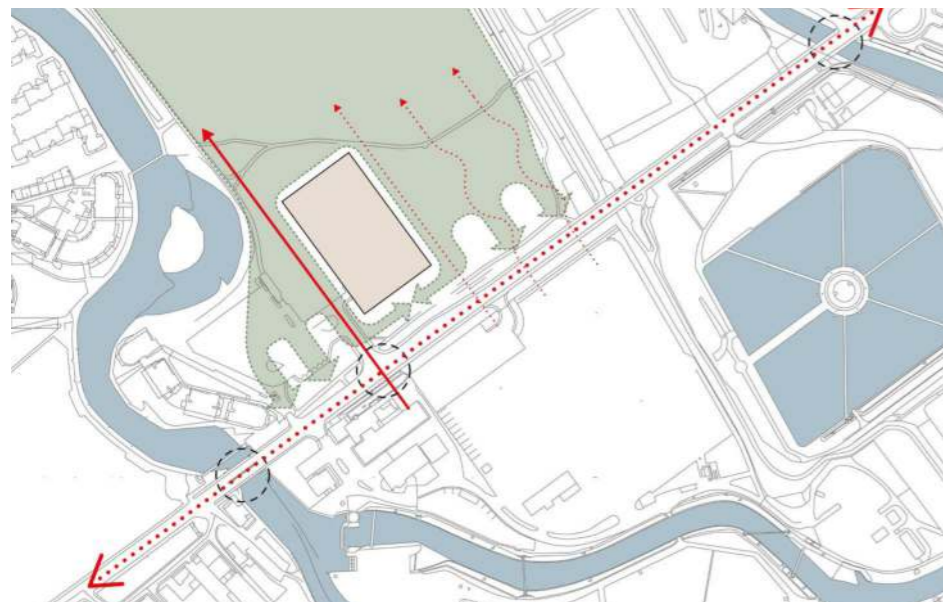


Figure 107 Site Concept Development - Extending the Marshes

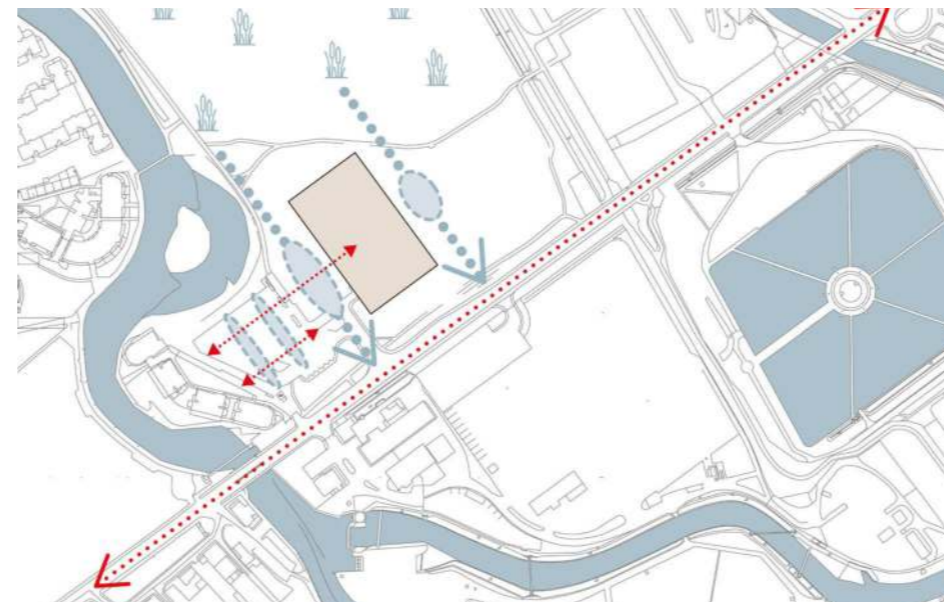


Figure 108 Site Concept Development - Bringing the Marshes to the front

5.0 LAYOUT

5.1. BUILDING LOCATION AND ORIENTATION

The proposed building orientation responds to the existing site constraints described in Section 2.1, and the desire to improve site permeability through the site in order to improve the connections between Lea Bridge Road and Leyton Marshes.

Section 2.1 describes the existing condition of the site boundaries along Lea Bridge Road. The desired improvements to physical and visual connectivity between both sides of the Park is beyond the scope of these proposals to resolve, and much will depend on the future of the Thames Water site. However there is an aspiration for the LVIC project to provide a catalyst for future reconnection of the Lea Valley and the Park.

The principal concept for the landscape strategy for LVIC is to enable the reconnection between Lea Bridge Road and the northern marshes, by extending the landscape and habitat of the marshes through to the road to create a "gateway" to the marshes, and maximise the opportunities for views and glimpses through the site. Our site analysis identified that the existing building's location reduced the legibility of the site. On arrival at the current LVIC, the presence of Sandy Lane and the marshes is obscured. The possibilities of retaining and enhancing long views between the road and the marshes were explored, and an opportunity was identified to create a gateway space for users of the marshes as well as the new Ice Centre.

During the early stages of the design process, 2 options for the orientation were explored:

Option 1:

Building aligned perpendicular to Lea Bridge Road, with the narrowest elevations addressing the road and the marshes, and the main entrance facing the existing car park.

Option 2:

Building aligned parallel to Lea Bridge Road, with the longest elevations addressing the road and the marshes, and the main entrance facing the road.

As described in Section 2.3, following a review with the LVRPA members and pre-application discussions with LBWF, and the GLA, Option 1 was selected as the preferred orientation. This arrangement offers the following benefits:

- Minimises apparent width of building when viewed from the road.
- Minimises the visual impact of the new building when viewed from Leyton Marshes.
- Maximises permeability of the site, to allow glimpses and vistas from Lea Bridge Road to Leyton Marshes to be retained and improved.
- Opportunity to improve the site legibility and open up views to and from Sandy Lane.
- Opportunity to create a public arrival space at the entrance to the building and the Park.
- Opportunity to build the Pad A alongside the existing Ice Centre, thus ensuring a phased delivery and continuity of ice provision.

5.2. SITE LAYOUT

The layout of the principal elements of the site will remain broadly unchanged in the proposed scheme. The existing site access from Lea Bridge Road is retained, and the car park will be kept in its existing location, but reduced in size, re-organised and re-surfaced. The parking lanes will be re-orientated through 90 degrees to run perpendicular to the road, allowing views through the carpark and along the green drainage swales located between the parking bays.

The eastern part of the site, comprising the large group of trees and amenity grassland along Lea Bridge Road will remain, but will be undergo sensitive improvements to its landscape and biodiversity (refer to Section 7.0 for more detail). As described in Section 5.1, the principle behind the landscape proposals and site layout is to reconnect the northern marshes with Lea Bridge Road, and to create a Gateway space for all visitors, whether they are arriving to use the Ice Centre or the wider Park. The building location and orientation facilitates this by wrapping a high quality landscape around the proposed building and extending it along the street frontage. This offers passers by a sense of the Regional Park landscape beyond.

The building position has been moved further to the east, in order to maintain clearance between the proposed building and hard landscape, and the boundary of the SMINC in the north west corner of the site. Space is also retained for construction activities (See Section 5.6 below) to minimise the impact on the SMINC. The existing amenity grassland between the current LVIC and the eastern tree group will be reduced as a result, but the trees retained, with the exception of the loss of one Crack Willow and one Alder on the south west fringe of the group which are of poor arboricultural quality. 97% of the existing woodland tree cover will be retained in the proposed scheme.

Permeability through the eastern group will be improved through tree management, including a long term maintenance programme. The creation of some clearings and crown lifting will improve the visual connectivity while maintaining the character of the tree groups, and will also offer benefits in improved site safety and security. The building orientation and location provides a generous landscaped public gateway space, and a buffer between the building and the car park. The scheme provides a significant public landscape space to act as a stepping stone to the marshes for all uses, and creating a safe and welcoming area for people passing by the site to use. Moving the building to the east focusses the public activity within a central space, emphasising the differing characters of each side of the building.

This space is centred on a new wetland habitat, which acts as a signpost to the marshes and allows interpretation and celebration of the Regional Park. This space arranged around the landscaped ponds provides an arrival space at the main entrance to the Ice Centre, as well as a convivial setting for an external terrace to the public café, and a pleasant aspect for views from the first floor gym. The terrace benefits from a south westerly aspect which will maximise the attractiveness for people to dwell, providing passive security for the people moving through the site.

The main access point between Lea Bridge Road and Sandy Lane is maintained, and follows a sweeping curve which provides a landscaped buffer space between car park traffic and the building. Coach parking is provided along the edge of the landscape buffer, with covered cycle shelters contained within pockets of paving within the buffer.

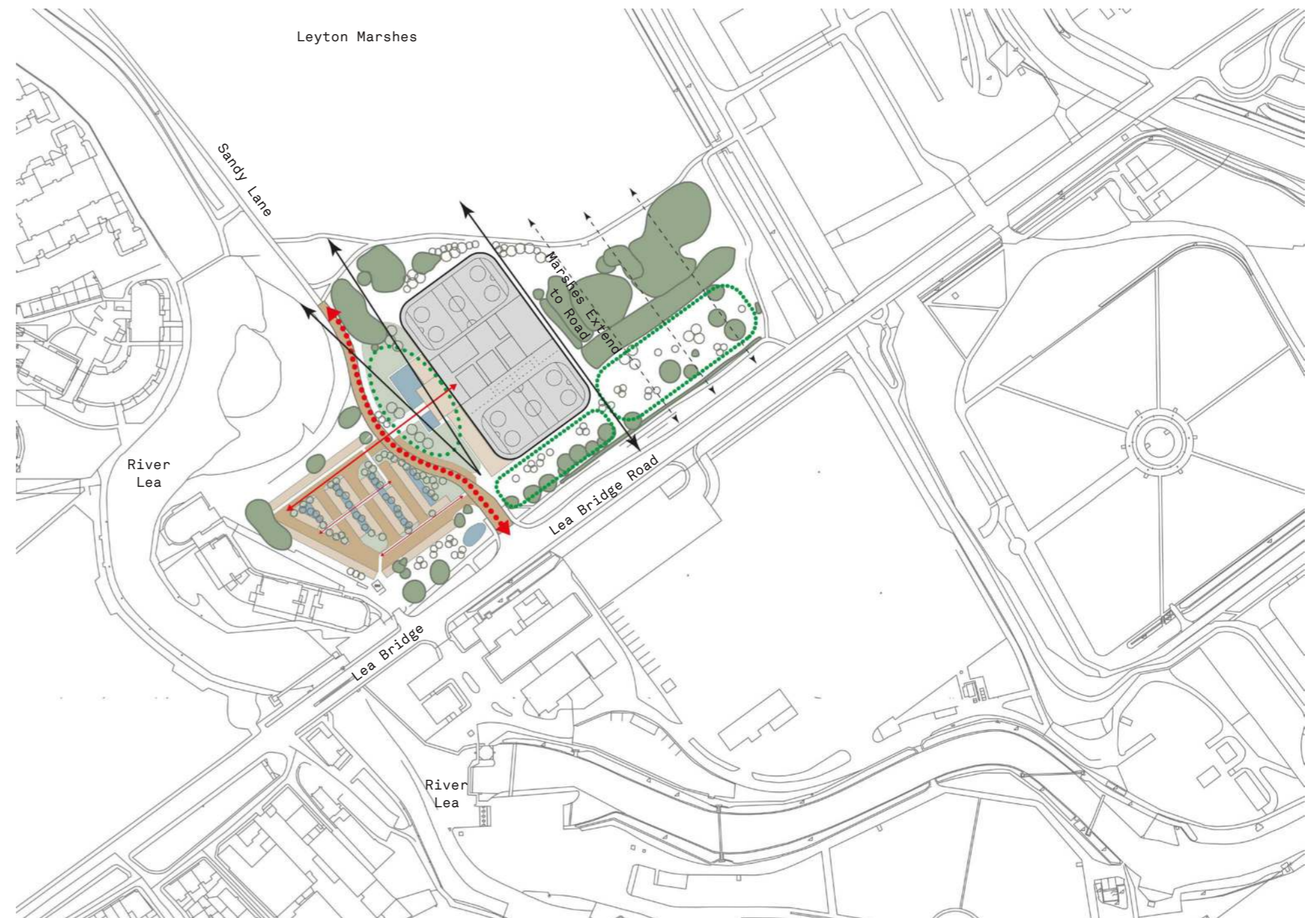


Figure 109 Site Concept Diagram

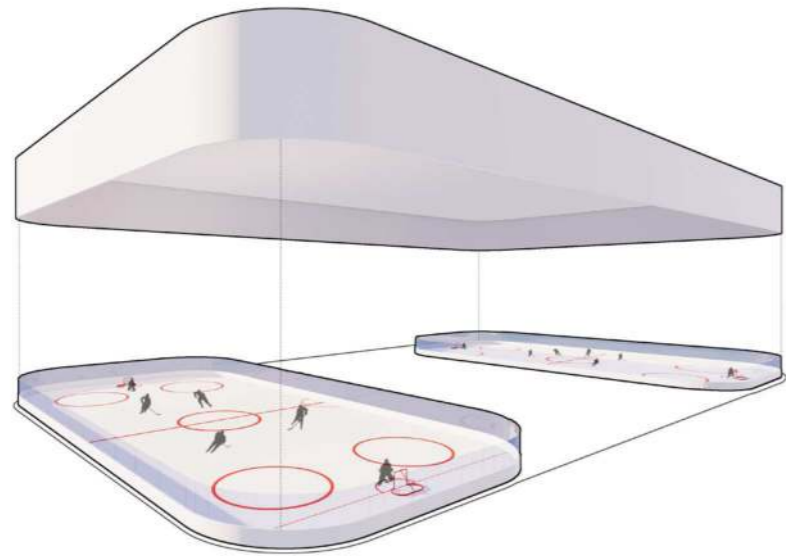


Figure 110 Concept Development - Tight Wrapper around ice rinks

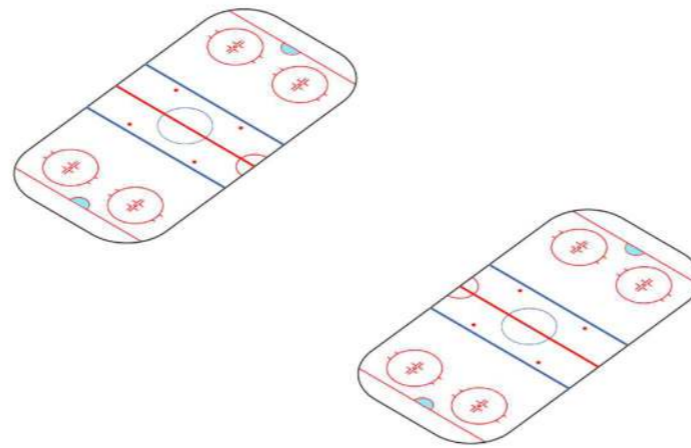


Figure 111 Concept Development - Twin Pads

Refer to Section 9.0 for a full description of the proposed site circulation.

5.3. BUILDING PARTI AND LEGIBILITY

The first iterations of the plan used to establish the site layout and orientation were tested through the use of physical models, and arranging scale cut-outs of each space to find the most spatially and functionally efficient layout. Two main approaches were tested; the first placed some of the service and support spaces as individual blocks arranged around the outside of the ice halls, the second placed all the ancillary spaces within a single central core, flanked on either side by the ice halls.

The second approach was found to be the most efficient in terms of structure, building services and circulation by avoiding the need to wrap circulation space and building services around the ice perimeter. It also produced a plan form with the smallest perimeter and surface area, therefore maximising thermal efficiency of the building skin.

This established the basic organisational diagram or "parti", with three primary elements, the two ice halls and the central core. The Pad B volume also wraps around and contains the spectator seating tribune.

The volumes of the ice halls are expressed internally through the use of insulated cladding panels to create two "Fridges" which provide the environmental control required for the ice rinks. Between the two fridges the central core, containing ancillary spaces such as changing, WC's kitchens, plant etc, is expressed as a separate entity.

The Fridges and the core are articulated by pushing the front of the core back to create a void containing the reception foyer and cafe. To each side of this void, the insulated fridges are visible from both inside and out. A second void is created to the opposite side of the core, to provide an external service yard within the footprint of the building. This is a significant improvement on the existing external layout, preventing the building services from bleeding out into the landscape. An external wrapper is then stretched around all three elements and the voids to create a unified form. The result is a building which can be seen "in the round" with an equal amount of importance given to the visual appearance from any given angle.

The central core is arranged with a clear hierarchy, from the outward facing café and entrance foyer area within the void, followed by a front of house area containing the reception, café servery and support areas, through to the changing and skate hire. A dividing line formed by a service corridor linking both rinks, separates the public areas from the ice garage and plant to the rear.

The core at ground floor comprises of a collection of blocks which cluster together cellular accommodation, with the primary circulation arranged between each block. The gym is contained within a larger block at first floor.

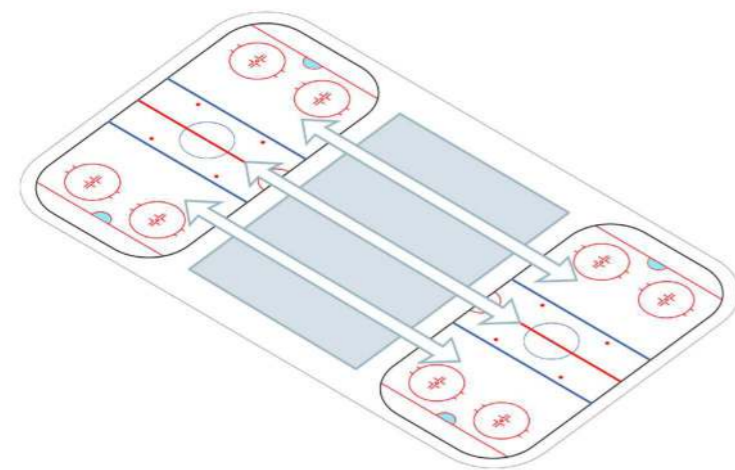


Figure 112 Concept Development - Compact Efficient Core

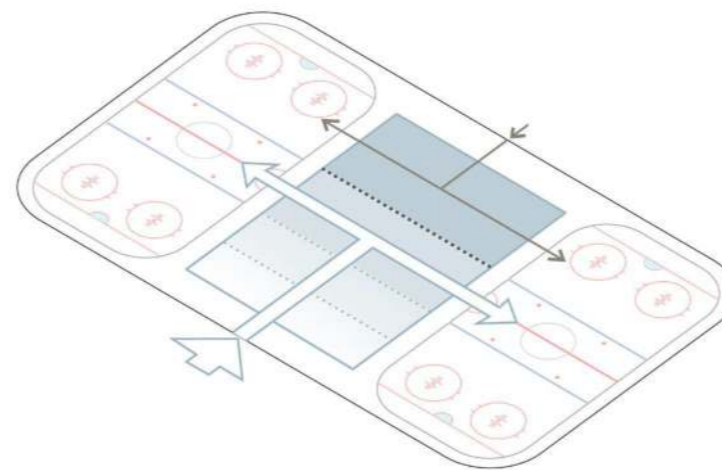


Figure 113 Concept Development - Spatial Hierarchy, Separation of services

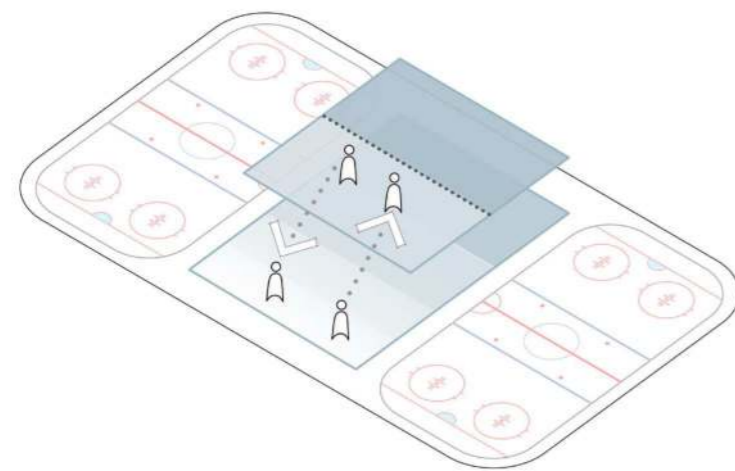
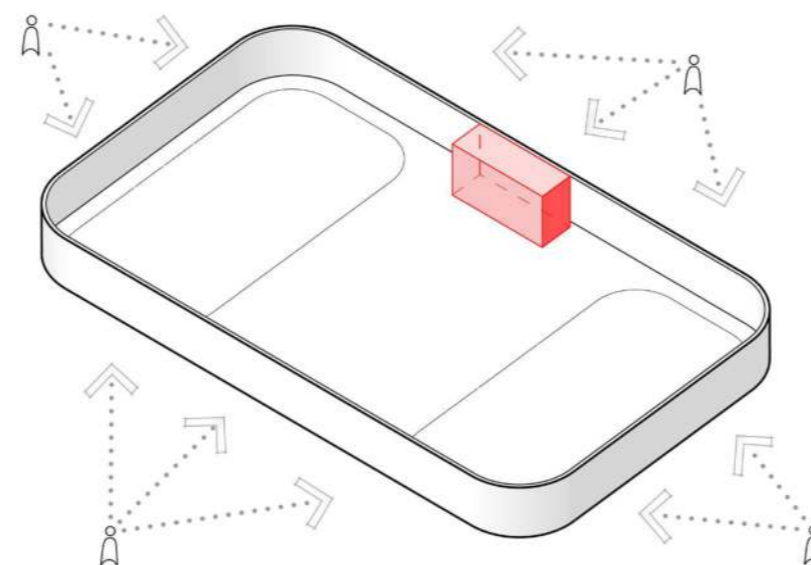


Figure 114 Concept Development - Visual Connection between Gym and Foyer



Concept Development - pavillion Typology - A building in the round

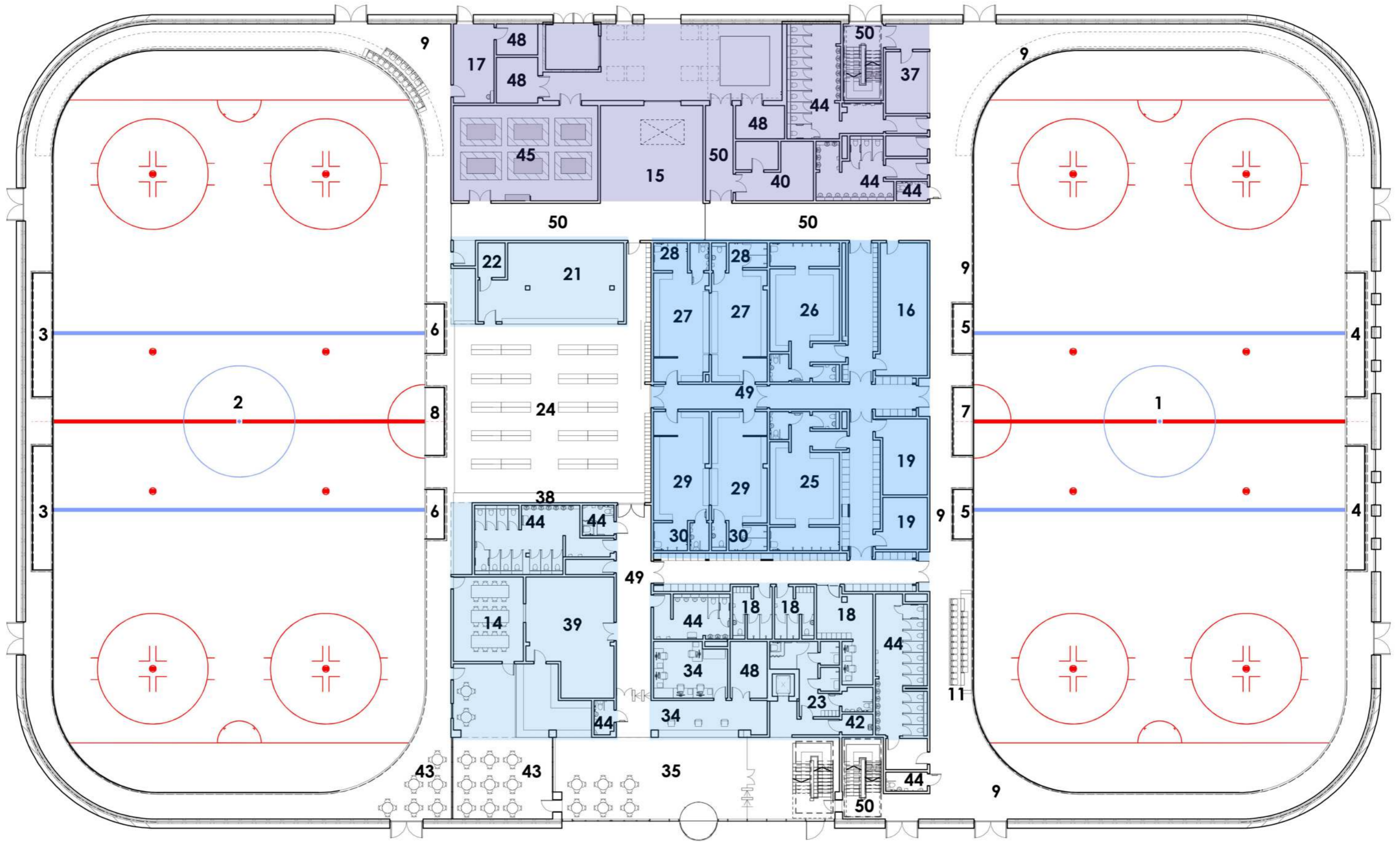


Figure 115 Ground Floor Plan

LEVEL 00 PLAN - KEY

1	60 x 30m Pad B
2	60 x 30m Pad A
3	Team Bench
4	Team Bench
5	Penalty Box
6	Penalty Box
7	Scorekeepers Bench
8	Scorekeepers Bench
9	Rinkside Circulation
11	Arena Seating
12	Leisure Pad Seating
13	Seating Circulation
14	Flexible Room
15	Ice Resurfacing Machine Garage
16	Equipment Storage
17	First Aid
18	Ref Changing
19	Team Storage
20	Rentable Lockers
21	Skate Hire Storage Area
22	Skate Sharpening
23	Staff Changing / Welfare
24	Skate Change
25	Home Team Ice Change
26	Away Team Ice Change
27	Split Change 1
28	WC / Showers
29	Split Change 2
30	WC / Showers
31	Gym
32	Gym and Exercise Studio Change
33	Exercise Studio
34	Reception / Lobby
35	Foyer
36	Venue Operations
37	Bar / Cafe
38	Vending
39	Kitchen
40	Kitchen Storage
42	Cleaning Store
43	Community Pad Cafe
44	Toilets
45	Ice Plant
46	LV Switch Room
47	AHU Room
48	Other Plant
49	Circulation - Ice Hall
50	Circulation - Other

5.4. GROUND FLOOR LAYOUT

The primary public access route for skaters is through a circular double sliding door in the western (car park) façade. This is fully accessible for wheelchair users, and skaters with bulky kit bags. See Figure 117 and Figure 118 for examples. To the right of the main entrance door is an emergency escape door from the gym staircase. This door will be provided with access control and will be the point of staff entry and egress at the start and end of the day. During events, spectators can enter directly into the Pad B hall through double doors on the west elevation, with the potential to use the corresponding doors on the east if required. Both sets of doors are available for spectator egress.

The foyer and café spaces are arranged across the full width of the core, within the double height void. Reception is placed directly opposite the main entrance doors, with a cash and admin office and the main server room to the rear. This position allows clear legibility for visitors and passive control of the route to the skate change on the left of the reception desk.

The café is subdivided between the skaters' café adjacent to the Pad A and the public café within the reception and foyer space, by a full height glazed wall allowing a visual connection with some climatic and acoustic separation. This maintains security and segregation of paid access areas such as the ice, from the open access public cafe, and allows a change in finish suitable for skate wearers. A connecting door allows the two sides of the café to be used in combination depending on the current demand. The public café can be opened up to the external terrace with 2 sets of bi-folding doors.

The public cafe is conceived as being a space within the same volume as the entrance foyer, without a physical separation, however it is intended to define the extent of the cafe using furniture, low level screening and / or planting as part of the fitout to be provided by the operator.

Both sides of the café are served from a single split counter servery, with direct access to the kitchen. The kitchen can also serve the flexible room via a roller shutter servery hatch and a connecting door from the skater's café. An internal refuse store has been added to the rear of the kitchen, to allow the removal of waste to be managed within quieter periods or at the end of the day when it can be taken to the external refuse compound with minimal disruption. The café and kitchen block also contains the female skaters' WCs and an accessible changing, shower and WC.

The Reception block contains the male skaters' WCs, cleaner's store; and staff welfare space with enclosed shower and change cubicles, and an accessible WC and shower. Two referees and officials changing rooms with showers, WCs and lockers are provided, however following feedback from consultation with the Ice Centre users and coaches, a dedicated coach's room, with secure lockers and administration workspaces has been included in place of the third referee's room.

Beyond the café and reception blocks, the skate changing areas are accessed via a central corridor. The public skate change is open to Pad A on the left of the building, with skate hire contained within its own block to the rear. To the right the split change and team change are within a separate block, with corridor access to Pad B providing controlled access between both pads and differing user groups.

The layouts of the split change and team change have been developed in more detail based upon benchmarking of similar schemes including Sheffield, Cardiff, Romford, Streatham and Cambridge. The development of the layout has also taken into account, where possible, feedback from the consultation sessions.

The split change areas are capable of being connected by a roller shutter door and moveable benching, to allow both sides to operate as one. One side of each pair of split change has been provided with enclosed shower cubicles to provide a degree of choice between cubicle and open group showers. Team changing rooms have open showers, and each team change and pair of split change benefits from an accessible WC and wheelchair accessible shower space.

The layout of the changing rooms has been developed to balance the requirement for privacy required by different age, gender or ethnic user groups, with maximising the useful space for changing and maintaining accessibility for wheelchair and ambulant disabled users. Feedback from user groups has also taken into account the need for separating home and away teams and their respective routes to and from the ice. The configuration of the changing rooms also allows them to serve both rinks during events by moving the line of separation within the corridors by closing and opening doors.

The corridors around the changing rooms accommodate rentable equipment lockers. Lockers are also provided within the public skate change area for bags and valuables. Lockers for public skaters are provided with a key and coin return lock. Rentable lockers are designed to accept padlocks provided by the user.

WCs for spectators, ice equipment and team storage are all located below the spectator seating tribune, between the core and Pad B. A bar and concessions area is located at the north eastern corner of Pad B, in close proximity to the cellar store.

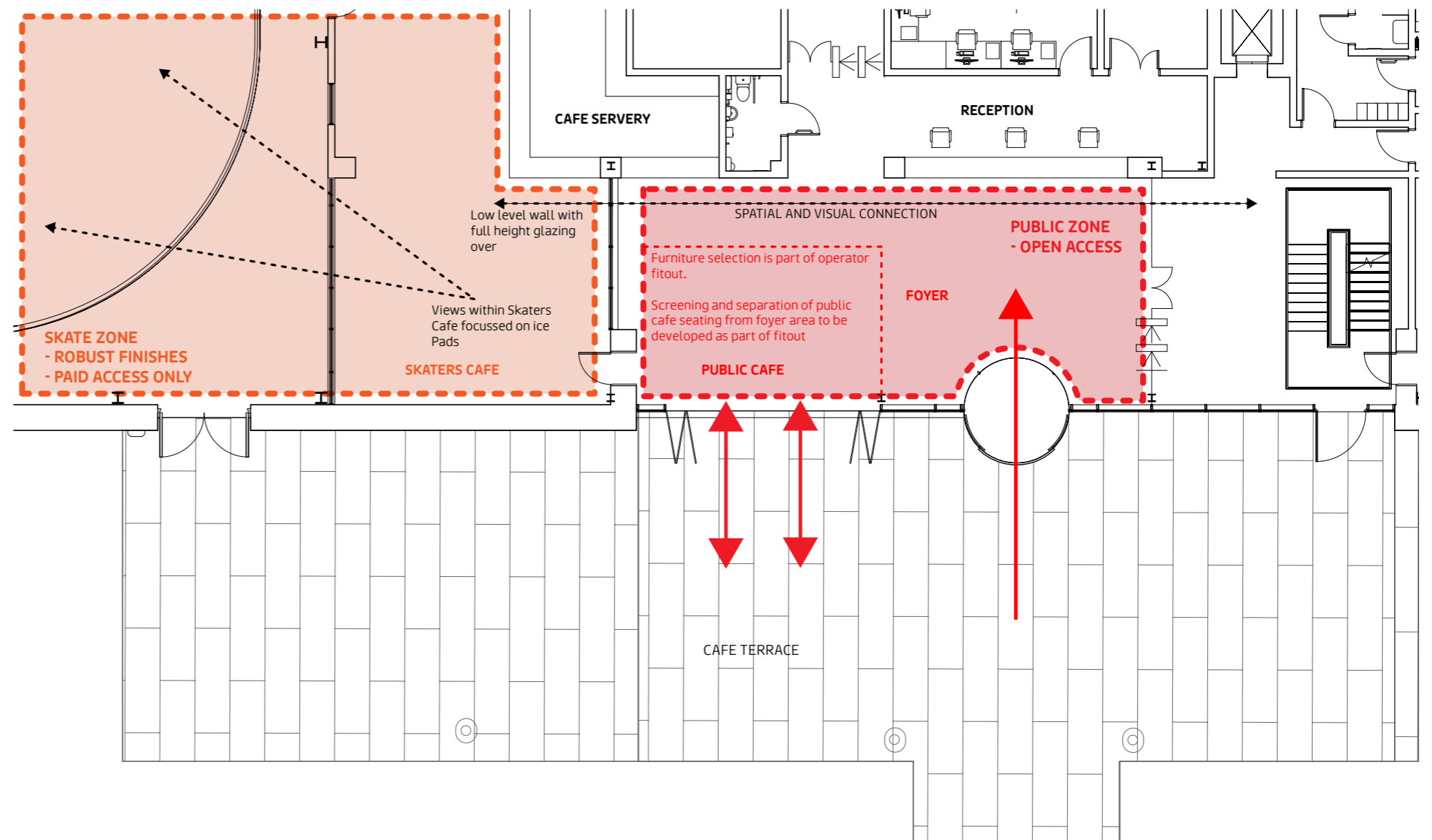


Figure 116 Reception Area Layout and segregation of Public and Skaters within cafe



Figure 117 Proposed type of entrance door to provide draught control and accessibility for wheelchair users and those carrying bulky equipment



Figure 118 Similar entrance door installed at Sapphire Centre, Romford

Beyond the changing rooms and skate hire, a corridor connects both rinks with the ice machine garage. Fire rated roller shutter doors allow the garage area to be segregated from the public areas and the rinks. To either side of the central garage area are the ice making plant, incoming electrical and data rooms and the cold water booster set. The first aid room is accessed from the eastern corner of Pad A, and is directly accessible from outside the building. An access corridor provides a route for incoming goods from the service yard. A kitchen store, including a walk in freezer and cellar store is located close to the rear access door, to provide a holding area for catering deliveries.

Within the service yard, the substation is housed within a single storey brick enclosure to UKPN's standard details. Louvered access doors to UKPN's specifications provide 24 hour access from the external elevation. No access is required through the service yard. The yard is accessed externally through a security rated roller shutter door, with an insulated sectional overhead door providing a direct route into the garage. The yard houses an external cold water tank, and provides storage areas for up to eight 1100 litre roll top Eurobins, to allow segregated waste storage.

The two ice halls have circulation to the full perimeter of the pads, however along the external walls of the long edges of the pad access will be through the sides of the team benches, which will be hinged to open to their full depth. There are 19 spectator seats provided at rink-side within Pad A, in addition to the rink-side seating within the skater's café. An additional 24 rink-side seats are included in the Pad B hall. The rink-side seating maintains a clear 1.5m circulation route to the perimeter, but is fully demountable and removable if required to provide access to header trenches or for additional event overlay space within Pad B.

