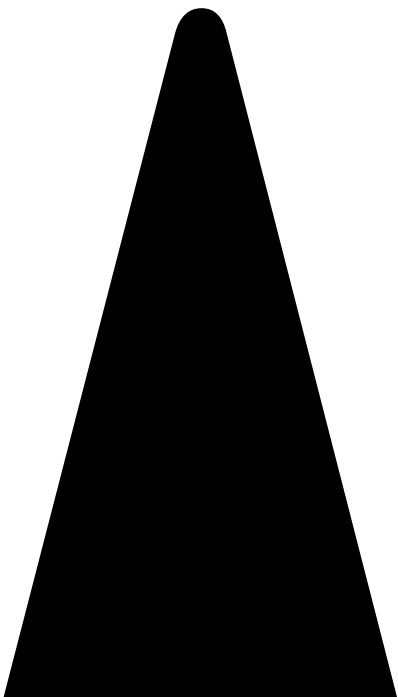
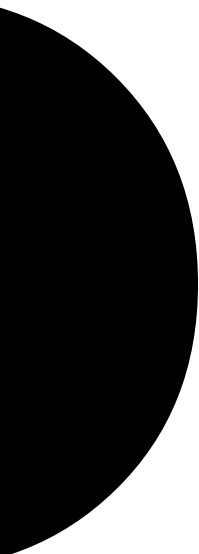
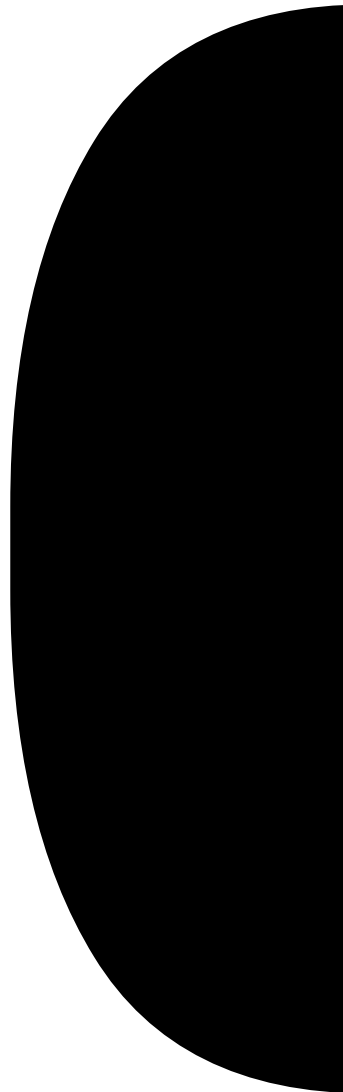
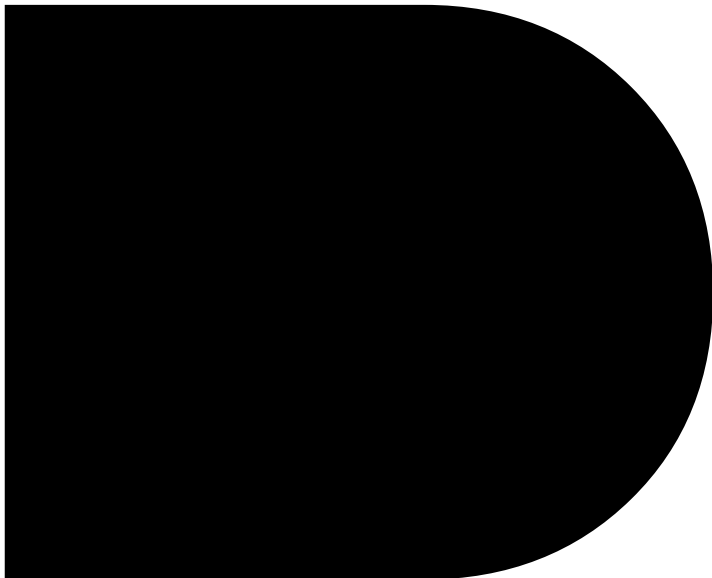


**FAULKNERBROWNS  
ARCHITECTS**



CARDIFF  
VELODROME  
DESIGN AND ACCESS  
STATEMENT



# FAULKNERBROWNS ARCHITECTS

## Contents

1.0	Introduction	009
2.0	Site, Context & Heritage	017
3.0	Demand	033
4.0	Design	049
5.0	Access & Inclusivity	107

Prepared by AS  
Checked by JC

## The Project Team

**Client:** Cardiff Council  
**Project Management:** RPA Group  
**Architect:** FaulknerBrowns Architects  
**Structural Engineer:** WSP  
**Civil Engineer:** WSP

**Services Engineer:** WSP  
**Planning Consultant:** WSP  
**Cost Consultant:** RPA Group  
**Environmental Consultant:** WSP

# INTRODUCTION





# 1.0

## Introduction

This Design and Access Statement has been prepared by Faulknerbrowns Architects to accompany the detailed planning application for the proposed outdoor velodrome on the site of the existing Toys R' Us car park within the regeneration district known as the International Sports Village, Cardiff. The new scheme proposal is known as "Cardiff Velodrome" and the site "International Sports Village (ISV)", for the purposes of this document.

The Design and Access Statement has been prepared in accordance with the Town and Country Planning (Development Management Procedure) Order 2015, the Department of Communities and Local Government (DCLG) 'Guidance on Information Requirements and Validation' (published 2010) ('the and the Commission for Architecture and Built Environment publication 'Design and Access Statements how to write, read and use them'.

The submission of a Design and Access Statement (DAS) is required as part of the detailed planning application by article 9 (Part 3) of the 2015 Order.

Specific matters for consideration are planning context, demand, site, heritage and context, placemaking, design, flood mitigation, landscape, access and lighting, all of which have been incorporated in the Design and Access Statement as follows:

### PLANNING CONTEXT

A full review of planning policy relevant to the proposed Cardiff Velodrome have been provided in the Planning Statement which accompanies the Planning application. A number of key considerations have been covered on the following pages.

### SITE, CONTEXT & HERITAGE

Section 2.0 defines the application site as supported by the drawings that accompany this application. The immediate and wider heritage and context are also covered in this section.

### DEMAND

The demand for the velodrome is outlined in section 3.0 alongside the social and economic context which outlines the need for a new velodrome within Cardiff. Section 3.0 also illustrates the impact the proposed new velodrome will have on the success of the wider ISV as well as adjacent developments and the wider Cardiff Bay.

### PLACEMAKING

The proposed placemaking objectives and layout of the detailed application zone along with the placemaking aspirations for the velodrome are addressed in section 4.0.

### DESIGN

The scale, appearance and design of the proposed velodrome have been outlined in section 5.0. Alongside this, section 5.0 also includes illustrative material studies of the proposed velodrome and the associated wind break.

### LIGHTING

An overview of the proposed lighting of the new velodrome is provided in section 5.0, this covers both internal and external lighting approaches. A separate detailed lighting document has also been provided as part of the submission.

### ACCESS

Pedestrian and Inclusive access is addressed in section 6.0. Future maintenance and management access is supported by an independent access statement that is submitted in support of this application.

### DRAWINGS

A full set of drawings have been submitted separately in support of this document. A full list of those drawings can be found on the following page.



**CARDIFF VELODROME PLANNING SUBMISSION DRAWING REGISTER**

Description	No.	Drawing no.	Drawings	Size	Roatation	Scale	Status	Notes
<b>Existing Site Info</b>	1	3846-FBA-00-XX-DR-A-01_01	SITE LOCATION PLAN	A3	L	1:1250	P1	
	2	3846-FBA-00-XX-DR-A-01_02	SITE LOCATION PLAN	A1	L	1:1000	P1	
	3	3846-FBA-00-XX-DR-A-01_03	APPLICATION AREA	A1	L	1:500	P1	
	4	3846-FBA-00-XX-DR-A-01_04	EXISTING SITE PLAN	A1	L	1:1000	P1	
	5	3846-FBA-00-XX-DR-A-01_05	PROPOSED SITE PLAN	A1	L	1:1000	P1	
	6	3846-FBA-00-XX-DR-A-01_06	INDICATIVE MASTERPLAN	A1	L	1:1000	P1	
<b>GA Floor Plans</b>	7	3846-FBA-00-XX-DR-A-01001	PROPOSED VELODROME PLAN	A1	P	1:250	P1	
	8	3846-FBA-00-XX-DR-A-01000	PROPOSED GROUND FLOOR PLAN	A1	L	1:100	P1	
	9	3846-FBA-00-XX-DR-A-01100	PROPOSED FIRST FLOOR PLAN	A1	L	1:100	P1	
	10	3846-FBA-00-XX-DR-A-01200	PROPOSED ROOF PLAN	A1	L	1:100	P1	
<b>Site Sections</b>	11	3846-FBA-00-XX-DR-A-01_20	EXISTING AND PROPOSED SITE SECTION A-A	A1	L	1:500	P1	
	12	3846-FBA-00-XX-DR-A-01_21	EXISTING AND PROPOSED SITE SECTION B-B	A1	L	1:500	P1	
	13	3846-FBA-00-XX-DR-A-01_22	EXISTING AND PROPOSED SITE SECTION C-C	A1	L	1:500	P1	
	14	3846-FBA-00-XX-DR-A-01_23	EXISTING AND PROPOSED SITE SECTION D-D	A1	L	1:500	P1	
<b>GA Sections</b>	15	3846-FBA-00-XX-DR-A-01_30	BUILDING LONG SECTION	A1	L	1:50	P1	
	16	3846-FBA-00-XX-DR-A-01_31	BUILDING SHORT SECTION	A1	L	1:50	P1	
<b>Elevations</b>	17	3846-FBA-00-XX-DR-A-01_50	PROPOSED BUILDING ELEVATION NORTH	A1	L	1:50	P1	
	18	3846-FBA-00-XX-DR-A-01_51	PROPOSED BUILDING ELEVATION SOUTH	A1	L	1:50	P1	
	19	3846-FBA-00-XX-DR-A-01_52	PROPOSED BUILDING ELEVATION EAST	A1	L	1:50	P1	
	20	3846-FBA-00-XX-DR-A-01_53	PROPOSED BUILDING ELEVATION WEST	A1	L	1:50	P1	
	21	3846-FBA-00-XX-DR-A-01_54	PROPOSED VELODROME LONG ELEVATION	A1	L	1:200	P1	
<b>Detailed Elevations</b>	22	3846-FBA-00-XX-DR-A-01_60	BAY STUDY 001	A2	P	1:50	P1	
	23	3846-FBA-00-XX-DR-A-01_61	BAY STUDY 002	A2	P	1:50	P1	
<b>3D Details</b>	24	3846-FBA-00-XX-DR-A-01_70	PROPOSED ENTRANCE DETAIL	A2	L	1:25	P1	
	25	3846-FBA-00-XX-DR-A-01_71	3D BAY STUDY	A1	P	1:25	P1	
	26	3846-FBA-00-XX-DR-A-01_72	3D TRACK SECTION	A1	L	N/A	P1	
	27	3846-FBA-00-XX-DR-A-01_73	3D SITE COMPOSITION 001	A1	L	N/A	P1	
	28	3846-FBA-00-XX-DR-A-01_74	3D SITE COMPOSITION 002	A1	L	N/A	P1	
<b>Details</b>	29	3846-FBA-00-XX-DR-A-01_80	WALL DETAIL 001	A1	P	1:5	P1	
	30	3846-FBA-00-XX-DR-A-01_81	WALL DETAIL 002	A1	P	1:5	P1	
	31	3846-FBA-00-XX-DR-A-01_82	WALL DETAIL 003	A1	P	1:5	P1	
	32	3846-FBA-00-XX-DR-A-01_83	ROOF PITCH DETAIL	A1	P	1:5	P1	
	33	3846-FBA-00-XX-DR-A-01_84	VALLEY GUTTER DETAIL	A1	P	1:5	P1	
	34	3846-FBA-00-XX-DR-A-01_85	PERIMETER GUTTER DETAIL 001	A1	P	1:5	P1	
	35	3846-FBA-00-XX-DR-A-01_86	PERIMETER GUTTER DETAIL 002	A1	P	1:5	P1	
	36	3846-FBA-00-XX-DR-A-01_87	TRACK HANDRAIL DETAIL	A3	L	1:10	P1	
<b>Wind Break</b>	37	3846-FBA-00-XX-DR-A-01_90	WINDBREAK DETAIL	A1	L	1:20	P1	
	38	3846-FBA-00-XX-DR-A-01_91	3D WINDBREAK STUDY 001	A1	L	N/A	P1	
	39	3846-FBA-00-XX-DR-A-01_92	3D WINDBREAK STUDY 002	A1	L	N/A	P1	
	40	3846-FBA-00-XX-DR-A-01_93	3D WINDBREAK STUDY 003	A1	L	N/A	P1	
	41	3846-FBA-00-XX-DR-A-01_94	3D WINDBREAK STUDY 004	A1	L	N/A	P1	
	42	3846-FBA-00-XX-DR-A-01_95	WINDBREAK 3D BUILD UP	A1	L	N/A	P1	

Figure 001 (above): Cardiff Velodrome Planning Drawing Submission Register

The development of Cardiff Velodrome represents a major phase of a wider Cardiff Bay and ISV renewal agenda which has already seen the redevelopment of the former derelict land to create Cardiff International Pool and Ice Arena Wales.