Access to the spectator seating will be via the two enclosed stairs at each end of the tribune. The stair to the west, adjacent to the spectators' access door, is open to the ice hall at low level to ease spectator flows during events, although both stairs will be available for circulation to and from the bar and WCs during intervals. A security controlled pass door provides a direct route from the foyer into the hall

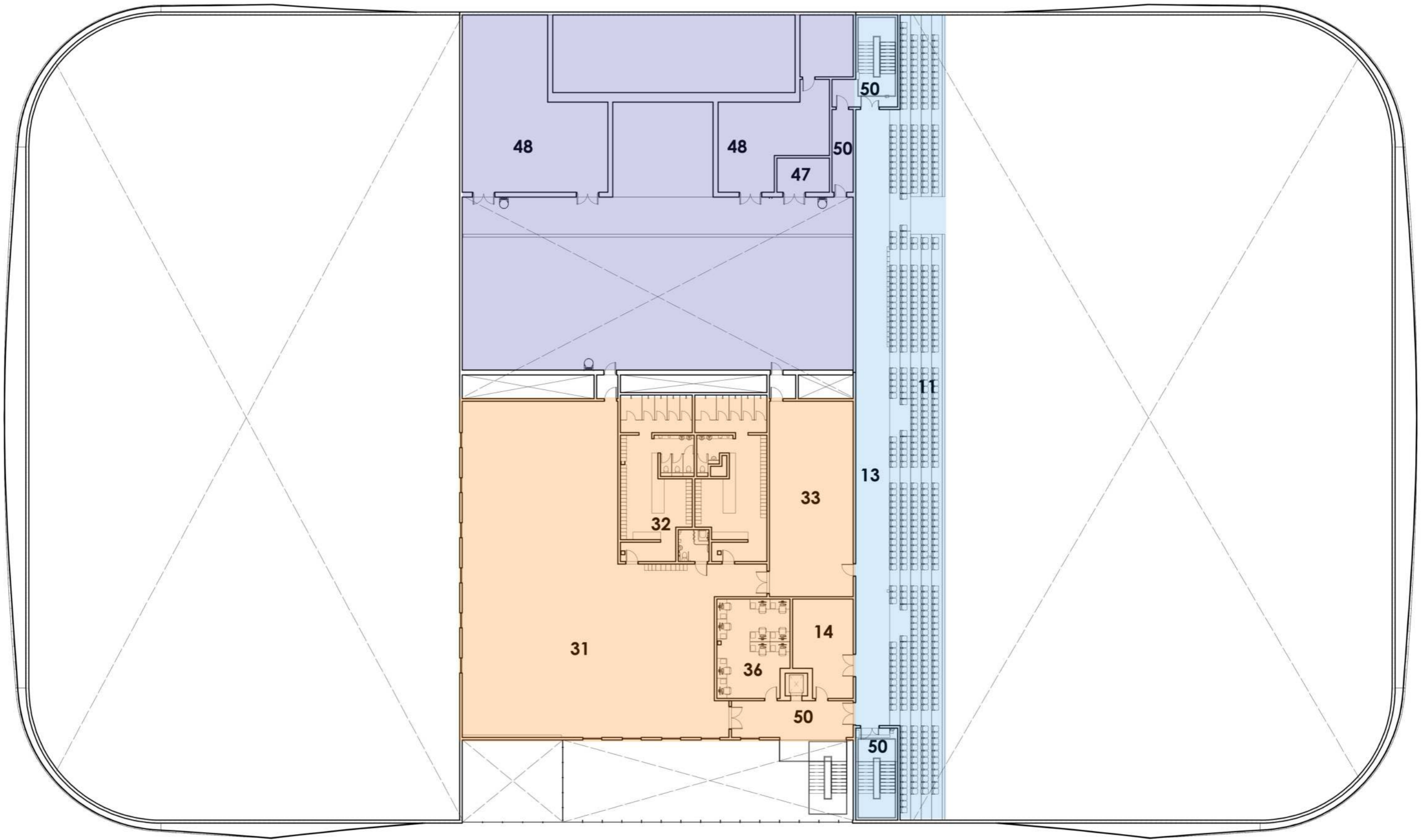


Figure 119 First Floor Plan

LEVEL 01 PLAN - KEY

1	60 x 30m Pad B
2	60 x 30m Pad A
3	Team Bench
4	Team Bench
5	Penalty Box
6	Penalty Box
7	Scorekeepers Bench
8	Scorekeepers Bench
9	Rinkside Circulation
11	Arena Seating
12	Leisure Pad Seating
13	Seating Circulation
14	Flexible Room
15	Ice Resurfacing Machine Garage
16	Equipment Storage
17	First Aid
18	Ref Changing
19	Team Storage
20	Rentable Lockers
21	Skate Hire Storage Area
22	Skate Sharpening
23	Staff Changing / Welfare
24	Skate Change
25	Home Team Ice Change
26	Away Team Ice Change
27	Split Change 1
28	WC / Showers
29	Split Change 2
30	WC / Showers
31	Gym
32	Gym and Exercise Studio Change
33	Exercise Studio
34	Reception / Lobby
35	Foyer
36	Venue Operations
37	Bar / Cafe
38	Vending
39	Kitchen
40	Kitchen Storage
42	Cleaning Store
43	Community Pad Cafe
44	Toilets
45	Ice Plant
46	LV Switch Room
47	AHU Room
48	Other Plant
49	Circulation - Ice Hall
50	Circulation - Other

5.5. FIRST FLOOR LAYOUT

The first floor accommodation is accessed from an open plan staircase within the double height foyer space. An 8 person lift is provided to give wheelchair access to the gym and the spectator seating concourse. The stair landing and lift lobby are open to the foyer space, and provide direct access to the venue operations space and a second flexible room.

Access control to the first floor is maintained via turnstiles and a glazed barrier at ground floor level, which limits access to the stair and lift to gym members or paying visitors. It is intended that access to and from the lift, and between the first floor landing and the concourse, is managed during spectator events to control unauthorised access while allowing wheelchair access to the concourse.

The gym area benefits from windows providing views into both Pad A, and the foyer space, with views through the foyer to the landscaped areas beyond. Glazing extends to floor level, to maximise visibility into the gym, provide articulation to the south west elevation and generate a presence for the gym from the main entrance.

The exercise studio and gym changing are accessed directly from the fitness area. Separate male and female changing rooms are included, with an additional unisex accessible shower and WC. Split level lockers are provided in each changing room behind the changing benches, with wheelchair accessible lockers and smaller valuables lockers provided within the gym area. The gym changing includes individual cubicles within the shower areas for increased privacy.

Secondary escape routes are provided at the rear of the gym and the exercise studio. In the event of fire preventing occupants escaping through the open foyer stair, clear routes will be provided through the external air-handling plant area to the protected staircase at the north east corner of Pad B.

The spectator seating within the Pad B ice hall is entered from a concourse at first floor, which is also capable of holding up to 120 standing spectators, in addition to 481 permanent seats, and 6 wheelchair spectator spaces at concourse level. The maximum spectator capacity of the hall is 800 people, with the remaining spectators at rink-side (including 24 seated). The first floor flexible room has the ability to serve as a concessions or hospitality area, opening onto the concourse.

Beyond the gym, vertical service risers provide a weathertight route between the external plant area and the ground floor accommodation. Internal plantrooms are located to the eastern edge of the external plant well. Fixed ladder access to the roof is located within the external plant space.

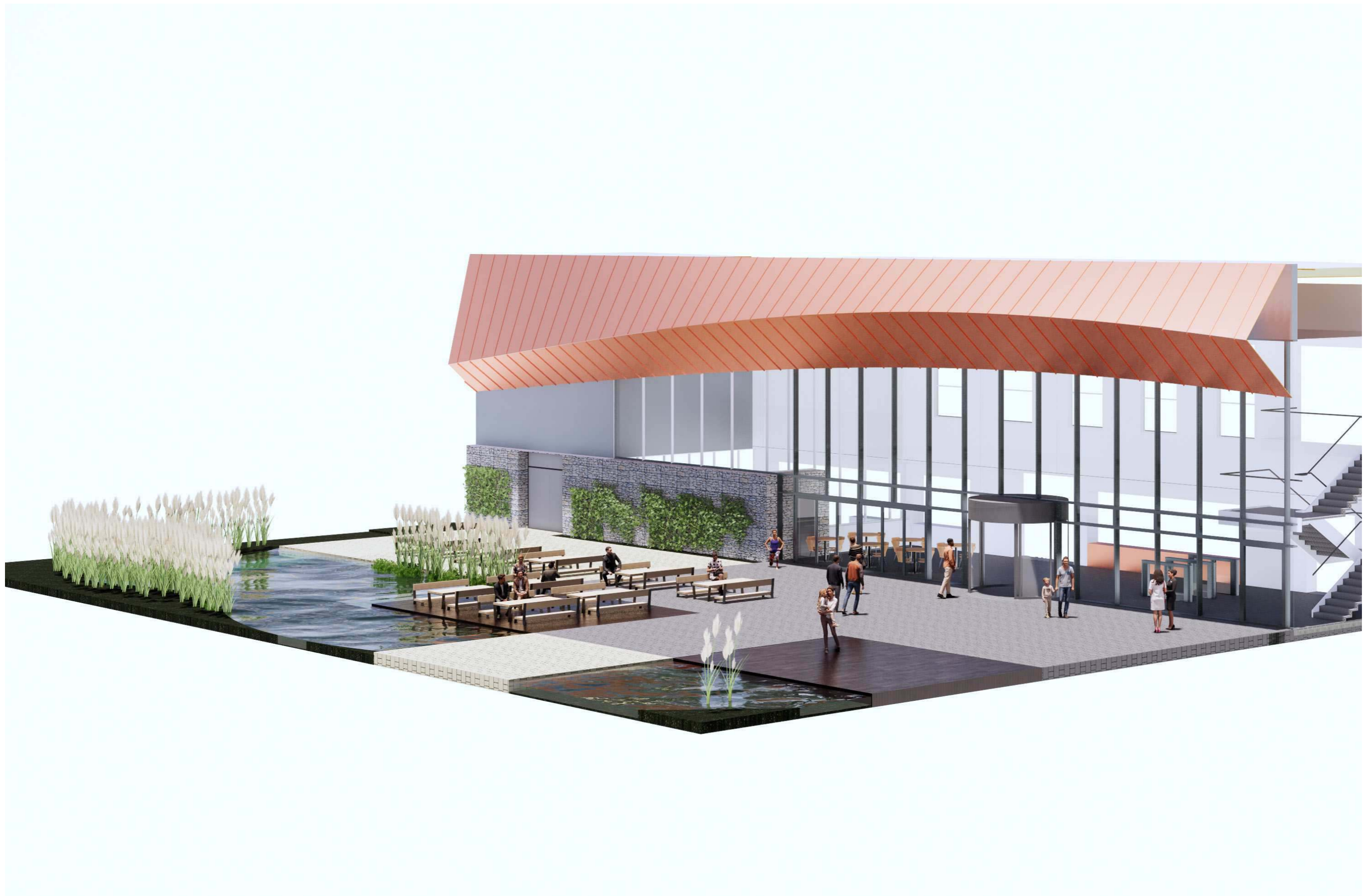


Figure 120 Main Entrance and external Terrace with water feature and public cafe

5.6. PHASING

A key benefit of the proposed building and site orientation is the ability to phase the construction of the new ice pads around the demolition of the existing building, thus maintaining ice continuity with a minimal closure period.

The phasing strategy has been reviewed and refined several times during the Stage 3 design process, and specialist advice has been sought from contractors. As a result the position of the new building has moved slightly to the north east in order to maintain clearance from both the SMINC boundary and the existing building.

As noted in Section 2.1, some existing plant equipment and storage containers are located within the SMINC boundary. The final proposals will clear the SMINC of buildings and structures, with only soft landscaping in this area. Construction activities will be limited within the SMINC, with site hoarding protecting the area from site operations with the exception of landscaping works. However during construction it will be necessary to utilise the area of the SMINC currently occupied by plant to provide temporary changing accommodation. This will take place completely within the area currently developed, as indicated on the accompanying plans.

A clearance of approximately 5.2m has been maintained from the northern edge and 6.8m from the eastern edge of the existing building footprint to maximise the available working space during construction and demolition. It is proposed to limit internal access to the north and eastern side of the existing rink during construction, to avoid the need to use the existing fire escape routes on these facades.

The phasing strategy proposes the full demolition of the existing building at the completion of the first phase, with the exception of the single storey ice garage extension and adjacent plant rooms. The retained structure will provide accommodation for the ice machine, with temporary structures to contain the changing, sanitary, café and support accommodation.

The proposed phasing approach is summarised as follows:

Phase 1

Construction of the Pad A Ice Hall and the core accommodation block over 2 storeys for the 4 structural bays closest to the east. This will deliver the following accommodation and M&E services to be installed in their final location:

- Ice Pad A.
- Ice plant room.
- New substation.
- Incoming LV electrical rooms and switch room.
- Incoming comms room.
- Dehumidification plantroom.
- Water tank and booster set.
- Air source heat pumps.

Temporary weather protection will be installed where required along internal walls in the temporary condition.

Phase 2

During Phase 2 the existing LVIC building will be demolished, and temporary accommodation (portacabins and marquees) provided for the following building areas:

- Skate and team change.
- WCs.
- Café or temporary F&B provision.

The retained existing ice garage and plantroom will be used for the ice resurfacing machine during the construction of phase 3. Packaged plant will be installed in a temporary location where it is not possible to install in the final location, such that it can be relocated during phase 3.

It is anticipated that the demolition and installation of the temporary accommodation will require a 2 – 3 month closure of the building, and a temporary break in ice provision.

The full details of the temporary accommodation will be developed upon the appointment of the main contractor. It is acknowledged a planning approval for temporary accommodation will be required, and it is intended to submit details for approval at the commencement of Phase 1, with the application to be determined prior to the commencement of Phase 2.

It is anticipated that some of the temporary changing facilities will be provided within 2 storey high stacked portacabins. As shown in Figure 124, the footprint of the portacabins will sit partially within the boundary of the SMINC, in the area currently occupied plant.

The proposed location of temporary accommodation indicated in Figure 121 to Figure 125 takes into account the most likely construction sequence, and ensures separation of building users from site operations in the temporary condition. Safe and covered access is ensured between temporary changing facilities and the new Pad A while minimising travel distances and ensuring there is no conflict between the public and construction operations.

Phase 3

Phase 3 will complete the new build elements of the core and deliver the new Pad B Ice Hall and spectator seating. Any temporarily located plant will be relocated to its permanent location.

Hard landscaping and access routes from the car park and site perimeter to the building entrance will be completed. At this stage the partial handover of the remaining building can be carried out so the new building is fully operational. Following handover of the building, any temporary accommodation will be removed, and the external works and landscaping completed.

Figure 121 to Figure 125 show the proposed phasing strategy, together with an indicative contractor's site logistics overlay. The overlay makes allowances for tree protection zones, contractor's site access and circulation and accommodation, and ensures segregation of construction activity and traffic from members of the public and building users at each stage.

The proposed phasing and overlay strategy will be reviewed in detail with prospective contractors during the procurement process.

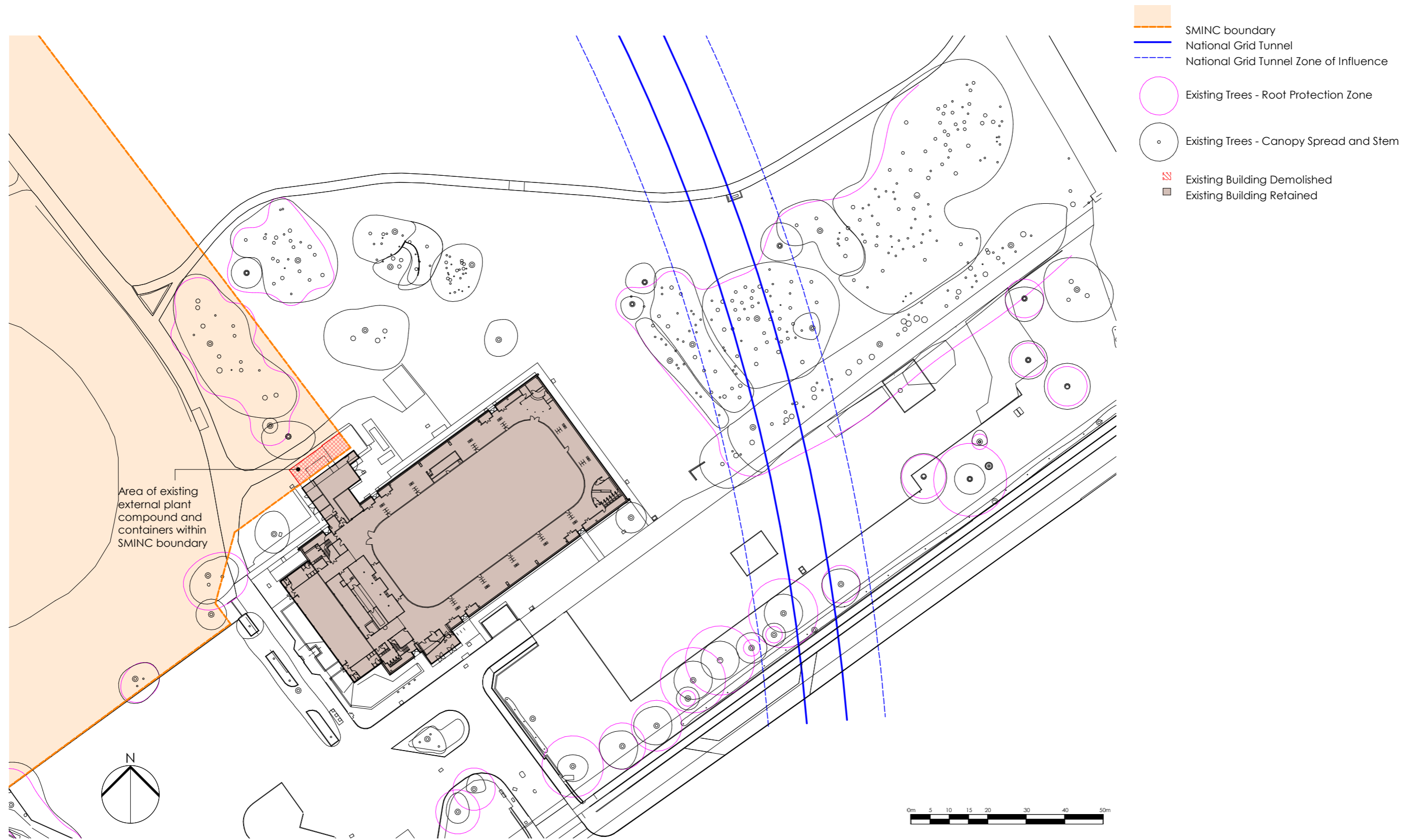


Figure 121 Phasing Strategy and Construction Logistics Plan - Existing Building

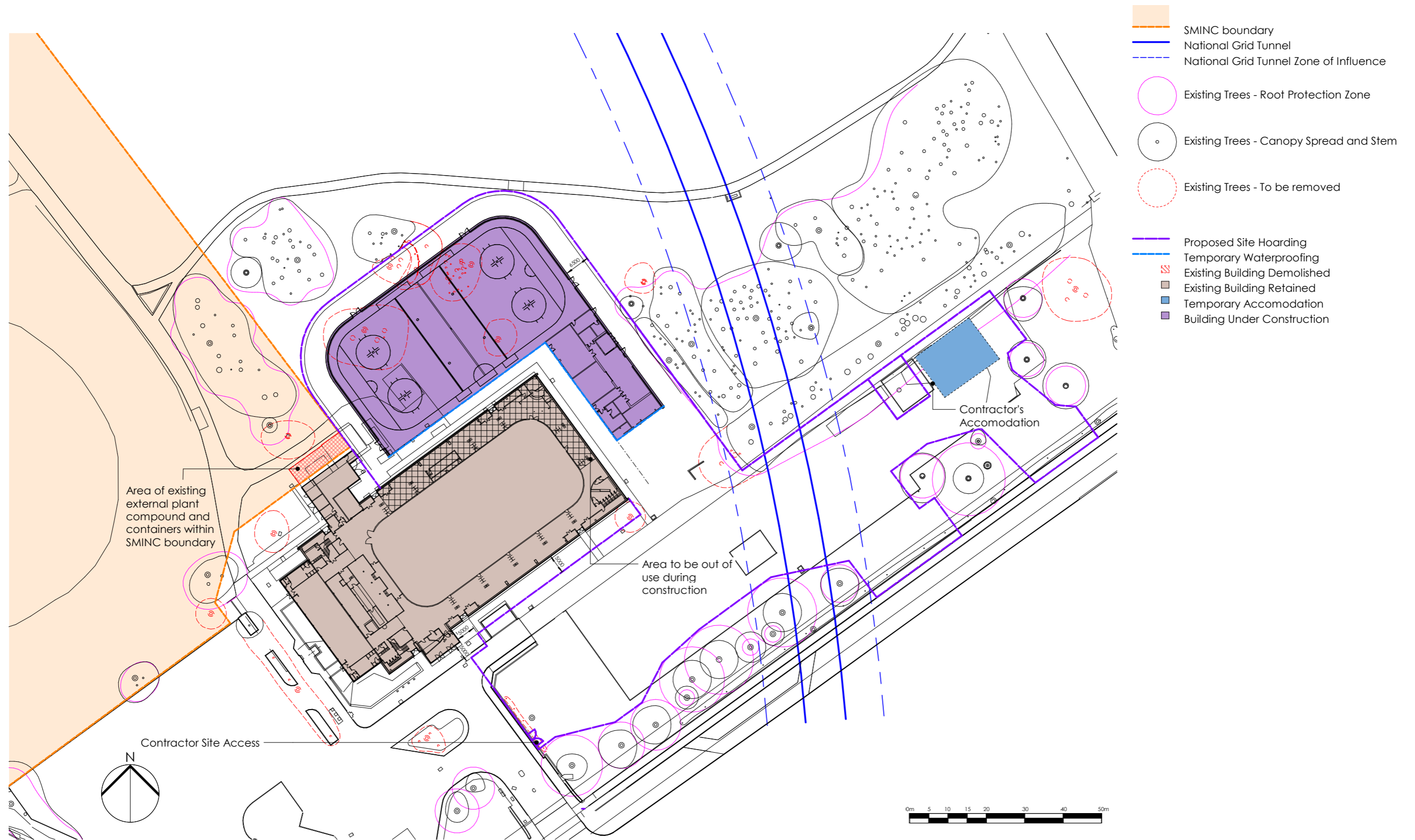


Figure 122 Phasing Strategy and Construction Logistics Plan - Phase 1 Construction (Recreation Pad)

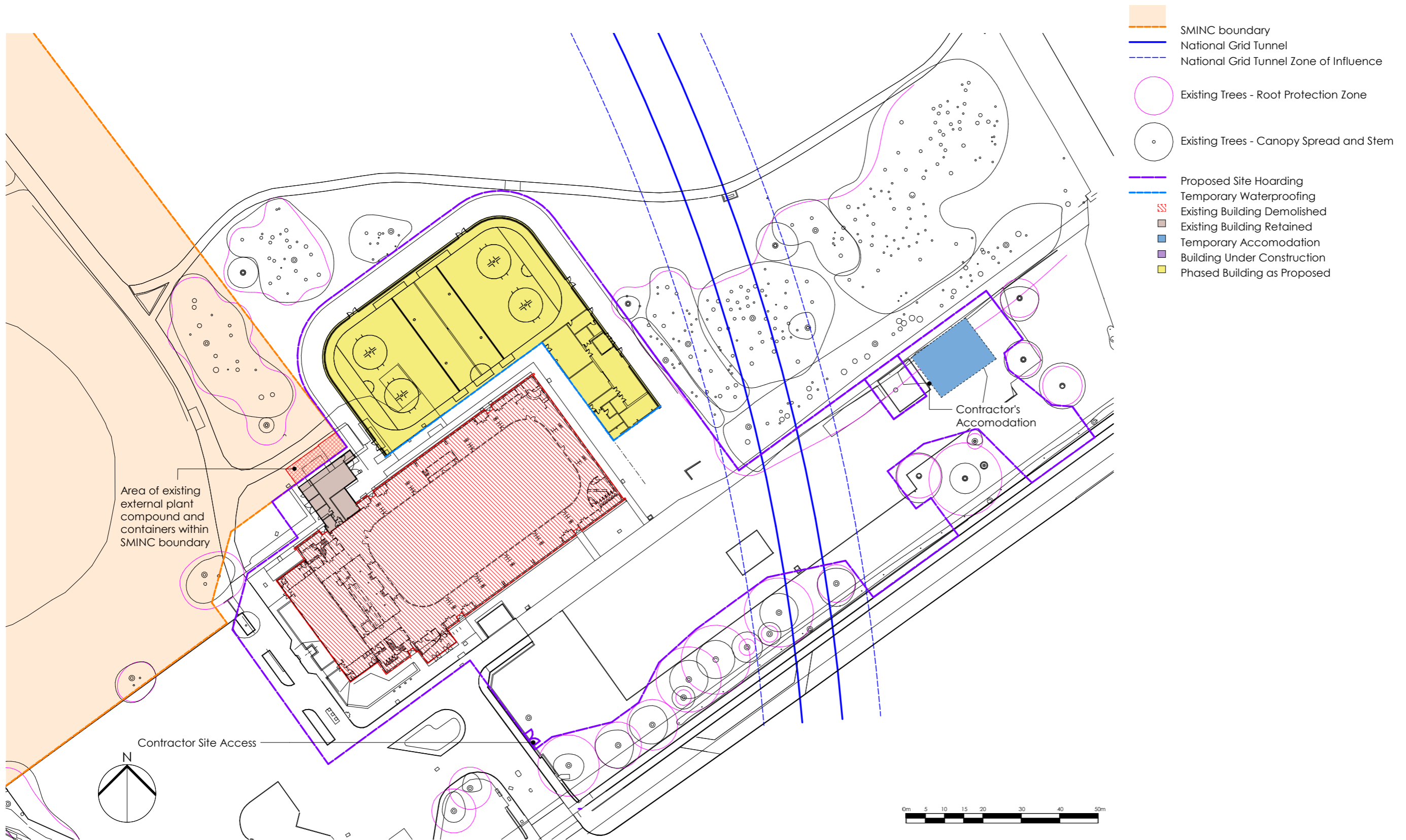


Figure 123 Phasing Strategy and Construction Logistics Plan - Demolitions Phase

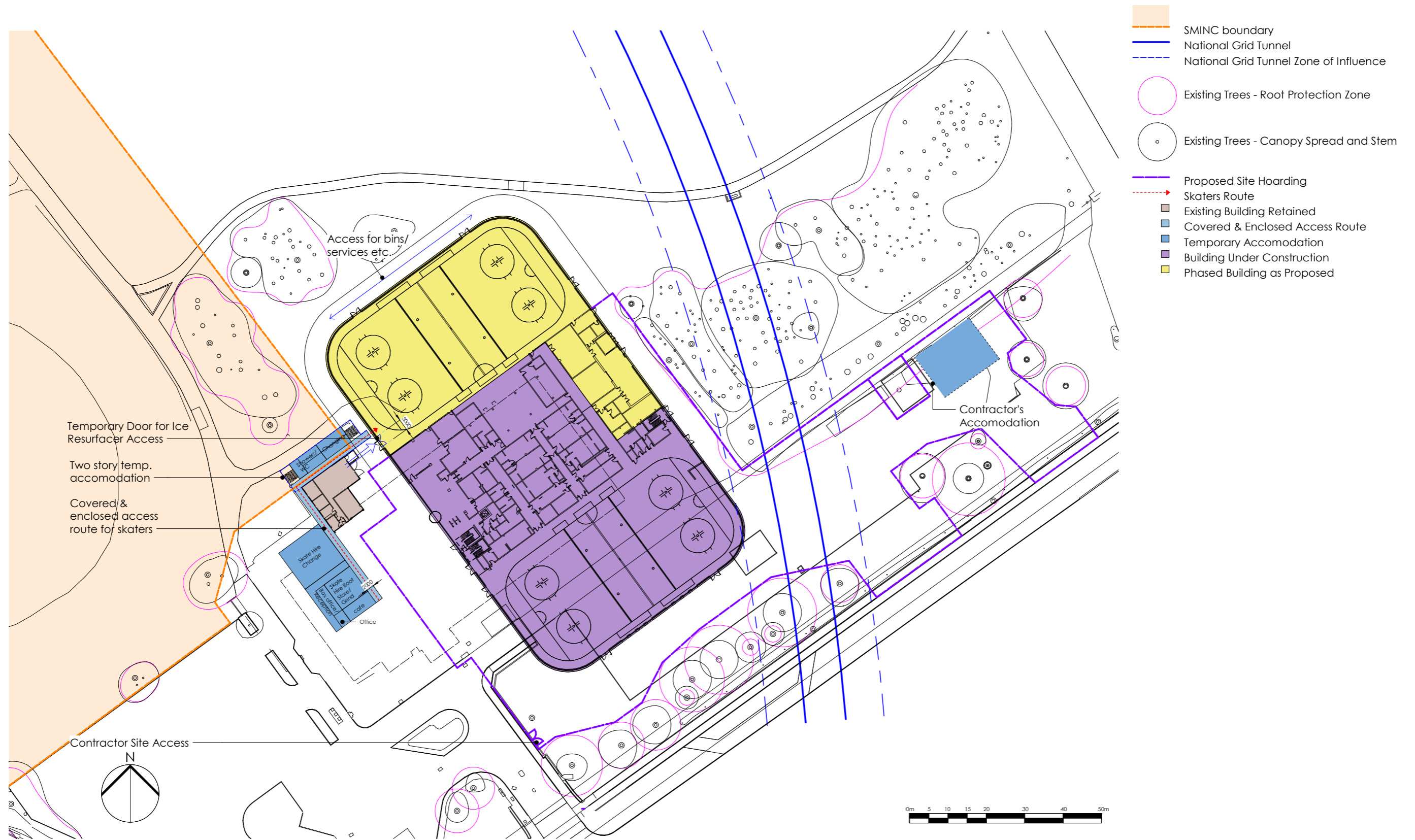


Figure 124 Phasing Strategy and Construction Logistics Plan - Phase 2 Construction with temporary changing facilities

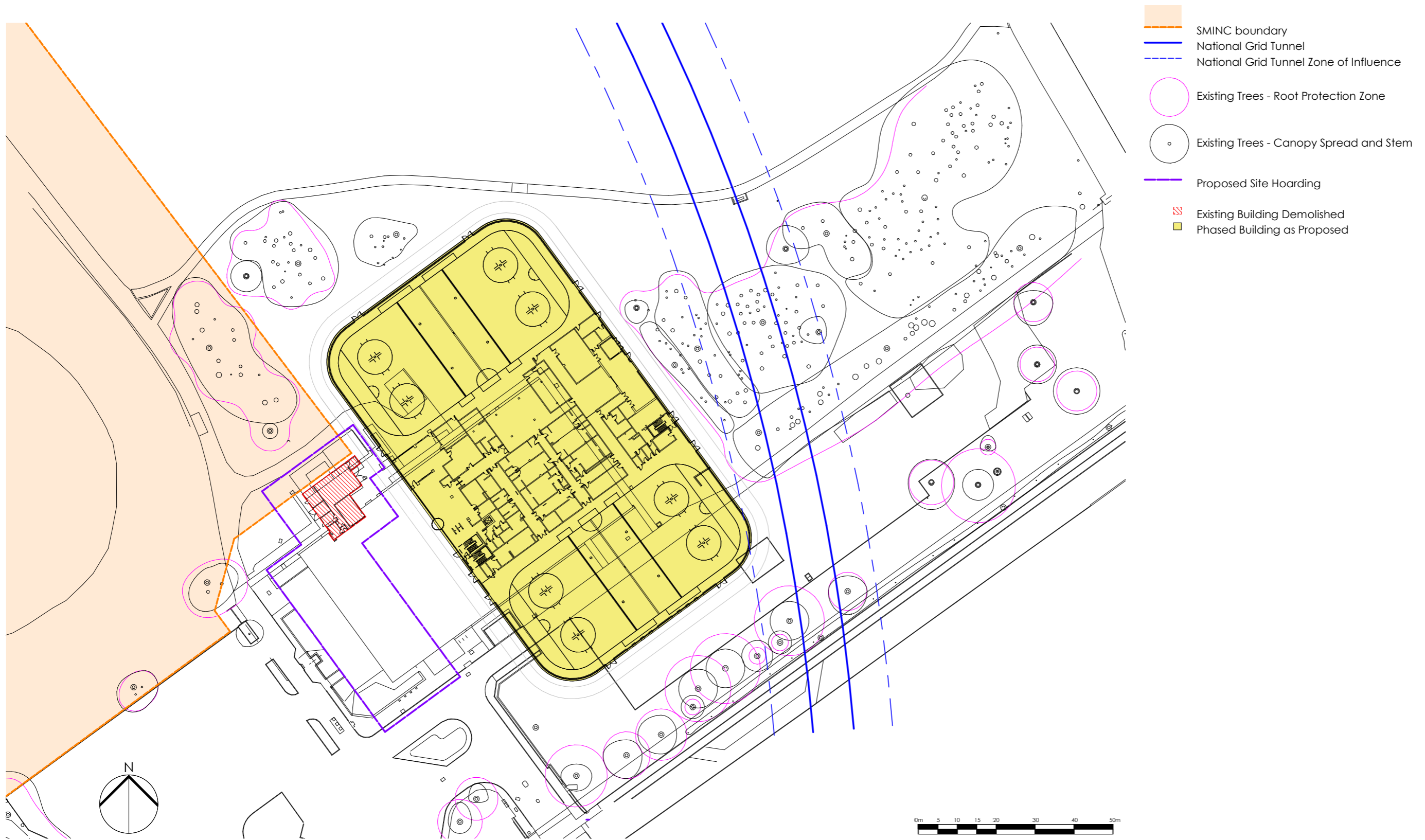


Figure 125 Phasing Strategy and Construction Logistics Plan - Post handover demolitions and completion of landscape

6.0 SCALE

6.1. MINIMISING FOOTPRINT

From the outset, one of the overarching principles of the project has been the need to produce as tight and efficient a building footprint as possible. The reasons for this are twofold.

The first is an economic requirement to deliver the scheme within a fixed budget. The brief was developed to deliver a compact twin pad facility with a GIA of approximately 8,400 m².

The second, but equally important consideration is the need to mitigate the impact on MOL, the landscape of the Regional Park, and its biodiversity and habitat. To this end, the design team has taken the revised brief and made the further reduction of floor area and efficiency a key driver in the proposed design. This has both economic and environmental benefits – a more compact building form has less surface area, and therefore less heat gains and losses through the building fabric, reducing the energy load on the building services.

The initial massing studies carried out to test the impact of the building location and orientation were made on the premise of a conceptual organisational diagram which delivered the brief area in the most compact form.

Locating the changing areas, reception, cafe, gym and service and plant areas within a single core block, with the ice rinks located to each side, minimises the extent of circulation needed. This has allowed the building to be reduced to the minimum footprint possible, without compromising the functional layout. As described in Section 4.3, the proposals deliver a 144% increase in ice area, within only a 95% increase in building footprint.

Further area savings have been made by closely following the curvature of the ice pads with the building line on the external corners.

6.2. BUILDING HEIGHT

The existing LVIC has a height to the ridgeline of the barrel vault of approximately 12.17m from the adjacent ground level, or 20.07m A.O.D. To the immediate left of the site, bordering the MOL and the Regional Park is the recent residential development of Essex Wharf. This consists of four residential blocks between 5 and 7 storeys high, with a maximum height of approximately 32m A.O.D. This is the tallest structure in the immediate vicinity.

To the south of Lea Bridge road, the Thames Water site contains a number of single storey Victorian brick industrial buildings, with the tallest building being the red brick Engineer's House, with a ridge line of approximately 19m A.O.D. Across the River Lea to the west, within the Lea Bridge Conservation Area, are a number of residential blocks with a maximum height of 25m, and the chimney of the former carbonic acid works which reaches a height of 29m A.O.D. To the north west, beyond the River Lea are a number of residential developments bordering the River Lea and Millfields Park, which range in height from 1.3m to 28m A.O.D.

The remaining context surrounding the site is generally flat and low, with no other buildings within the site boundary, or in Leyton marshes to the north. The riding centre to the east of the site is generally single storey with a maximum height of 14m A.O.D.

The existing Ice Centre's height was established as the maximum vertical datum, with no part of the proposed building to exceed this line.

The proposed building height is generated from the clear internal height required over the ice pads. A clearance of 7m is maintained below any structure or services. Early structural designs proposed a portal frame structure, with pitched rafters and an insulated metal roof panel to achieve a cost effective structural solution for the long spans of the ice halls. However, this solution required a pitched roof of at least 5 degrees pitch. Over the 42m span of the Pad B hall, this would result in a roof 1.83m high. Therefore the design team proposed an alternative solution of a flat truss and single ply membrane roof, which could be installed to a lower pitch of 1 degree, significantly reducing the overall roof height, with the added advantage of reducing the depth of the perimeter columns and allowing the floor plan to be further reduced. In these revised iterations of the section, a 1m clear zone was maintained between the clear height and the structure to accommodate PA speakers, lighting gantries and similar services. With a truss height of between 2 and 2.2m depending on the span, an internal clear height to the underside of the structural roof deck of 10.25m was achieved. During the Stage 3 design process the lighting gantry zone was moved to sit between rather than below the structure, allowing the overall building height to be reduced by 0.5m.

The final design has minimised the height of the perimeter roof edge parapet to further reduce the overall height. Fold-down balustrading is proposed for edge protection where required, to avoid the need for balustrading or parapets to break the parapet line.

The proposed design reduces the maximum building height to a maximum of 10.5m to its highest point at the roof apex, although within the central core area, PV panels will sit above the maximum ridge level. Overall however, the proposed building has succeeded in reducing the overall height to 1.8m lower than the existing Ice Centre ridge line, with a maximum level of 18.4m A.O.D.

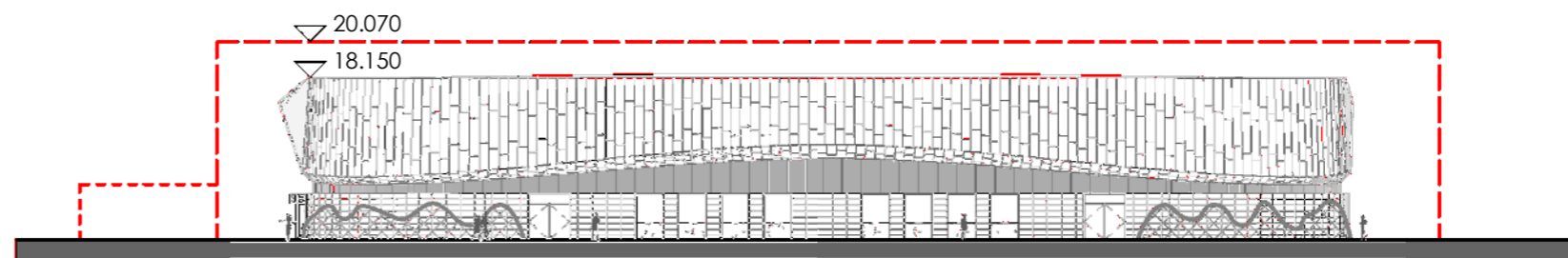


Figure 126 Comparative scale of existing LVIC building (in red) with proposals - south east elevation to Lea Bridge Road

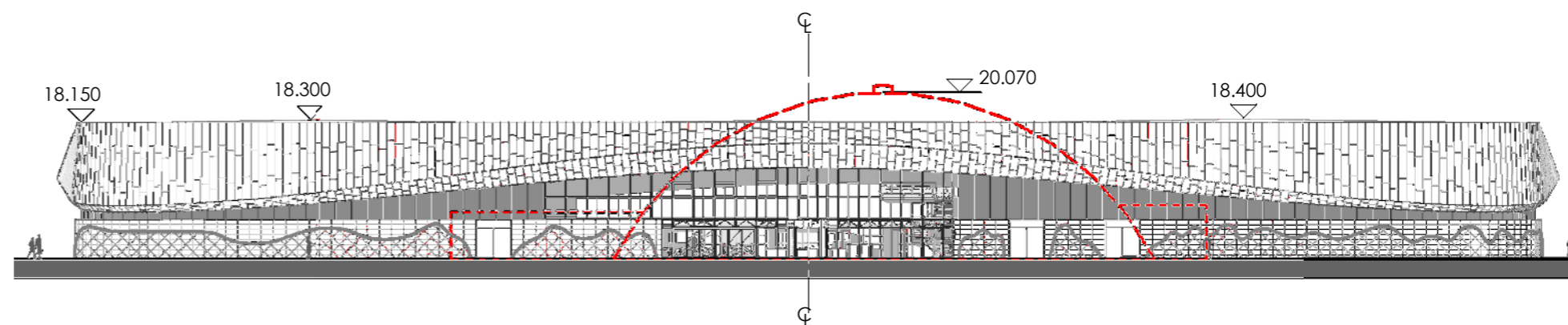


Figure 127 Comparative scale of existing LVIC building (in red) with proposals - south west elevation to car park



Figure 128 Contextual elevation to Lea Bridge Road showing comparative height of adjacent residential buildings at Essex Wharf

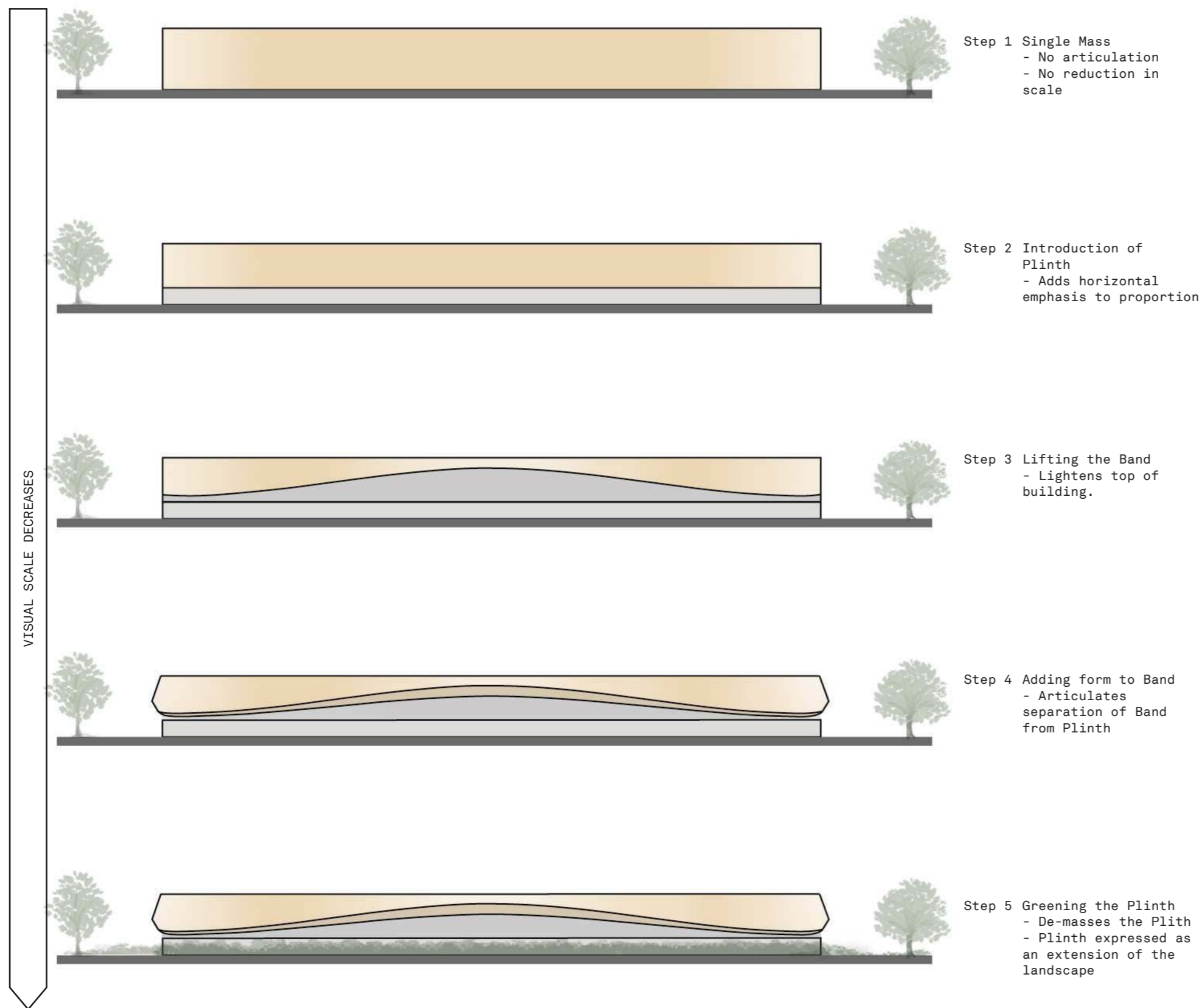


Figure 129 Articulation of facade to reduce visual scale and massing

6.3. CONCEPT MASSING STUDIES

The proposed massing strategy has been developed in response to a number of influences:

- The need first and foremost to respond the landscape setting of the Regional Park and the context.
- The need to mitigate the larger building mass arising from an increased ice area.
- The need to achieve an efficient and compact building form, to minimise energy use.
- The functional and spatial requirements of the activities within.
- The desire to create a legible architectural composition that can be clearly understood by the user, internally and externally.

The concept massing has undergone significant review, change and refinement throughout the design stages, prompted by internal peer review, the planning pre-application process, the DRP, and public and stakeholder consultation. Throughout the process the principles described above have been a yardstick by which the building has been measured. Sections 2.1 to 2.4 have described the process and the influences that have shaped the design. The following describes the final massing concept of the proposals being submitted for approval.

From the simple parti plan of the Fridges and the core described in Section 5.3, the starting point of the massing concept was derived from the geometry of the ice hockey field of play. The unique form established by the curved corners of the ice pad is unlike that of any other sport, and the proposals looked to celebrate this outwardly in the building envelope. The massing concept took the plan of the pad and extruded the form upwards to create the volume of the Fridge. This concept is then expanded to the twin rink arrangement with a single, larger container wrapping around both fridges and the central core.

The massing concept responds to its context by adopting the principle of a pavilion within the Regional Park, with a consistent architectural language to each elevation. There is no front or back to the building, each side addresses its surroundings in the same manner. The internal spatial hierarchy is expressed through the placement of the glazed foyer space around the main public entrance facing the car park to the east. To integrate such a large building into the Regional Park, a low lying horizontal proportion has been created by dividing the façade into two elements. A heavy weight plinth to the lower portion of the elevation responds to the flat surroundings and anchors the building within the landscape. The plinth creates a robust base, both internally where it will be subject to impact from ice skates and equipment, and externally where it needs to provide a low maintenance and secure protective barrier. The plinth brings the scale of the building to a human level on the ground, and is conceived as an extension of the ground plane, extruded up to form a solid base. This is expressed through the chosen materiality described in Section 8.0.

The Plinth forms a podium, above which sit the Fridges. A continuous horizontal datum is expressed internally and externally where the two elements meet. The final element of the concept massing is the "Band". This is a tight wrapper stretched around the Fridges to contain the 3 internal elements of the Fridges and the core, together with the entrance foyer and service yard voids. The Band is separated from the Plinth, with a flowing curving lower edge revealing the internal volumes, and creating the impression of the Band floating within the landscape.

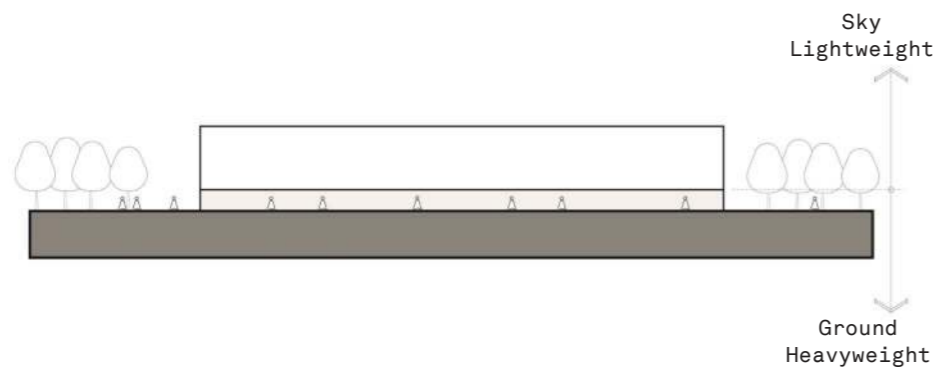


Figure 130 Concept Development - Elevation Parti - Plinth and Top

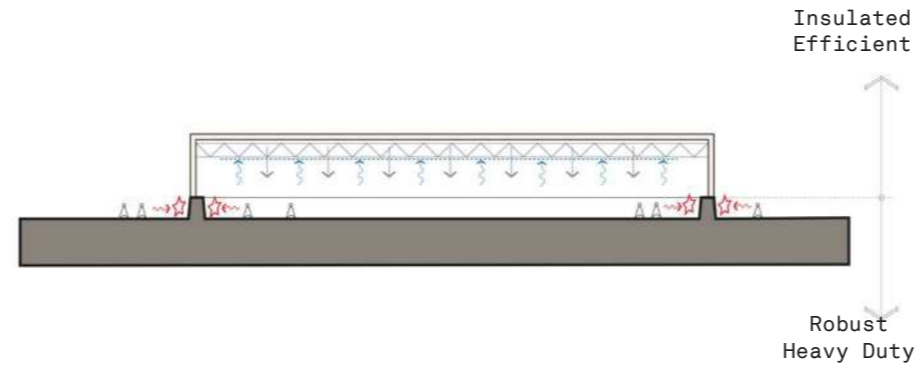


Figure 131 Concept Development - Section parti - Plinth and Fridge

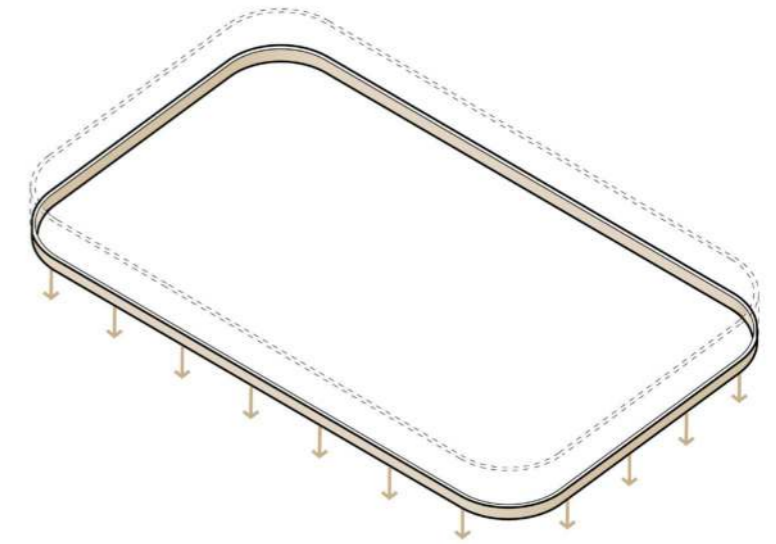


Figure 132 Concept Development - The Plinth

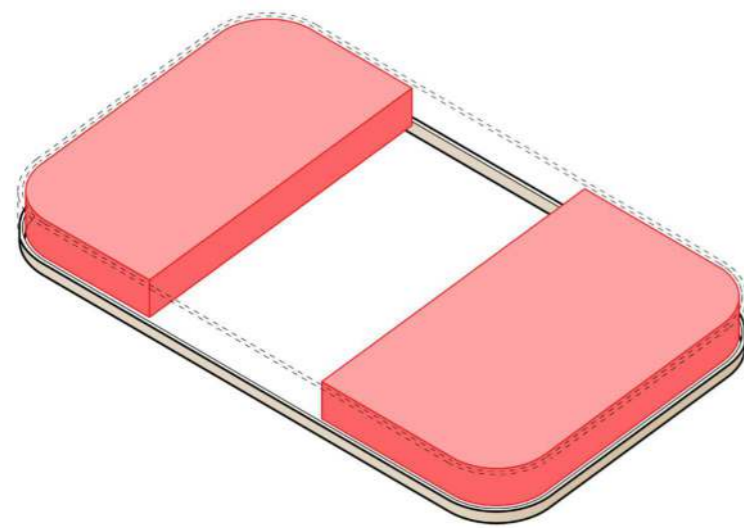


Figure 133 Concept Development - The Fridges

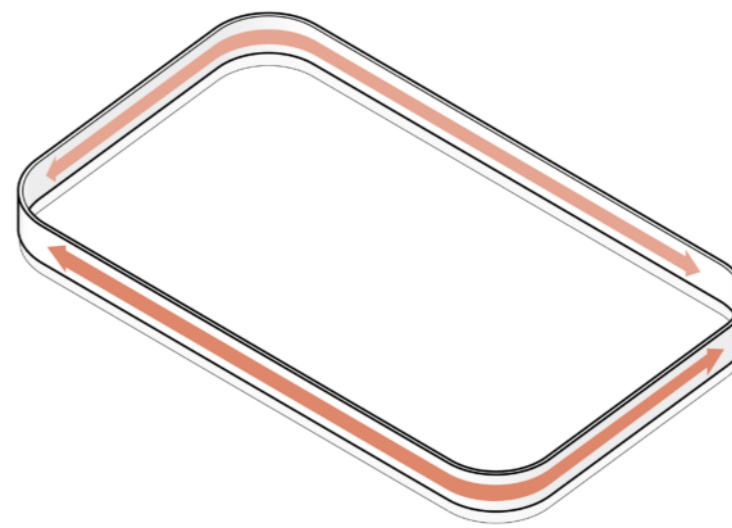


Figure 134 Concept Development - Tight Band

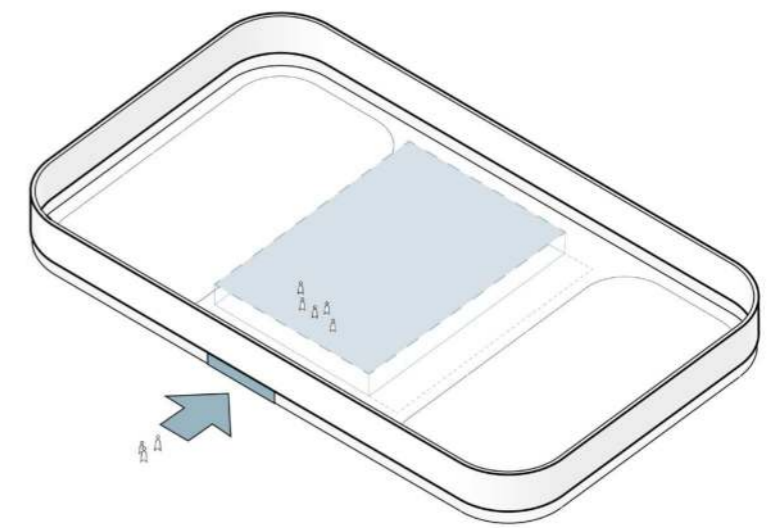


Figure 135 Concept Development - Break in Plinth to create entrance

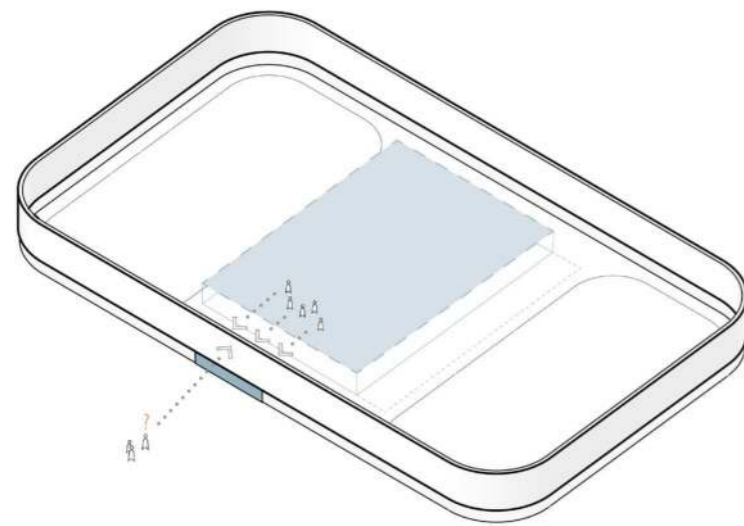


Figure 136 Concept Development - Visual Connection to Gym limited by Band

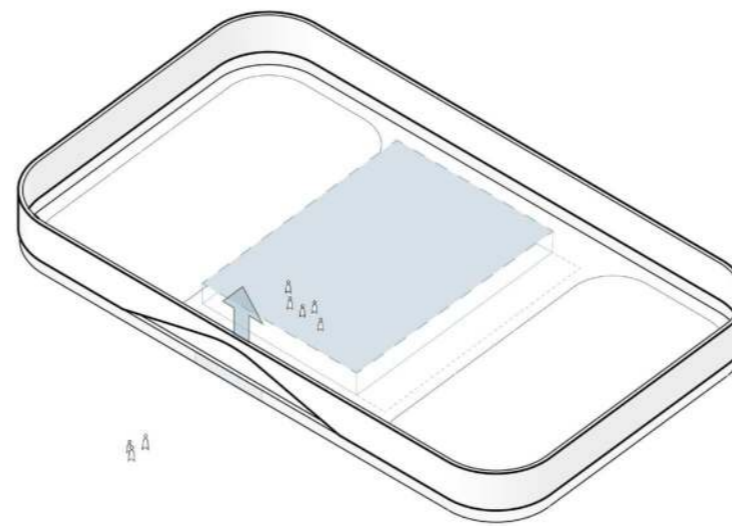


Figure 137 Concept Development - Lifting the Band

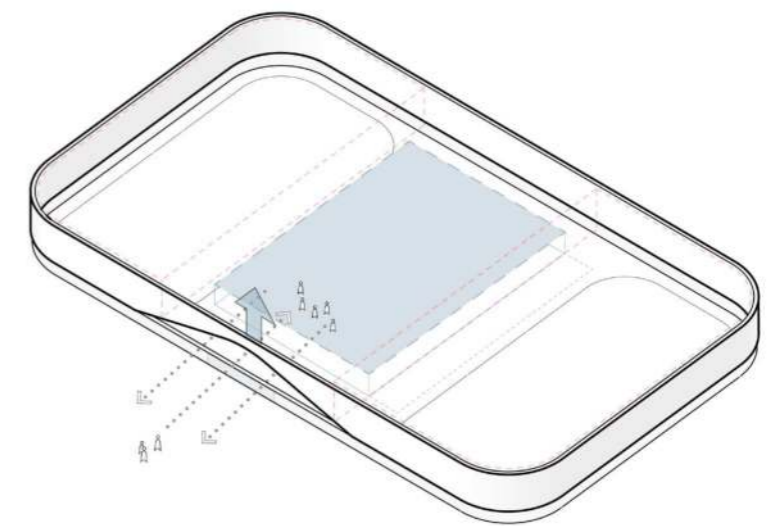


Figure 138 Concept Development - Visual connections enhanced

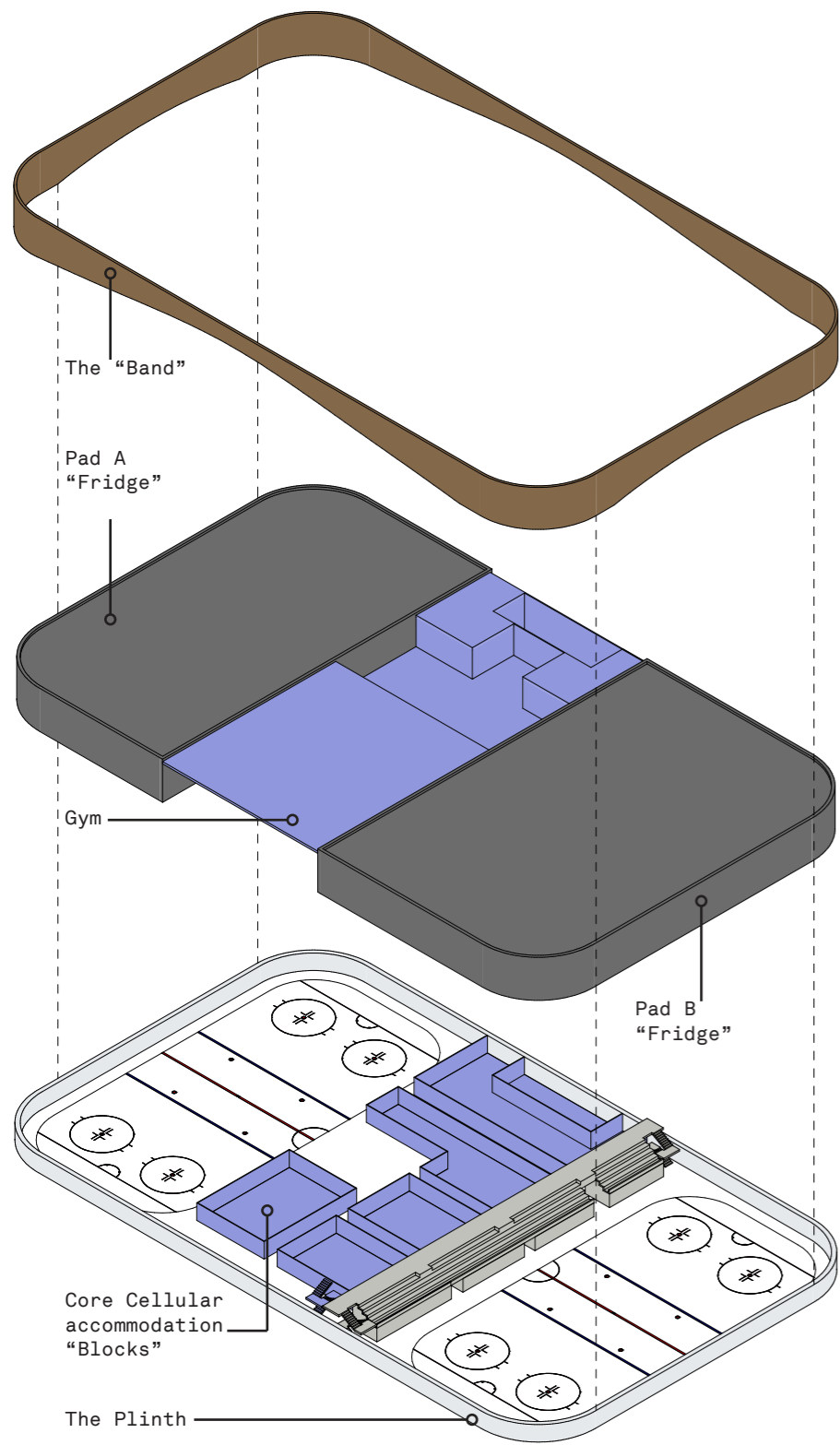


Figure 139 Massing Strategy

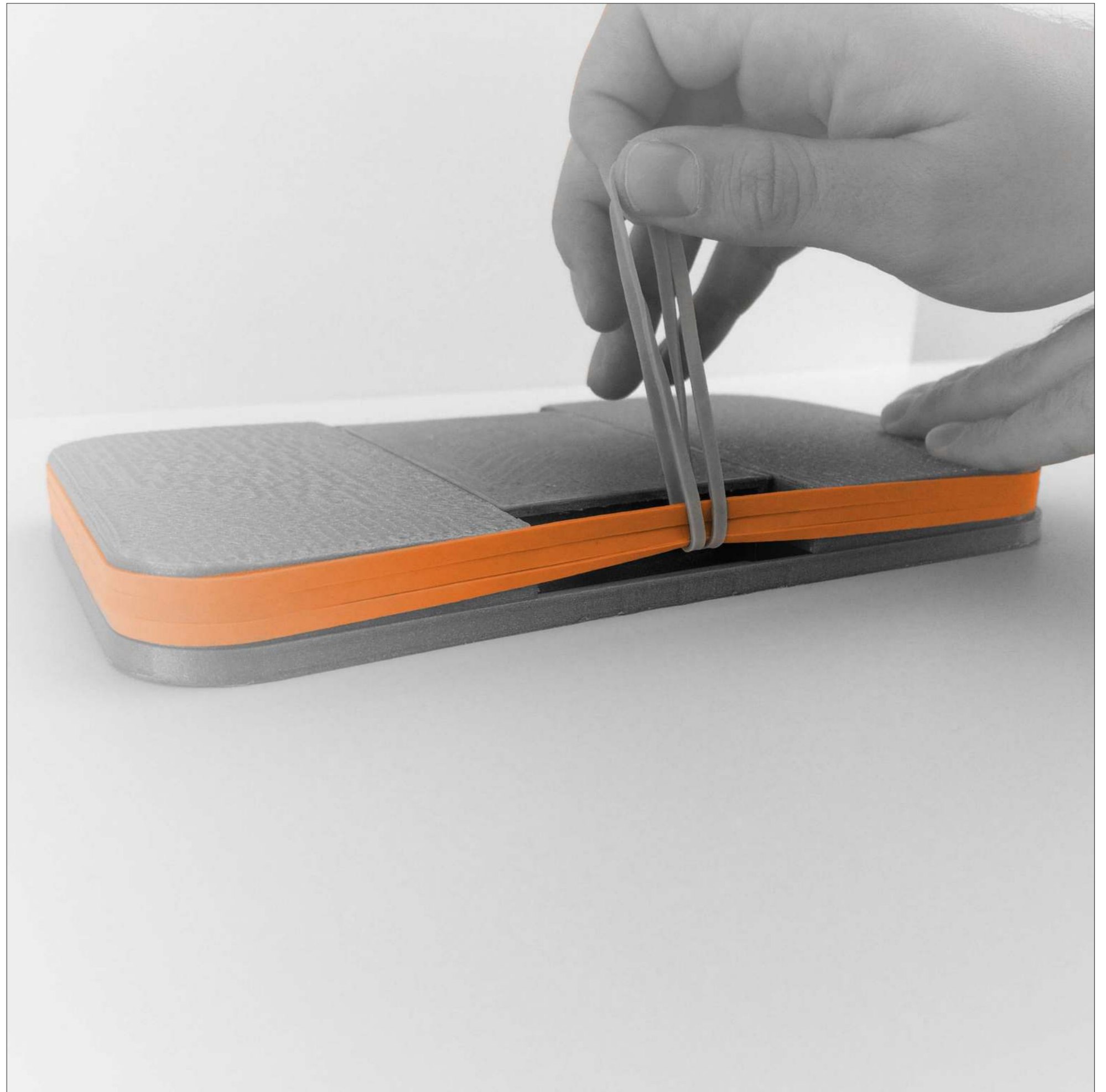


Figure 140 Concept - Lifting the Band

6.4. LVIA VIEWS

During the pre-application process a number of strategic viewpoints looking into the site were agreed with LBWF. These are:

1. From the South side of Lea Bridge Road at the entrance to the Thames Water site, looking west towards the building.
2. From Lea Bridge looking east along Lea Bridge Road.
3. From the Capital Ring footpath to the west of the River Lea, north of the footbridge, looking towards the Ice Centre.
4. From Sandy Lane to the north, looking South east along Sandy Lane to Lea Bridge Road.
5. From the north of Leyton Marshes, looking south east towards the Ice Centre.
6. From the South Side of Lea Bridge Road at the westbound bus stop, looking towards the building.

FaulknerBrowns had previously selected Views 1, 2, 4 and 5 and used these views to test the very early concept massing and site selection. We revisited the site to photograph views 3 and 6, and have carried out further massing tests within these views.

For View 6, we took a number of views along Lea Bridge Road looking directly across the road at the ice centre, as it was apparent that with a standard lens, in the agreed location, the scale of the building and its proximity to Lea Bridge Road would mean the whole building could not be framed in the view. Therefore views were taken either side of the bus stop to frame the corner of the building to demonstrate its mass, while demonstrating its effect on views past the building and through the site.

The massing views in Figure 141 to Figure 146 have broadly adopted the methodology for Accurate Visual Representations (AVRs) but have been produced in house by FaulknerBrowns as part of the massing testing and options appraisals throughout RIBA Stages 2 and 3. They do not purport to be accurately verifiable views however, and are representative of the design tools used to develop the design.

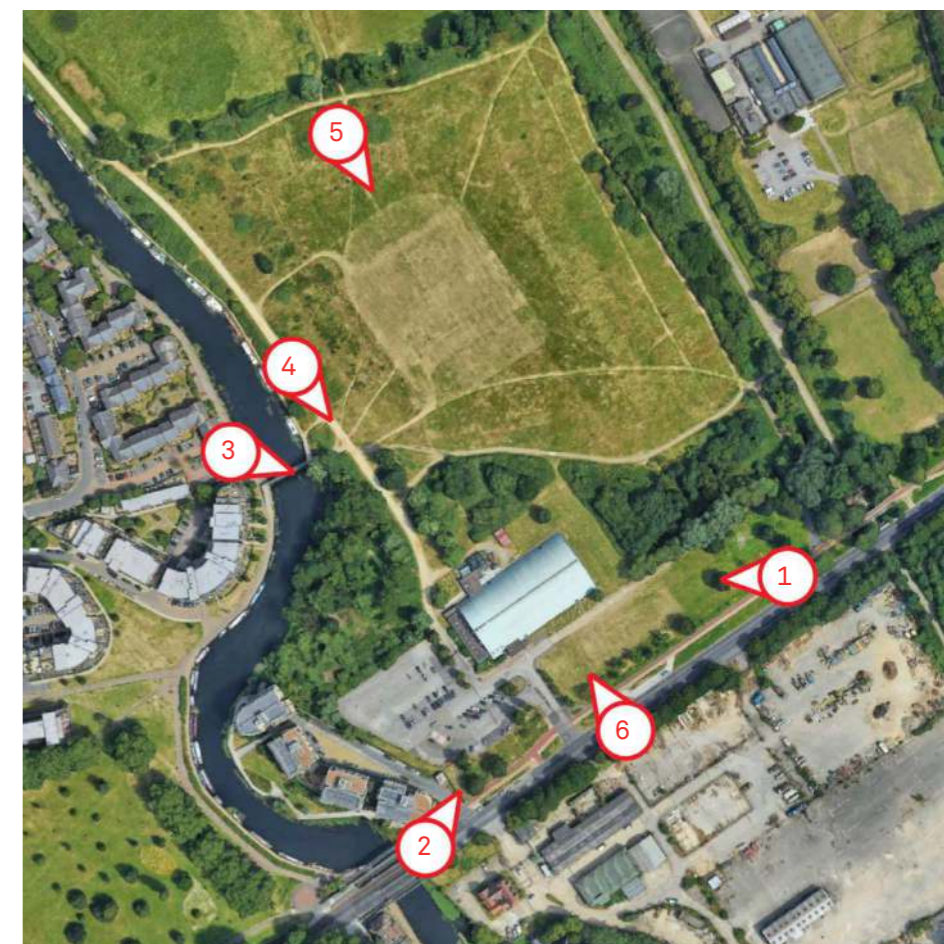




Figure 141 Massing Test View 1 - Lea Bridge Road Looking west



Figure 142 Massing Test View 2 - Lea Bridge looking north east



Figure 143 Massing Test View 3 - Capital Ring looking east



Figure 144 Massing Test View 4 - Sandy Lane looking south east



Figure 145 Massing Test View 5 - Leyton Marshes looking south east



Figure 146 Massing Test View 6 - Lea Bridge Road looking north west

The massing studies highlight the following key features of the proposed design:

1. From the Capital Ring (View 3) the proposed building is screened by the existing tree line around the ox-bow lake and within the SMINC.
2. The building orientation and location significantly opens up views through the landscape to the marshes on the west side of the building.
3. The view along Sandy Lane towards Lea Bridge Road (View 4) is improved by moving the building to the east and creating a clear line of sight through the treeline.
4. The new building will be partially visible from the Marshes to the north (View 5), a situation partially exacerbated by moving the building to the east and closer to the marshes, and the resulting loss of some tree groups. This will be mitigated by appropriate tree planting to reinforce the existing tree line. It was noted that a significant amount of tree cover is retained on the western edge of the building.
5. The proposed building line is closer to Lea Bridge Road, creating a greater apparent building height from View 6, and introducing a greater scale to the road. However, in the perpendicular views, the view of the building is filtered and screened by the existing tree planting.
6. Viewed from Lea Bridge Road to the east of the site (View 1), existing tree planting effectively screens the building, with the northern portion and much of the building mass completely concealed by the existing tree group to the east.
7. Looking from Lea Bridge (View 2) the increased building length and proximity to Lea Bridge Road is clear, but again the existing retained trees break up the mass. Proposed tree planting within the car park will further filter these views.

In all the massing studies, the effect of curving the corners of the building, and the reduction on the apparent mass when viewed at an angle became apparent. The most visible views of the building occur on the corners; the mass of the south west corner viewed from the existing site entrance and the north east corner in the gap between the tree groups in particular, are mitigated by softening the corner.