The development of the wider ISV, which is due to deliver new homes, offices and retail opportunities and the new home of sport in South Wales will activate and re-energise the area creating a new destination in the Bay.

Cardiff Velodrome will represent a true and much needed boost to the ISV, its progression and will provide a key turning point to the development of the wider site, that once complete will see this once in a generation redevelopment of Cardiff's new ISV realised.

The wider vision is to create a new part of Cardiff which is thriving, socially inclusive, sustainable and enjoyable. The ambition is to give Cardiff a place that is varied and diverse and is supported by a sustainable blend of uses that delivers active and varied use throughout the day and through the evening. It is hoped that the new Cardiff Velodrome will enable Cardiff International Pool, Ice Arena Wales, and the future wider development of the ISV to act as a single destination, improving the draw and quality of both the existing and new quarters of the Bay.

#### A NEWLY CONNECTED PART OF THE CITY

The following document illustrates a series of design parameters that the proposed Cardiff Velodrome strives to address. In short the new Cardiff Velodrome will:

1 - Provide a new high quality velodrome, meeting and exceeding the opportunities currently experience at the Maindy site. A new outdoor velodrome will create a strong visual link and create a welcoming front door to the ISV. Doing so will open new urban connection opportunities through the ISV, connecting the ISV back into the Bay Loop and the city beyond.

2 - Reinforce the strong urban waterside destinations that have been created by the development of Cardiff International Pool and the Ice Arena Wales by connecting the two with a truly accessible and level future public space. Removing the requirement for users to need to transition to the development as an out of the way destination.

3 - Manage and negate the impact of future events and developments at the ISV. The addition of the new Cardiff

Velodrome will not negatively impact or worsen the current public realm and will aim to increase and enhance the ISV as a destination at the Bay.

4 - Provide a new and interesting way of engaging with sport, the ISV and the wider bay loop. Providing a space to stop and take in the beauty of sport and cycling in South Wales.

5 - Maintain and improve upon the quality and standards set by the existing sports infrastructure on the site and will add to Cardiff's rich history of sport architecture.

6 - Not distract from the wider bay to which the velodrome will form a new and significant piece of.

7 - Provide a simple and elegant design solution to providing a new velodrome within this location considering all the above.

#### THE CLIENT BRIEF

The guiding vision of this application is the creation of a detailed design that will regenerate and fully integrate a new piece of urban fabric into the existing context of the ISV, regenerating the currently dislocated site by establishing a new outdoor velodrome to replace the existing site at Maindy which is due to be decommissioned as part of wider redevelopments plans.

This vision requires commitment and excellence from all who become involved and has informed the client's instructions given to the design team throughout the design process.

The new Cardiff Velodrome aspires to create a new piece of urban fabric that combines the strengths of the ISV to revitalise Cardiff's position as a major living, working and recreational destination both in Wales and nationally.

The ambition is to bring life to this new vibrant quarter within the bay, unifying public spaces and reinforcing the unique character of the new sports environment at the ISV.

With an aspiration to create a new waterside destination at the ISV with residential and public spaces and landscapes at the heart of the development connecting into the bay loop and public spaces at Mermaids Quay and Roald Dahl Plass it is the aim for Cardiff's new velodrome to become a regional and national destination in its own right.

Early on in the design process it was clear what the main guiding design principles were for the development of the new velodrome, these are best summed up in a statement:

*"The new Cardiff Velodrome will provide an outstanding new sports facility that will not only match the facilities currently provided at Maindy, but will improve upon the existing velodrome offer Cardiff has.*

*The velodrome will respond architecturally to the historic and contextual surrounds in which it will be located. The velodrome will utilise modern engineering methods to ensure that there is a forward thinking sports facility fitting for its new location at the heart of Cardiff Bay."*

#### OTHER MATERIAL CONSIDERATIONS

Cardiff International Sports Village Masterplan - Ongoing. The Masterplan will eventually be intended as a briefing document to outline the strategic context for the development of the ISV and to guide investment. The Masterplan will seek to identify the adjacent sites as a major project locations and will highlight that the Council is keen to encourage development solutions which secure improvements to the ISV and wider Bay.

Although work on the wider ISV masterplan is ongoing the development of the Velodrome scheme has been progressed with the wider and longer term nature of the site in mind. This has informed the location and positioning of the track, pavilion and access point with an eye on future public realm and sports infrastructure.

#### CONSULTATION AND COMMUNITY INVOLVEMENT

Given the nature and sensitivity of the development consultation with the public and local community groups has been ongoing throughout the design process to ensure the new design best meets the requirements of both council and users of the facility.

This approach embraces the fact that communities can make a difference and feel a sense of ownership of Local Planning and Policy decisions.

The engagement strategy is based on the following principles:

- Telling communities and other interested third parties about emerging policies and proposals in good time;
- Enabling communities to put forward ideas and suggestions and participate in developing proposals and

options;

- Consulting on proposals;
- Ensuring that consultation are accessible both in location and times; and
- Providing and seeking feedback.

Extensive pre-application discussions have been held with the LPA, statutory consultees and members of local teams and clubs that will utilise the facility. This process began in early 2021.

#### PUBLIC CONSULTATION: SEPTEMBER 2021

Following the limitations on group meetings and gatherings following the Covid-19 epidemic it was decided to host the public consultation for the new Cardiff Velodrome online. The purpose of the online 'event' was to present the vision for the velodrome as part of the continued regeneration of the ISV.

In September 2021 Pre-Application Consultation (PAC) was carried out. This involved informing key stakeholders and local residents of the proposed planning application via email and by putting up site notices in the International Sports Village. The draft planning application documents were then made available publicly online, and a 28 day consultation period was had in which any queries or comments regarding the application could be sent to the project team. During the consultation period a total of nine responses were received from local residents. The responses raised queries regarding access, increases traffic, car parking, public transport, the development of a closed-circuit track, the wider ISV masterplan, community services, crime, design, environmental and economic impact, construction, and the existing Maindy velodrome. Comments in support of the development were also received from local residents who welcome investment in the area. Comments were received from specialist consultees National Resources Wales (NRW). NRW recommended that further information was provided regarding European Protected Species and Land Contamination. Our responses to the queries raised, and further information on the consultation process is available in the PAC Report.

# SITE, CONTEXT & HERITAGE





# 2.0

## Site, Context & Heritage

Cardiff has become the location of choice for people working in the wider region and beyond, all of whom take advantage of the connectivity that makes it so accessible.

With almost 300,000 people living within South Wales, Cardiff sits at the heart of a region that is home to high-quality skills, talent and employment across a broad range of sectors, as well as a thriving student and tourism economy.

### WITHIN 15 MINUTES WALK

Cardiff Bay
Cardiff Barrage
Bayscape
Penarth Marina & Haven
Penarth Leisure Centre
Plymouth Park
Grangemoor Park

### IN WALKING DISTANCE

Ice Arena Wales	100M / 2 MINS
Cardiff International Pool	100M / 2 MINS
Cardiff International White Water	482M / 3 MINS
Pont y Werin Bridge	4 MINS
Cardiff Bay Trail	5 MINS
Cardiff Bay Wetlands Reserve	20 MINS
Mount Stuart Graving Docks	28 MINS
Mermaid Quay	29 MINS
Roald Dahl Plass	31 MINS
The Senedd	31 MINS
Wales Millennium Centre	32 MINS
Cardiff City Stadium	42 MINS
Principality Stadium	44 MINS

### LOCATION

The site of the new velodrome is located in the heart of Cardiff Bay at the evolving International Sports Village with its fast evolving and brand new waterside destination.

Driven by new sports development such as the International Pool and Ice Arena the ISV is becoming a new and thriving destination with aspirations to feature new restaurants, bars and leisure provisions. All supported by hotels, luxury apartments, contemporary offices and some of the best views of the bay that can be found in the city.

### CARDIFF INTERNATIONAL POOL

Cardiff International Pool is an Olympic-sized swimming pool built as a public-private funded project; with a partnership between Cardiff Council, OLLC which is a partnership between Orion Land & Leisure and Explore Investments and Parkwood Leisure.

### ICE ARENA WALES

Ice Arena Wales is an ice hockey rink in the Cardiff International Sports Village in Cardiff, Wales. It opened on 12 March 2016, and has two ice rinks and seating for 3,088 spectators.

### CARDIFF INTERNATIONAL WHITE WATER

Cardiff International White Water is an Olympic standard white water rafting centre based at the Cardiff International Sports Village in Cardiff Bay. The centre opened on 26 March 2010, after taking two years to build the £13.3m venue, which is the first on-demand white water centre in the UK.

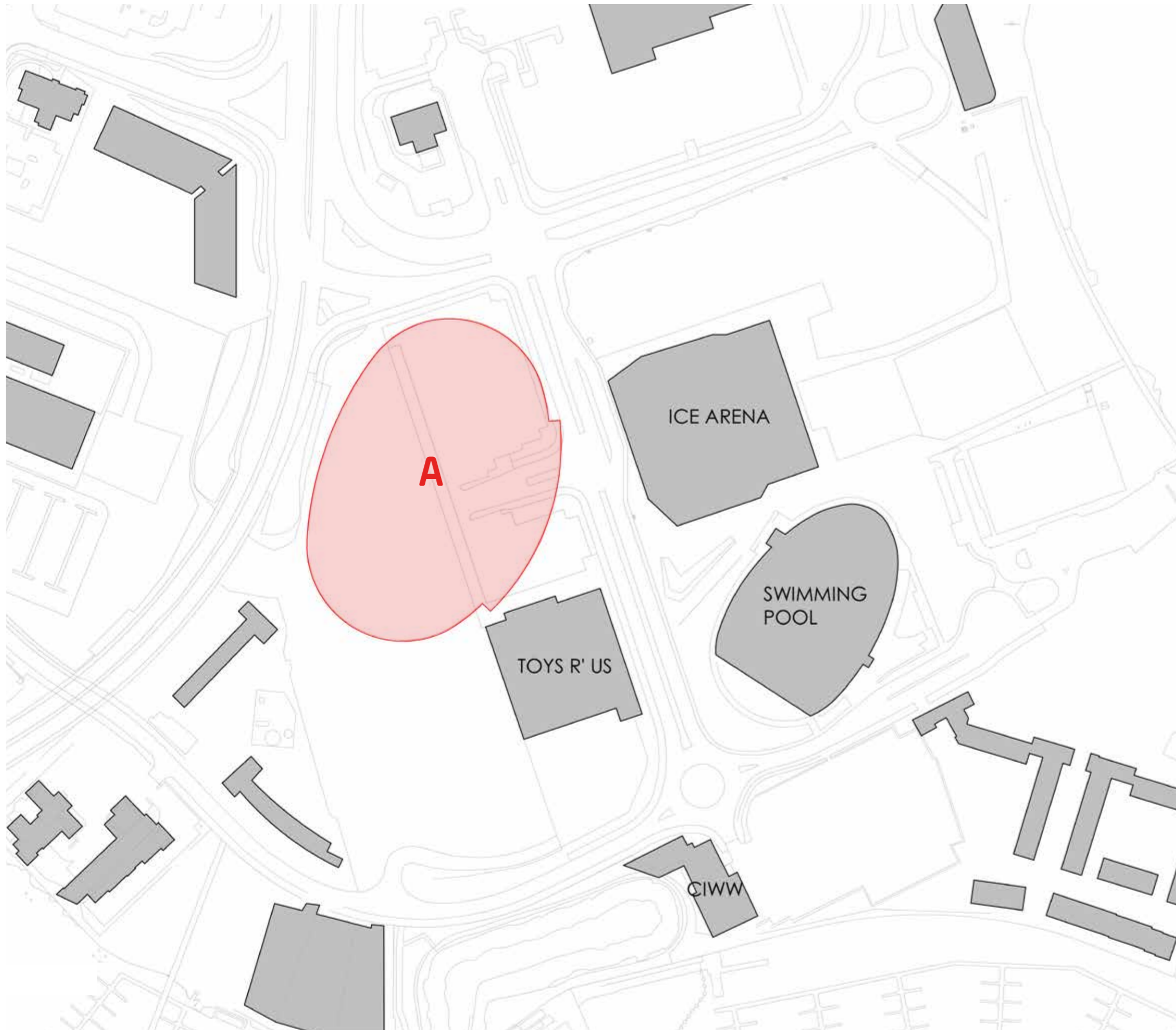
### THE SITE

The application site that forms the base for the submission of the new Cardiff Velodrome is outlined on the following page. The application site measures 14,175.5m<sup>2</sup>.

The site sits to the north west of the ISV on land currently composed of brown field site and car park for the old Toys R' Us. Recently the car park has provided parking for the NHS vaccination centre within the old Toys R' Us building.

The area extends three meters beyond the proposed footprint of the development to allow for any minor landscape works and any required services connections.





#### EXISTING SITE CONDITION

The submission site spans the existing Toys R' Us car park and the adjacent brown field land at the existing site level of approximately +10.90m AOD.

The red line site is relatively compact but does allow for minor landscape alterations and any services connections required to operate, maintain and access the velodrome and associated building.

The submission site sits on land owned by Cardiff Council and is in a generally OK condition. Previous uses of the land as waste fill mean there are conditions within the ground, but these are understood by the team and it is believed that the potentially contaminated land sits on average three meters below the existing ground level.

There are plans in place for the redevelopment of the wider ISV as part of the councils ambitions to accelerate development and increase investment in the area.

Initial investigations into the current condition of the site have carried out as part of initial design development.

#### APPLICANT

This submission is being made by Cardiff Council.

#### SITE LOCATION PLAN

An extract from supporting drawing: 3846-FBA-00-XX-DR-A-01\_03 has been included on the next page for clarity.

Figure 002 (above): Extract from drawing 3617-FBA-00-XX-DR-A-01\_04





APPLICATION  
AREA: 15,515m2

ICE ARENA

TOYS R' US

SWIMMING  
POOL

Figure 003: Extract from drawing 3846-FBA-00-XX-DR-A-01\_03





## CONTEXT

The proposed new velodrome sits to the north of the existing Toys R' Us unit and to the west and north west of the more recent Ice Arena and International Pool respectively.

This marks a key location in the wider context of Cardiff and the new ISV Quarter that is emerging.

The new developments across the wider ISV from the leisure to the residential and the cafe and bar offers illustrate an increasing footfall focused around the Bay and the ISV. These spaces are however connected by wide, windswept spaces with the low quality landscaping that does not encourage and increased dwell time or better activation of the spaces with people and activity. The addition of a new front door offered by the new velodrome will capture a more significant space at the centre of the leisure offer, and will go along way to setting the groundwork for the future ISV masterplan.

The site offers unprecedented and unrivalled views of Cardiff, the Bay and wider coastline through a full 360 degree panorama. The ISV site and the proposed velodrome offer new views and vistas both to and from separate areas of the bay.

The immediate architectural context offers large form, blank boxes with little to offer in way of ground floor activation the scene is set for a modern intervention at the heart of the ISV.

The drawing adjacent outlines the context in which the site and proposed velodrome sit.

01 - Proposed Velodrome Location

02 - Cardiff International Pool

03 - Ice Arena Wales

04 - Cardiff International White Water

05 - Toys R' Us

06 - Existing Residential

07 - Cardiff Bay Yacht Club

08 - Pont y Werin Bridge

09 - Cardiff Barrage

10 - Cardiff Bay

11 - River Ely

12 - River Taff

13 - Cardiff Bay Link Bridge

14 - Portway Marina

15 - Plymouth Park

16 - Grangemoor Park

17 - Cardiff Bay Wetlands Reserve

18 - Mount Stuart Graving Docks

19 - Mermaid Quay

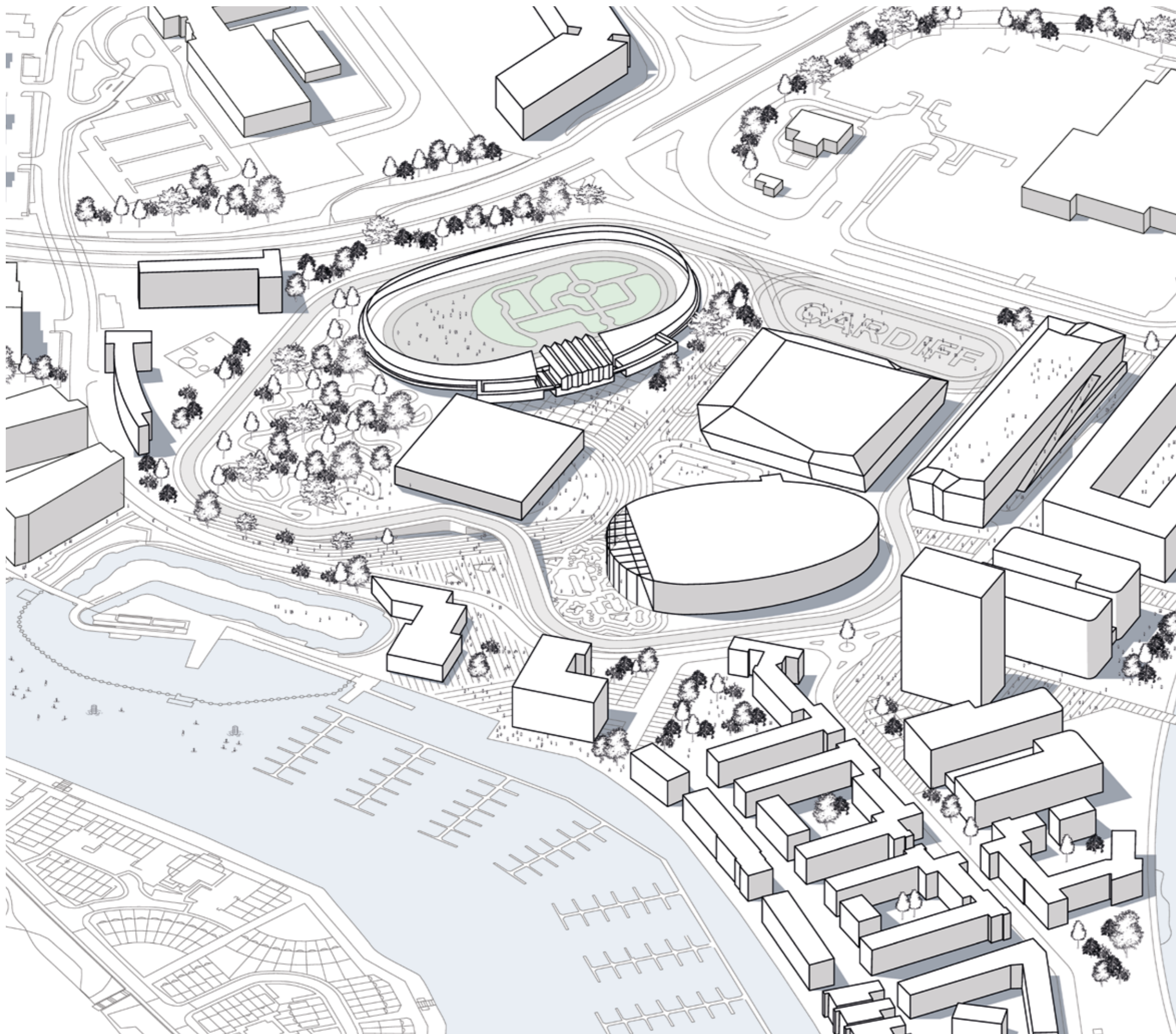
20 - Roald Dahl Plass

21 - The Senedd

22 - Bristol Channel

Figure 004 (above): Cardiff Velodrome context plan





## CONNECTED TO THE BAY

The proposed new velodrome and the regeneration it will hopefully bring to the ISV is critical to both the success the velodrome and ISV impart on the bay, and visa versa.

Both are not mutually exclusive, and have to work in combination to ensure further exceptional development around the bay.

*The regeneration of Cardiff Bay was undertaken to create a complementary mix of housing, open space, commerce, leisure and industrial development. The total estimated cost of the scheme was £2.4 billion, with a public/private leverage ratio of 1:2. That is, the government funding was expected to attract double the investment from the private sector.*

*Some of the significant achievements of the project included the construction of a Barrage across the mouth of the Bay to create a 200-hectare freshwater lake; new homes, such as those at Atlantic Wharf; and new offices, including Crickhowell House, now the home of the National Assembly for Wales.*

*The development also created commercial and leisure facilities, such as those at Mermaid Quay on the waterfront, and the Atlantic Wharf Leisure Village (now known as The Red Dragon Centre). Many jobs were also created by the Regeneration Project.*

*The Development Corporation was formally wound up on 31 March 2000. It was estimated that it had achieved the following:*

16750  
NEW JOBS

4800  
NEW HOUSING UNITS

695000  
NON-RESIDENTIAL DEVELOPMENTS (M2)

79  
OPEN SPACE (HECTARES)

327  
LAND RECLAMATION (HECTARES)

42  
ROADS BUILT/UPGRADED (KM)

*The responsibilities of the Development Corporation were passed to four successor bodies on 1 April 2000, namely Cardiff Council (including Cardiff Harbour Authority), the Welsh Development Agency, Vale of Glamorgan Council and the Countryside Council for Wales.*

CARDIFFHARBOUR.COM

Figure 005 (above): Cardiff Velodrome indicative masterplan context 3D





## SITE AND BAY HERITAGE

Cardiff owes much of its history to the Industrial Revolution. The rapidly increasing iron and coal trade was the catalyst for the construction of a number of docks during the 1830s. These included the Bute West Dock, which was the first dock to be opened by the 2nd Marquis of Bute in 1839 and its seaward entrance known as the Oval Basin, the Bute East Dock in 1855, Roath Basin in 1874, Roath Dock in 1887 and the Queen Alexandra Dock in 1907.

During this time, Butetown and the surrounding dockland area grew into a cosmopolitan community, with seafarers from all over the world making Cardiff their home. It's estimated that at least 50 different nationalities settled in this area, which became known as Tiger Bay. This kaleidoscope of settlers assisted with the building of the docks, worked aboard the ships and helped to service this industrial and maritime city.

By the 1880s, Cardiff had transformed from one of the smallest towns in Wales to the largest, and its port was handling more coal than any other in the world. In 1913, the year before the First World War began, exports reached their peak at over 13 million tonnes. At this time, the international price of coal was struck in the Coal Exchange building, and it was here that the world's first £1 million deal was signed!

After the Second World War, however, demand for coal slumped and international deals suffered as other countries developed their own steel industries. Also, trade was increasingly lost to container ports and by the 1960s coal exports had virtually ceased. In 1978, East Moors Steelworks closed with the loss of 3,200 jobs, which dealt a further blow to South Cardiff.

By the early 1980s, Cardiff Bay had become a neglected wasteland of derelict docks and mudflats. Its population suffered from social exclusion and had above average levels of unemployment.

The docklands had given the city its wealth, but had then been disinherited.

The Cardiff Bay Development Corporation was set up in April 1987 to regenerate the 1,100 hectares of old derelict docklands of Cardiff and Penarth. It was part of the British government's Urban Development Programme to regenerate particularly deprived and run-down areas of British inner cities.

The mission statement for the Regeneration Project was:

*"To put Cardiff on the international map as a superlative maritime city, which will stand comparison with any such city in the world, thereby enhancing the image and economic well-being of Cardiff and Wales as a whole."*

While the then Secretary of State for Wales, Nicholas Edwards, set no deadlines for the life of the Development Corporation, he stated that its main objectives should be substantially completed within 10 years.

CARDIFFHARBOUR.COM

Figure 006 (above): Cardiff Bay historical reference image



## CARDIFF INTERNATIONAL POOL

Opened 2008

Construction of the £32 million facility commenced in April 2006 and includes two pools; an Olympic size 50 m (160 ft) 10-lane competition swimming pool with seating for 1,000 spectators and a 25 m (82 ft) 4-lane indoor water park with flume rides, a beach area with water slides, a lazy river and jacuzzi. The centre also has a fitness suite and studios, conference rooms and a café.

The pool was also built to support the London 2012 Olympics as a training facility.

The opening of the pool ended 10 years without an Olympic size pool in Wales since the closure and demolition in 1998 of the Empire Pool (which had been built for the Cardiff-hosted 1958 British Empire and Commonwealth Games) to make way for the Millennium Stadium.



Figure 007, 008, 009, 010 (above): Images of Cardiff International Pool, Sources vary

## ICE ARENA WALES

Opened 2016

Ice Arena Wales is an ice hockey rink in the Cardiff International Sports Village in Cardiff, Wales. It opened on 12 March 2016, and has two ice rinks and seating for 3,088 spectators.

It is home to the Cardiff Devils ice hockey team, who play in the professional British Elite Ice Hockey League, which is the top tier of ice hockey in the UK. It replaced the Cardiff Arena, which was close to the current site. The Cardiff Arena (affectionately named the Big Blue Tent) was a temporary structure, built after the Wales National Ice Rink was demolished in September 2006. The Cardiff Devils played their first game at the arena against Belfast Giants on 12 March 2016.