In all the massing studies where existing or proposed trees and vegetation provide screening and filtering of the proposed building, this screening effect would be reduced during the winter months when trees are not in leaf. However, there is sufficient depth of vegetation in the tree line around the ox-bow lake and within the SMINC to the east, and within the tree cover retained to the west of the building to continue to filter views.

A full set of AVR's have been produced as part of the Visual Impact Assessment submitted in support of this application to demonstrate the impact of the proposals.

7.0 LANDSCAPE AND ECOLOGY

LDA DESIGN

7.1. EXECUTIVE SUMMARY

This section has been compiled by LDA Design, in conjunction with Faulkner Browns Architects, Expedition Engineering Ltd, Max Fordham, Lighting and BREEAM consultants, ARUP CCTV, Cole Easdon Transport Consultants and Core 5 Cost Consultants. It sets out the approach to and design of the landscape and ecological aspects of the proposed new Ice Centre on Lea Bridge Road, Waltham Forest.

The overall aims and objectives of the Landscape proposals are as follows:

In old English the word **'Land'** means **'home territory'** while **'Scape'** comes from **'Scapen'** meaning to **'create'**. Together they describe a process of making a place where people belong.

Through significant landscape enhancement and ecological habitat creation we will deliver:

- a purposeful environment which connects people and place with nature to deliver a strong ecosystem which provides habitats for a wide range of species and pollinators.
- a landscape that will feel tranquil but also diverse, playful and free range.
- a native species landscape and ecology which will build resilience to climate breakdown, minimising flood risks with planting and bioswales capable of absorbing surface water as well as offering sustainable solutions to waste water and ice-melt management.
- a healthy environment which will afford frequent users and occasional visitors alike the opportunity to foster equitable relationships with people and nature and at the same time, provide significant opportunities for wildlife biodiversity and environmental awareness.

In summary, our proposals for the landscape and ecological designs are contextually founded on the principles of:

- respect
- protect and
- enhance



7.2. INTRODUCTION

To the immediate west of the development site sits the residential development known as Essex Wharf which fronts the River Lea. The north of the site is bounded by the Marshes and the Regional Park, and to the east lies the Lea Valley Riding Centre. These land uses provide the context and determine the physical and built boundaries of the proposed new ice facility.

It is proposed to retain a substantial area of the existing vegetation and tree cover within the development boundary. Soft landscape proposals will comprise native species, rich in ecological diversity and they will be selected for their suitability to evoke a landscape typically associated with riverine and meadow mixes. The majority of the sites surface water drainage will be channelled through a series of swales (shallow open ditches), water features and reed beds before being finally discharged into the Lea River in a clean state. Existing road gullies will be maintained. It is also proposed that daily ice scrape and melt from the two ice pads will be cleaned and filtered through a small reed bed system before the clean water is returned to the building for use as grey water for flushing the complex's WC's.

The hard landscape components will comprise coloured asphalt car park surfacing with contrast coloured asphalt pedestrian priority footways and high quality paved surfacing to the ice centre's entrance and outdoor cafe terrace. In addition, permeable reinforced grass routes will be provided for emergency access routes. The building 'plinth' will be faced in gabion basket walling structures providing significant greening as well as opportunities for habitat creation for numerous invertebrates who will inhabit the many cracks and fissures created by the stone facade. These will also be planted with native plants and climbers. All external lighting will be designed in full accordance with the current guidelines for the accommodation of bats and moths as well as to minimise any light spill to respect the dark sky environment of the Marshes. The lighting design will not cause demonstrable harm to the peace and tranquility of the Marshes, while maintaining secure and safe routes for all users while the centre is in operational use.



Figure 147 RIBA STAGE 3 MASTERPLAN

7.3. DESIGN DEVELOPMENT

Between March 2019 and September 2019, a number of meetings, workshops and presentations have taken place with various groups including LBWF, the GLA, DRP and key local groups including members of SLM (Save Lea Marshes). These have focused on the design of the ice centre and the surrounding landscape and ecological considerations and we have taken full cognisance of these discussions in developing our landscape and ecological proposals.

In summary, the following broad range of comments have been made by the respondents. All of these requests have been **addressed and incorporated** into the final design:

- Consider retaining the existing curvilinear access route to Sandy Lane where it passes the eastern edge of the car park to maintain a more natural route and preserving the gradual reveal of the Marshes in the north.
- Explore further greening opportunities for the site and car park.
- Enhance accessibility for users of the MOL.
- Enhance biodiversity improvements and mitigate ecological impacts.
- Ensure that the landscape proposals make a considerable contribution to the parkland.
- Mitigate any potential light pollution to the Marshes.
- Minimise the loss of existing trees and vegetation.
- Welcome more trees.
- Re use any site won spoil on site to ensure greater sustainability.
- Create a 'playful' quality to the landscape that responds to the natural biodiversity of the site.
- Protect the SMINC.
- Re position the car park further south to ensure that there is no encroachment into the SMINC in terms of physical construction.
- Undertake ecological site assessment and develop details of biodiversity measures.
- Pursue opportunities to bring the external environment into the building.
- landscape proposals should maximise the potential of the existing context.

The following surveys have been undertaken in order to fulfil the statutory planning system requirements as well as additional studies, out-with the formal process, in order to ensure the highest quality of environmental enhancements are delivered:

- Full topographical survey.
- Comprehensive arboricultural survey of all the vegetation within the development boundary.
- Extended Phase 1 surveys in 2017 and 2019.
- Bat activity surveys.
- Bat re-emergence surveys.
- Water vole survey.
- Otter survey.
- Appraisal of opportunities for the enhancement of hedgehog habitat.
- Biodiversity Impact Assessment (BIA), to provide objective measurement of net gain values.
- BREEAM Assessment.



Figure 148 RIBA STAGE 2 MASTERPLAN

7.4. LANDSCAPE STRATEGY - KEY PRINCIPLES

The landscape and ecological proposals aim to:

- Create an outstanding and distinctive setting for the proposed new LVIC and to provide a strong direct visual link between the road and the wider more distant marshland landscapes.
- Integrate the story of the sustainable water cycle into the design by harnessing the carpark surface drainage water and waste ice rink melt in swales and wetlands around the site.
- Design a site that connects and permeates through the surrounding marsh and meadow landscape.
- Bring Leyton Marshes to the Lea Bridge Road. Enhance the ecological biodiversity of the site's existing vegetation and significantly add value to the natural capital and character of the surrounding and adjacent landscape infrastructure with enhancement of existing and addition of new terrestrial, wetlands, meadow habitats.
- Enrich the visitor and local communities enjoyment of the public realm when on site and establish goals to better connect the site with the surrounding recreational opportunities associated with the nearby nature reserves, Oxbow Lake, horse-riding facility and wider network of bridleways, footpaths, cycleways and river frontages.
- Reuse of ice melt from ice pads as grey water for use in the Ice Centre ie for WC flushing (and other possible uses) as well as water feature in front of the building and Oxbow Lake biodiversity enhancement.
- Include hard and soft landscape design which responds to the existing landscape typologies in the immediate site vicinity.



Extending Leyton Marshes will consist of:

- Removal of existing concrete grasscrete and poor quality compacted lawn.
- Breaking existing carpark by introducing swales.
- Creating native meadows with local species present in Leyton Marshes.
- Introducing native nectar-rich trees and shrubs.
- Creating new wetland habitats with native plants and reed beds.



Figure 149 Introducing nectar rich native meadows with local native species present in Leyton Marshes, in place of existing concrete grasscrete and poor quality compacted lawn with plastic grasscrete.



EXISTING PHASE 1 HABITAT SURVEY
Figure 150

- KEY
- Amenity grassland
 - Neutral grassland
 - Broadleaved semi-natural woodland
 - Dense scrub
 - Tall ruderal
 - Introduced Shrub
 - Bare ground
 - Building
 - Grasscrete
 - Hardstanding
 - Standing water (Oxbow Lake)
 - Running water (River Lea)
 - Scattered tree
 - Line of trees



PROPOSED ECOLOGICAL ENHANCEMENT
Figure 151

- KEY
- Proposed species rich native meadow
 - Existing dense scrub
 - Proposed native swale planting
 - Proposed reed beds
 - Broadleaved semi-natural woodland
 - Proposed native ornamental planting
 - Proposed reinforced grass
 - Proposed native emergent and submergent planting
 - Proposed native bog and marginal planting
 - Proposed native shrub planting
 - Existing tall ruderal
 - Existing bare ground
 - Building
 - Hardstanding
 - Standing water (Oxbow Lake)
 - Running water (River Lea)
 - Proposed native biodiverse green roof
 - Existing trees
 - Proposed trees
 - Proposed native climber planting

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7.5. ECOLOGY STRATEGY - KEY PRINCIPLES

In addition to the principles set out for the strategic landscape development we have further identified key ecological principles which will be followed in the development of the scheme. These are:

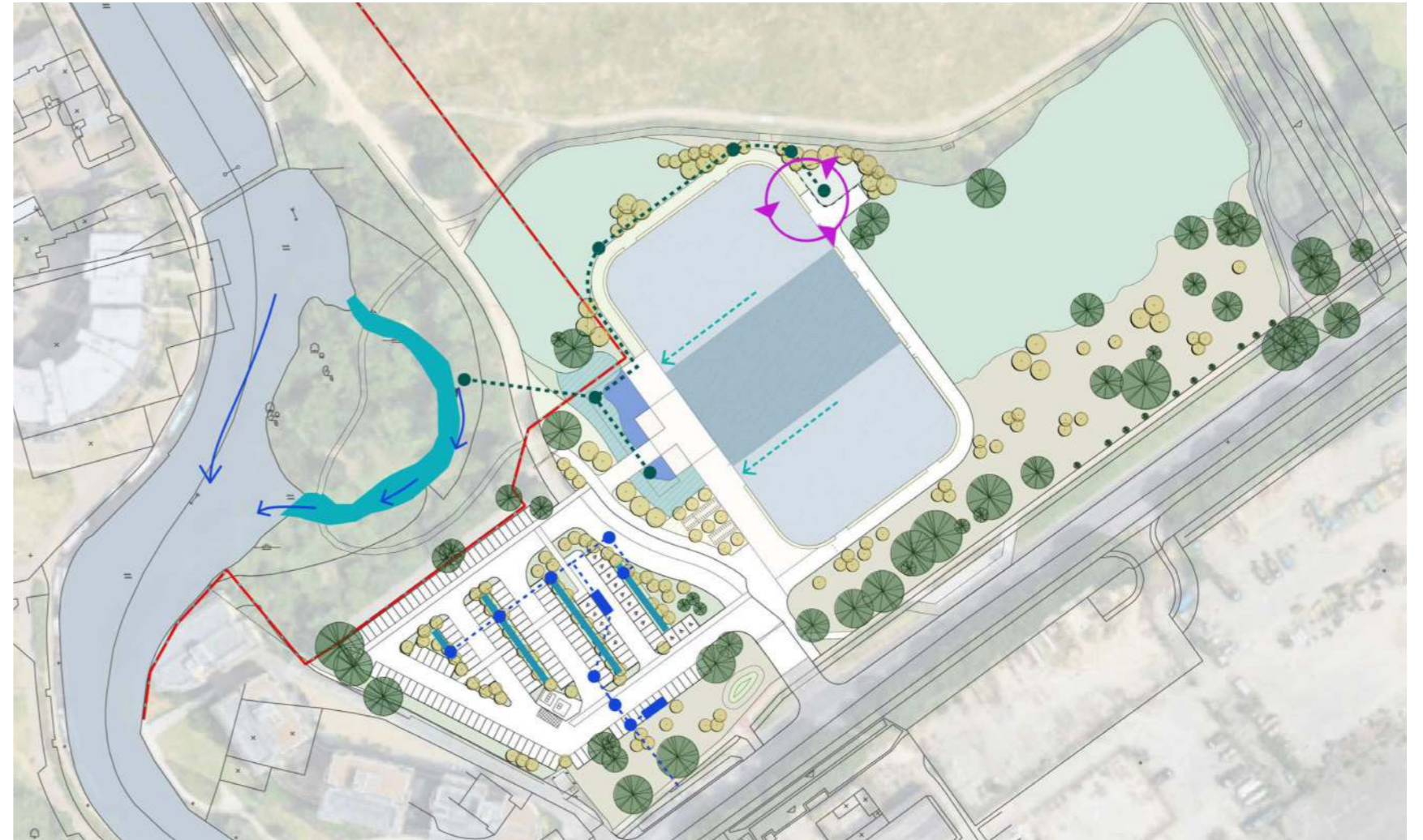
- to deliver a strong net gain for the site's ecological biodiversity through the use of a Biodiversity Calculator (as defined by the most up to date methodology as set out in DEFRA's 2019 consultation proposal statement.)
- to ensure that all proposed biodiversity measures 'dovetail' perfectly with the environmental policies set out by the local authority . Specifically Policy 86 (Biodiversity and Geodiversity), set out in the LBWF emerging Local Plan.
- To ensure that all proposed biodiversity measures are in accordance with the NPPF Paragraph 170.

7.6. WATER STRATEGY - KEY PRINCIPLES







The surface water drainage strategy has been developed to create an exemplar system and deliver a solution which is not only sustainable but also a thing of beauty. In doing so we will also significantly enhance the biodiversity of the site by creating an ecologically rich landscape which will evoke the very essence of the surrounding marshlands character. The following Principles will be adopted:

- Integration of the water cycle within the Landscape proposals in the form of bioswales and attenuation scrapes which will assist in the enhancement of the biodiversity, with the control of the surface water runoff throughout the site and car park in line with the requirements of the SUDS Manual (CIRIA C753).
- Improvement of the water condition and oxygen levels of the 'Oxbow Lake' within the nature reserve to the west of the site.
- To harvest all of the buildings roof drainage water and feed this into the oxbow lake.
- To harvest the daily ice 'shavings' periodically removed from the pads surface and pass the ice melt through a series of reed bed filtration beds before discharging the cleaned water into the Oxbow lake and River Lea.
- To reuse a proportion of the clean ice melt water by reintroducing the filtered water into the WC flushing system and possibly to use in new ice making.

Note: for technical details of the aforementioned principles please refer to the civil engineer report, section 6 Drainage.



KEY

- - - SITE OF METROPOLITAN IMPORTANCE FOR NATURE CONSERVATION
-  RAIN WATER RUNOFF FROM THE ROOF
-  OXBOW LAKE WATER CIRCULATION
-  GREY WATER CYCLE WITHIN THE BUILDING
-  ICE MELT WATER MOVEMENT
-  UNDERGROUND CONNECTIONS BETWEEN CAR PARK SWALES
-  CAR PARK SWALES



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7.7. LANDSCAPE MASTERPLAN

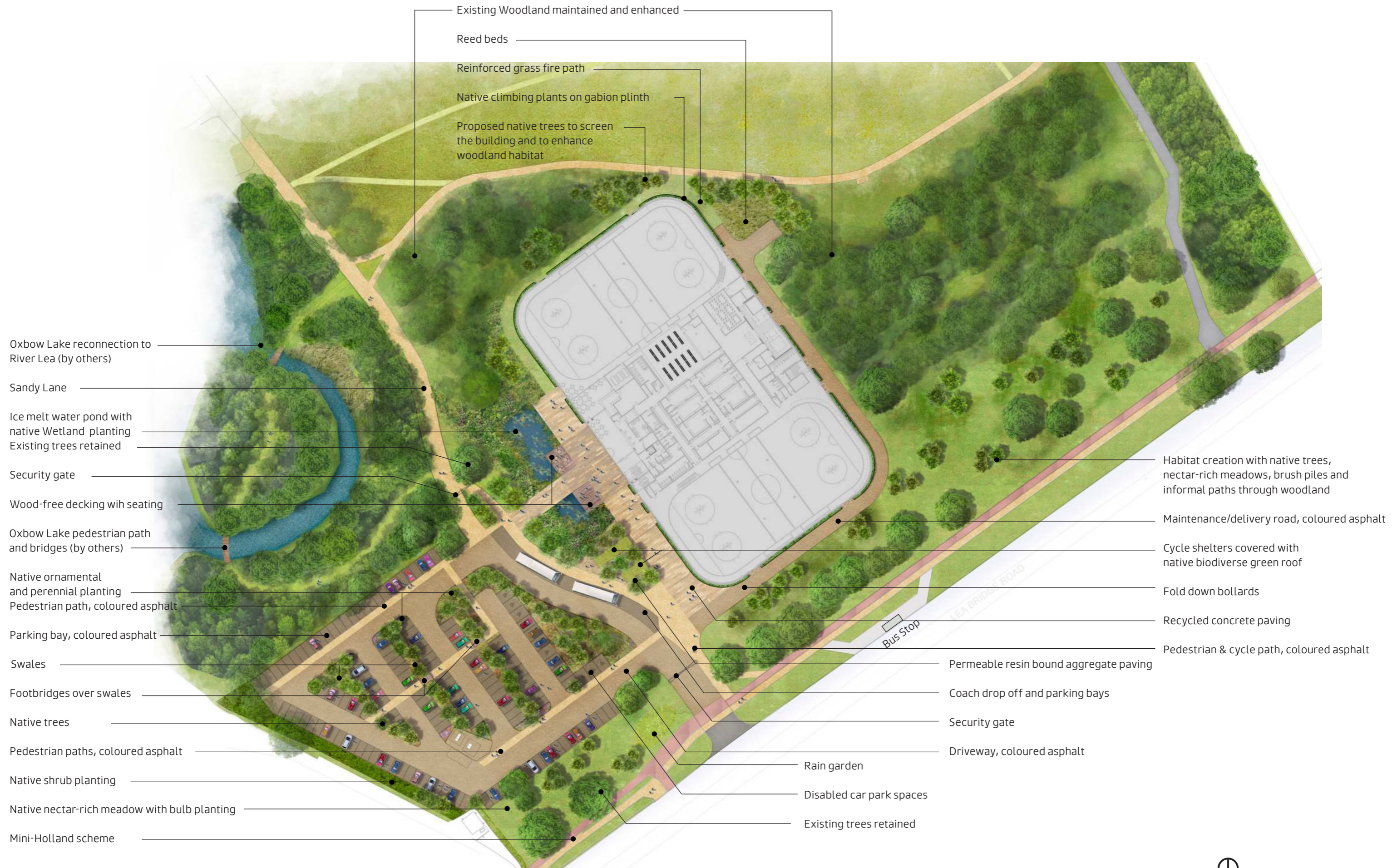
The landscape and public realm Masterplan layout has been driven and informed by a full understanding of the site's inherent constraints as well as an overwhelming desire, through sensitive design, to significantly improve, enhance and create a landscape which is focused not only on the frequent users of the facility but also for people rambling through the site. The proposals aim to provide the optimum conditions for flora and fauna to flourish in harmony with human activity and increase the biodiversity and sustainability of the locality.

The baseline landscape context is currently very poor and basic in quality with little on offer by way of inspiration or joy for the user experience together with a low level of ecological value in and around the immediate site area.



Figure 152

RIBA STAGE 3 MASTERPLAN



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7.8. LANDSCAPE DESIGN COMPONENTS

Hard and soft design form and materiality has been designed to be:

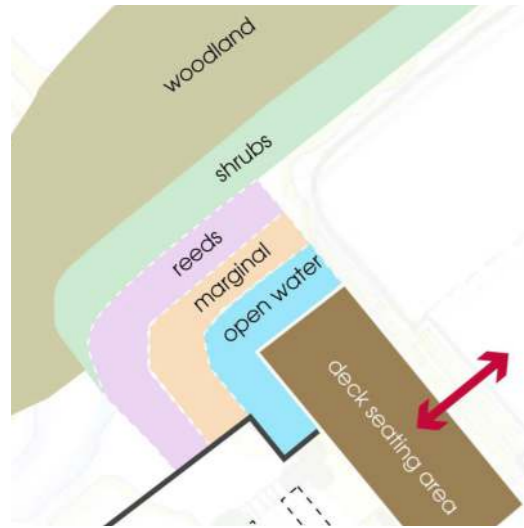
- Sustainable.
- Resilient.
- With legible circulation.
- Maintenance and management lifecycle cost effective.
- Of the place and character of the surrounding marsh landscape.
- Ecologically rich and biodiverse with a focus on locally occurring native species.



Figure 153 View from arrival terrace towards water feature and car park



Figure 154 View towards arrival terrace



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ARRIVAL TERRACE

Whether arriving on foot, by public transport/team coach, or by car, all visitors will arrive at the 'front door' of the 'Pavilion' building by passing between two naturalistic planted waterbodies with associated decking on which to relax and enjoy either fresh drinks and high quality food offers from the building's in house cafe or to simply sit and wait for friends and take in the marshland landscape with all its biodiverse components. The water itself will be recycled ice melt having already undergone a filtered cleaning process by having passed through a series of reedbeds en route from the east of the facility to the main entrance. The arrival terrace surfacing will comprise of a clean modular concrete paving system in a complimentary colour to that of the main 'Pavilion' facade and be of a slip resistant texture. Groups of cycle stands will be positioned on the terrace and covered by simple timber roof structures planted with a range of biodiverse flora to encourage a richness of invertebrates and particularly pollinators. A range of soft landscape elements of large native trees, shrubs and ground cover will complete the palette in this area and will provide a significant area of high quality landscape treatment at the entrance to the Ice Centre and visually buffer the views to Lea Bridge Road and the car park providing an atmosphere of tranquility and calm.



CAR PARK & COACH DROP OFF LAY-BY

The car park and coach drop off areas will comprise a non porous bituminous coloured asphalt. The running carriageways will be of a contrast colour to the bays themselves. In addition there will be 'safe pedestrian corridors' also in contrast colour throughout the car park aisles to collect people safely from their vehicles and lead them to the Arrivals Terrace. The groups of parking bays will be separated by a series of bioswales whose function it is to collect rain and storm water from the car park surface and to capture the water and channel it into small depressions or valleys in the centre of the swales. Here the water will be cleaned via a series of filtering plant material before passing out from the site to the nearby Thames Water foul sewage system for ultimate discharge into the Greater London water system. The vegetation within the swales will also filter out the massing of the parked vehicles in the car park and contribute to the screening of vehicles from the Arrivals Terrace.

The car park will incorporate 155 car park spaces (a significant reduction from the existing level of car parking provision) including 16 number of accessible parking bays together with a provision of 10% active and 10% passive electric car charging points.



Figure 155 Swales in the Olympic park in soft landscape



Figure 156 Bridges over swales

ACCESS AND MOVEMENT

VEHICULAR MOVEMENT

The visitor car park will be retained in existing location but will undergo a degree of reduction and reconfiguration, resurfacing and hard and soft landscape enhancement.

A drop off coach and VIP zone will be created to the immediate east of the car parking, in front of the main entrance.

PEDESTRIAN MOVEMENT

Visitors arriving to the Ice Centre by foot or by public transport will do so via series of new pedestrian footways which will run from the public highway on the Lea Bridge Road and along the Ice Centre building. This will be defined using a coloured asphalt colour surfacing.

CYCLE WAYS

It is not envisaged that we will create any specific cycle ways within the development site itself however, we will utilise the adjacent "Mini-Holland" cycle scheme routes which run along Lea Bridge Road and also the existing routes which are already designated in the locality.













Connections from the site to these routes will be made.

55 bicycle stands (110 bicycle spaces) will be provided on site near the main entrance to the ice centre for cycle parking.

IN NUMBERS:

- 155 car park spaces including 16 disabled spaces.
- 55 bicycle stands (110 bicycle spaces).

KEY

- | | | | |
|---|----------------------------|---|---------------------------|
|  | Pedestrian movement |  | Cycle ways |
|  | Main entrances |  | Bicycle shelters |
|  | Coach circulation |  | Bicycle stands |
|  | Drop off and coach parking |  | Sandy Lane traffic (HGVs) |
|  | Deliveries |  | Disabled car park spaces |
|  | Delivery entrance |  | Passenger car movement |

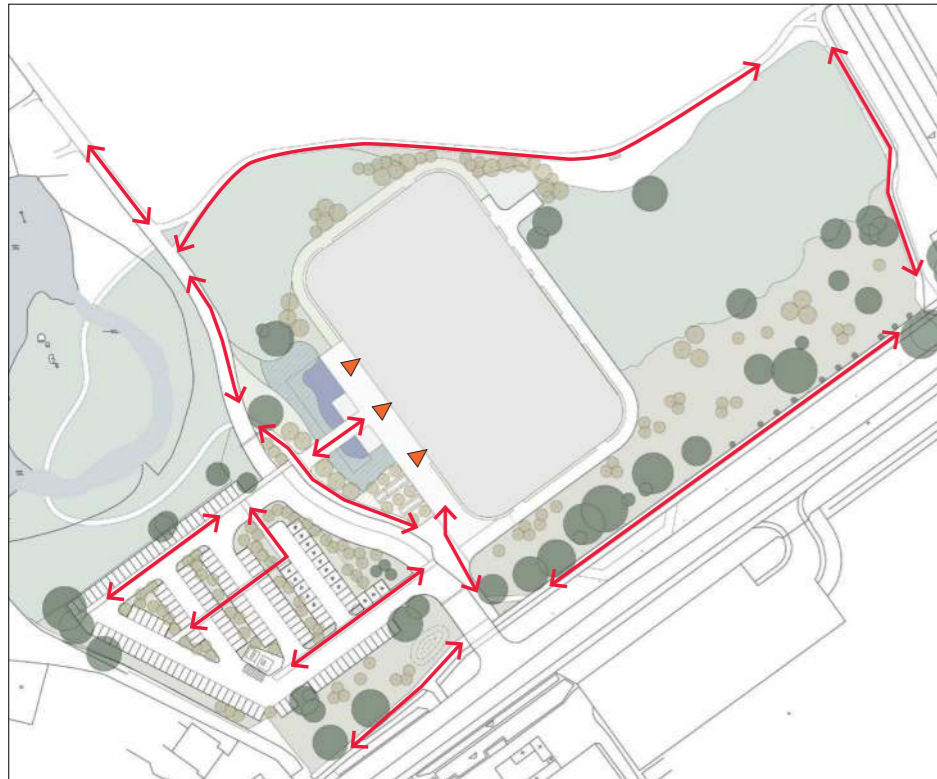


Figure 157 PEDESTRIAN MOVEMENT



Figure 158 CYCLE WAYS

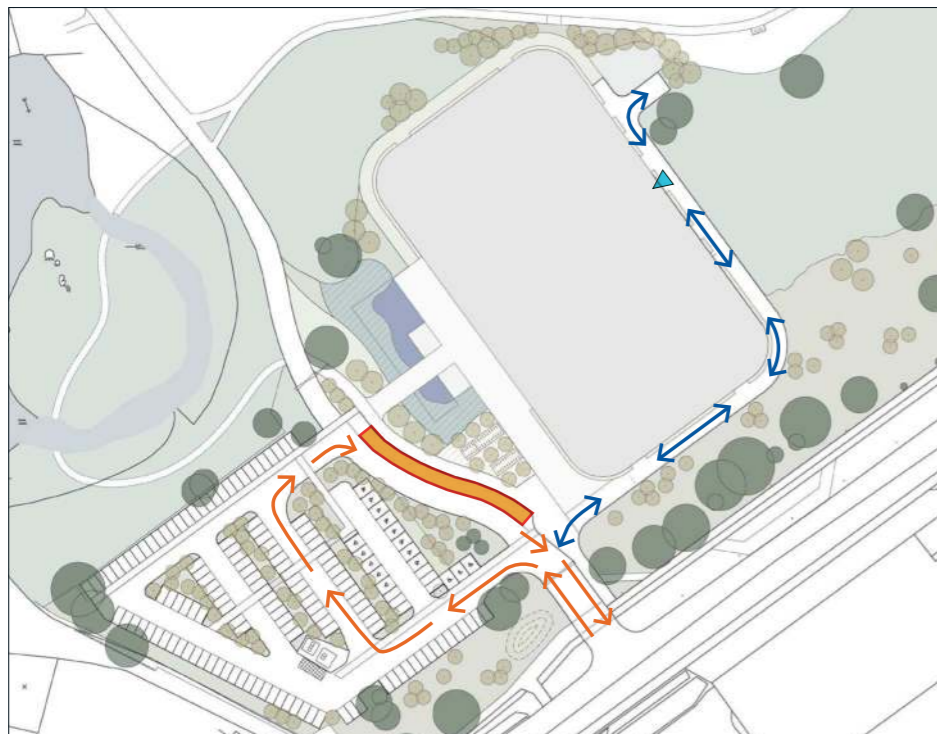


Figure 159 VEHICULAR MOVEMENT - coaches and delivery vehicles

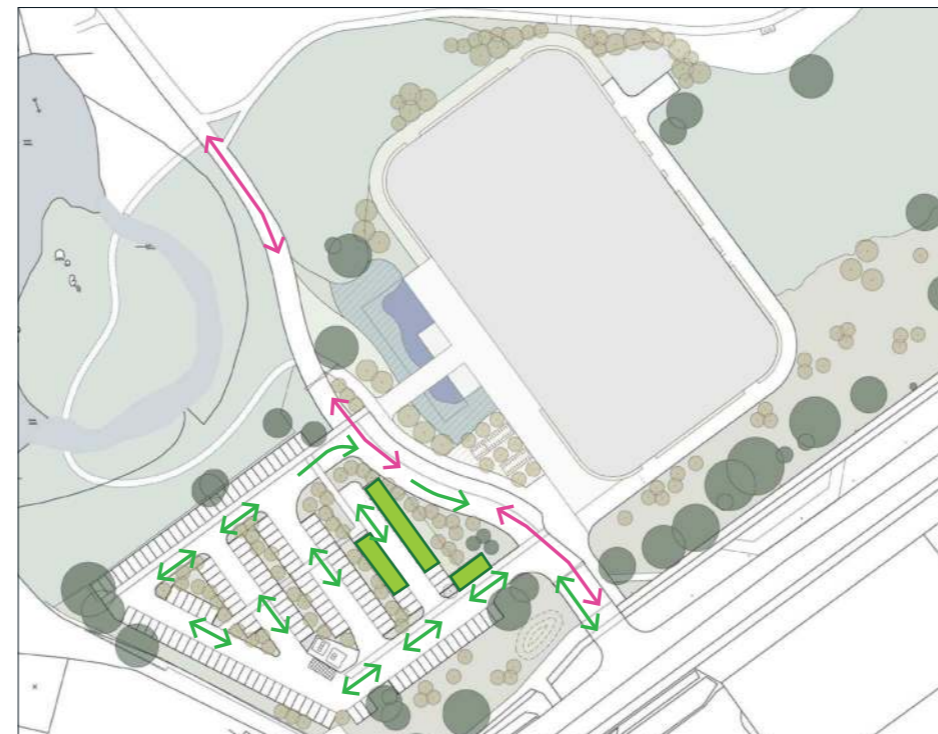


Figure 160 VEHICULAR MOVEMENT - cars and Sandy Lane traffic

Lea Bridge Road frontage

Enhanced connectivity into the venue will be offered via additional footpath connections directly from Lea Bridge Road. There will also be a cycleway link from and to the facility which will 'marry in' with the existing "Mini-Holland" cycleway route which exists on Lea Bridge Road. The existing poor quality amenity grassland and remnant 'grasscrete' surface and associated former building footings will all be replaced by a rich wildflower meadow mix, high in biodiverse grass species, to encourage greater biodiversity of the flora and fauna both for reproduction and food sources. In addition there will be further planting of groups of native trees within the meadow grassland.



Woodland areas

Three areas of broadleaved woodland currently occupy the site, the most notable of which is located in the north east corner of the site. Mostly comprising of ash, silver birch, willow and hazel. Over 97% of the existing site woodland cover will be retained in full in accommodating the new Twin Pad Ice Centre. Currently there are areas of invasive species present and the entire woodlands require a significant management programme to ensure the long term health and reproductive succession of the woodlands. At the present time there is visual evidence of temporary human habitation within the woodland areas and also evidence of anti social behavioural activities. A key aspect of the landscape delivery will be to prepare a long term (circa 10-20 years) management plan and programme of key tasks for the future success of the woods including descriptive maintenance tasks on a rotational basis. In addition, clearings will be carved out and canopies crown lifted to provide visual continuity with the site and the Marshes to the north while also making the area safer for family groups to enjoy the site.





Oxbow Lake

Our overriding principle is to improve the water condition of the Oxbow Lake to provide enhanced habitat conditions for the long term success of the associated fauna and flora.

Proposals for the existing Oxbow lake are confined to construction of a small outfall through which clean water will be discharged into the River Lea. The source of this water will be from the daily ice melt and roof drainage from the proposed facility. The car park will be moved 0.5m south and away from the Oxbow Lake area. By removing concrete kerbs and surfaces along the South and East Oxbow Lake area's border and replacing them with species rich native wildflower meadow the wildlife habitat area will become larger.

In its present condition the lake is stagnant and water flows have been impeded by logs which are acting as a dam. There is evidence of recent management to clear out invasive aquatic plants and the existing trees have been managed so as to ensure that there is no overhanging vegetation. The lake is shallow at approximately 100mm (4 inches) in depth with a silt layer.

In order to ensure that the construction of the ice centre does not impact adversely on the oxbow lake and nature reserve, the outfall will only be small and capable of accepting and directing a maximum of 50% of the site's clean surface water drainage into the River. The remainder will be directed off site into the Thames Water system. Outline approval has been obtained from the Environment Agency (EA), the Canals and Rivers Trust and LBWF for the discharge proposals into the Oxbow Lake.

All works undertaken by the appointed contractor will be implemented in strict accordance with a Construction Environmental Management Plan (CEMP). This document would be prepared ahead of any construction works . As well as addressing good practice measures including such matters as constructing buffer zones and temporary screen fencing, dust suppression measures and restricted working hours it would also address the protection of wildlife during the construction of the outfall. This would include carrying out pre works checks to ensure that no wildlife will be impacted and appropriate measures to close off works at night and provide escape routes/ramps for any wildlife inadvertently trapped . Contractor site inductions would also include the provision of a Biodiversity Champion who will work in accordance with BREEAM requirements to ensure that environmentally sensitive working practices were being adhered to.

The Ice Centre building plinth & landscape interface

The outer face of the building's plinth will be constructed from gabion baskets which will form a ' living green wall' around the whole building. The gabion wall will be formed from a series of cages or baskets hand filled with local reclaimed stone or brick. The interstices, between the pieces of Stonell brick will provide a myriad of living and breeding opportunities for many invertebrates. Interspersed between the stone will be pockets of growing medium to enable the planting and establishment of various native plants which will also provide habitat creation opportunities . For the first three or so years the planting will be supported by an irrigation system to ensure successful establishment. It is hoped that the water would be recycled ice melt water from the pads. Also, at the base of the gabions further planting would be incorporated including a range of native climbers. This concept and design treatment will give the impression that the building is sat within the landscape and is simply rising up out of the landscape.

7.9. HARD LANDSCAPE MATERIALITY PALETTE

SURFACES

The surface materiality palette for the internal highway, coach drop off zone, car parking bays, cycle paths, cycle park, fire paths, maintenance roads, pedestrian routes and entrance terrace has all been selected in accordance with the following Principles:

- Suitability for use in a sensitive, landscape led designed public realm which is located in a zone of transition between an urban environment and a rural environment.
- User friendly and intuitive slip resistant materials.
- Provide opportunities for biodiversity integration.
- Ease of frequent maintenance and long term sustainable management.

Internal highway, coach drop off, maintenance road and car park bays

will comprise non porous coloured asphalt surfacing with the parking bays finished in a contrast colour. Bay and highway line marking will be delivered with thermoplastic line makings.

Pedestrian footways and cycle paths

will also be finished in a coloured asphalt but in a strongly contrasting colour to provide clear visual messaging to both drivers and pedestrians in terms of safe route travel to and from the car park to the ice centre.

Cycle Park

as well as cycle stands this area will incorporate semi mature trees. As such the surfacing will be of a coloured permeable bound aggregate which, while smooth and clean underfoot, will also be permeable to surface water ingress to assist in the irrigation demands of the trees.

Entrance arrivals terrace

this area will be surfaced in a sustainable concrete modular paving system in contrast colours and textures to clearly define the 'front door' and general entrance area of the building. Elements of this paving material will also comprise recycled materials. Either side of the entrance doors will be two areas of decking, resembling hardwood timber but made from a wood free resin mineral composite which is highly environmentally sustainable.