Figure 011, 012, 013, 014 (above): Images of Ice Arena Wales, Sources vary



DEMAND



# 3.0

## Demand

The success of the velodrome as a piece of infrastructure comes down to its ability to create a sense of place and destination within Cardiff's new ISV quarter. The proposed velodrome connects several aspects of Cardiff's existing ISV infrastructure to create a destination that will allow them to function as one while creating a new focal point at the heart of the ISV.

### PLACEMAKING

Already home to the Cardiff International Pool, Ice Arena Wales and Cardiff International White Water there is no real focus around the public realm which is made of significant road infrastructure and lack lustre landscaping.

The public realm requires significant work and to encourage this to happen there needs to be a means of destination and arrival with a series of carefully considered front doors addressing an arrival sequence. This will then drive an increase in dwell time and a sense of purpose for the ISV, something that is currently lacking.

### MAINDY VELODROME

The existing outdoor velodrome at the site of Maindy Leisure Centre to the north of the city is due to be decommissioned from use as the site is redeveloped to provide new and significantly needed access to educational facilities for the local community. Historically the city of Cardiff has committed to providing a velodrome within the city and has taken this opportunity to re-provide and improve upon the existing facility within a more central and accessible location at the heart of a sports driven destination.

### INTERNATIONAL SPORTS VILLAGE

With the existing partial development on the site of the ISV and the aspiration for an up coming wider ISV development there is a new focus around the ISV and the land that form the immediate open land to the west of Cardiff Bay. Referred too in this application as the International Sports Village or ISV, it encapsulates the new section of Cardiff Bay focused around the positive aspects of the water. These include fresh air, outside space, views and the sense of nature, these are all things that can bring wellness to the users.

### PEOPLE

With the increased density of activity around the bay, comes an increased number of people, the whole region immediately adjacent to the water will have a significant new population

wishing to use facilities to work, live and play. This critical mass is focused around the bay but currently is not provided. The proposed velodrome will be key in creating a destination and help refine the ISV focus and encourage increased investment.

### ACTIVITY

Activity and health are all positive aspects that have been proven to bring greater benefits to local areas, the aspiration is that the proposed velodrome brings together a number of wider activities such as running and multisport and not solely cycling, inadvertently creating a breeding ground for sports excellence throughout the city. This in turn will increase investment and activity in the city. It will also encourage greater activity as the proposed velodrome will help complete and animate the wider bay loop that will encourage physical activities such as running and the associated health benefits of being active outdoors.

### CONNECTIVITY (NEW FERRY CONNECTION)

The new velodrome and the increased draw of the ISV will require a new offer and a new and alternate way to travel too and around the bay that will encourage new visitors and users through the city and increase the success of the new places provided within the ISV, Mermaid Quay and beyond. With this in mind the Council are reviewing the possibility of new ferry connections across the bay as part of the wider ISV strategy.

### MAJOR EVENTS

The success of Maindy Flyers, British and Welsh Cycling and Team Ineos (formally Team Sky) has contributed significantly to the success of the existing velodrome at the current Maindy site within the last few years. The proposed velodrome offers new and exciting ways to view and experience the sport of cycling. This proposed development opens new possibilities for events at all levels, from local club events to major national events.

### FOCAL POINT

The proposed velodrome and its design offers a new and exciting focal point for the new ISV quarter, offering complimentary yet more immediate visual connections to sport allowing the surrounding developments to focus around a new piece of modern design that holds and brings meaning to the central space of the ISV. The velodrome will also act as a new reference point within the city and for people travelling along the A4055.





### CARDIFF BAY LOOP

The circular trail for cyclists and walkers is 10km (6.2 miles) long. It runs around the Bay and across to the seaside town of Penarth via Pont Y Werin, a 140m bridge providing a link for pedestrians and cyclists between Penarth and the International Sports Village.

Along the trail, you can enjoy Cardiff's rich heritage, see historic landmarks, such as the Norwegian Church, alongside iconic buildings like the world renowned Wales Millennium Centre and the Senedd, the Welsh Assembly's building. The vibrant waterfront cafés, bars and restaurants give the Bay a special, unique appeal.

That said, the legibility of the current movement path through and around the ISV is confusing and disorientating for new users and visitors. Way finding and signage is none existent and the experience is significantly hindered by the oversized road infrastructure and the lack of landmarks to help orientate loop users.

There are significant issues that can be addressed alongside the development of the site.

Figure 015 (above): Diagram illustrating the existing bay loop





#### PROPOSED BAY LOOP ENHANCEMENTS

The proposed new velodrome creates a new sense of destination and adds a new front door to the heart of the ISV encouraging movement through the site, signposting the new heart of the ISV and creates a focal point to which users can move around the site.

The velodrome does not directly create new paths but will signpost places and spaces and will act as an iconic signpost as the wider ISV develops and matures the movement paths as part of the wider masterplan.

Rather than changing or challenging the successful bay loop completely, it brings together the more well marked, used and signposted components of the bay loop and aims to signpost a path through the ISV both in its existing and future condition.

Doing so will encourage more use of the wider loop, increasing the success and value of the bay, increase exercise and movement and improve the wellbeing of users of the immediate area.

Figure 016 (above): Diagram illustrating increased connectivity through ISV





Figure 017 (above): Diagram illustrating a future urban corridor as part of the wider ISV development

#### FUTURE URBAN CORRIDOR

The developing masterplan for the wider ISV has evolved around parameters derived from both requirement analysis and the investigation of existing amenity / recreation use patterns.

Conceptually the idea is to create an arc of public realm that completes the bay loop but also brings together the aspiration to have residential and sports and leisure uses across the ISV. This arc will be activated through the use of active public realm, leisure destinations such as cafes, bars and restaurants and open and inviting spaces both internal and external.

The aspiration is that the velodrome and its "front door" will help activate and address this future mixed use space. Both helping to activate the corridor but also to mutually benefit from the users and activity it will bring.



Figure 018 (above): Indicative ISV ground floor study



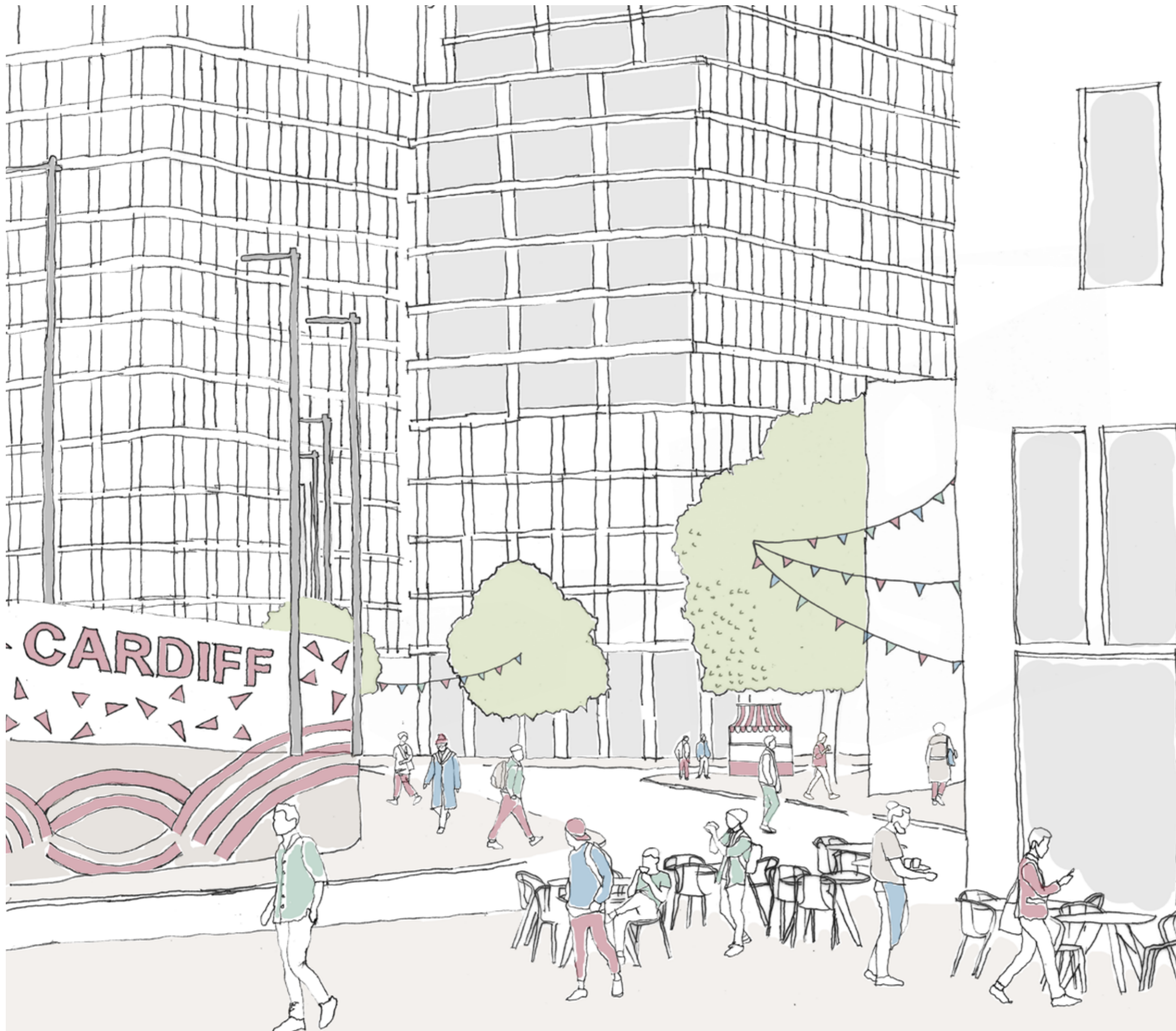


Figure 019 (above): Illustrative sketch picturing new public realm and landscape

#### URBAN AND VISUAL CONNECTIVITY

A fully connected Cardiff Bay will help reinforce the urban loop potential around Cardiff, and provide a much needed boost to the network of new pedestrianised areas across the bay - offering additional variety to the places, adding to the richness and variety of Cardiff and it's potential to deliver a new waterside destination for the city.

Connecting into this wider infrastructure with urban space and an identity will be key to the success of the velodrome in the long term.

With the aspiration to not only act as a base for Cardiff and South Wales' existing cyclists but to draw in and create new cyclists and users who can go on to challenge for national and world titles. Visual connectivity and accessibility is also key to the design of the new velodrome.



Figure 020 (above): Illustrative sketch



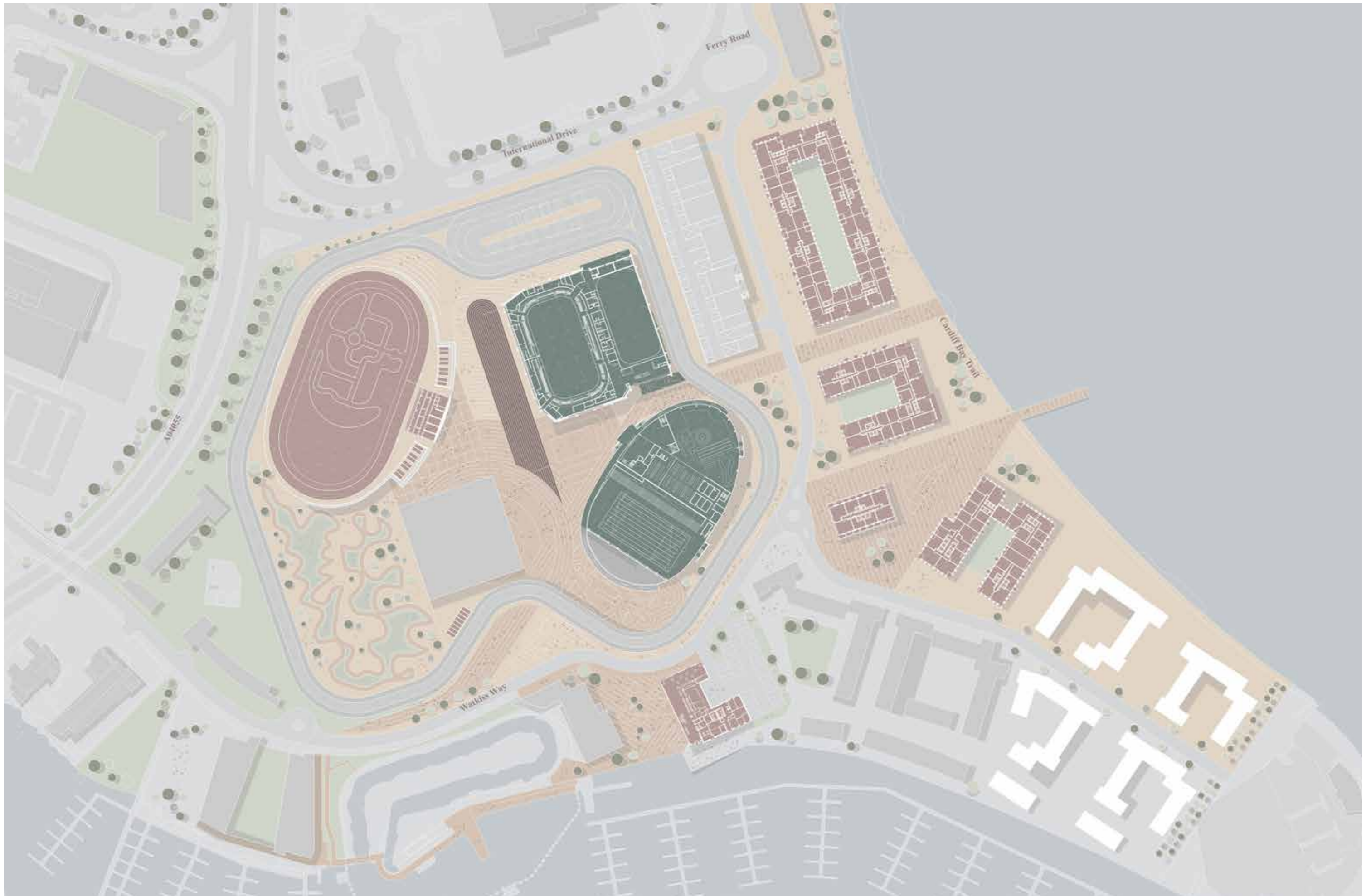


Figure 021 (above): Indicative future masterplan context





Figure 022: Illustrative CGI looking towards the new Velodrome and wider ISV



DESIGN



# 4.0

## DESIGN OBJECTIVES FOR CARDIFF VELODROME

The design requirements of an outdoor velodrome can be deceptively simple, in this case the design of the velodrome had to overcome multiple external factors. The following design objectives result from the planning and regulatory context, discussions with local stakeholders and in response to the site specific conditions alongside the unique context in which the velodrome will sit. The design objectives are:

- Provide a new outdoor velodrome within Cardiff.
- Provide a visually unobtrusive scheme that still remains iconic.
- Maintain a level and accessible connection to the public realm.
- Provide a velodrome alignment that acts as a visual marker at the end of sight lines through the ISV, and surrounding context.
- Bring together a proposed design that blends the velodrome with its surrounding, by drawing on characteristics of the site and its history whilst respecting the integrity of the specific site qualities.
- Ensures the proposal responds to potential future design moves made across the wider ISV masterplan.
- Ensure that the views from the ISV towards Cardiff Bay are respected.
- Ensure that the views back towards the velodrome from Mermaid Quay and the wider Bay are not negatively impacted.
- Create a safe environment for the participation in sport, primarily track cycling, while maintaining a sense of connection to the location.
- Provide sufficient support accommodation for efficient current and future uses and capacities.
- Light the velodrome in a way that provides safe illuminance levels while respecting the existing light level and minimising the ecological impact on surrounding vegetation corridors.
- Explore the possibility of creating a new iconic landmark building and destination for the future ISV.

- Activate the immediate public realm to encourage activity and movement of people around the ISV and Bay.
- Leave the current site with a usable, clean and safe site that can be used by the public.
- Leave the current site with a clean safe site that encourages pedestrian movement through the ISV and down to the waters edge.
- Explore opportunities for future integration of any upgrades to the wider ISV particularly the potential removal of Olympian Drive.
- Manage and mitigate the impact on any environmental or ground conditions.
- Provide a safe and secure environment when the velodrome is in an active condition. This includes time frames before, during and after any events.
- Balance the need to adhere to British Cycling guidance, with the need to meet the objectives above.

## DESIGN INTRODUCTION

Although developed as a single, coherent design in terms of materials, detailing and geometry, the proposal can be broken down into four components:

- A 333m velodrome cycle track
- Associated ground work
- Changing and facilities pavilion
- Wind break, lighting and security canopy

In addition, the proposal incorporates walls and gates at both entries and are included to ensure the site can be run and maintained as a viable facility and can maintain a secure and safe facility.

Lighting within the scheme is downward facing or controlled to minimise light pollution and external lighting can be controlled, dimmed and even turned off at night to mitigate ecological concerns.

The proposed scheme has been developed in conjunction with Cardiff Council.



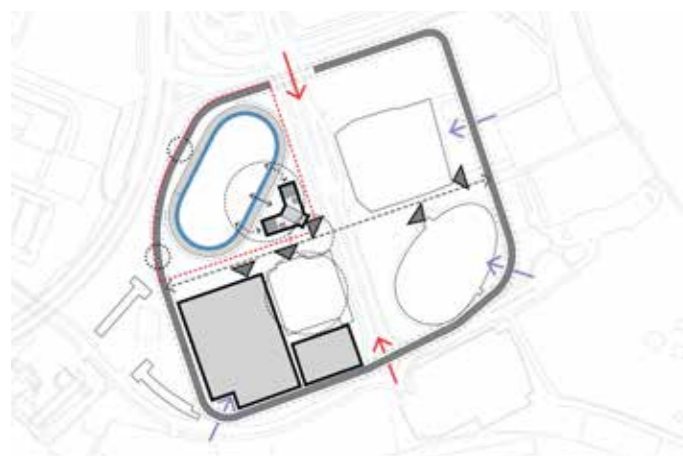
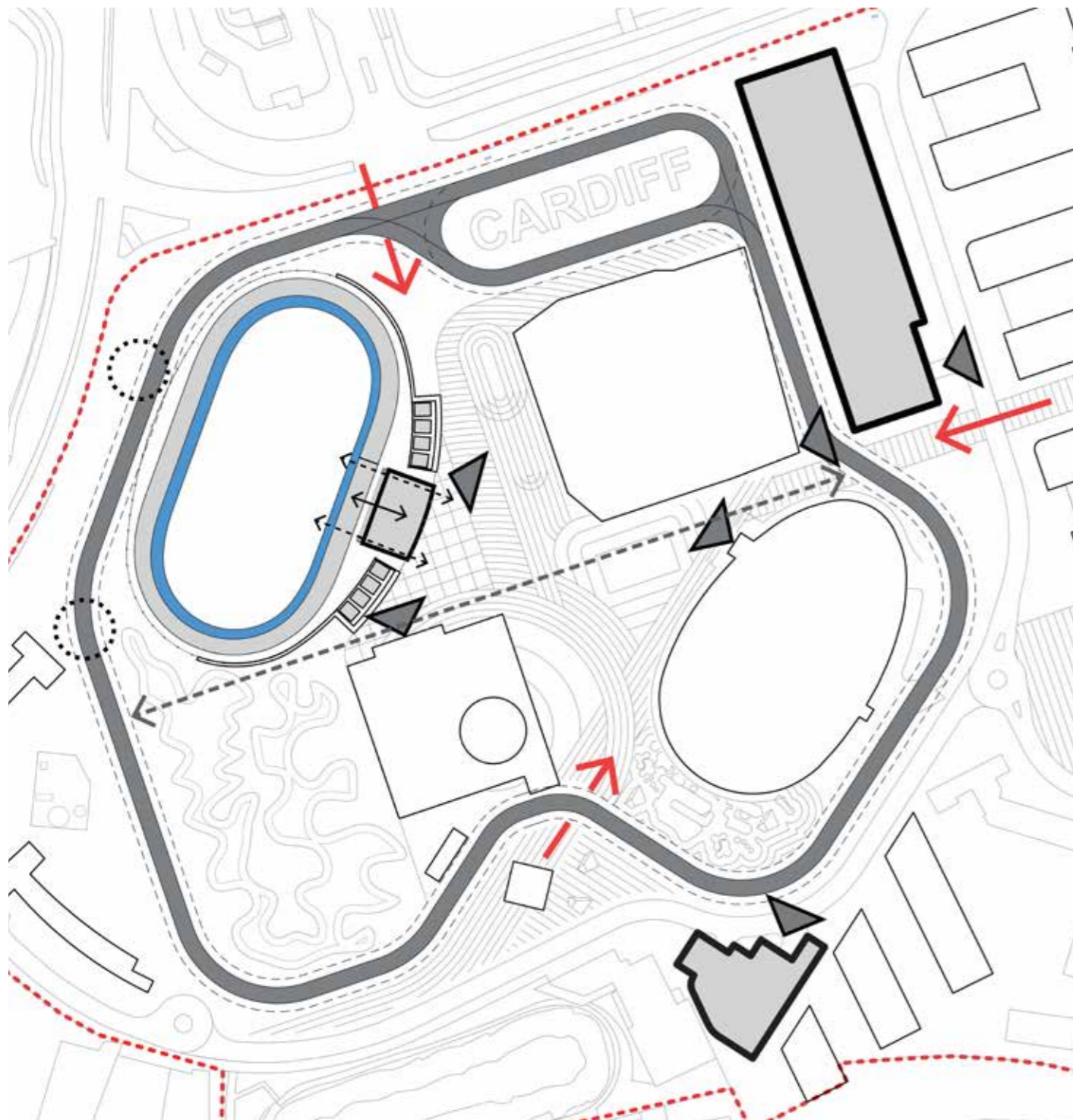
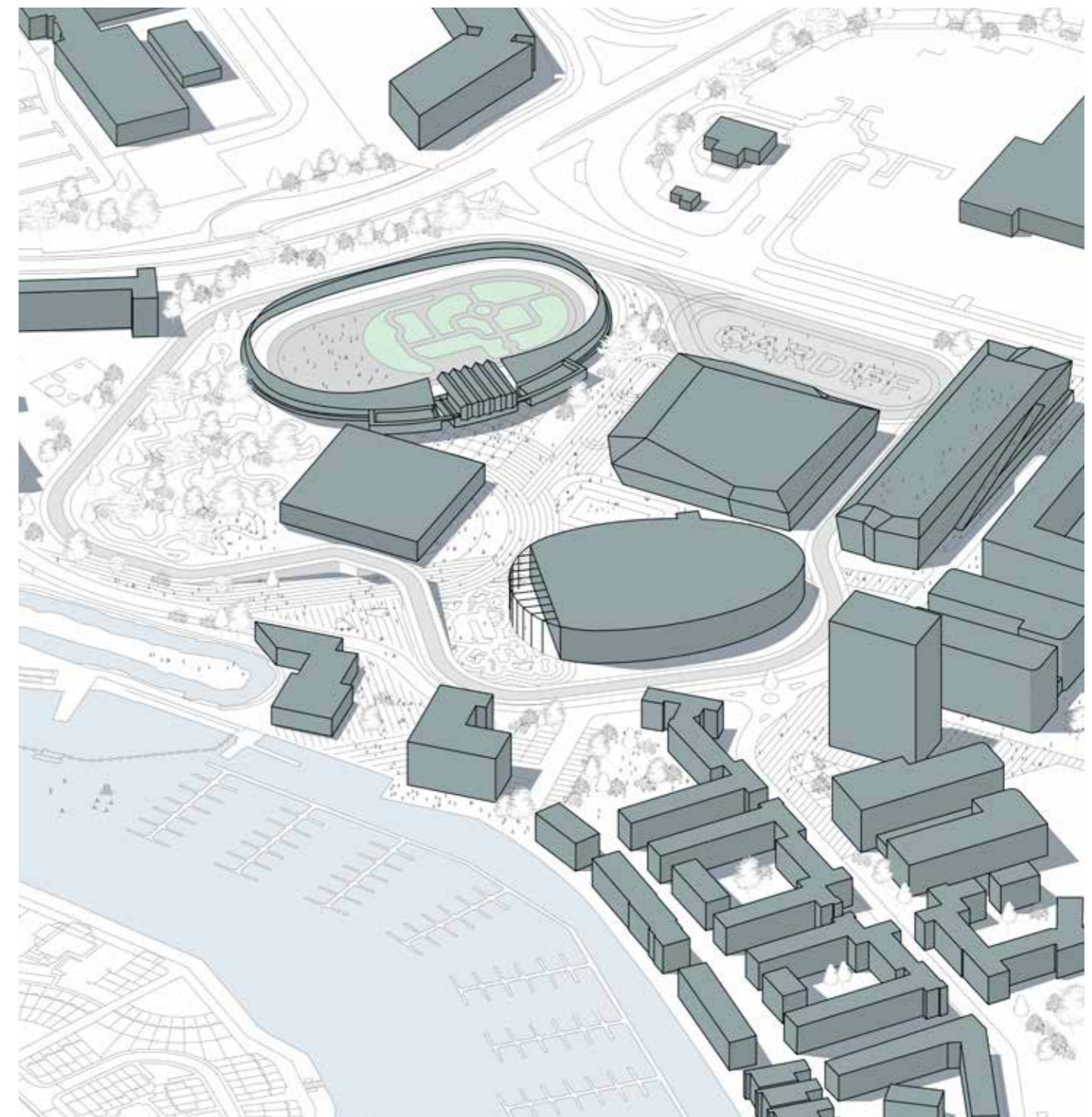


Figure 023 (above, top), Figure 024 (above, bottom left) and Figure 025 (above, bottom right), Velodrome alignment and location studies



#### VELODROME ALIGNMENT AND POSITIONING

The proposed site on the north west corner of the ISV has been a constant through the design process, given the scale of the development no other area of land within the immediate ISV plot could house a fully functioning 333m velodrome and associated infrastructure.