Fire path

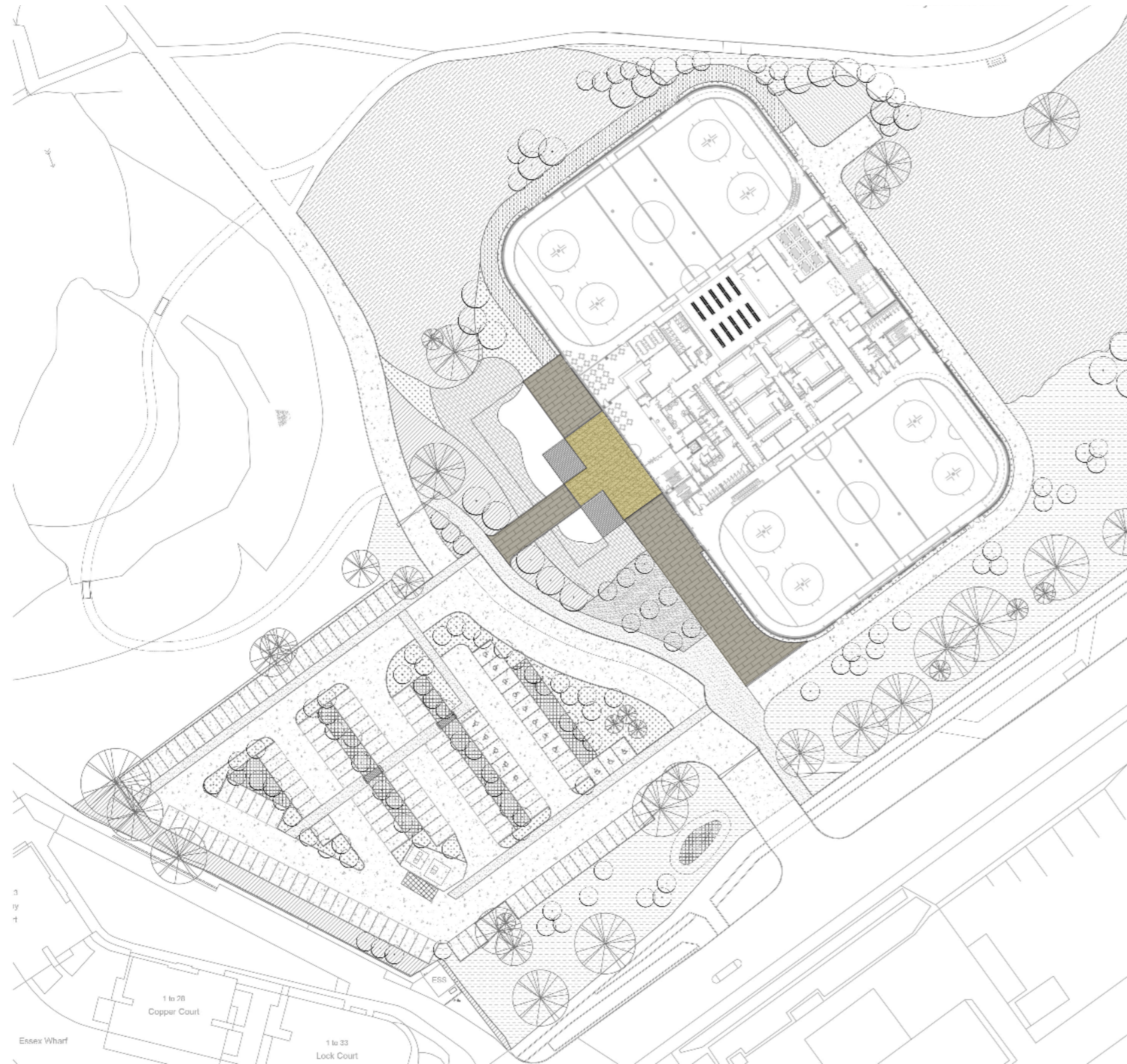
on the north side of the ice centre there will be a fire path for use by the emergency services. This will be constructed using a reinforced grass product. It will be resilient enough to cope with the occasional use of vehicles while appearing to be art of the surrounding landscape thus bringing the visual landscape up to the building plinth.

KEY

	SUSTAINABLE CONCRETE PAVING TO ENTRANCE WAY AND ARRIVALS: TEXTURED FINISH		COLOURED ASPHALT TO PARKING BAYS
	SUSTAINABLE CONCRETE PAVING TO ENTRANCE WAY AND ARRIVALS: SMOOTH FINISH		PERMEABLE BOUND AGGREGATE PAVING TO CYCLE PARK
	COLOURED ASPHALT TO CYCLE AND PEDESTRIAN PATH		WOOD-FREE DECKING TO ECOLOGICAL POOLS
	COLOURED ASPHALT TO PARKING ACCESS ROADS		REINFORCED GRASS FIRE PATH



- SUSTAINABLE CONCRETE PAVING TO ENTRANCE WAY AND ARRIVALS
TEXTURED FINISH
- SUSTAINABLE CONCRETE PAVING TO ENTRANCE WAY AND ARRIVALS
SMOOTH FINISH



LDĀ DESIGN

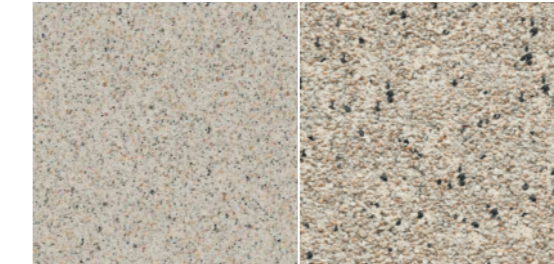
SUSTAINABLE CONCRETE PAVING

- manufactured in the UK
- low carbon footprint
- high BREEAM rating if used together with recycled sub base

MODAL: preferred colour options

smooth

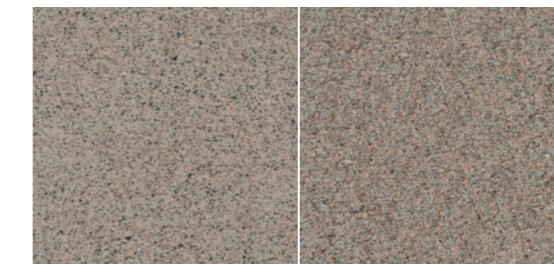
textured



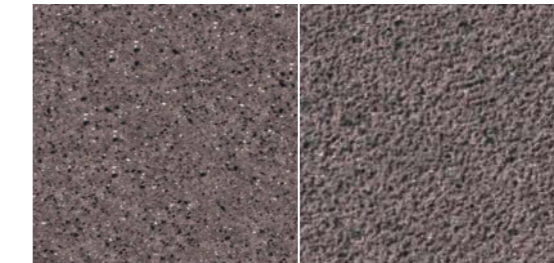
Light cream by Marshalls



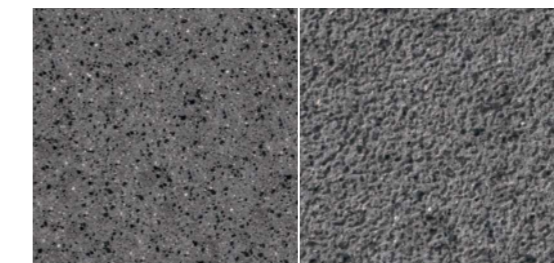
Oatmeal by Marshalls



Indian by Marshalls



Mauve Granite by Marshalls



Charcoal by Marshalls

COLOURED ASPHALT



Cycle and pedestrian paths:
Light Buff by Ulticolour




Access road:
Buff Quartzite by Ulticolour

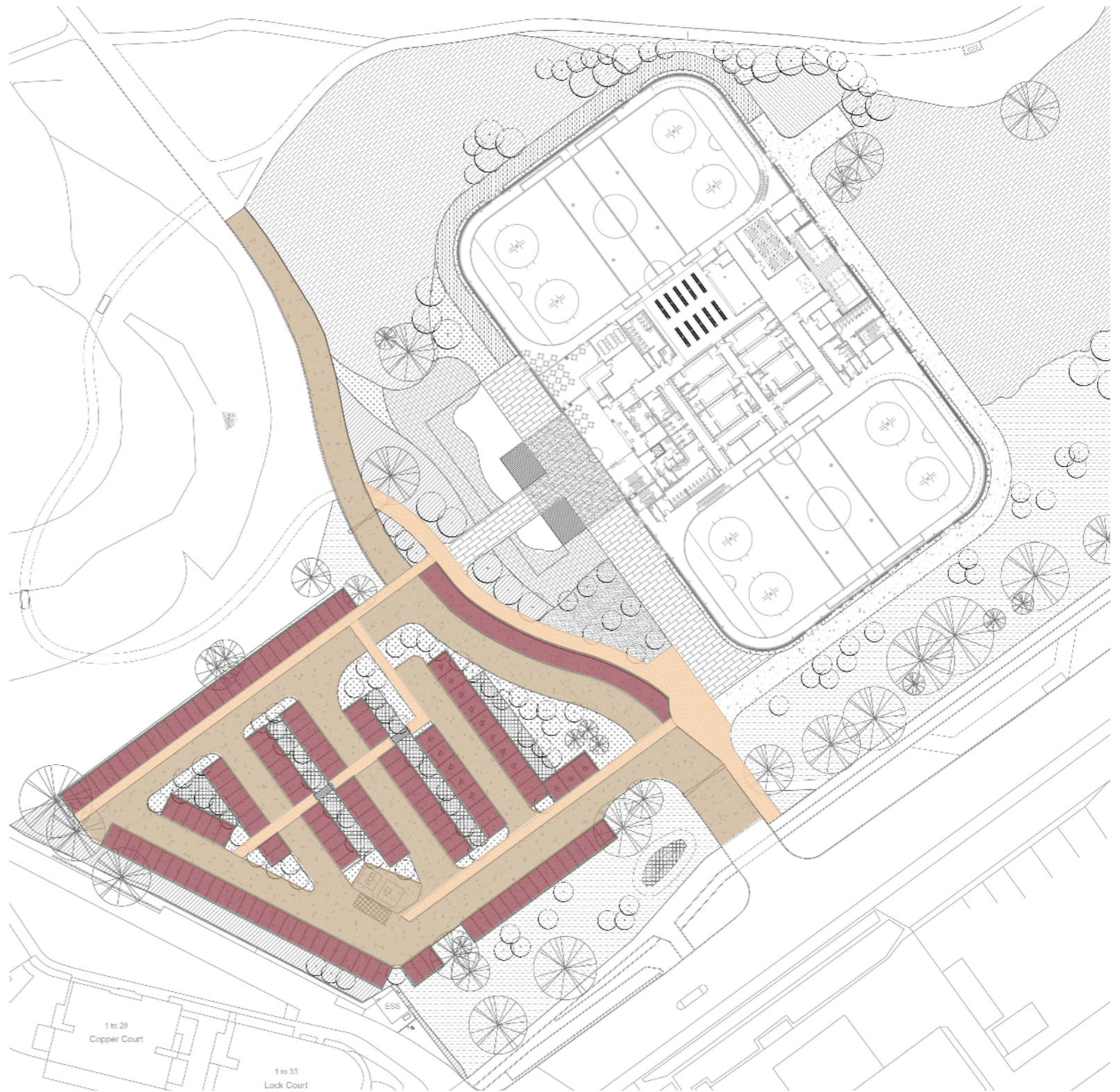
Parking bay:
Natural Quartzite by Ulticolour



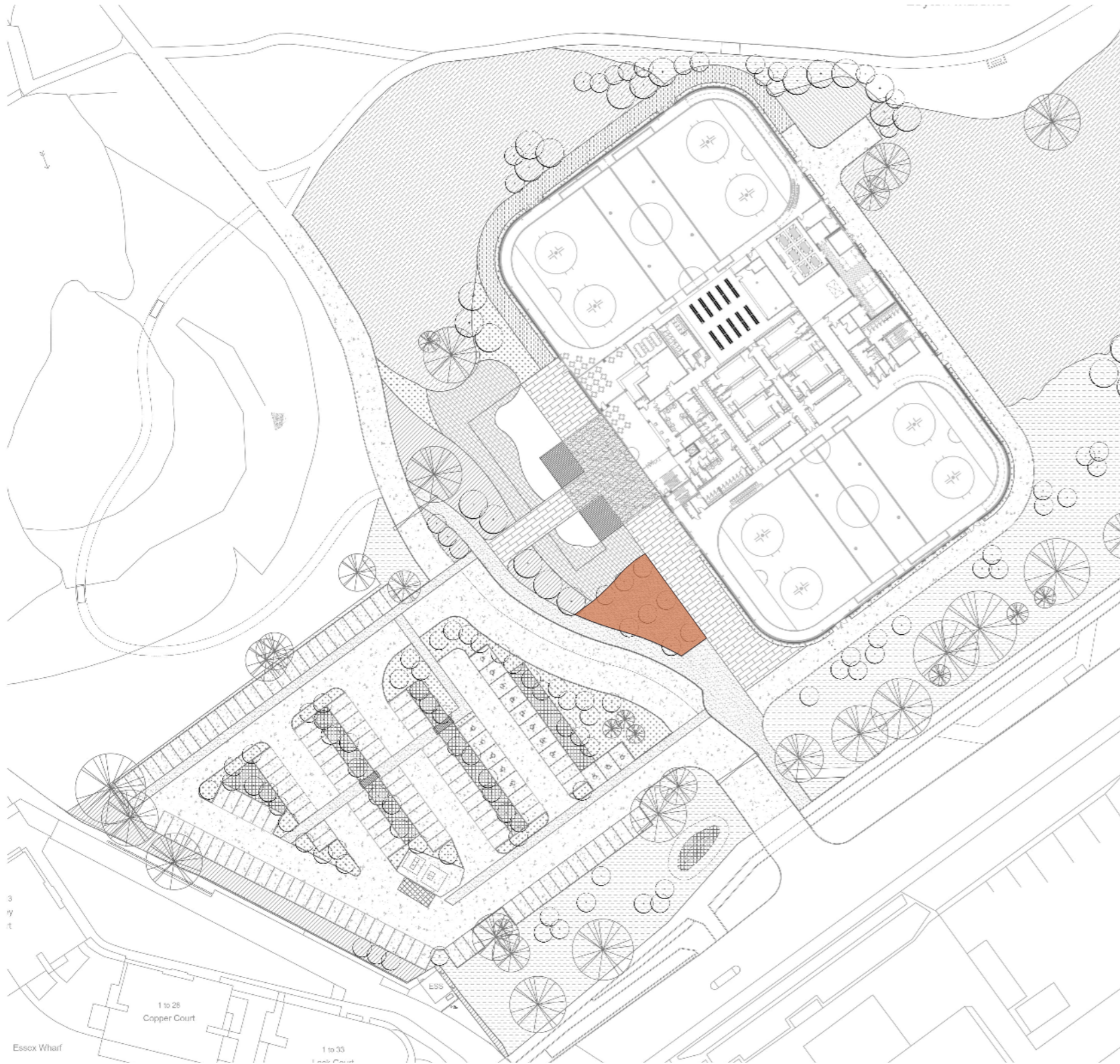
Figure 161 Parking reference image with proposed thermoplastic line marking.

NOTE: Road and bay to be in different colour, as shown on plan.

-  COLOURED ASPHALT TO CYCLE AND PEDESTRIAN PATH
-  COLOURED ASPHALT TO PARKING ACCESS ROADS
-  COLOURED ASPHALT TO PARKING BAYS



PERMEABLE BOUND AGGREGATE PAVING TO CYCLE PARK



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NATURAL AGGREGATE



Butterscotch
permeable resin bound
by Sureset

Barley Butter
permeable resin bound
by Sureset

Norwegian Bronze
permeable resin bound
by Sureset

WOOD-FREE DECKING

Colour options:
Note: final colour pending external building envelope materiality selection



Embered by Millboard

Vintage Oak by Millboard

Colour selection

Reference images



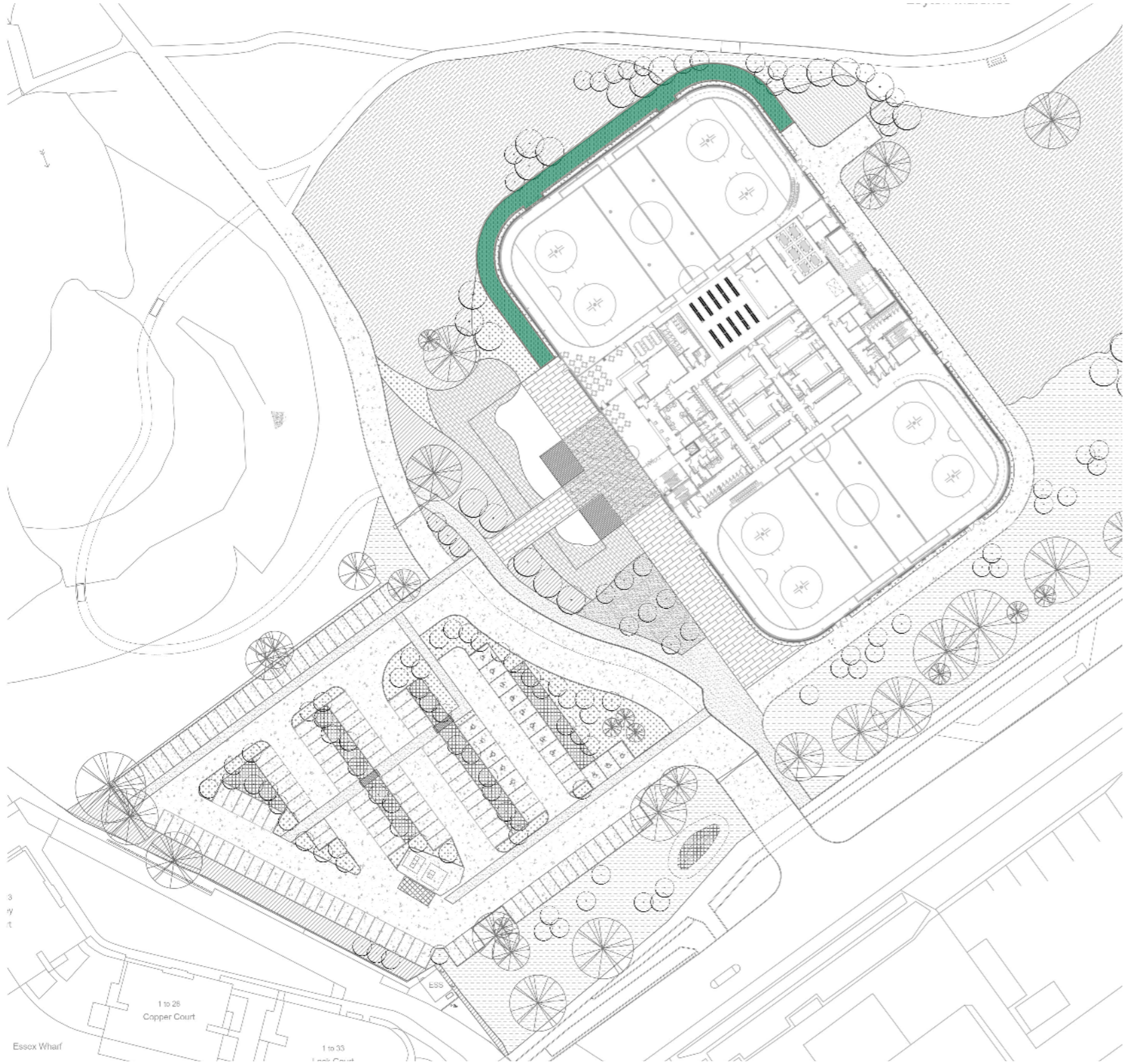
Merchant Square. Paddington Basin by Millboard



Yorkshire Wildlife Park by Millboard

WOOD-FREE DECKING TO ECOLOGICAL POOLS





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REINFORCED GRASS - FIRE PATH



Advanced turf typical section by ABG

Advanced turf soil mesh interaction by ABG



London Pottersfield Park by ABG.



Glasgow Green by ABG

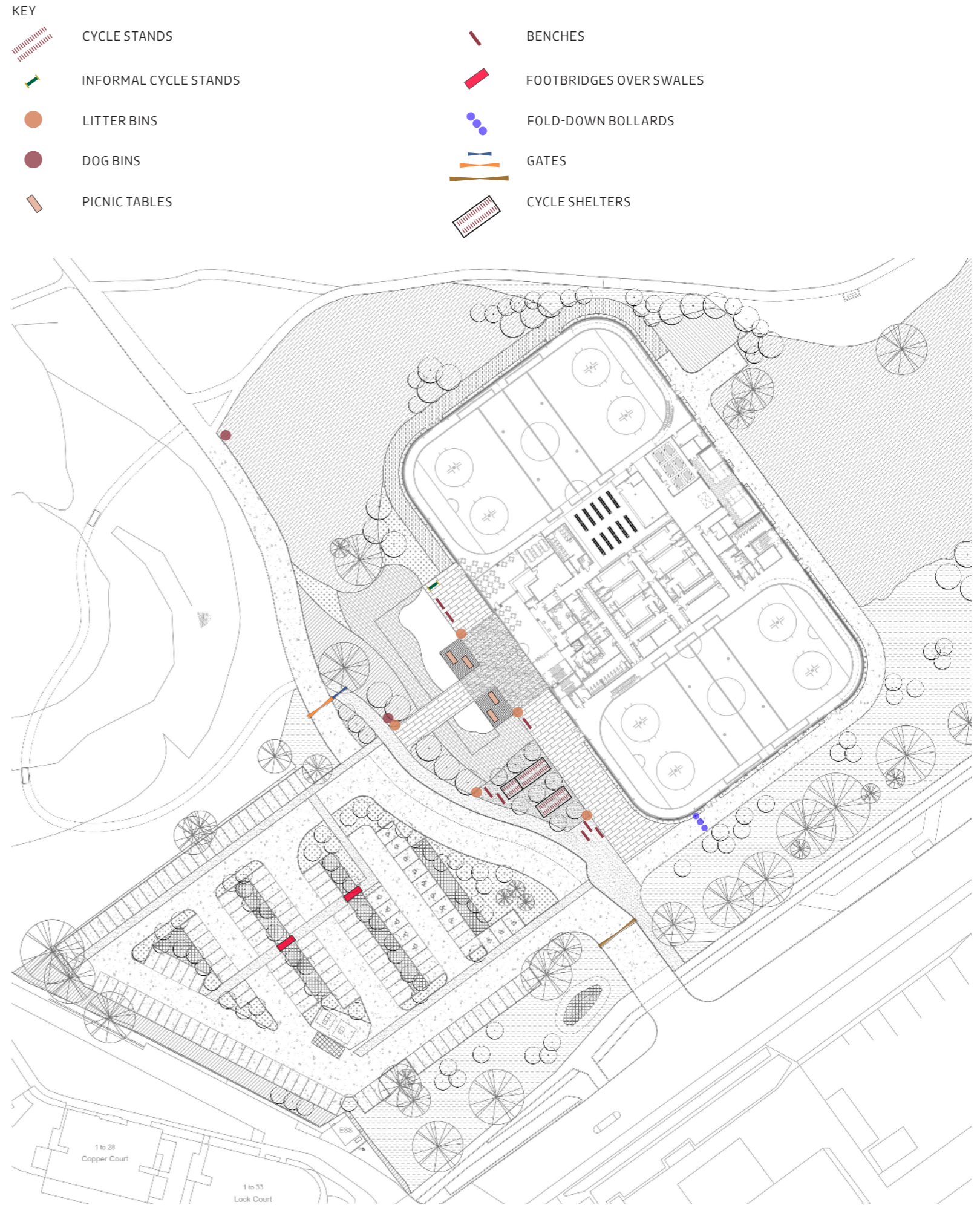




Figure 162 Parking reference image with reinforced grass BY ABG

STREET FURNITURE

The family of street furniture will include cycle stands, cycle shelters, litter and dog bins, picnic tables, bench seating, small pedestrian footbridges over the Swales in the car park, and various security gates, bollards and entry barriers.

The selection of suitable products has been achieved with simplicity of design, opportunity to create ecological habitat, sustainability of material and life cycle maintenance and management costs at the centre of the process. Visually the products are sympathetic to the site context and are, where possible, typical of a more rural appearance rather than of an urban nature.



-  50 NO. CYCLE STANDS
-  5 NO. INFORMAL CYCLE STANDS



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CYCLE STANDS



Sheffield cycle stand by Broxap



Sheffield extra cycle stand by Broxap



Rough&Ready Bike Parking by Streetlife



BINS

Client to confirm the type of bin



Crystal litter bin by mmcite'



Litter bin by Omos s45TA



Litter bin by Omos s53TA



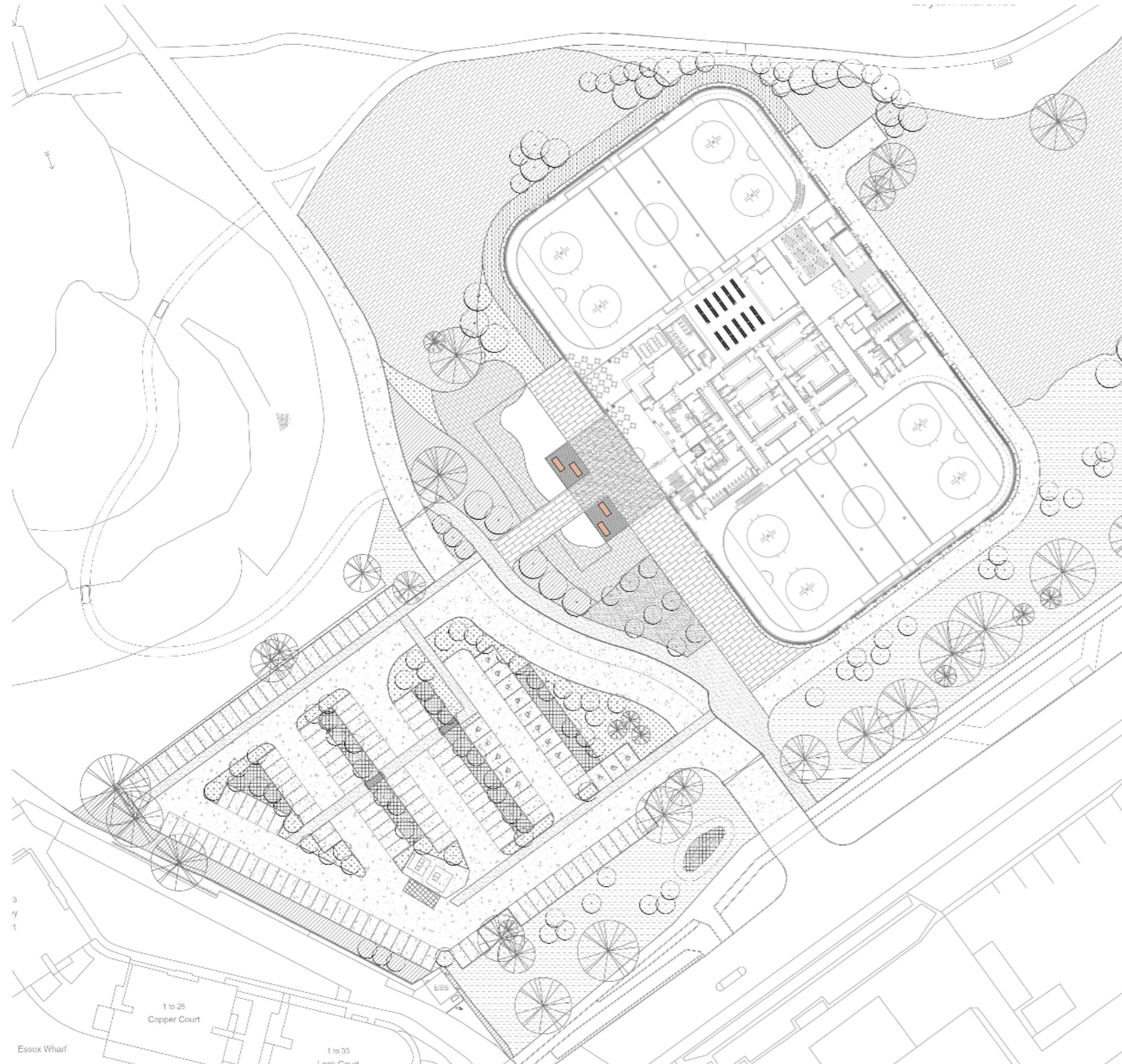
Recycling litter bin by Omos s45TA



- DOG BINS
- LITTER BINS



 PICNIC TABLES



LDĀ DESIGN

PICNIC TABLES



'Drifter' picnic tables and benches: recycled timber or composite, by Streetlife

INDIVIDUAL BENCHES



Gabion bench by Furnitubes



Gabion with lighting option



'Drifter' benches by Streetlife

▬ BENCHES



 FOOT BRIDGES



LDĀ DESIGN

FOOT BRIDGES OVER SWALES



Footbridge structure by Streetlife

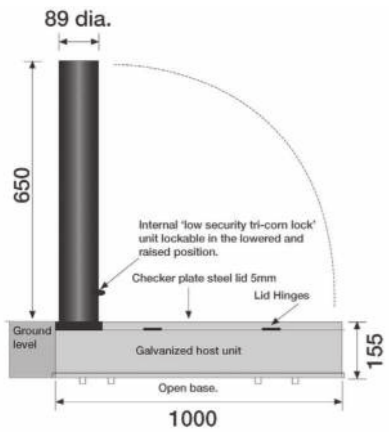
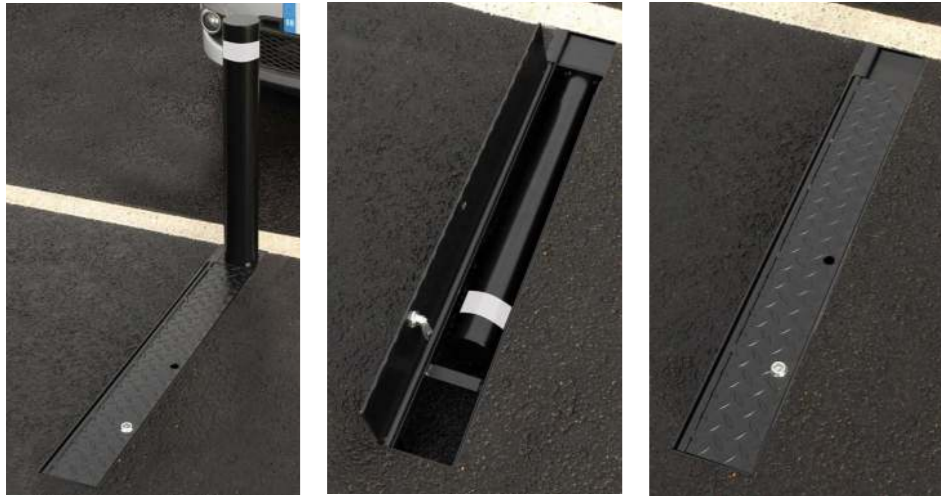


Timber swale footbridge



Timber swale footbridge

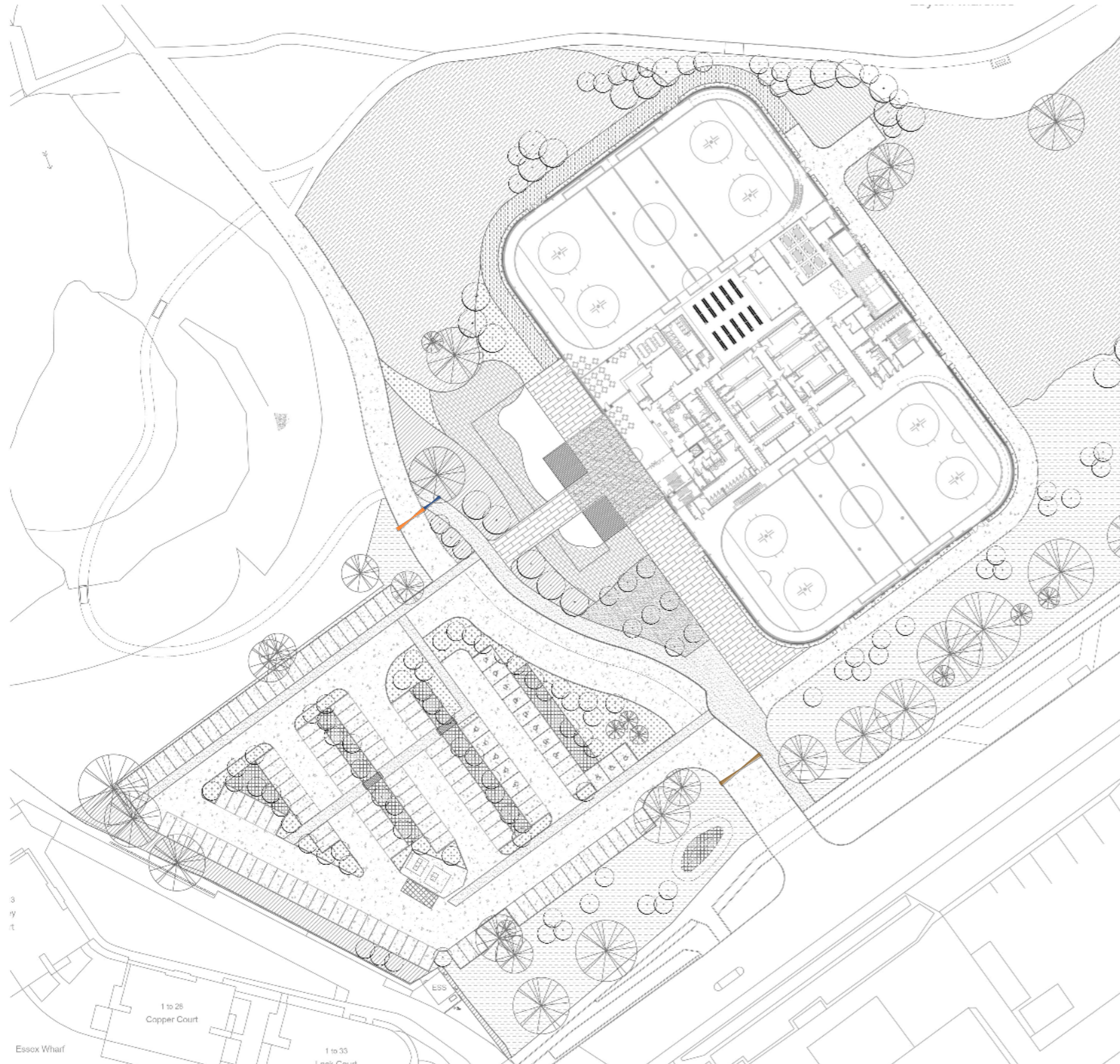
BOLLARDS



Fold down bollards by Broxap

FOLD DOWN BOLLARDS





LDĀ DESIGN

GATES

Illustrative examples only. Detail design pending



Metal Barrier Gate by tbc



Metal gate 5 bar hinging by Estate Guard Gates



Classic metal gate by Estate Guard Gates

CYCLE SHELTERS WITH NATIVE BIODIVERSE GREEN ROOFS



Cycle Shelter SCS304 by Langley Design





Cycle Shelter SCS302 by Langley Design



Cycle Shelter concept by Green Roof Shelters



Biodiverse green roof

-  2No. CYCLE SHELTERS with 20 cycle racks in each
-  1No. CYCLE SHELTER with 10 cycle racks



KEY

- LX01 - POLE TOP LUMINAIRE SINGLE ARRANGEMENT ON 5m POLE; 8091 LUMENS
- LX02 - POLE TOP LUMINAIRE SINGLE ARRANGEMENT ON 5m POLE; 5931 LUMENS
- LX03 - POLE TOP LUMINAIRE SINGLE ARRANGEMENT ON 5m POLE; 8487 LUMENS
- ▲ LX04A - 1 no. LIGHT LUMINAIRE MOUNTED ON 4.5m POLE; 5880 LUMENS
- ▲ LX04B - 2 no. LIGHT LUMINAIRES MOUNTED ON 4.5m POLE; 5880 LUMENS
- LX05 - DUST AND MOISTURE RESISTANT LED LUMINAIRE; CEILING MOUNTED TO BIKE STORE; 4300 LUMENS
- ▬ LX06 - WALL LIGHTING MOUNTED AT 2.75m ON GABION; 2392 LUMENS
- LX07 - POLE TOP LUMINAIRE SINGLE ARRANGEMENT ON 5m POLE; 5049 & 5148 LUMENS
- ▲ LX08 - 4 no. LIGHT LUMINAIRES MOUNTED ON 4.5m POLE; 4 x 1835 LUMENS
- ☒ CCTV - MOUNTED TO LAMP POST AND BUILDING. For exact CCTV locations please refer to Arup documents and drawings



LDĀ DESIGN

LIGHTING STRATEGY

The street lighting system selection is fully compatible with the sensitivity needs of the site location. Light spill and intensity levels will be kept to a minimum requirement to ensure safe navigation of the site by all users but be extremely cognisant of the wider dark skies context of the Marshes to the north. Similarly, the light sources have been selected so as to be fully compliant with the recommendations of the Bat Conservation Trust and Institution of Lighting Professionals Guidance Note 08/18 'Bats in the Built Environment'.