In contrast there were initially several considered locations for the associated pavilion which were reviewed to give the best user experience of the new facility and equally to offer the best external "front door" given the Council's growing aspirations for the wider ISV site.

At the initial design stage a number of studies were produced to explore the implications of the alignment of the effective front door and pavilion building.

The diagrams opposite illustrate a number of considered locations and alignments that were explored at the initial stage. These were reviewed with the wider design and client team.

Given the desire to maximise the attraction, to enforce and strengthen the impact of the surrounding sites it was inevitable that the final location selected addressed a new future public realm to the south east. This was due to:

- Manageable and accessible levels
- Visibility and connectivity
- Potential to create a new urban public realm around a series of existing and new front doors.

Figure 026 (above), 3D Velodrome alignment diagram illustrating immediate context and connections



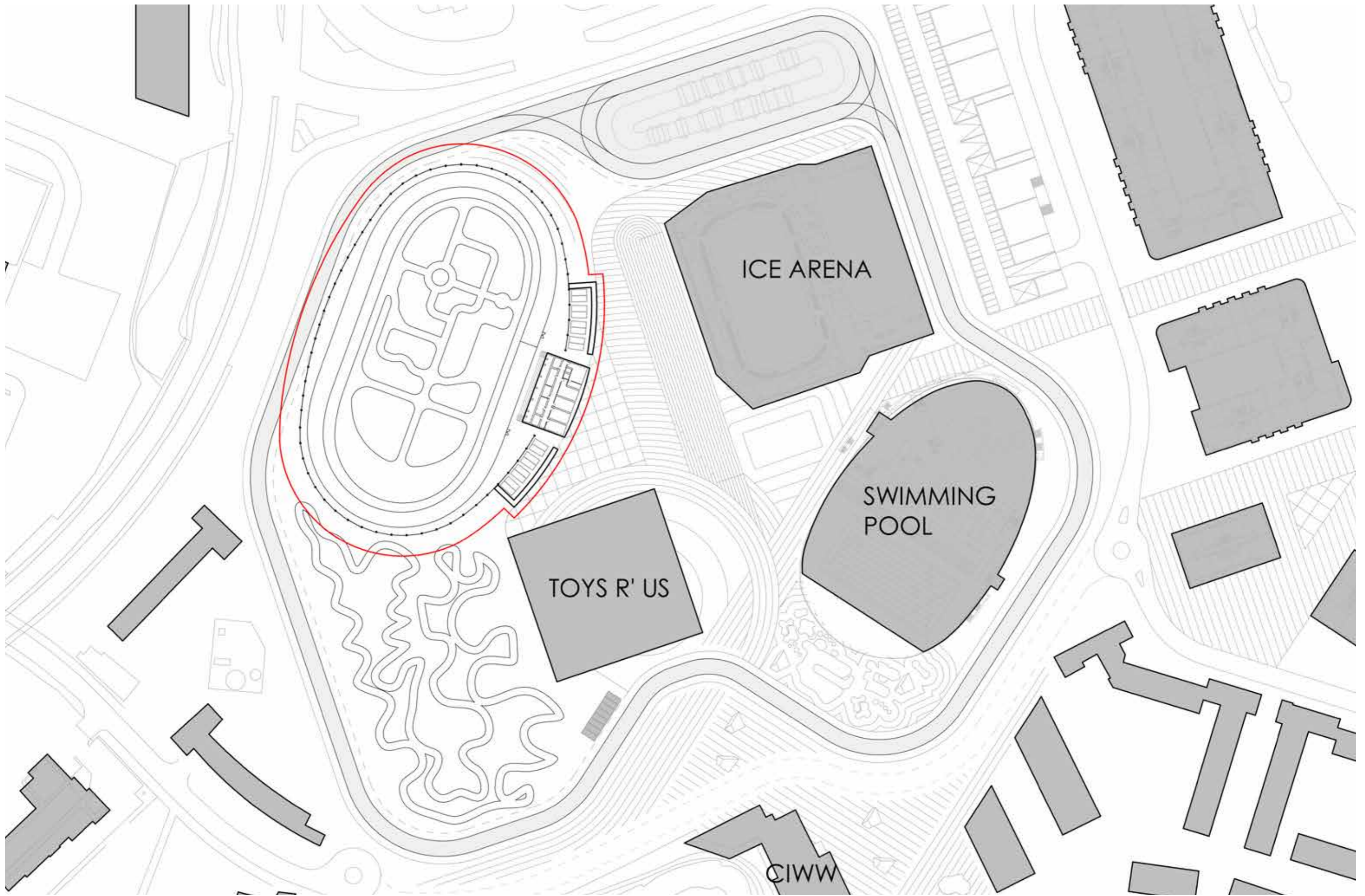


Figure 027: Extract from drawing 3846-FBA-00-XX-DR-A-01\_06





Figure 028 (above): Illustrative CGI showing the proposed velodrome in the context of the future ISV public realm

## ACCESS, WIDTH AND GRADIENTS

The proposed velodrome has been designed to sit within the landscape acting as a single composed intervention with no change in level and minimise access difficulties both for cyclist and people with impaired movement. The result is a flat and level public realm that is easily accessible and usable by all.

The public space around the outside of the track has been designed to have a constant width of 2.95m for its entire perimeter extending to 3 meters between structure. This is to encourage passive movement around the track, encourage spectators and create an environment of inclusion.

At the points of entrance into the scheme there are two clear openings with widths of 1.40m with a central gate post of 0.15m width.

The width of the pedestrian route has been chosen for the following reasons:

- To encourage pedestrians to slow down and enjoy the view;
- To optimise the footprint of the velodrome;
- To provide sufficient space for viewing and passing;
- To ensure the velodrome maintains an elegant profile.

## APPEARANCE

In keeping with the surroundings the approach has been to design a velodrome that is simple and elegant, sitting low in the landscape and contained within an earthwork band the pavilion sits with its pitched roof form reflecting the historic buildings of the wider dock whilst the timber windbreak stations echo the tree bowl of the existing Maindy velodrome.

With such a heavily and diverse context the velodrome should be considered and attractive, it should not detract from its neighbours, but should add too and enhance the location, the design should be modern to encapsulate the essence of the ISV.

The proposed velodrome sits effortlessly in the north west corner of the ISV and addresses new and developing public realm thinking which allows users to move around the site without thought. The wind break structure which houses the lighting and creates the secure line sweeps around the outside of the track and is punctured by the new pavilion with its changing and public facilities. The break in the windbreak indicates and signals the entrance points.

The velodrome is held and captured by a gabion wall that clasp the velodrome in place, grounding the composition whilst signifying the insertion of the new into the old fabric of the Bay.

Externally the velodrome wind break creates a large and expansive canvas which by using pixels can create one of the largest artworks in Wales, it is intention to illustrate and capture the success of Welsh cycling as indicatively shown in this document, however the final art work will need to be finalised.

The pavilion itself reflects patterns that can be historically found across the city, from the historic dock buildings to the big leisure box architecture found at the ISV, the velodrome reflects the character of its location.



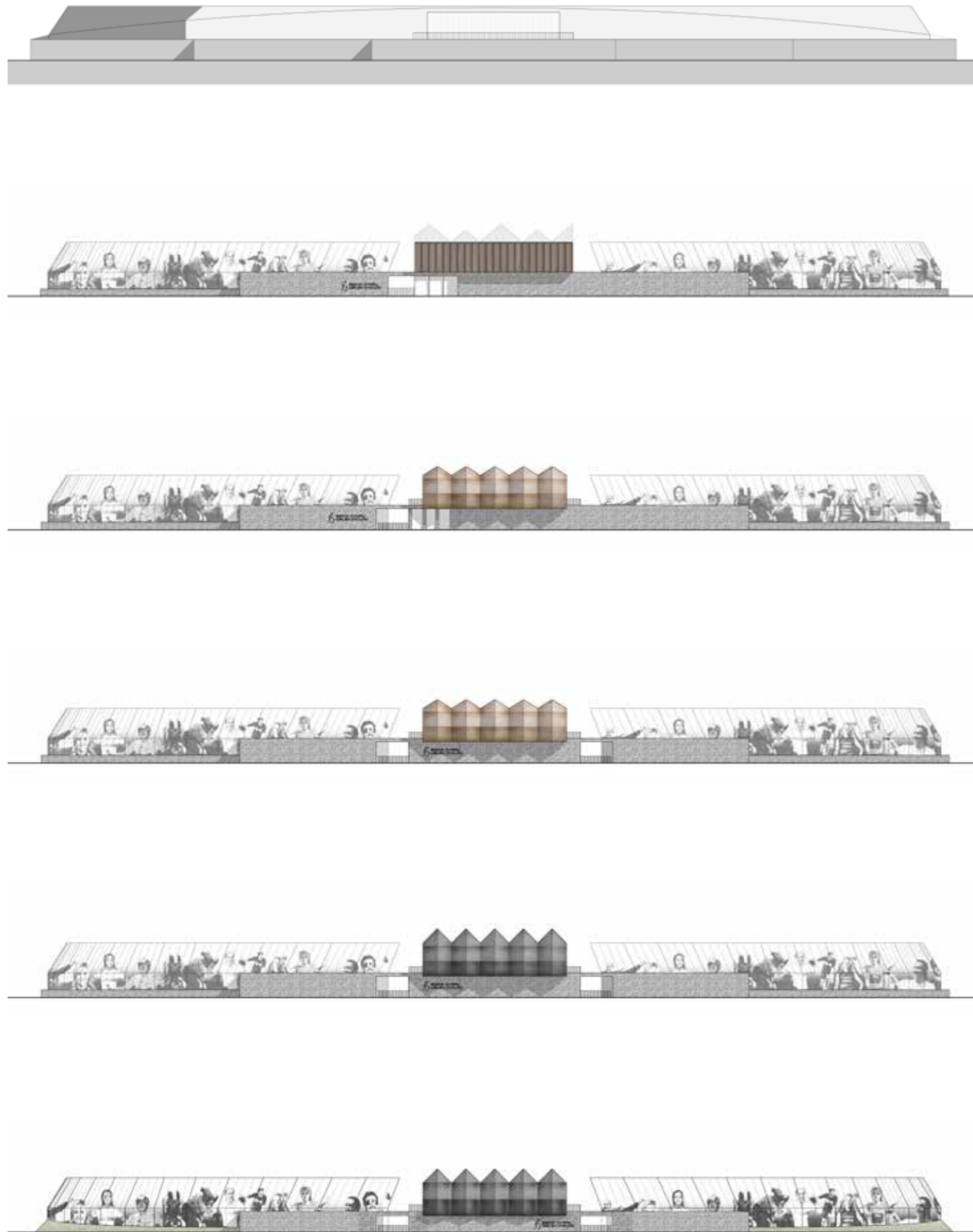


Figure 029 (above): Illustrative form concept sketches

## VELODROME FORM

As mentioned previously in this document the concept for the velodrome is to provide a low profile, elegant design that sits within the ISV.

To do this the velodrome went through several variations of design at the initial concept stage. Some of these are illustrated on the opposite page. As the requirements became more apparent so did the form of the velodrome till the final form was achieved.

The structural principle, three-dimensional form, materiality and construction method have all been carefully considered and have driven the direction of the design so that the velodrome is physically and philosophically robust.

The velodrome itself is composed of four main element:

- the wind break;
- the track;
- the earthworks;
- the pavilion.

The public realm infrastructure is composed of just two elements:

- the access points;
- the level and accessible landscape.

The velodrome track itself is made up of simple concrete foundations with a tarmac finish to provide the appropriate surface finish.

The windbreak comprises of a series of timber stantions at approximately 6m intervals, between this is hung a mesh fence system which then houses the pixels which will create the imagery.

The pavilion itself is constructed using timber technologies to provide the main structural framework, this sits above a solid gabion wall that houses and controls the levels both within the velodrome and externally.

Breaking the design down into these four elements allowed the design team to achieve several important aspects of the design:

- keep any structure as low as possible so to minimise the visual impact of the new scheme on the Bay, both into and out from the ISV;
- keep all structure as low as possible to avoid a negative impact on the adjacent and planned public realm within the developing ISV masterplan;
- ensure a controlled and visually appealing composition;
- produce a simple, uniform and legible profile to the windbreak structure;
- create an environment to capture light spill from the track lighting;
- and, keep the track environment as consistent as possible to reduce the amount of time the velodrome will require closing for weather events. This will ensure that the velodrome can provide a positive contribution to the community and wider bay for as many days of the year as possible.



Figure 030 (above): Early 3D massing concept study





## FORM

The intricate detailed silhouette of the pavilions external form is that of a pitched design reflecting forms found and mirrored historically across Cardiff.

The grain of the pitched design runs from east to west and is also echoed along the east and west elevations, breaking up the mass and adding an architectural grain and language that helps break up the large sports box architecture already prevalent on the site.

Constructed out of modern materials the velodrome pavilion will be a clean, modern and attractive take on Cardiff, reflecting the history of the Bay and the more modern immediate context of the ISV. The form will mediate large format sports boxes with a traditional and historic grain.

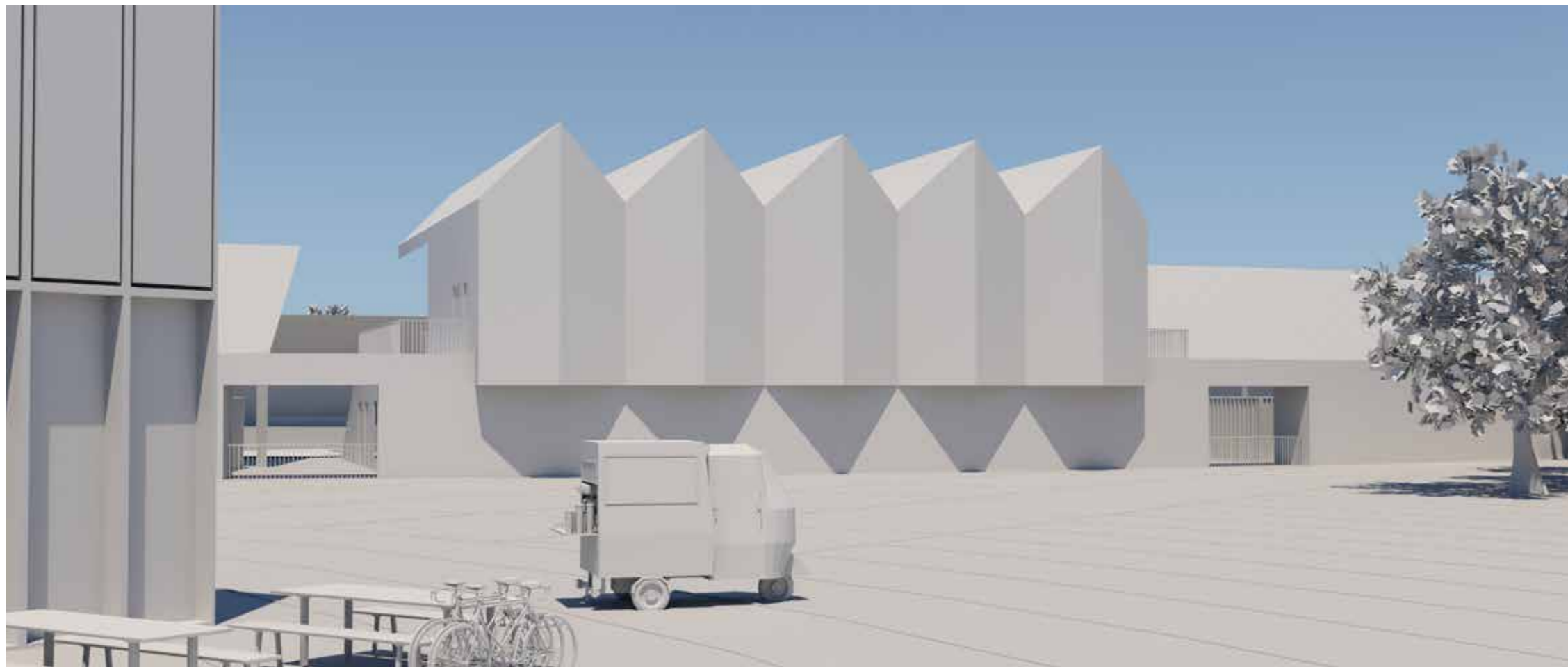


Figure 031 (above, top): Initial form and massing study, Figure 032 (above, bottom): Initial form and massing study



## FINAL PAVILION FORM

The final pavilion form is made up of crisp black box with six pitched roof components, these have been driven by modern timber technologies and the desire to reflect the historic buildings of the surround bay. This approach reflects a modern twist on the historic buildings seldom found around the bay with their pitched roofs and simple forms. The form of the pavilion sits atop the heavy gabion ground floor and appears to hang and perch over the landscape form. The gabion wall itself is punctured by the pre cast concrete entrance points that ground the form and give the modern insertion a sense weight within the existing landscape.

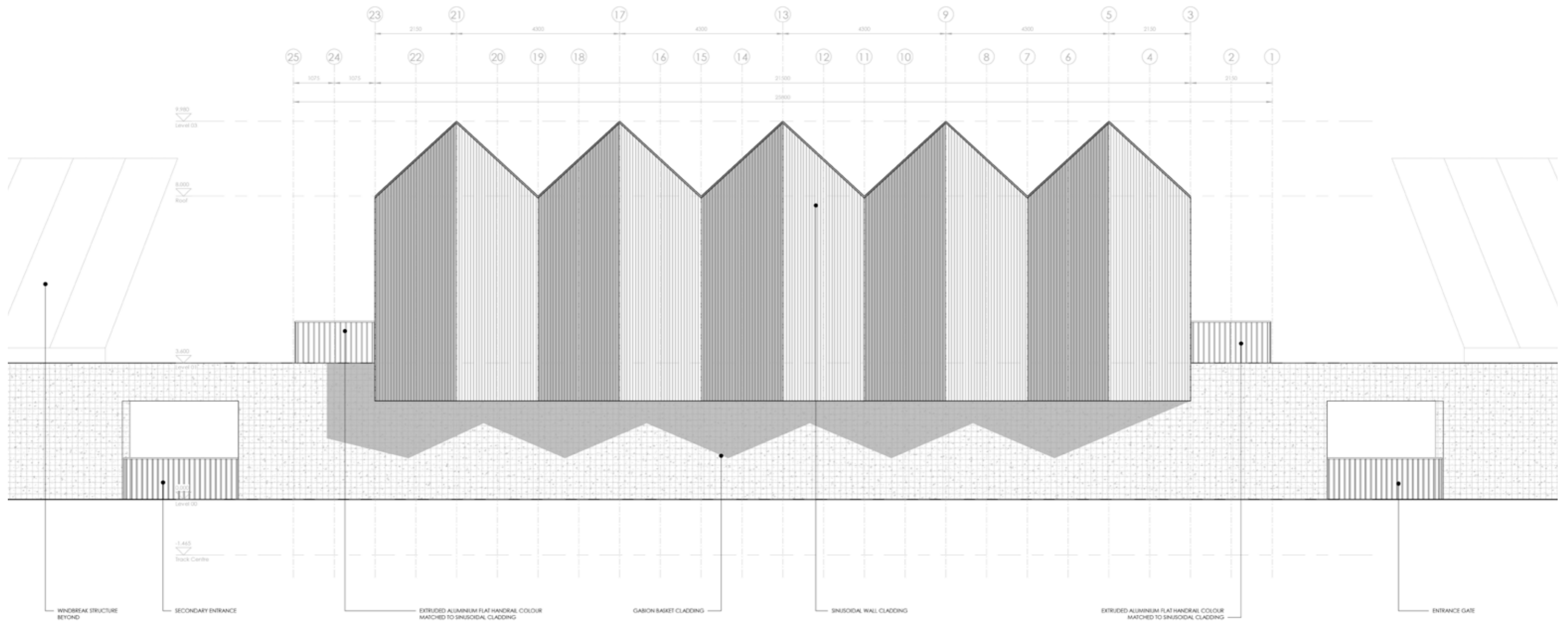


Figure 033: Extract from drawing 3846-FBA-00-XX-DR-A-01\_52\_PROPOSED EAST ELEVATION



## CARDIFF VELODROME - GROUND FLOOR

The ground floor of the pavilion building provides all the essential spaces required for the site to function properly as a sports venue.

The main components of the ground floor are:

- Reception and associated back of house;
- First aid;
- Performance Gym;
- Workshop;
- Plant;
- Universal change area.

Universal change covers the following spaces:

- Toilets;
- Showers;
- Public changing space;
- Private changing space.

Given the aspiration of the client to embrace, encourage and enhance the experience of using the facility and the aspiration to inspire an increasingly diverse demographic into cycling the client asked the design team to embrace the universal changing space concept.

This is a concept developed by FaulknerBrowns Architects whereby users of the space are not required to make a choice between their gender or sexual preference upon entering the space. Instead the changing facilities are predominantly open with private spaces such as showers and toilet provided as additional support space.

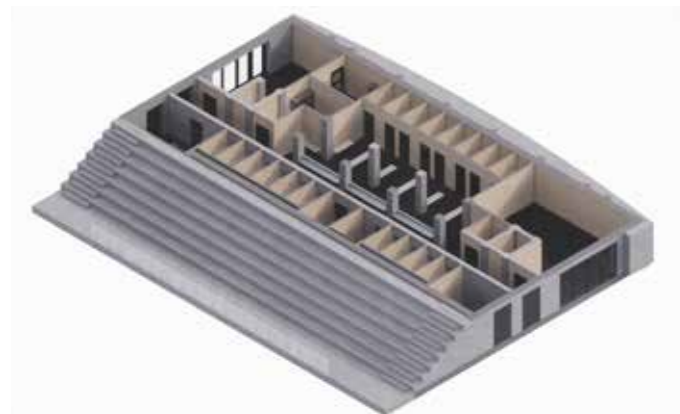


Figure 034 (above): Ground floor 3D study

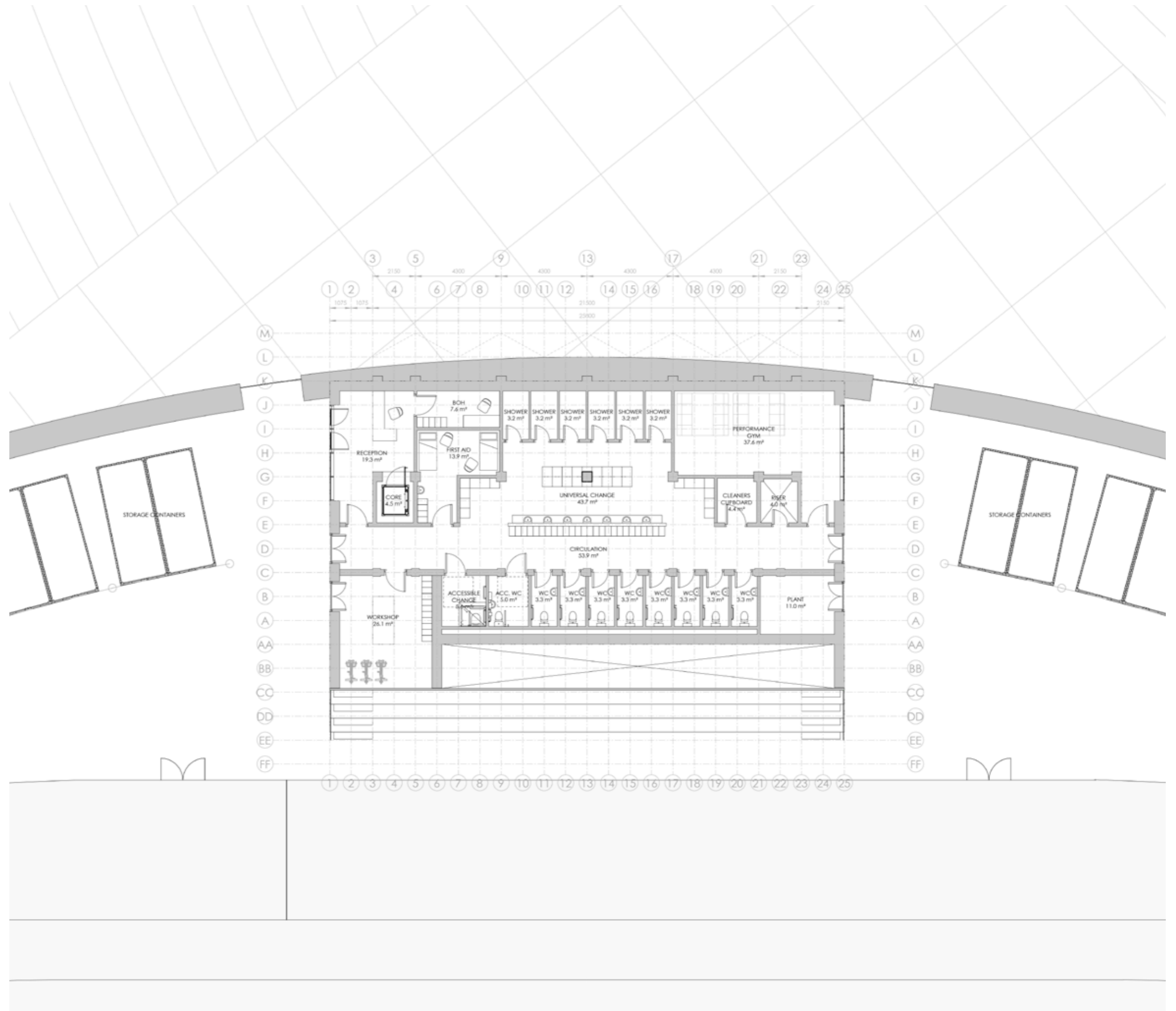


Figure 035 (above): Extract from drawing 3617-FBA-00-XX-DR-A-01000\_GROUND FLOOR PLAN



## CARDIFF VELODROME - FIRST FLOOR

The first floor of the pavilion building provides all the support spaces required for the running of events or club sessions.