Note: For technical details refer to: External Lighting Assessment for Planning by Max Fordham.



Ufo by iGuzzini



Olivio Lampadaire by Selux




Turn by DW Windsor

7.10. SOFT LANDSCAPE MATERIALITY PALETTE

The species selection, layout and structure of the planting around the various planting zones has been designed to maximise biodiversity and provide a varied habitat mosaic and connectivity for local wildlife using the guidance, research and recommendations referred to in this section, both publicly available and that which has been commissioned specifically for this proposal. Species have been checked against the 'Online Atlas of the British and Irish flora' to ensure they occur naturally in the locality.
 Reed bed specifications to be advised by water engineer.

KEY

-  PROPOSED NATIVE TREES
-  NATIVE SHRUB PLANTING
-  NATIVE ORNAMENTAL PLANTING
-  NATIVE CLIMBER PLANTING
-  NATIVE DRY GRASSLAND SPECIES
-  NATIVE SPECIES RICH MEADOW PLANTING
-  NATIVE EMERGENT AND SUBMERGMENT PLANTING
-  NATIVE BOG & MARGINAL PLANTING
-  NATIVE SWALE PLANTING
-  REED BEDS (SPECIFICATION BY WATER ENGINEER)
-  BIODIVERSE NATIVE GREEN ROOF



LDĀ DESIGN

Native trees

Native tree planting will reflect the existing species in surrounding landscape and be positioned to enhance habitat connectivity with local nature reserves and riverbank woodland. Trees planted directly around the proposed building will be selected with raised crowns to allow safe pedestrian access and CCTV surveillance, while informal areas will showcase a range of forms to harmonise with existing specimens. Views to the wider landscape will be retained and reinforced.

Early season pollen and nectar for bees and other insects will be provided by Black Poplar, a variety of Willow species, Hazel, Alder, Hawthorn, Rowan and Oak extending this food source into mid and late spring.

Hazelnuts, Black Poplar and Alder seeds, Rowan berries and Hawthorn flowers and haws are also eaten by a variety of birds and small mammals. Planting a varied selection of trees will provide the widest possible range nesting and roosting sites.

The lighter canopy of some species such as Silver Birch will allow understory bulbs and woodland wildflowers to establish.

Black poplar, Rowan, Oak, Silver Birch and Willow species are the food plants for the caterpillars of many moths.

Retaining fallen leaves from hard landscaped areas and allowing leaf mould to build up under trees undisturbed in less formal zones supports invertebrates, fungi species and sequester carbon. Planting Alder into areas of the site where soils are poorer will help improve the soil due to its nitrogen fixing capabilities.



○ PROPOSED NATIVE TREES



Betula pendula, Silver Birch



Populus nigra, Black Poplar



Corylus avellana, Hazel



Quercus robur, English Oak



Crataegus monogyna, Hawthorn



Sorbus aucuparia, Rowan



Alnus glutinosa, Alder



Salix viminalis, Common Osier



Salix pentandra, Bay Willow



Salix fragilis, Crack Willow

NATIVE SHRUB PLANTING

Shrub planting will provide a mid layer (eye level) screen, adding height to selections of native herbaceous perennials and grasses around the proposed building and create an intermediate layer between trees and the native wildflower and grass meadows across the east and south east of the site.

Native shrub planting has been selected to be well adapted to local conditions, providing mid height structure down to the ground which provides shelter and cover for small mammals and birds from which to forage in the more exposed meadows.

Pollen and nectar for bees and other insects will be provided from early spring through to summer with Grey Willow and Blackthorn.

Alder Buckthorn, Purging Buckthorn, Blackthorn, Dogwood and Guelder Rose berries will provide food for a variety of birds and small mammals, while Blackthorn and Juniper with their dense structure are also particularly favoured as nesting sites.

Alder and Purging Buckthorn leaves are the food plants of the Brimstone butterfly and Cornus is a food plant of a variety of moths.



Berberis vulgaris, Common Barberry



Rhamnus cathartica, Purging Buckthorn



Euonymus europaea, Spindle



Cornus sanguinea, Dogwood



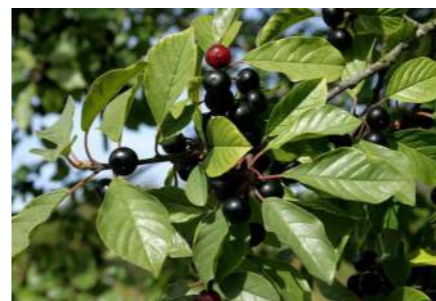
Viburnum opulus, Guelder Rose



Prunus spinosa, Blackthorn



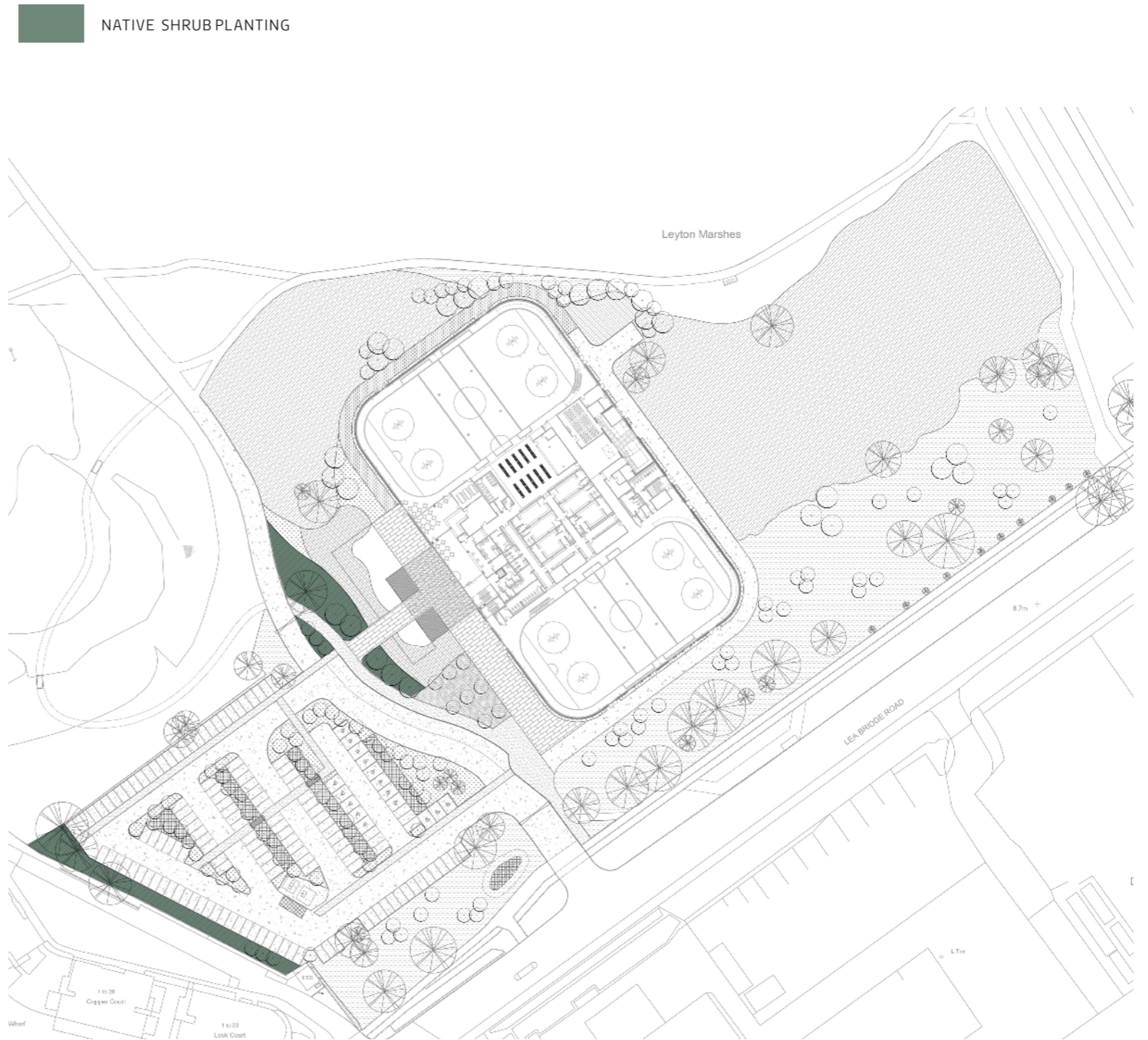
Rosa Canina, Dog Rose



Frangula alnus, Alder buckthorn



Salix cinerea subsp. oleifolia, Grey Willow





NATIVE WILDFLOWER SPECIES



Centaurea nigra, Black Knapweed



Achillea millefolium, Yarrow



Euphorbia amygdaloides var. robbiae, Wood Spurge



Geranium pratense, Meadow Cranesbill



Salvia pratensis, Meadow Clary



Verbascum nigrum, Dark Mullein



Daucus carota, Wild Carrot



Stachys officinalis 'Hummelo' Betony



Silene dioica, Red Campion



Galium verum, Lady's Bedstraw

LDĀ DESIGN

NATIVE ORNAMENTAL PLANTING

A selection of native shrubs have been chosen for a variety of leaf forms and textures, coloured winter stems, berries and blooms to create a year round interest and provide screening in the car park.

In this plant palette, although many of the same local native plants have been used, the emphasis will be less on grasses and more on long season flowering shrubs and perennials planted in groups.

In this areas some grasses will also provide evergreen groundcover during the winter months.

NATIVE SHRUBS



Viburnum opulus 'Compactum', Guelder Rose



Cornus sanguinea, Dogwood



Salix repens var. argentea, Creeping Willow



Rosa pimpinellifolia, Burnet Rose

NATIVE GRASS SPECIES



Carex flacca, Glaucous Sedge



Deschampsia flexuosa, Wavy Hair Grass



Briza media, Quaking Grass

NATIVE CLIMBER PLANTING

Native climbers will be planted within gabion structures and over pergolas around the bicycle storage areas providing additional habitat, nesting sites and cover for invertebrates.

The Honeysuckle in particular is a rich source of nectar for butterflies, moths and bees and provides berries as a food source for birds.

Nectar, pollen and berries will also be provided by Ivy once mature for birds, insects and small mammals to feed on.

Hops provides a particularly dense habitat for nesting birds and insects as well as late season nectar.



Lonicera periclymenum, Honeysuckle



Humulus lupulus, Common Hop



Clematis vitalba, Old Man's Beard



Lonicera periclymenum 'Belgica', Honeysuckle



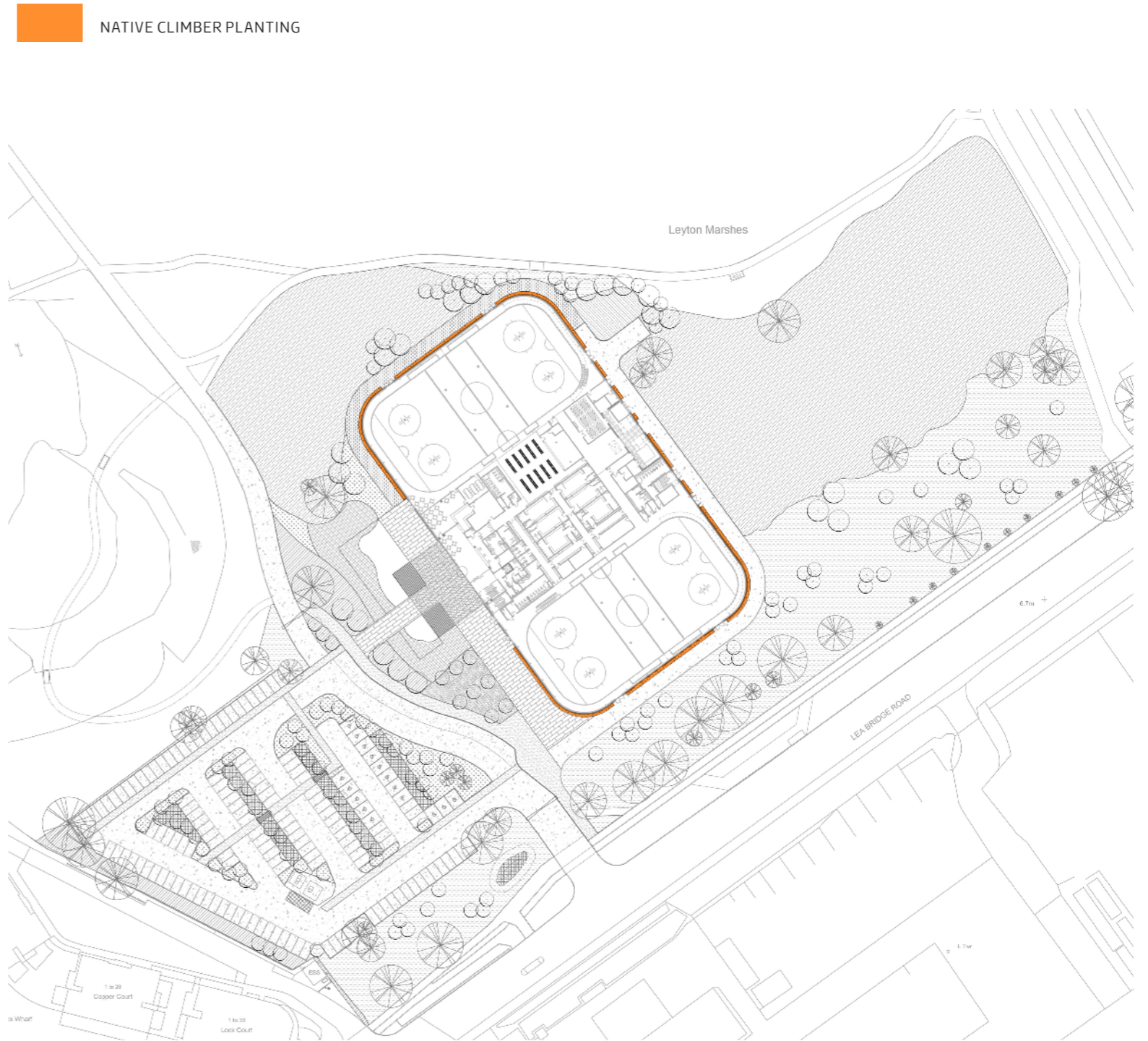
Rosa arvensis, Field Rose



Hedera helix, English Ivy



Rosa rubiginosa, Sweet Briar



NATIVE DRY GRASSLAND SPECIES



LDĀ DESIGN

NATIVE DRY GRASSLAND

The basis of the species range will be similar to those in the wider meadow areas. This slightly raised area of landform will create a particularly dry habitat with opportunities for the inclusion of dry meadow and chalk loving species.



Prunella vulgaris, Selfheal



Festuca rubra, Slender-creeping Red-fescue



Trifolium pratense, Common Hop



Deschampsia flexuosa, Wavy Hair Grass



Festuca ovina, Sheep's fescue



Ranunculus bulbosus, Buttercup



Phleum bertolonii, Smaller Cat's-tail



Origanum vulgare, Wild Marjoram



Koeleria macrantha, Crested Hair-grass



Lotus corniculatus, Birdsfoot Trefoil

SPECIES RICH NATIVE MEADOW PLANTING

Native wildflower meadows will be sown around existing trees on the open areas of the site with a series of mown paths and small mown clearings winding through the wildflowers allowing visitors to cross the meadow in a range of ways, take an alternative route to the footpath along the adjacent A104 Lee Bridge Road and as a place to spend time sitting among the flowers and insects.

A resilient selection of nectar rich plants for pollinators will be selected for their long flowering seasons and contrast in colour and form, incorporated into the mix.

NATIVE GRASS SPECIES



Cynosurus cristatus, Crested Dogtail



Agrostis capillaris, Common Bent



Anthoxanthum odoratum, Sweet Vernal-grass

NATIVE WILDFLOWER SPECIES



Galium verum, Lady's Bedstraw



Daucus carota, Wild Carrot



Malva moschata, Musk Mallow



Echium vulgare, Vipers Bugloss



Leucanthemum vulgare, Ox-Eye Daisy



Centaurea nigra, Black Knapweed



Silene dioica, Red Campion



Knautia arvensis, Field Scabious



Linaria vulgaris, Common Toadflax



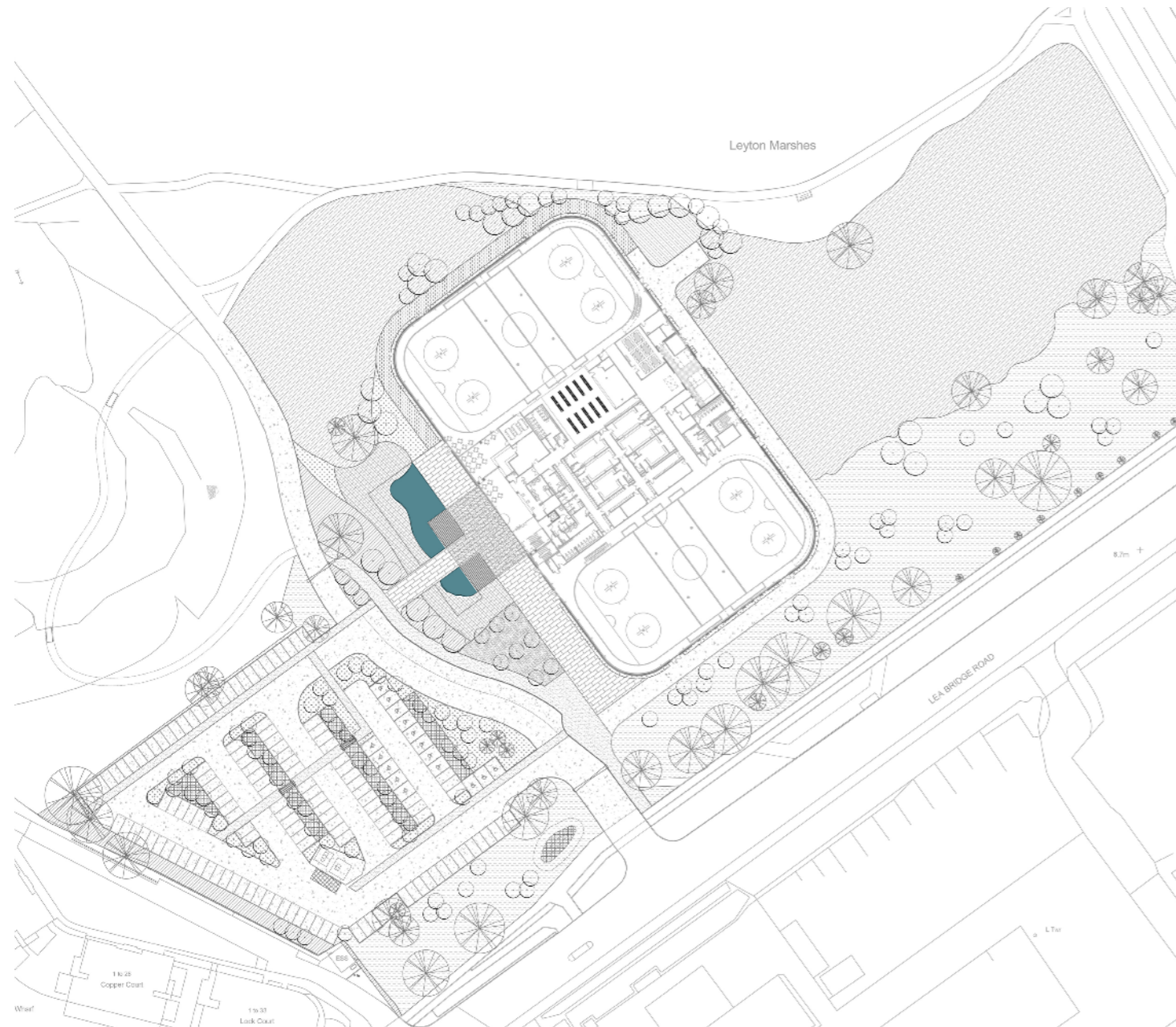
Achillea millefolium, Yarrow

NATIVE BULB SPECIES



Narcissus pseudonarcissus subs. *pseudonarcissus*, Wild Daffodil





LDĀ DESIGN

NATIVE EMERGENT & SUBMERGENT PLANTING

Visitors here will be able to directly connect with the ice melt water as it flows from the reed beds to the ornamental native pond through experiencing the native wildlife that will make use of this locally important wetland habitat.

The selection of local native plants is likely to attract amphibians, invertebrates, birds and mammals.

A mixture of open water and surface leaf cover as well as emergent vertical planting allows access to and from the water and provides food sources, breeding habitat and cover from predators.



Ranunculus lingua, Greater Spearwort



Callitriche stagnalis, Starwort



Berula erecta, Lesser Water Parsnip



Glyceria fluitans, Floating Sweet-grass



Nymphaea alba, Water Lily



Nuphar lutea, Yellow Water Lily



Myosotis scorpioides, Water Forget-me-not



Persicaria amphibia, Water Smartweed



Alisma plantago-aquatica, Water Plantain

NATIVE BOG & MARGINAL PLANTING

The intension for this area is to create a visual link between the visitors to the LVIC and the important historical landscape character. Visitors to the cafe will look out over the multi-layered wetland planting.

The plants have been selected to create the widest possible range of habitats allowing wildlife access to the water, breeding cover, food sources and protection in a stable damp growing environment.



Eleocharis palustris, Common Spike-rush



Lythrum salicaria, Purple loosestrife



Filipendula ulmaria, Meadowsweet



Lychnis flos-cuculi, Ragged Robin



Lycopodium europaeus, Gypsywort



Lysimachia nummularia, Creeping Jenny



Iris pseudacorus, Yellow Flag Iris



Mentha aquatica, Water Mint

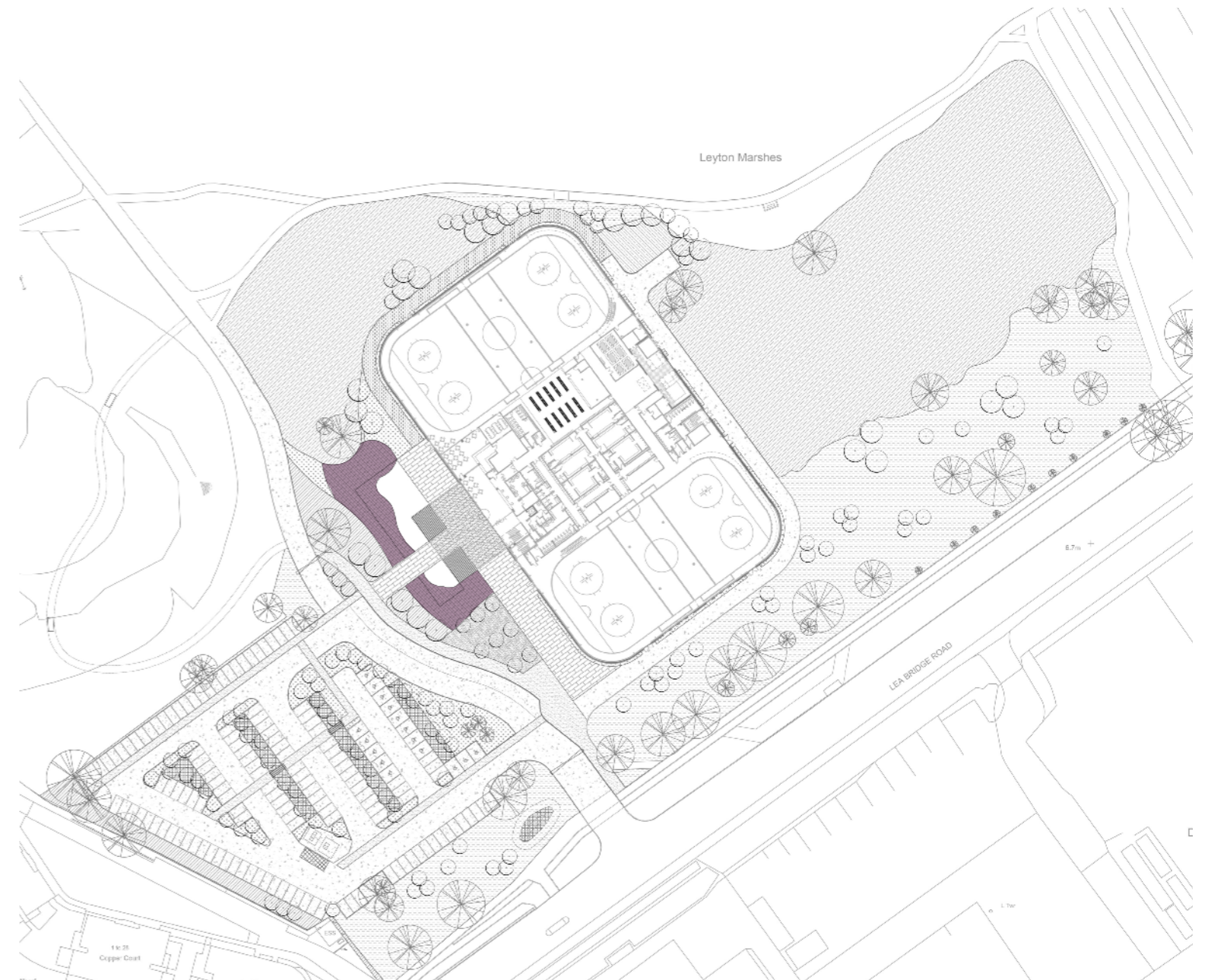


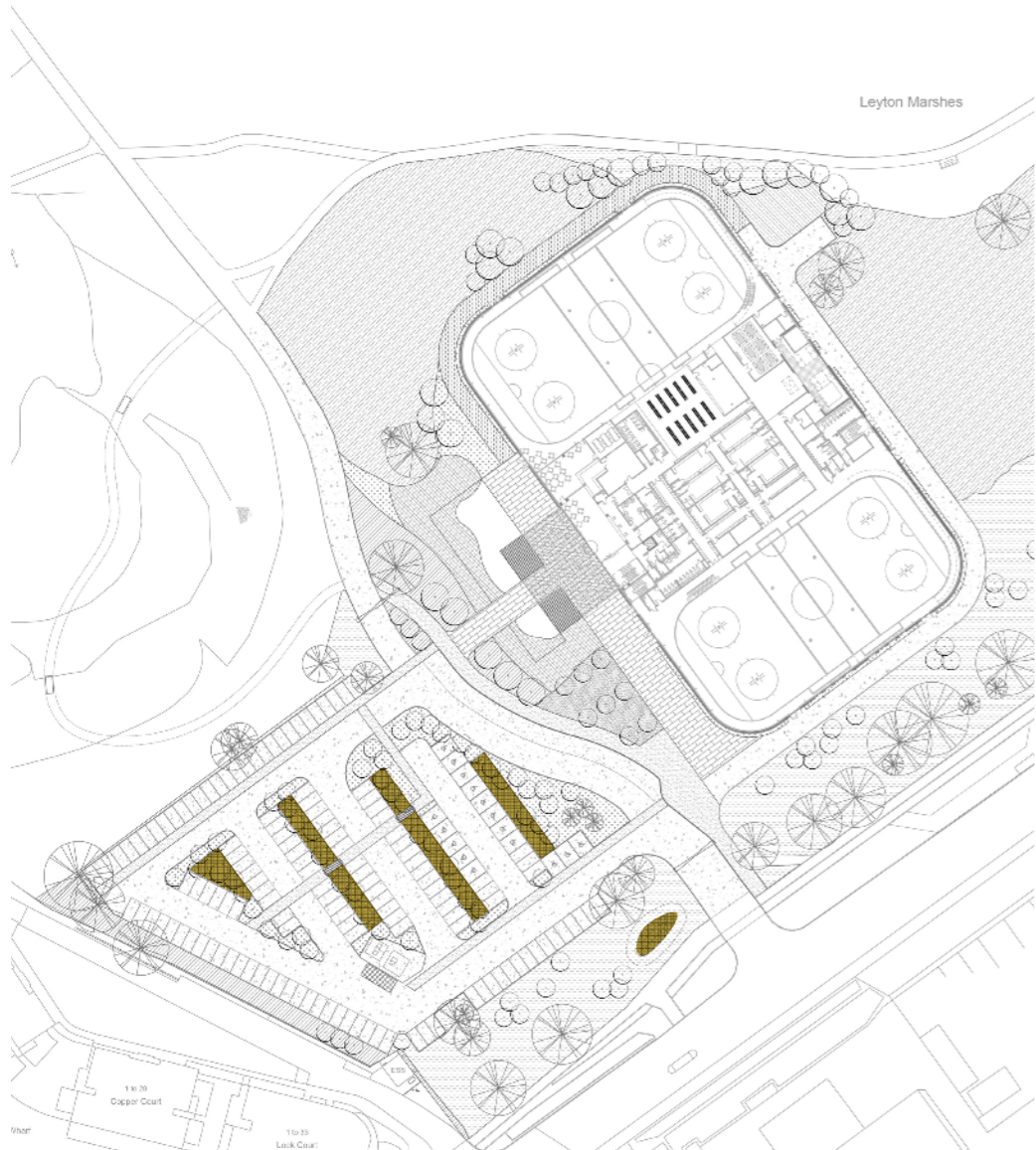
Phalaris arundinacea, Reed Canary Grass



Geum rivale, Water Avens

NATIVE BOG AND MARGINAL PLANTING





NATIVE WILDFLOWER SPECIES



Sanguisorba officinalis, Burnet



Achillea millefolium, Yarrow



Leucanthemum vulgare, Ox-Eye Daisy



Galium verum, Lady's Bedstraw



Veronica spicata 'Rosea', Spiked speedwell



Silene dioica, Red Campion



Daucus carota, Wild Carrot



Primula veris, Cowslip



Scabiosa columbaria, Small Scabious



Euphorbia amygdaloides var. *robbiae*, Wood Spurge

LDĀ DESIGN

NATIVE SWALE PLANTING

Native wildflowers will be combined with shrubs and a mixture of evergreen and deciduous grasses. All the swale planting will be particularly resilient; tolerant of periodic wet and temporary standing water after heavy rain and equally able to cope with sustained drought during the summer months.

Smaller shrubs have been selected as accent planting with good autumn colour, berries and spring blooms. The Dogwood in particular has warm red coloured stems to give added winter interest.

Evergreen grasses form a soft base layer to the shrubs with varying textures with deciduous Quaking Grass, with its long lasting nodding seed heads, as an accent species.

Many of the more robust and long flowering meadow species have been selected for the swales with additional evergreens such as Spurge and Small Scabious adding year round texture and interest.

NATIVE GRASS SPECIES



Molinia 'Poul Petersen', Purple Moor Grass



Carex flacca, Glaucous Sedge



Deschampsia flexuosa, Wavy Hair Grass

NATIVE SHRUBS



Viburnum opulus 'Compactum', Guelder ROSE



Cornus sanguinea, Dogwood

LDĀ DESIGN

7.11. BIODIVERSITY ENHANCEMENTS AND HABITAT CREATION

The construction of the proposed Ice Centre will involve the demolition of the existing LVIC. The footprint of the proposed development will be greater than the existing centre and some existing vegetation and associated habitats will be lost. This is chiefly amenity grassland, dense scrub and tree cover. The retained habitats will be actively managed and enhanced.

The following interventions will be incorporated into the landscape and ecology designs in selected locations across the entire development site:

THE PLINTH

- Incorporation of invertebrate 'hotels' within the gabion walls.
- Incorporation of roost and nest boxes within the gabion walls.
- Incorporation of native climbing plants within the gabion walls and at the base of the walls.

CYCLE SHELTERS

- Green biodiverse roofs to be incorporated into all covered cycle shelters.

ENTRANCE WATER FEATURE

- Incorporate selected native bog and emergent plants to provide shelter, food source and nesting opportunities for wildlife.
- The clean water will provide accessible drinking water for hedgehogs, birds, invertebrates and amphibians.

WOODLAND AREAS

- Incorporate a range of refugia and hibernacula, log piles, loggeries and leaf mould for reptiles and amphibians. Timber to be utilised from those existing trees which have to be removed.
- Incorporate hedgehog shelters around the edge of the woodland areas.
- Incorporate bird and bat boxes in woodland trees.

CAR PARK

- Incorporate bioswales to harvest surface water run off from car park hard surfaces.
- Incorporate sensitive street lighting in full accordance with Guidance Note 08/18 Bat Conservation Trust & Institute of Lighting Professionals, *'Bats and artificial lighting in the UK'*.

ICE MELTWATER AREAS, ENTRANCE WATER FEATURE AND OXBOW LAKE

- Incorporate reedbeds to facilitate water cleaning and recycling opportunities.

LEE BRIDGE ROAD FRONTAGE

- Incorporate native nectar rich wildflower meadow mix to encourage pollinators.



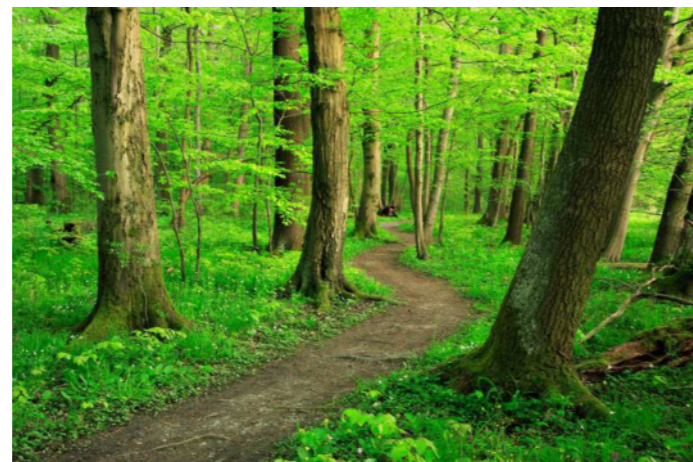
LDĀ DESIGN

BIODIVERSITY IMPACT ASSESSMENT










LVRPA has committed to undertake a Biodiversity Impact Assessment (BIA) to calculate the current and future biodiversity value of the site. When such assessments are undertaken, then Government (national and local planning policy) considers that the 'net gain' in biodiversity of a site once developed, should be a minimum of 10% or greater over the baseline conditions.

The biodiversity calculation was done using the Defra Metric Biodiversity Impact Assessment Calculator, version 2.0.

The site, in its current condition, delivers a credit score of 15.07 Credits. The site, once developed, is estimated to deliver a credit score of between 20.44 Credits and 20.56 Credits. This translates into a biodiversity net gain of between 35.66% minimum gain and 36.43% maximum gain. Both of these percentages are significantly greater than the minimum requirement of 10% required by Government.







KEY

-  Proposed ice melt water feature as a suitable habitat and source of accessible drinking water for small mammals, birds, invertebrates and other animals
-  Biodiverse native green roofs on cycle shelters
-  Provision of invertebrate hotels and insect hotels across the site and in building plinth
-  Proposed native nectar rich wildflower meadow across the site
-  Proposed swales fed by harvested water from the site
-  Provision of bird boxes on trees across the site and in building plinth
-  Woodland enhancement and provision of bat boxes
-  Proposed reedbeds as a potential habitat for waterfowl, amphibians and invertebrates
-  Proposed woodland & scrubland enhancement including brush piles and hibernaculas, created to attract and sustain biodiversity

7.12. EXISTING TREES, SCRUB AND GRASSLAND VEGETATION

The existing vegetation is collectively and typically of low ecological value. Broad leaved woodland, largely unmanaged, dense scrubland and amenity grassland form the predominant vegetation palette. All existing trees with confirmed bat roosts or with potential for roosts will be retained. In order to construct the ice centre however, 20 existing trees will require removal which are currently located within the footprint plan of the facility.

33 individual trees will be retained and form part of the long term landscape matrix. In addition over 95% (6,690 sqm.) of the existing scrub vegetation will be retained with the loss of 184sqm required to deliver the development. The remaining vegetation is largely amenity grassland. It is proposed to remove this and replace with native meadow grassland and native bulbs.

- KEY
-  INDIVIDUAL TREES TO BE REMOVED (20NO).
 -  VEGETATION TO BE REMOVED IN GROUPS (184M2)
 -  INDIVIDUAL TREES TO BE RETAINED (33NO).
 -  VEGETATION TO BE RETAINED IN GROUPS (6690m2)



KEY

● PROPOSED TREES (143NO).



LDĀ DESIGN

7.13. PROPOSED TREES

As part of the landscape design proposals over 140 new native nectar-rich trees will be planted. These will be of varying sizes from semi mature trees placed around the arrivals and entrance to the building to a range of standard and feathered trees which will be planted throughout the landscape areas and car park.



Betula pendula, Silver Birch



Populus nigra, Black Poplar



Corylus avellana, Hazel



Alnus glutinosa, Alder



Quercus robur, English Oak



Crataegus monogyna, Hawthorn



Sorbus aucuparia, Rowan



Salix viminalis, Common Osier



Salix pentandra, Bay Willow



Salix fragilis, Crack Willow

7.15. BREEAM CREDITS

We are targeting BREEAM Credits to a level of 'Excellent' within the category of Land Use and Ecology. The following targets areas are applicable:

LE 02 Protection of Ecological Features: Potential for 2 Credits

LE 03 Minimising Impact on Existing Site Ecology: Potential for 2 Credits

LE 04 Enhancing Site Ecology: Potential for 2 Credits

LE 05 Long Term Impact on Biodiversity: Potential for 2 Credits

It is concluded that a total of eight credits can be achieved under LE02 to LE05 for this project.

7.14. MAINTENANCE AND MANAGEMENT PRINCIPLES

The landscape and ecological habitat creation proposals will all be delivered, maintained and managed in accordance with the following principles. A full Maintenance and Management Plan will be prepared, actioned and adhered to by the LVRPA to ensure a successful implementation, establishment and long term plant succession to a climax matrix which will support a full range of fauna and flora within the site and surrounding area.

The following aims and objectives set out a framework for guiding the management operations of the site:

AIM 1 - TO ENHANCE THE AESTHETIC QUALITY OF THE LANDSCAPE IN AN ECOLOGICALLY SENSITIVE MANNER

To maintain a high level of visual amenity.

To demonstrate a high level of horticultural and ecological awareness that considers the qualities of the specific plant species used and timing of maintenance operations required.

To recognize the plant typologies represented on the site and manage them to realize their primary characteristics.

To maintain an appropriate density of plant species, pruning and dividing as required so as to generate a healthy growth.

AIM 2: TO MAINTAIN AND ENHANCE THE AMENITY VALUE OF LVIC

To maintain a high quality, visually attractive setting for site users.

To maintain a high level of cleanliness and maintenance throughout the site.

AIM 3: TO MANAGE LVIC AND ITS SURROUNDINGS SUSTAINABLY

To maximize the sustainability of site maintenance operations.

To promote a cost-effective management strategy which demonstrates value for money.

To comply with all statutory duties and demonstrate use of best practice.

To promote an ecological based best practice management approach.

To maintain a flexible management approach which responds to landscape change and user requirements.

To ensure that undesirable invasive and dominating plant species are prevented from establishing in the newly designed landscape.



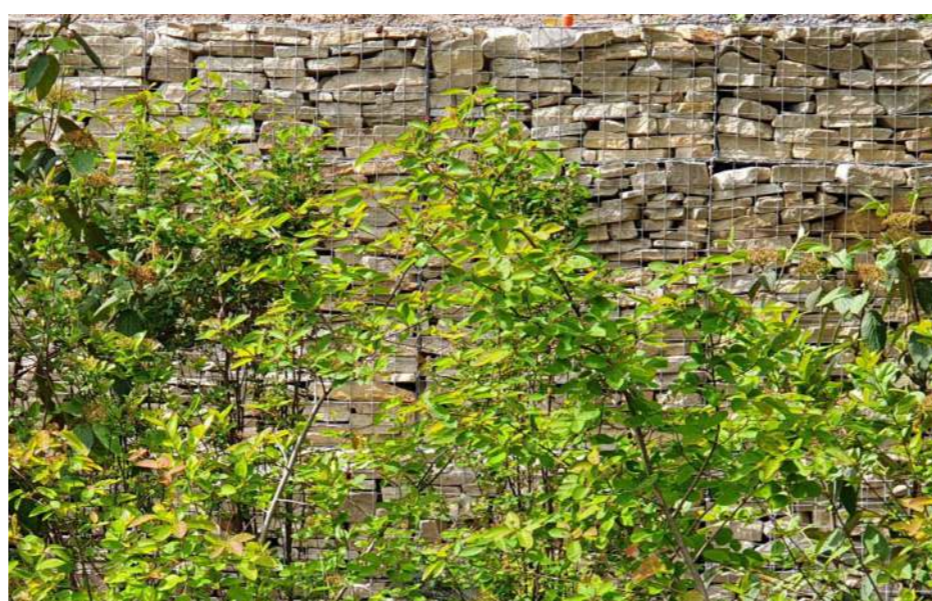
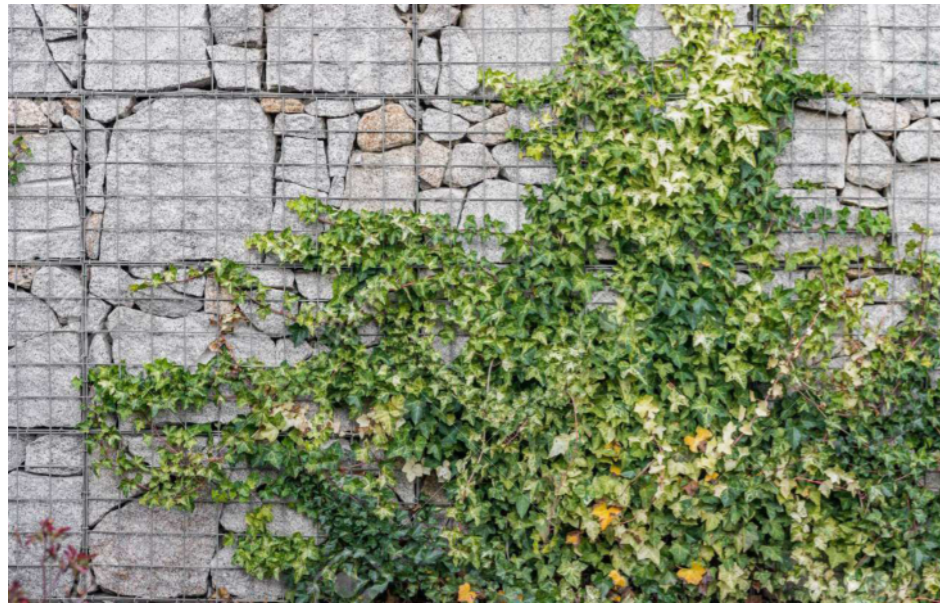


Figure 163 Indicative examples of modular gabion baskets

8.0 APPEARANCE

8.1. MATERIALITY AND MASSING

Section 6.3 described the proposed concept that has responded to the context and defined the massing strategy. The following section describes the proposed detail and materiality for each element.

8.2. THE PLINTH

The Plinth fulfils two functions. It has the practical function of providing a robust and impact resistant base at ground floor, and a visual function of grounding the building within the landscape and creating a more human scale at ground level.

Internally the Plinth comprises a fair-face paint grade blockwork with a cavity wall construction providing stability and thermal insulation. The outer face of the Plinth will be faced with a non-loadbearing gabion wall. Conceptually this material roots the building in the ground, with a visually heavy base to contrast with the lightweight band above. The use of gabions provides an opportunity for landscape and biodiversity to inhabit the elevation, creating the impression of the landscape rising up to form the base.

The gabions will be formed with a welded mesh basket construction for robustness, with a modular size co-ordinated with the door and window openings. Options for the gabion fill will explore the opportunity to re-use demolition materials such as brick or concrete.

The gabions will be planted at ground level with a landscaped perimeter strip, and within the gabion baskets themselves, in order to soften the appearance of the building, and further emphasise the Plinth as an extension of the landscape. The degree of greening will naturally increase over time, allowing nature to reclaim the building, and providing valuable habitat for birds and insects.

External openings such as emergency and access doors are expressed as full height slots within the Plinth. Windows were introduced in Pad B at stage 2 following consultation with LBWF's Design Review Panel and building users, in order to give an opportunity for contact with the external environment. The ability for some indication of the time of day and weather outside is proven to be beneficial for the wellbeing of the building occupants, particularly those who spend extended periods indoors, such as coaches. The introduction of some openings and transparency into the façade also helps to articulate the elevation, reducing the visual mass and giving passers by a glimpse into the activity inside.

The idea of internal and external visual connections was raised during planning pre-application discussions, the DRP comments and the public consultation. This needs to be balanced with the environmental and privacy control within the rinks, and the sensitivity of the surrounding landscape and biodiversity to light pollution. For this reason the glazing is controlled within a series of small vertical slot openings within the Plinth, on the Pad B side only facing Lea Bride Road. These openings are co-ordinated with the team benches and the gabion modules, with opaque glazing to the height of the team benches and dasher boards. The windows will be provided with dim-out blinds, and protective glazing to prevent impact from ice hockey pucks etc. At the main entrance, the Plinth is broken by the glazed elevation to the reception foyer. The Gabions return slightly into the foyer internally, to frame the space and its extension into the external landscape and the public entrance terrace.

8.3. THE "BAND"

The Stage 2 concept design proposed a Band formed of a lightweight metallic cladding, which tightly wrapped the building. The Band followed the height of the plinth around the building perimeter with a narrow shadow gap to articulate the point at which the two elements met, and lifted up over the entrance foyer to create a double height glazed façade.

The Band has been significantly reviewed and refined to respond to comments raised by the DRP. While the Stage 2 proposals included a flat vertical face to the Band, the final Stage 3 proposals create a much more expressive and playful elevation, with a constantly changing 3-Dimensional face.

The form of the Band is created by a continually changing sectional geometry, defined by a series of triangles at key points in the façade. The nodes at each corner of the triangles vary around the perimeter of the building to create a network of control points, between which a fluid curving form is created.

A set of triangular control points are created at the corners of the building, and at the centreline of each façade.

The top nodes are at a consistent height and follow the line of the building perimeter in the horizontal plane.

The bottom nodes follow the building perimeter in the horizontal plane, but lift up in the vertical plane at the centre of each façade, scribing a continuous smooth tangential curve along the elevation.

The centre node which forms the "point" of each triangle offsets from the building face in the horizontal plane, and rises and falls gradually from corner to corner. The extent of the horizontal and vertical offset places a different emphasis on each façade, with a higher lift and greater protrusion over the foyer placing a focus on the building entrance. At the corner control points, the triangle is almost vertical with a minimal horizontal and vertical offset.



Figure 164 Proposed cladding material sample - PVDF aluminium shingles. Reference photos taken from several lighting angles

		Euramax Coated Products Industrieweg 8 8548 JG Bovenmerel The Netherlands +31 (0)475 370 341 max@euramax.eu
Product:	MetalMax PVDF 3L	
Colour:	Classic Copper	
Layers:	3	
Reference:	E-45-03-F-005122.30	
<ul style="list-style-type: none"> Install MetalMax panels in the same direction to avoid reflection differences. Order projects in one batch to minimize color differences. Many other colors available on www.euramaxlab.com Questions? Contact our Architectural Support on +31 (0)475 370 341 or max@euramax.eu 		<p>Disclaimer: Color samples are an indication of the appearance of the final product to be supplied. Due to the nature of the coating process, there may be color differences from the sample and final product. Reference to color standards, such as RAL, Pantone and ICC, are an indication only and not a guarantee. The representation of the color in this document is not a guarantee. The final product can be derived from a reference to a color standard.</p>



Figure 165 Euromax UDF coated - example of colour, not finish or format



Figure 166 Metalmax Titanium PVDF - example of finish and format not colour



Figure 167 Metalmax copper brown PVDF - example of finish but not colour



Figure 168 Metalmax Brilliant Gold - Example of finish only

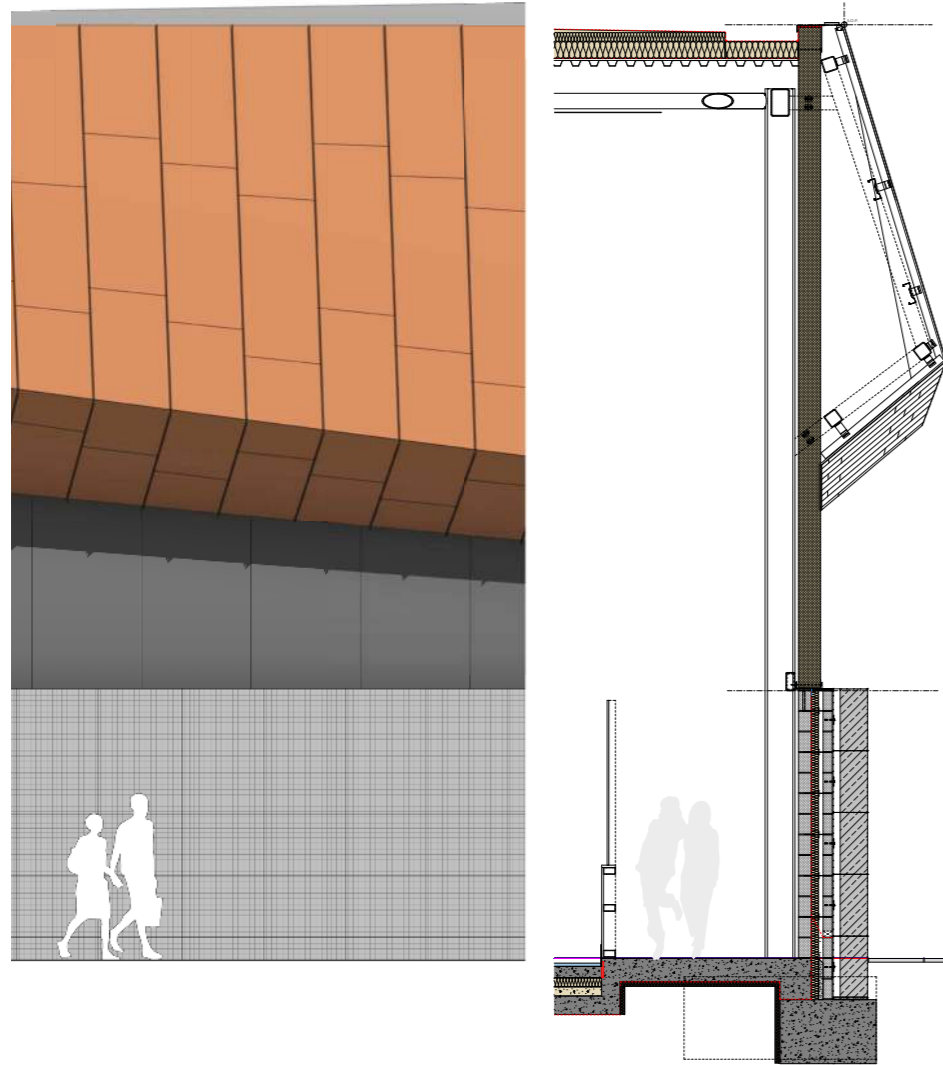


Figure 169 Detailed development study of the elevation elements

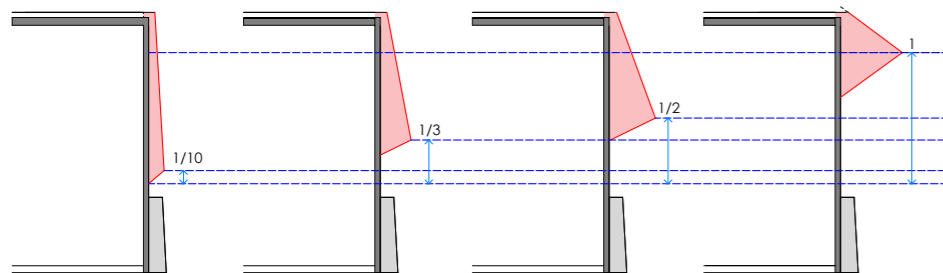


Figure 170 Geometric rules for the Development of the Band

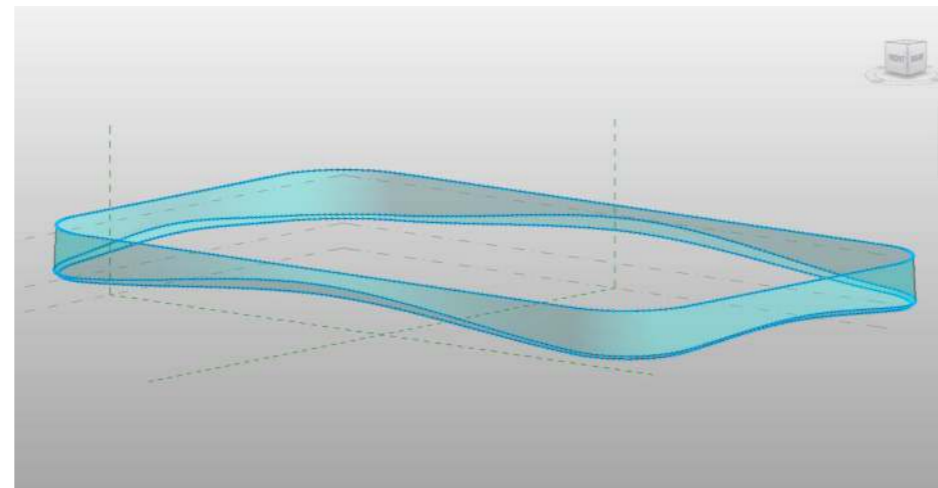


Figure 171 Development of Band geometry - Subdivision of edges with points

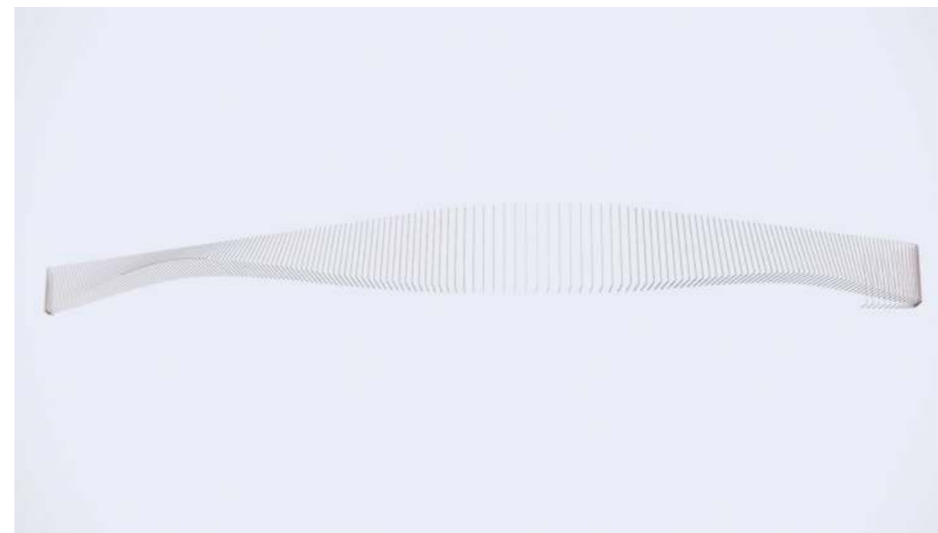


Figure 172 Development of Band geometry - Ruled lines between points

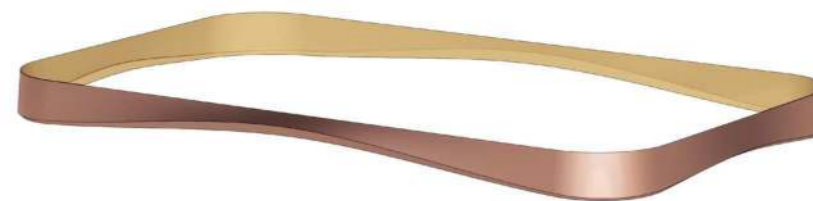


Figure 173 Development of Band geometry - resulting form

The geometry creates a continually changing and fluid surface, which reinforces the concept of the Band floating above the Plinth, creating a more balanced horizontal emphasis and substantially reducing the apparent mass of the building. This surface will be clad in interlocking aluminium shingles supported on a plywood substrate, fixed to the face of the building on a series of structural rails. The use of shingles allows the cladding to adopt the gradual twist of the Band.

The use of a warm copper-coloured finish is proposed for the metallic cladding. This responds to the natural setting of the building, and will harmonise with the surrounding canopies throughout the seasons. The use of a natural warm metallic tone sets the building apart from an industrial or "shed" aesthetic, which the design team have been striving to avoid in response to the sensitive context of the building. The twist in the surface of the Band in combination with the slight reflectivity of the cladding will give subtle variation in appearance depending on the viewer's relationship with the façade and the time of day.

The form of the Band has been modelled using Building Information Modelling, and can be subdivided into a network of 3 dimensional points and interconnecting straight lines, allowing it to be constructed using standard building components. The underlying model can be interrogated to generate the co-ordinates of individual nodes in order to assist in detailed design development during Stage 4, and test and validate shingle dimensions and the setting out of the structural elements.

8.4. THE FRIDGES

As described in Section 5.3, the environmentally controlled volumes of the ice halls are expressed internally through the use of an insulated composite panel. This forms an airtight, thermal and acoustically insulated skin to the rinks. The pre-finished panels provide the internal finish to the walls around the 4 sides of the rinks. These panels are conceived as insulated "Fridges" that sit above the Plinth, and reflect the space defined by the rinks and the dasher boards below.

The composite panels span vertically from a ring beam at the top of the Plinth to the roof structure. The Plinth provides an impact resistant base where the metal faced panels would be susceptible to damage from ice skates, cleaning machines etc. Within the foyer space the outer face of the panels are exposed, allowing occupants to read to volumes of the Fridges from within the void between. This language is extended to the external elevational treatment, where the Band lifts up to reveal the self-finished face of the Fridge panels behind, and expressing the corners of the Fridges where they frame the foyer. The panels will be coated with a coil-applied PVDF paint finish, suitable for the external environment. A darker grey colour to the panels will emphasise the variable gap between the Plinth and Band. On the service yard elevation to the east, the corners of the Fridges are defined by a pair of narrow vertical slots of insulated louvres, which also provide supply air to the dehumidification plantrooms.

8.5. BUILDING SYMMETRY

The dimensions of the two halls varies in width. Pad B contains the spectator seating and a slightly wider ice surround to optimise sightlines. There is therefore an inherent asymmetry of the Fridge volumes along the east and west elevations. The curved form of the Band is symmetrical around the overall building volume. In order to balance this tension between the asymmetry of the Fridges and the symmetry of the Band, the main entrance door and the glazing around the entrance foyer have been placed on the centreline of the elevation, with the Plinth extending beyond the corner of the Pad A Fridge to balance the proportion of the façade. The building symmetry is further reinforced through the landscape strategy, with the entrance terrace, pedestrian route and bridge through the wetland feature placing an emphasis on the building centreline.

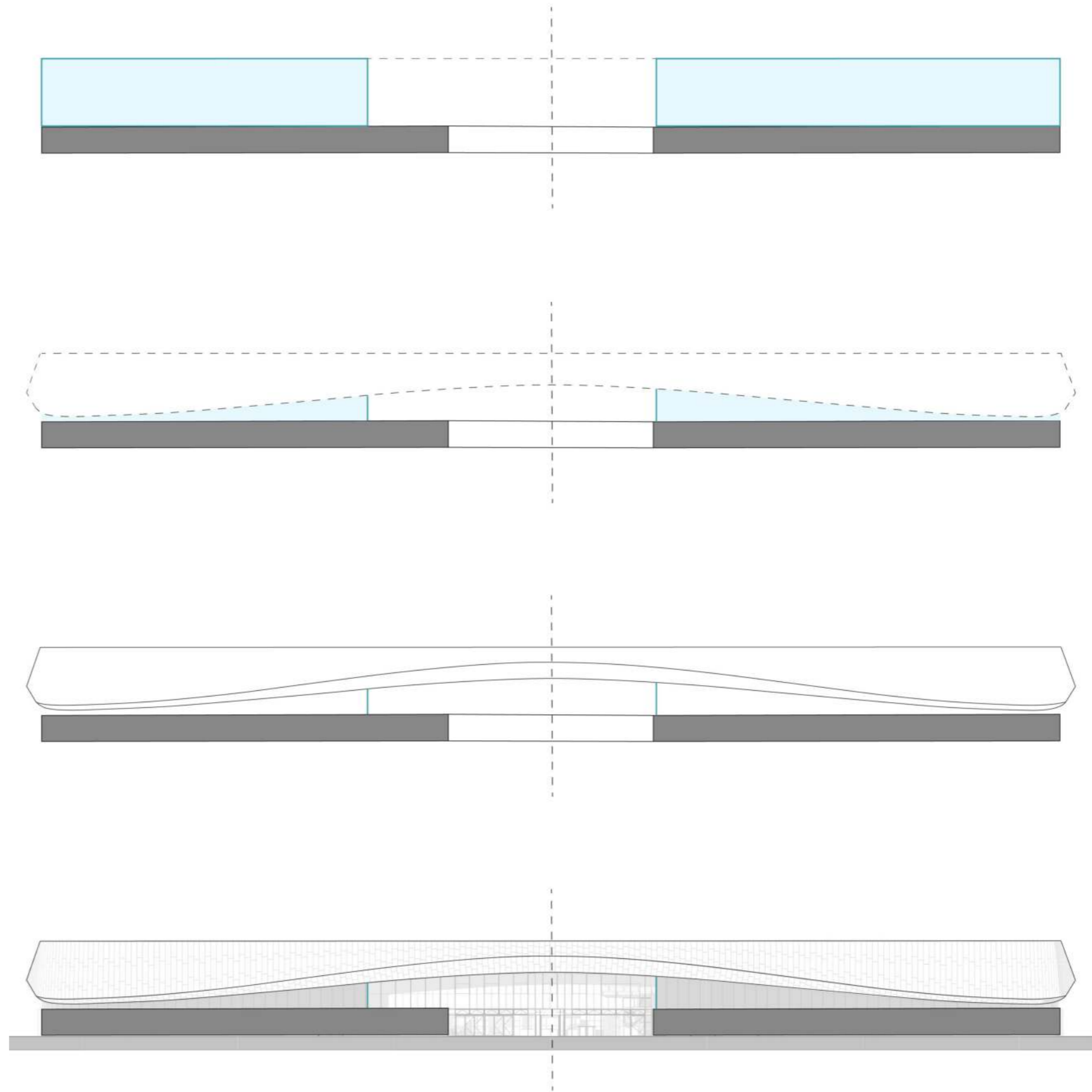


Figure 174 Development of building symmetry - ballancing tension between asymmetry of the ice halls with the symmetry of the Band



Figure 175 Illustrative view of proposals from Lea Bridge Road looking towards main entrance.



Figure 176 Illustrative view of proposals from Lea Bridge Road looking towards Pad B.



Figure 177 Illustrative view of proposals from car park looking towards main entrance.



Figure 178 Illustrative elevation - south west elevation facing car park



Figure 179 Illustrative elevation - south elevation facing Lea Bridge Road



Figure 180 Illustrative elevation - north east elevation

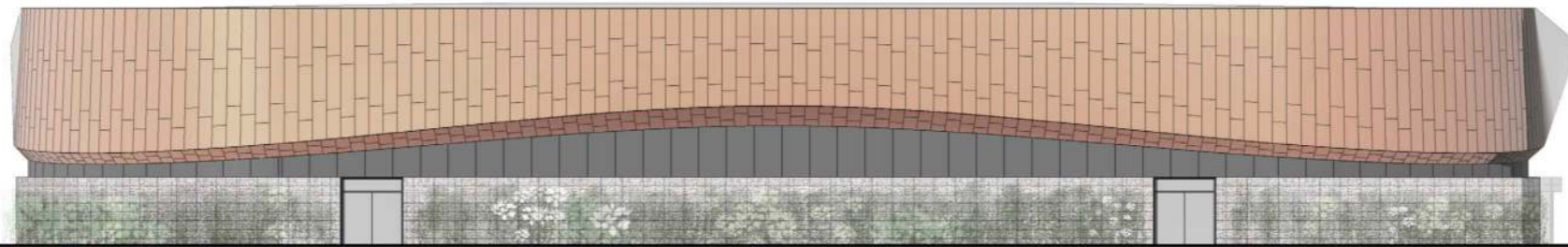


Figure 181 Illustrative elevation - north west elevation facing Leyton Marshes



Figure 182 Illustrative contextual elevation - north west



Figure 183 Illustrative contextual elevation - north east



Figure 184 Illustrative contextual elevation - south west (trees in car park not shown for clarity)



Figure 185 Illustrative contextual elevation - south east

9.0 ACCESS

9.1. PEDESTRIAN, VEHICULAR AND TRANSPORT LINKS

The proposals for the new LVIC keep the existing site access in its current location, but improve the quality of the surface treatment and landscape, rationalise the vehicular routes, and enhance the safety and segregation of drivers, cyclists and pedestrians. The location and alignment of the junction with Lea Bridge Road is retained, with new security gates installed to allow the site to be secured against vehicular access out of hours. New security gates will also be installed north of the car park as shown in Figure 188 to control vehicular access to Sandy Lane, with an intercom control linked to the Marina.

The car park location is retained, but reduced in size, with the number of spaces (including overflow) reduced from 307 to 155. The existing parking layout has been rationalised, with lanes arranged at right angles to Lea Bridge Road, and drainage swales introduced between the parking lanes. A clockwise search pattern is proposed through the car park, to ensure coaches dropping off or parking can do so on the building side of the road. A coach drop off and parking bay is provided to accommodate 3 coaches.

Pedestrian access from Lea Bridge Road is located on the building side of the access road, with a coloured asphalt surface demarking pedestrian routes from the carriageway. Pedestrian footways through the car park are identified in matching coloured asphalt, and these cross the access road at a controlled points. The pedestrian footpath follows the curve of the access road from Lea Bridge Road to Sandy Lane past the coach drop off points, and joins Sandy Lane just beyond the secure vehicle access gate. A paved arrival terrace runs along the south west elevation of the building, to provide a waiting and congregating space for spectators, or skaters at peak times. The terrace also provides an external seating area for the public café, overlooking the wetland habitat and reed bed. A paved bridge crosses through the water body to provide the primary pedestrian route from the car park to the main entrance. The bridge is aligned with the central axis of the building, placing a prominence on the main entrance door.

Visitors arriving by public transport will approach the building via Lea Bridge Road. An east bound bus stop is located immediately outside the site boundary, with a west bound stop across the road slightly further to the east. The site is an 11 minute walk (0.6 miles) from Lea Bridge station, and 14 minutes (0.7 miles) from Clapton station.

The proposals seek to encourage the use of bicycles and capitalise on the site's excellent connectivity to the wider cycle network. 100 covered cycle parking spaces are provided, within an area adjacent to the arrival terrace, with a further 10 uncovered spaces located within the terrace. The site is easily accessed from the Lea Bridge Road Mini-Holland cycle route and The Sustrans National Cycleway 1 to the east of the site.

A number of comments were raised by LBWF during the pre-application, including improvements to the legibility for cyclists in and around the site, with the possible benefits of additional footfall to the cafe. During the detailed design, the sitewide signage strategy will be reviewed.

Following the suggestion from LBWF, the existing footpath at the south west corner of the site connecting Lea Bridge to the car park has been removed, to discourage cyclists from crossing the car park, and to promote the use of the main site access point.



Figure 186 Pedestrian Access Strategy

A service access road crosses the pedestrian access footpath at the south west corner of the building, and runs around the building perimeter (See Section 9.2 below). At the crossing point, pedestrian priority is clearly demarcated through the continuation of the coloured asphalt paving.

The ground floor level of the building has been set at 7.9m A.O.D. Due to the existing level condition of the site, step and ramp free level access is available to the entrance door.

A Healthy Streets Transport Assessment (TA) has been prepared to accompany the application. The Healthy Streets Approach is a system of policies and strategies to deliver a healthier, more inclusive city where people choose to walk, cycle and use public transport. As such, the TA includes Active Travel Zone assessments, which have assessed key walking and cycling routes in the vicinity of the site, against TfL's Healthy Streets Indicators, which include safety, noise and ease of crossing considerations. Improvements have been identified where appropriate, for TfL to consider implementing.

The proposed car park layout reduces the number of spaces on the site from 177 (plus 130 overflow capacity) to 155, which will contribute towards a sustainable development and the uptake of sustainable transport modes. CEC has worked collaboratively with the design team, assisting with the provision of vehicle swept path analysis, for example, to develop a layout that is both practical for use by cars, coaches and service vehicles, but which also has an emphasis on pedestrian and cycle connectivity and safety. Dedicated coach parking is provided to accommodate three coaches close to the building's main entrance.

The impact of the development on London's network during a typical weekday, both in terms of vehicle trips and public transport users, is also assessed within the TA.

General visitor car parking would not be available on-site during events in order to manage the associated impact. Visitors to events will be required to travel sustainably to the venue, and it is envisaged that event staff would manage the car parking accordingly. Exceptions will be made for parking for disabled persons, staff, officials, teams and VIPs, although car use by these groups will be discouraged through implementation of the site's Travel Plan. Event staff would manage the car parking accordingly, allowing only access for these groups, taxis and coaches.

A standalone Travel Plan has been prepared proposing a number of measures and initiatives, seeking to promote sustainable travel to and from the site for both staff and visitors, and reduce car use.

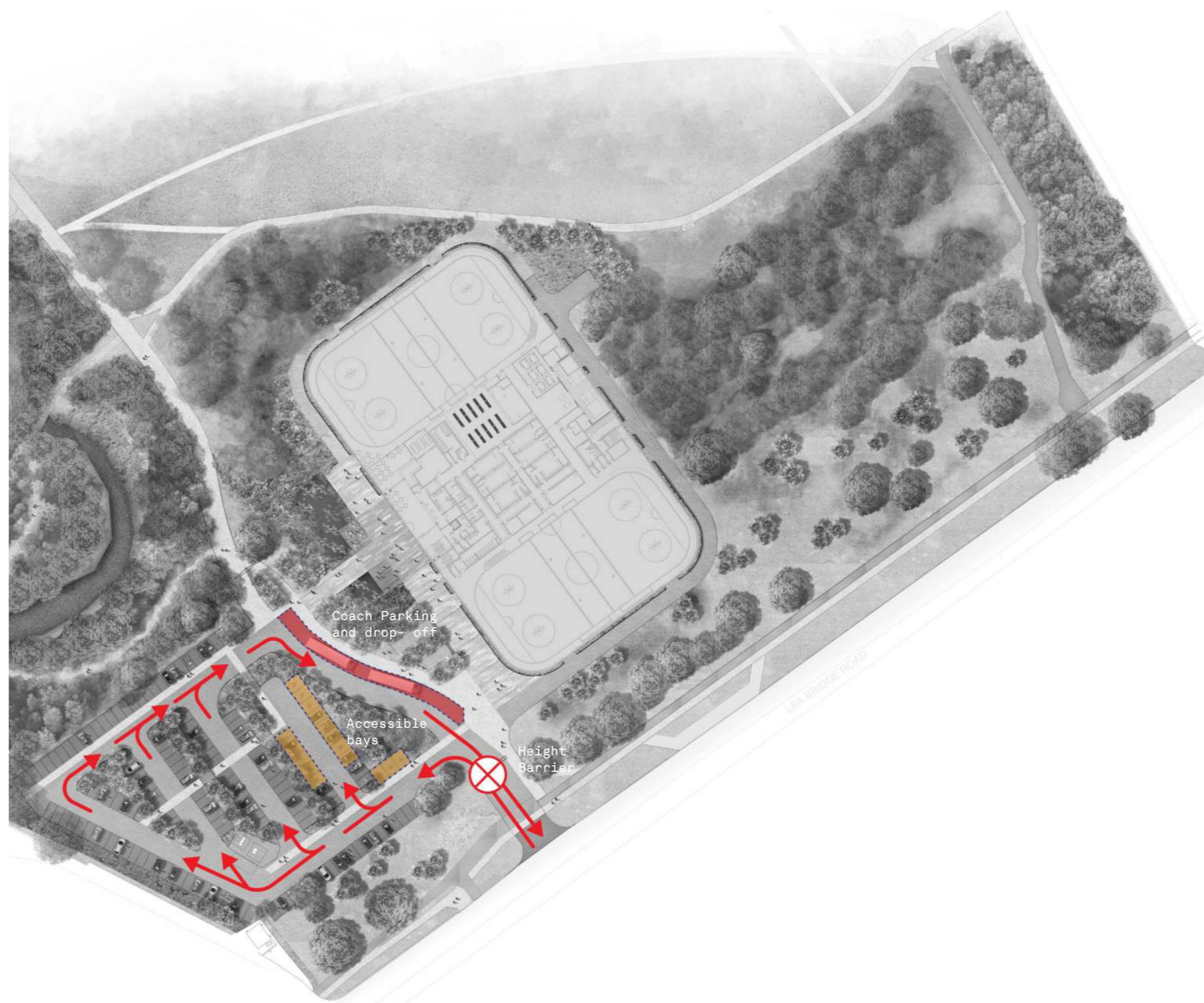
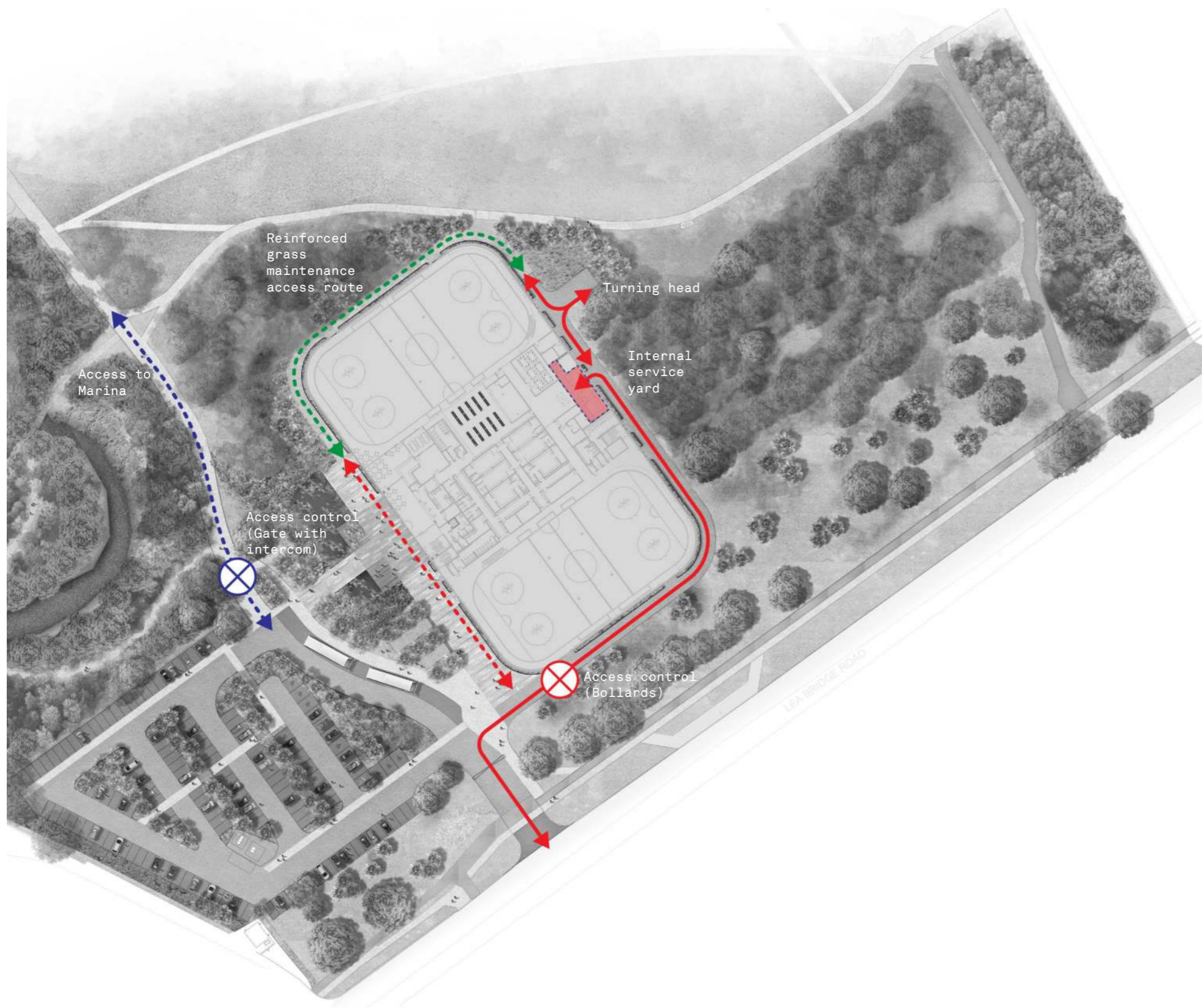


Figure 187 Car and Coach Access Strategy



9.2. SERVICE ACCESS

The layout of the building allows segregation of servicing from skaters and the public, through the provision of an external service yard on the east elevation within the overall building footprint. A coloured asphalt road allows service and delivery vehicles to drive around the south and east elevations to access the entrance to the yard, which is accessed via a security rated roller shutter door. The route has been Auto-tracked to ensure sufficient width and clearance to the bend at the south east corner of the building. A turning hammerhead allows vehicles to turn around and return along this route. Drop down padlocked bollards and earth mounding along the south elevation prevent unauthorised vehicular access. The route will accommodate delivery vans, refuse vehicles and fire tenders.

The service yard will contain access to all incoming services including water, IT and comms, and HV power. 24 hour external access will be maintained for the electricity supplier UKPN. The service yard provides space for refuse storage, and access to the kitchen store, cellar and freezer adjacent to the rear door. Access is provided into the ice machine garage through an insulated sectional overhead door.

Figure 188 Service Access Strategy

9.3. MAINTENANCE ACCESS

The maintenance strategy prioritises access from ground level. All glazing is capable of being cleaned via a telescopic reach and wash system from the adjacent hardstanding. Irrigation points with bib-taps are provided on each façade for hose connections.

The building façade is designed to be low maintenance, however a flat and stable access route is provided to all façades, capable of supporting mobile elevating work platforms (MEWPs) to reach the cladding at high level if necessary. This route consists of reinforced grass to the northern elevation. Refer to Section 7.0 for full details.

In order to keep the overall building height to a minimum, parapets and permanent fixed edge protection are not provided to the roof perimeter. The proposed syphonic roof drainage system minimises the number of roof drainage outlets and rainwater pipes. The perimeter roof gutter and outlets are capable of being inspected, cleaned and maintained via a MEWP from the building perimeter.

The roof level of the building does not require frequent access, and there is no mechanical plant located at this height. However, the roof mounted photovoltaic panels will require access for periodic cleaning and maintenance. There are also central roof outlets and gutters running along each side of the core. Access is provided to the roof via permanent fixed ladders with hooped cages, and edge protection is provided by fold-up counter-balanced balustrades. These will fold flat when not in use so not to be visible from ground level, and can be raised to provide edge guarding to the areas of the roof to be accessed. Access to the roof will be by authorised maintenance personnel only, and management processes to ensure full instruction of staff prior to access will need to be put in place. However, no specialist equipment or training (as would be necessary for fall restraint systems) is required.

Areas of the roof beyond the central PV area will be strictly prohibited, except by permit to work with a full access methodology statement. Portable anchors and harness systems can be used for these areas, for occasional access and inspection.

Internal access at height will be carried out via MEWP within the ice halls. The maximum working height internally is approximately 9.75m to the underside of the roof deck. Access routes into the building have been tested for suitable access equipment, using either the ice garage doors, or the perimeter escape doors.

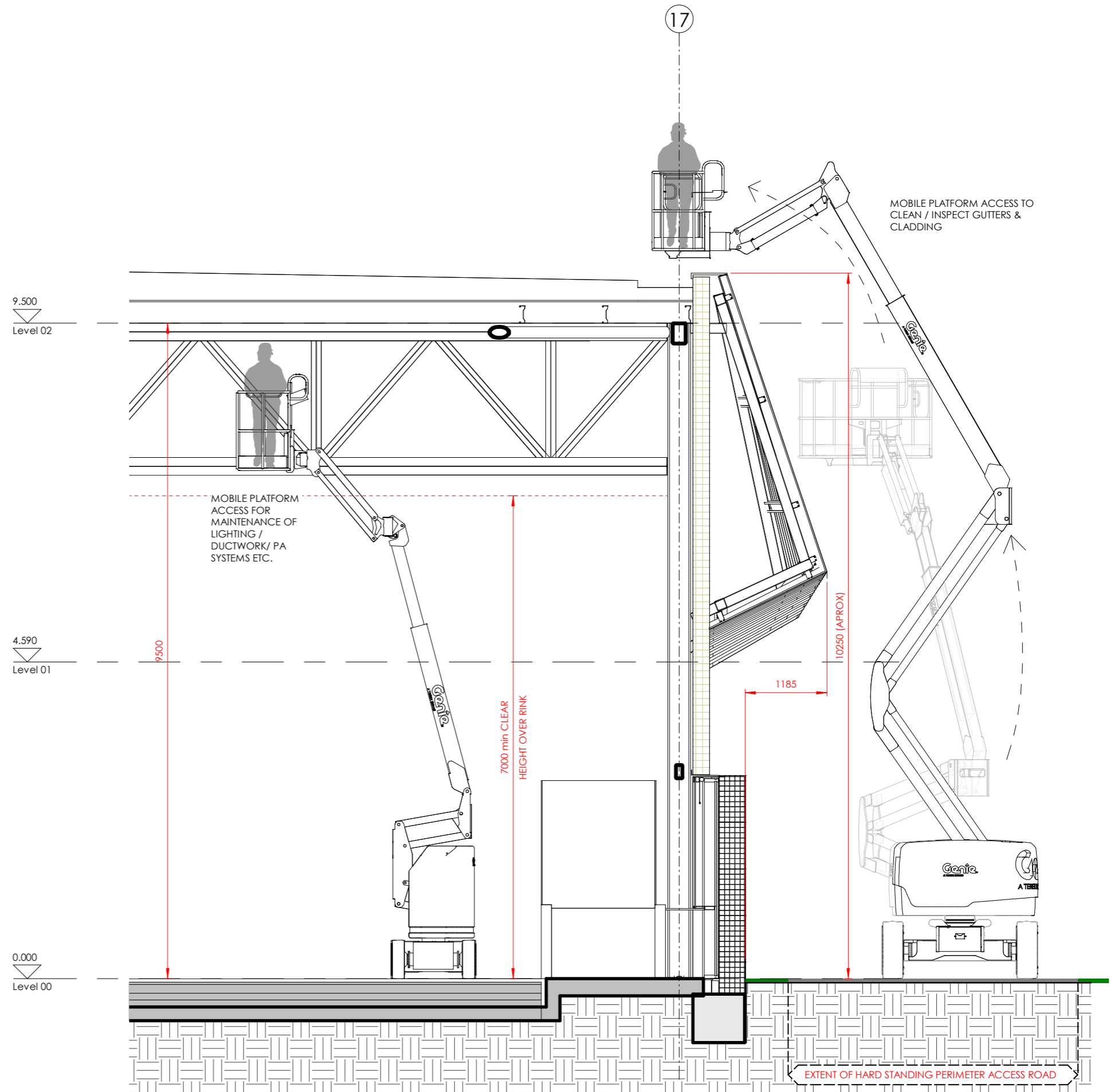




Figure 189 Cycle Access Strategy

9.4. INCLUSIVE ACCESS

The building and landscape have been designed to be fully accessible to all, and will be compliant with BS 8300, Approved Document Part M and Sports England Guidance. Level access is provided throughout the landscape and into the building. Falls within the landscape scheme have been developed to cater for wheelchair users and are within recommended limits. Throughout the project, access audits have been carried out by Faulkner Browns as part of an internal quality assurance process.

The main entrance for all building users is located on the west elevation facing the car park, and comprises a 3m circular sliding door arrangement, providing a clear width of 1.88m to ensure unimpeded level access for wheelchair users as well as those with large bags and bulky equipment.

The main entrance is clearly legible and orientated in line with the primary pedestrian routes from the car park, with pedestrian routes clearly demarcated. Pedestrian and cyclist access from the site boundary is separated from vehicular routes, with a clear pedestrian priority where it crosses the service access route to the south and east of the building. Covered and illuminated cycle stands are provided in sight of the reception area and adjacent to the entrance terrace.

17 accessible car parking spaces are provided, with flat and level access to the main entrance.

A wheelchair accessible lift is provided within the entrance foyer for access to the gym and dance studio, and the wheelchair spectator spaces on the concourse. 6 wheelchair spectator spaces are provided in line with Sport England and BS8300 recommendations, with increased riser heights to ensure sightlines are not blocked by standing spectators in the rows below. The wheelchair spaces are evenly distributed through the concourse, and each space has adjacent seating for able-bodied companions.

The proposed Ice Centre has been designed to encourage and support people of all abilities and disabilities to participate in ice sports, including disabled skating and sled hockey.

Wheelchair accessible WCs and showers are provided within the staff welfare space and the group and team change areas. The layout of changing facilities complies with the Sport England guidance and allows full access for use by both able-bodied and disabled skaters.

The public skate change and gym both have combined accessible WC, shower and changing provision, with wheelchair accessible WCs provided within the public café and reception area, and adjacent to the spectators WCs. All WC facilities include ambulant cubicles with outward opening doors and grab rails.

Baby change facilities are provided within the public skate change WCs (and not within accessible WCs).

APPENDICES

10.0 APPENDICES

10.1. APPENDIX A - RESPONSE TO PRE-APPLICATION FEEDBACK

COMMENT	DESIGN RESPONSE
A	Formal pre application feedback from LBWF in letter dated 15th February 2019 - Based upon designs presented in pre-application meeting on 23rd January 2019
A1	<p>Need to mitigate noise and light pollution to nearby sensitive receptors, including the SMINC</p> <p>The need to control light spill from the building and external lighting is critical to minimise adverse effects on sensitive habitats, and the design seeks to minimise this. However this is contradictory to other comments realised during pre-application discussions regarding views into and out of the building. To this end, glazed areas have been limited to the car park and Lea Bridge Road elevations where the impact on sensitive receivers, especially the SMINC, will be minimised. External architectural lighting has not been proposed, and external street and pavement lighting and controls have been designed to minimise light pollution, while still achieving sufficient levels of light to public accessible areas necessary to create a safe environment for users of the Ice Centre and the Park alike. Background noise assessments have been undertaken, and the building envelope is specified to minimise noise breakout. Noise from external plant has been controlled by placing it within the rooftop plant well, where it will be screened from the surrounding landscape. Attenuation and acoustic louvres will be incorporated as necessary to limit background noise to acceptable levels agreed with the LBWF Environmental Health Officer.</p>
A2	<p>Need for active engagement with relevant sports governing bodies</p> <p>LVRPA have notified a number of sports stakeholders, including the relevant sports governing bodies. Input from the bodies has been a challenge and no ice sports governing bodies have offered to meet to review the proposals. Sport England and London Sport have been consulted, and LVRPA have received letters of support. A briefing meeting was held on 24th June 2019 with Hilary Selby of the International Skating Union.</p>
A3	<p>Need for exploration of "greening" opportunities to the site and surrounding car park</p> <p>The design developed since January has significantly increased greening compared with the existing car park. The inclusion of extensive tree planting and swales, the overall reduction in the parking area, and the use of alternative surface materials to blacktop, have all contributed to a significant improvement to the appearance and biodiversity of the car park.</p>
A4	<p>Need to improve accessibility for users of the MOL</p> <p>The proposed public realm enhancements, including improvements to lighting, contribute to much better accessibility to Leyton Marshes. The revisions to the landscaped plaza area and wetland habitats contribute towards the creation of a Gateway Space, with an improved aspect along Sandy Lane (currently blighted by the existing refrigeration plant, waste compactors and storage containers), while the inclusion of the public cafe within this area provides a social facility for wider users of the Park.</p>
A5	<p>Need for biodiversity improvements, and mitigation of ecological impacts</p> <p>The proposed landscape design is based upon the principle of maximising the overall site biodiversity, and thus mitigating against damage caused by the bigger building footprint and massing. An Ecological and Biodiversity Assessment and Ecological Mitigation Strategy have been carried out and prepared in support of the application. refer to the Landscape section of this Design and Access Statement for full descriptions of the biodiversity improvements.</p>
A6	<p>Need for the building and landscaping to make a considerable contribution to the park setting</p> <p>The proposed design aims to enhance the existing parkland setting of the building. The introduction of the water story and wetland habitats create a "gateway to the marshes", to signify their presence along Lea Bridge Road. The overall species biodiversity of planting will be greatly increased, with the use of native species. Existing habitat will be preserved and protected as far as possible, and new habitats created for mammals, birds, invertebrates and insects.</p>
A7	<p>Need to balance views to the marshes from the gym, with mitigation of light pollution.</p> <p>See Item A1 above. The position of the gym on the western façade facing the car park minimises the effect on the sensitive landscape to the north and east, including the identified bat foraging routes. Ecological sensitivities have been prioritised over views across the marshes to the north. No glazing is proposed to the north elevation, with views concentrated on the Lea Bridge Road and car park elevations.</p>
A8	<p>Need to fully integrate the placement of plant in the scheme</p> <p>All plant is fully integrated either within the building, or in the first floor external roof terrace, where it is visually and acoustically screened from the surrounding landscape. No plant will be located outside the building footprint.</p>
A9	<p>Need to minimise loss of trees.</p> <p>The building orientation and location has been carefully considered to minimise the loss of existing trees. The arboricultural survey carried out in 2017 has been updated. Some tree loss is unfortunately unavoidable, either due to the larger building footprint, the rationalisation of the car park, or on the advice of the arboriculturalist due to the tree's condition. Where trees have been lost, significantly more trees of appropriate native species will be planted. Where trees are lost within the groups of trees in the north of the site, new tree planting will contribute to the partial screening of the building from the marshes.</p>

COMMENT		DESIGN RESPONSE
B	Formal pre application feedback from DRP in letter dated 2nd July 2019 - Based upon designs presented for review on 19th June 2019	
B1	Concern that the building appears monolithic	The design team has extensively explored massing iterations and evaluated these in terms of sustainability and visual impact. The initial massing proposals developed and tested during Stage 2 included proposals to express the building as a series of volumes. However, the design team felt on reflection, that the unifying elements of the Band and the Plinth offered a more pleasing, low lying and less "boxy" proportion and were more in keeping with the intention of creation a pavilion which is viewed in the round. A simpler form, with a compact footprint and minimal surface area is beneficial both to reduce the impact on MOL, and to minimise heat gains and losses. However we believe that the refinement of the elevations in response to the DRPs comments has resulted in a much more elegant proportion. The use of the proposed materiality (gabions and shingles) provides a textural surface that helps to break down the mass of the building. Early iterations of the massing studies also demonstrated that the introduction of the curved corners helps greatly in reducing the visual impact of the building when viewed from each corner, and the existing trees and vegetation around the site means that these corner views have the most impact from Lea Bridge Road and Leyton Marshes.
B2	Concern that the design is driven by a response to constraints and operational functionality	The concept design was driven by a response to site constraints and both operational and environmental functionality, which are very real considerations. Ice rinks are inherently high in their energy usage, which naturally creates inward looking and highly insulated buildings, with a tight environmental envelope and minimal penetrations. The proposed design intends to deliver the functional and environmental requirements, within an expressive external wrapper which responds to the site and context. The design reflects the unique geometry of the ice rinks through the curved corners, which we believe results in a form that is both efficient in footprint and volume, but also expresses the function within.
B3	Request that the sustainability aspirations are increased to BREEAM Excellent.	The design team have revisited the BREEAM pre-assessment to review where credits can be maximised. While it is not possible to commit to achieving Excellent (due in part to the specific technical requirements of the building typology) the team are striving to achieve this. The project will, of course, achieve the mandated Very Good rating, as well as the Excellent water credits required in planning policy.
B4	Statement that the building could be more "playful" in appearance	The Design team have revisited the design of the Band since the DRP, and a more playful and expressive elevation has been achieved by creating a 3 Dimensionality to what was previously a flat façade. This will optimise the subtle reflective qualities of the proposed cladding by creating a constantly changing angle, emphasising the colour and the manner the cladding responds to different light. The reintroduction of a continuous and gradually sweeping curve to the bottom of the Band results in a more elegant elevation proportion and expresses the band and the plinth as distinct elements.
B5	Need to optimise user experience with the building, reflecting its purpose and connection between inside and outside.	As described in item B2, there are significant operational and environmental issues associated with introducing glazing to the ice halls. In some cases where this has been carried out in the past (Ice Sheffield for example), the operator has subsequently closed the openings. Solar gains through expansive glazing will place additional energy load on the ice plant, which is already the most significant energy and carbon load in the building. Expansive areas of glass can cause issues with glare within the field of play. The practical operational requirements overwhelmingly support a "black box" approach. Extensive glazing is also in contradiction to the need to limit light pollution to the nearby ecological sites. Any glazing also needs to be capable of being blacked out to accommodate events. Considering the above, the design team has been cognizant of the desire to introduce some glazing where possible to animate facades and provide some degree of visual connection. This has been reviewed following the DRP comments, and has evolved into a series of discreet narrow vertical slots, which break up the mass of the plinth while emphasising its mass, and allowing glimpses in and out of the building. These slots have been coordinated with the grid of the gabion baskets, and integrated with the team benches on the long edge of the rink.
B6	Suggestion that opportunities for natural light and ventilation are explored	The design team has explored introducing natural light and ventilation into the building, but this needs to be balanced with the negative effect it will have on the energy requirements for the ice halls, and the effect of light-spill on surrounding sensitive landscape. Natural ventilation has been introduced within the foyer space. See also the responses to items A1, A7 and B5 above.
B7	Suggestion that the landscape proposals reuse site waste to introduce mounds and undulations	The design team believe that this approach is not in keeping with the naturally flat environment of the marshes. The site investigations have indicated the presence of contamination within the existing ground due to its previous use as land fill, which would make extensive reuse of excavations and arrisings impractical.
B8	Need to create playful quality in the landscape that responds to and enhances the natural biodiversity of the site.	The design team believe that the proposed landscape strategy is an appropriate approach to the context of Lea Valley; one that enhances the overall richness of the biodiversity based upon careful selection of native species, and celebrates the natural history of the Marshes and the River Lea through a unique approach to water treatment and use.
B9	Welcome the increase in the number of trees.	Noted. New tree planting will be used to mitigate the visual impact of the building when viewed from the marshes. We have discussed during consultation with Save Lea Marshes, the possibility of working together to determine the most appropriate location for new tree planting.

COMMENT		DESIGN RESPONSE
B10	Note that the site is a place of calm and tranquility.	Noted. The southern edge of the site along Lea Bridge Road is exposed to traffic noise, however the developed designs for the landscape buffer between the building and the car park have improved the quality of space for users of the café, as well as members of the public passing through to Leyton Marshes. As described above, the proposed design will control light and acoustic breakout to minimise the effect on the surrounding environment.
B11	Suggestion of creating a woodland setting for the building	The design team respectfully disagree with this statement. While there are existing tree groups on the site, which will be largely retained and supplemented with replanting, we wish to retain the open nature of the marshes, while exploring opportunities for enhanced permeability and controlled views and glimpses.
B12	Welcome proposed use of ice melt water, but suggest that opportunities are explored for grey water re-use.	Within an ice rink the biggest water use by far is the production of ice. By proportion the amount of water used for other functions such as WC flushing and showers is relatively small. Therefore the design team are continuing to investigate the re-use of ice melt water for ice production. Roof grey water is proposed to discharge to the adjacent ox-bow lake, via the feature ponds near the building entrance. This system capacity is design to accommodate flood events.
B13	Questioned proposals to increase visual permeability, and the alignment of the route to Sandy Lane.	The design team respectfully disagree with the first part of this comment; the improvements in permeability and legibility are a fundamental part of the site massing approach, agreed in principle with LBWF and GLA, and supported in both LVRPA Park Development Framework and the Lea Bridge and Leyton Vision (published by LBWF in 2017). However, comments regarding the previously proposed direct route to Sandy Lane have been taken on board, with the existing "wiggle" reinstated. This has created a more generous landscape buffer between the car park and the building. Views from Lea Bridge Road to Sandy Lane are still possible, but filtered through a landscape context, rather than directly along a road.
B14	Need to maximise greenness of car park to respond better to context.	The car park area has been reduced from 177 to 155 spaces since the scheme presented to the DRP. The landscape proposals described in this Design and Access Statement introduce extensive greening between bays with the use of swales, and through additional tree planting.
B15	Need to justify reduction in parking spaces	The reduction in parking spaces is justified in the Transport Assessment, Travel Plan and Parking Management Plan submitted in support of this application. It is noted that feedback from GLA and LBWF has promoted reducing the number of car parking spaces. These have been reduced from the existing 177 space (plus overflow), to 155 in the current proposals. This has had the welcome benefit of increasing the extent of soft landscaping and reducing the visual impact of the car park.
B16	Agreement in principle with the site orientation	Noted.
B17	Concern with proximity of café to the SMINC	The building footprint has been adjusted to ensure that there is no overlap with the SMINC. The position of the café has been chosen to maximise its presence at the building entrance, provide a public facility and social hub for passers by and users of the marshes, and to avoid light spill into the SMINC.
B18	Need to promote sustainable modes of transport.	The number of total car parking spaces has been reduced, while the ice area has more than doubled, therefore the ratio of floor area per car parking space has significantly increased. The reduction in spaces and the encouragement alternative methods of transport is explained further in the Transport Assessment and Travel Plan. Covered and secure cyclist facilities are being provided in line with BREEAM and GLA recommendations.
B19	Concern about "blank" facades	See Response to items B1, B4 and B5 above.
B20	Requirement for building that better integrates into the landscape	The concept of a plinth to "ground" the building in the landscape has been revisited and reviewed following the DRP review. The change in materiality from brickwork to gabions, in order to provide habitat and reinforce the monolithic nature of the plinth was discussed in the review, and has been incorporated into the design. The introduction of planting into the plinth will help integrate the building into the landscape, and reduce its visual impact.
B21	Need to rationalise internal circulation to improve wayfinding and legibility	The conceptual design development described in this Design and Access Statement aims to create a legible architectural parti, comprising of the core, between the two volumes of the ice rinks. Within the core, the language of blocks of accommodation, with circulation between has been developed, and the interior design scheme will reinforce this concept through the selection of surface finishes and colour. The legibility has also been balanced with the needs for operational security and management, and the need to separate different user groups. Following the DRP review, this concept has been strengthened and refined through some alternations to the alignment of the internal blocks and rationalisation of corridors.
B22	Encouragement for use of green roofs	The design team have carried out a feasibility study into the use of green roofs. It was found that the increase in the weight of the structural frame needed to accommodate the additional load of a green roof across the clear spans of the ice halls is uneconomic and environmentally damaging due to the extra embodied energy in the steelwork. The design team elected to concentrate the increase in biodiversity at ground level, where unlike the roof it could be viewed and experienced by the public and users of the Park. The enhanced biodiversity achieved through the proposed landscaping strategy is supplemented by the greening and opportunities for habitat creation offered by the proposed gabion walling to the plinth.

COMMENT	DESIGN RESPONSE
C	Pre application feedback from LBWF received via email on 28th August 2019 - Based upon designs presented in pre-application meetings on 23rd January 2019, and 15th August 2019
C1	<p>Acknowledgement that massing studies demonstrate that the building will be relatively concealed from all views except along Lea Bridge Road, with need to ensure tree screening along the northern site boundary with the marshes.</p> <p>Noted. Visual Impact assessments have been carried out throughout the early design development as illustrated in the Design and Access Statement, and a Visual Impact Study has been prepared for the final design in support of this planning application.</p>
C2	<p>Need for clarification of functional layout of the building (e.g. Layout of WCs)</p> <p>It is unclear which version of the plans this comment related to, as plans were not discussed on 15th August. However, in response to the DRP feedback, the internal configuration of the building has been refined as described in item B21 above.</p>
C3	<p>Need for development of Café area to create a welcoming space and to engage with outside</p> <p>The entrance foyer has been developed as a light and airy double height space, to create a welcoming space for both building users and the public. The Landscape proposals have been significantly updated since the DRP review, with the existing vehicular route around the west side of the existing Ice Centre retained in order to create a larger landscape buffer between the cafe and the car park.</p> <p>The external terrace has been redesigned to engage with both the cafe and entrance foyer, with floor and pavement finishes and the extent of the plinth helping to frame and define these interconnected spaces. The cafe can be opened up onto the external terrace with two sets of bi-folding doors. The re-designed terrace is a more generous space with an enhanced connection to the wider landscape, and benefits from a south westerly aspect and the inclusion of reed beds and water features to reinforce the connection with the marshes.</p>
C4	<p>Review access to the café, in particular segregation of public and skater cafes.</p> <p>The public facing skaters cafe is located within the entrance foyer, but is required to be physically separate from the skaters' rink-side cafe, in order to avoid people by-passing the access control and payment point. However, a double height glazed partition ensures the two spaces can be read as one volume, and a connecting door allows both spaces to work together when required.</p>
C5	<p>Review of the competition pad café location and proximity to kitchen</p> <p>A catering brief and design has been developed during RIBA Stage 3 design, and revised proposals for the event kiosk area within the Competition ice hall have been developed. The servery is located in close proximity to the cellar store and will be capable of serving hot and cold drinks and food.</p>
C6	<p>Questions about benefits of increased glazing to front façade, with no views of activity, and views of a wall.</p> <p>The high level glazing provides views into, and out of the gym located at the first floor. There are a series of floor to ceiling glazed openings within the gym wall at first floor above the reception area to provide views. The design team believe the double height facade creates a welcoming space within the cafe and foyer, while also placing an emphasis on the entrance to assist in site orientation and legibility.</p> <p>See also Item C7 below.</p>
C7	<p>Clarification required for asymmetric glazing at high level of main façade.</p> <p>The dimensions of the two ice halls varies in width. The competition pad contains the spectator seating and a slightly wider ice surround to optimise sightlines. There is therefore an inherent asymmetry of the Fridge volumes along the east and west elevations. The curved form of the Band is symmetrical around the overall building volume. During design development we tested multiple iterations of the band to reflect the asymmetry of the interior spaces, but in the design team's opinion these were not as successful.</p> <p>In order to balance this tension between the asymmetry of the Fridges and the symmetry of the Band, the main entrance door and the glazing around the entrance foyer have been reorganised to place them the centreline of the elevation, with the Plinth extending beyond the corner of the recreation pad Fridge to balance the proportion of the façade. The building symmetry is further reinforced through the landscape strategy, with the entrance terrace, pedestrian route and bridge through the wetland feature placing an emphasis on the building centreline.</p>
C8	<p>Support for proposed materiality, but questions about successful relationship between the plinth and band elements</p> <p>The development of the massing strategy introduced 3 distinct elements, in the Plinth, the Band and the Fridges. The Fridges enclose the volumes of the ice halls as described in the Design and Access Statement. Iterations of the elevations played with the extent to which the Fridge volumes were revealed externally. The scheme presented to the DRP concealed the majority of the fridges behind the bands, with only a small reveal around the entrance. The bottom of the Band in these earlier proposals was otherwise level with the top of the Plinth, with a narrow shadow gap to articulate this joint.</p> <p>The design team believe that the revised scheme, with the continual rise and fall of the band, successfully uses the third element of the Fridges to make a clear distinction between the Band and the Plinth, while allowing the internal configuration to be read from outside. We think this is an honest representation of the architectural parti, with the Fridges acting as the thermal envelope and the band as a unifying wrapper.</p>
C9	<p>Need for details of planted gabions and maintenance strategy.</p> <p>The Design and Access statement provides proposed details for the gabion basket construction. The design team wishes to explore options to reuse demolition material as fill for the baskets as opposed to virgin quarried materials, in order to minimise the environmental footprint. However this approach will be dependant of the availability and structural suitability of material. Opportunities for the use of material banks will be explored, but this will require full participation of the supply chain. It is proposed that the development of the basket fill material is explored further during the technical design stage.</p> <p>The planting of the gabions will incorporate both ground level planting and plug planting within the wall. Temporary irrigation will be provided until the planting becomes established. Maintenance will be carried out by LVRPA as part of the site wide landscape maintenance. Refer to the detailed landscape proposals in this Design and Access Statement for more details.</p>

COMMENT		DESIGN RESPONSE
C10	Question over integration of entrance door in façade.	See Item C8 above. The design team believes the location of the door on the centre axis of the foyer space and external terrace and water features, places an emphasis on the building centreline and the entrance, assisting legibility. The entrance door has been repositioned to place it directly opposite the reception desk to ensure clear internal circulation. The specification of the door will mitigate draughts, while allowing full access for wheelchair users and users with large equipment holdalls. Alternative arrangements were tested during Stage 3 design development including canopies, porches and lobbies, but the proposed arrangement was felt to be uncluttered and most spatially efficient.
C11	Acknowledgement of improvements to landscape scheme since the proposals presented in June 2019	Noted.

10.2. APPENDIX C- CRIME PREVENTION STATEMENT

LVRPA are redeveloping the existing site to increase the ice rink capacity and improve the other public facilities.

Secured by Design (SBD) is a police initiative that improves the security of buildings and their immediate surroundings to provide safe places to live, work, shop and visit by considering the security from the outset in a structured manner, embedding it in the planning process and other building and site assessment schemes such as BREEAM. The facility will achieve a 'Very Good' rating and will be targeting an 'Excellent' under BREEAM 2014 and will achieve the SBD objectives under Hea 06 (Safety and security). This process commenced early in the design to inform the development. It is based on a Security Needs Assessment (SNA) that has been completed and a security strategy developed with LVPRA. A visual audit of the site and surroundings to identify environmental cues and features pertinent to the security of the proposed development was completed and together with an assessment of local crime statistics. The DOCO was contacted.

The SNA has been used to inform the development of the security measures that will form part of the built environment and complement the operational procedures and policies that will be implemented by the operator. The SNA was produced to consider all the potential threats that site and operations could be exposed to, assess them and agree with the LVPRA which required mitigation in the design of the building and site. Some will be managed and dealt with using operational overlays and procedures. The site design implements SBD guidelines and adopts a Crime Prevention Through Environmental Design (CPTED) approach, which has been achieved both externally and internally by:

- Designing the external lighting in the carpark and public access routes to be of a high quality to support CCTV and natural surveillance by the public and employees. Specific attention has been given to vertical illuminance and colour rendering. The lighting levels exceed those recommended whilst still achieving the environmental control targets,
- Lighting is used to enforce territoriality and encourage users to stay in "safe" areas for the main thoroughfares,

- A comprehensive CCTV surveillance is provided of the car park, cycle parking, vulnerable locations and designated approach routes,
- The provision of secure cycle parking in a naturally overlooked area and high footfall areas,
- Selection and management of new landscape planting to minimise the opportunities for concealment of items, persons or interrupt the CCTV fields of view,
- Access and movement such that the site has well-defined access routes, spaces and entrances where the potential conflict areas existing are minimised,
- All planned publicly accessible space is overlooked, such as the main entrance and the route of regular pedestrian movement, to reduce the likelihood of crime and promote a sense of safety,
- Ownership is promoted using wayfinding and clear surface finishes to promote private and public areas,
- Selection of finishes to the building and security rating of publicly accessible doors and windows, and
- The car park has access control to the car park out of normal opening hours whilst maintaining access to the marina for pedestrians. This is aimed at controlling misuse of the space. Operationally cars will not be allowed to stay onsite after the facility has been closed.

Within the building a range of electronic security measures will be installed including:

- Intruder detection and alarm system (IDS), CCTV, and
- Electronic Access Control System (EACS).

The IDS has been designed to:

- Allow the site to be classified as lock and leave. This will allow a police response to be called if an intruder is detected and verified, and
- The system can be zoned to allow a flexible management pattern.

The EACS has been designed to:

- Create public and private areas to restrict access and enforce territoriality,
- Secure high value and operational critical areas,
- Detect if misuse occurs of access-controlled doors, and
- Complement the intruder detection system to control movement of intruders.

The CCTV has been designed to:

- Provide an evidence base for forensic analysis post event,
- Provide continuity of video evidence moving through the building in public into private areas, and
- Act as a deterrent to unauthorised acts by providing coverage to high risk areas and areas where conflict between customers might exist.

The design of the video surveillance system will meet the requirements of the surveillance camera code of practice issued by the Office for the Information Commissioner and meet the requirements of the General Data Protection Regulation (GDPR) and the Data Protection Act 2018.

The sales and amenities strategy has been designed around minimising the need for cash handling on site has been reduced to a minimum and no ATM will be installed. All the security systems will be integrated to allow the facility to be managed during everyday operations and special events.

Therefore, the design process has considered security from the outset, designed in security and wherever possible removed or reduced opportunities for criminal activity through poor design. The measures are risk based, have been based on recognised good practice advocated in SBD guidance and an end user, experienced in the operation of these facilities has been engaged with to ensure they complement the operations.



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