The main components of the first floor are:

- Shared multi-use hall;
- Coaching space/classroom;
- Event office
- Committee room;
- Kitchen and servery;
- Store.

The aspiration is that the first floor will provide all the support and space needed to run and host events from regional racing events to Wednesday night club sessions.

The large open plan shared hall at the heart of the floor plan is intended as a flexible space that can host anything from race day sign on to yoga sessions to rainy Wednesday night club spin sessions.



Figure 036 (above): First floor 3D study

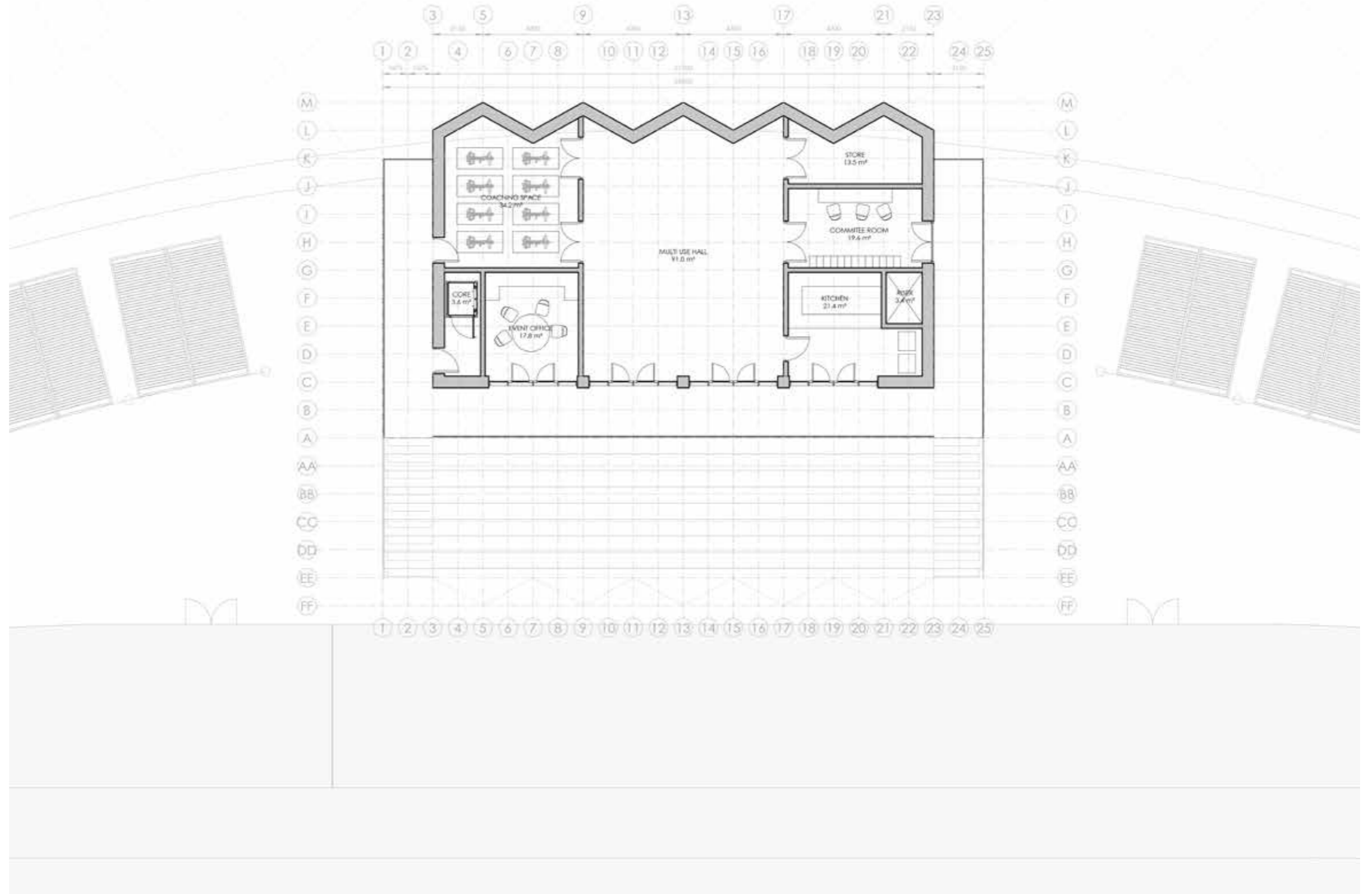


Figure 037 (above): Extract from drawing 3617-FBA-00-XX-DR-A-01100\_FIRST FLOOR PLAN



## CARDIFF VELODROME - BUILDING SECTION

In section the design of the velodrome pavilion is simple, an active and functional ground floor comprising dark and private spaces as described above and a usable flexible series of spaces at the first floor with views out over the velodrome track, infield and space beyond.

The primary point of access to the first floor is via the external grandstand seating zone which matches the approach taken at the revitalised Herne Hill velodrome in London.

The purpose of this is to create a sense of connection with the velodrome, increase dwell time and increase levels of engagement with the sport. This is an outdoor velodrome and although the design team are focused on creating the optimal condition for the track via the wind break it is important that there is a connection with the outdoors and a perceived outdoor experience.

Alongside the seating the design of the scheme incorporates two large gathering spaces to the north and south of the pavilion to handle cyclists and track users while access to the track centre is not viable due to track use. The aim of this is to reinforce and foster a sense of community within the velodrome perimeter rather than on adjacent land.

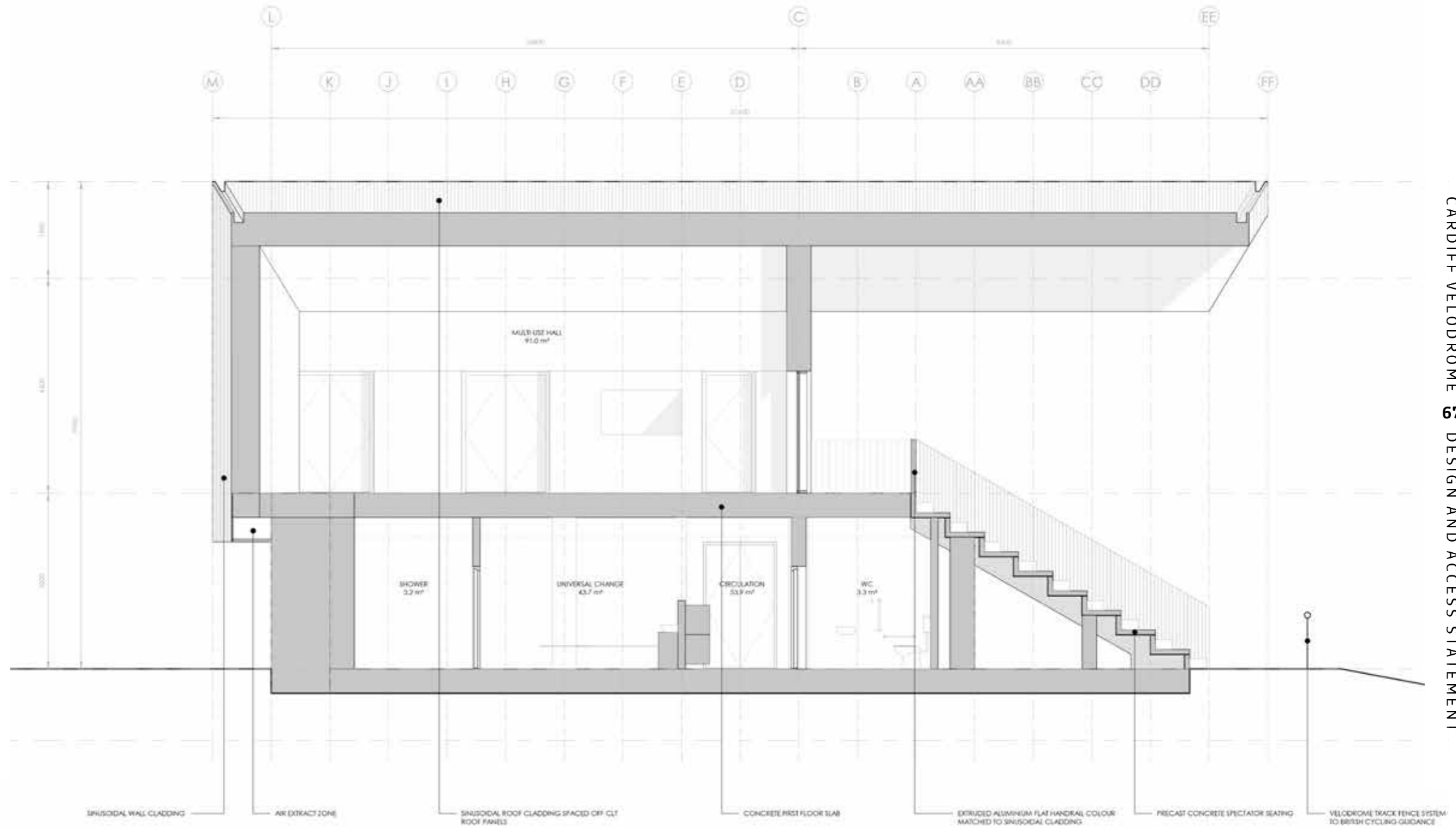


Figure 038 (above): Extract from drawing 3617-FBA-00-XX-DR-A-01\_31\_PROPOSED SHORT SECTION





### EXTERNAL SKIN

Once the final form of the pavilion had been defined by the structural team the wider design team could begin to work with the structural skeleton to create a pavilion fitting of the location.

To do this the design team looked back to the initial concept and moved towards an external 'skin' wrapped around the exterior of the structure.

The external 'skin' has to carry out several different aspects to ensure the success of the footbridge, these aspects are;

- create a clean, legible form;
- be low maintenance;
- be lightweight;
- be attractive and aesthetically pleasing.

The images above and the bay study opposite illustrate the final design solution based around a two part composition described in more detail on the following pages.

The conceptual design moves were;

- 1 - Heavy landscape ground floor form;
- 2 - Simple shapes and forms;
- 3 - Iconic silhouette;
- 4 - Simple skin, with lightweight extruded balustrade;
- 5 - Balanced first floor space;
- 6 - Natural and refined material pallet.



Figure 039 (above, top left), Figure 040 (above, top right): Examples of first floor material choices, sources vary, Figure 041 (above, bottom left) and Figure 042 (above, bottom right): Examples of ground floor material choices

Figure 043 (above), Early 3D skin concept sketch study



**MATERIALITY - GROUND FLOOR**

The design team have considered the look of the velodrome as an extension of both the ISV, the wider bay and the natural colour range of the historic Cardiff backdrop.

The ground floor of the scheme is expressed as a gabion wall, the intention is that this remains part of the language of the ground, a heavy structure, a solid base that retains the earthworks of the velodrome track.

The design team intend to utilise a range of metals with a natural colour range that requires minimal upkeep that will mature as the velodrome ages.

A natural, unstructured finish is proposed for the gabions, utilising local material, reclaimed where possible. As the images below illustrate the colours that result from the construction process give the gabion a natural and earthy feel reminiscent of the vast landscapes of Wales. As the gabions and stone age it will darken and tone down offering a more subtle contrast to the local environment whilst also providing a habitat for wildlife.



Figure 044 (above, top left) Figure 045 (above, top right) Figure 046 (above, bottom left) and Figure 047 (above, bottom right): material samples

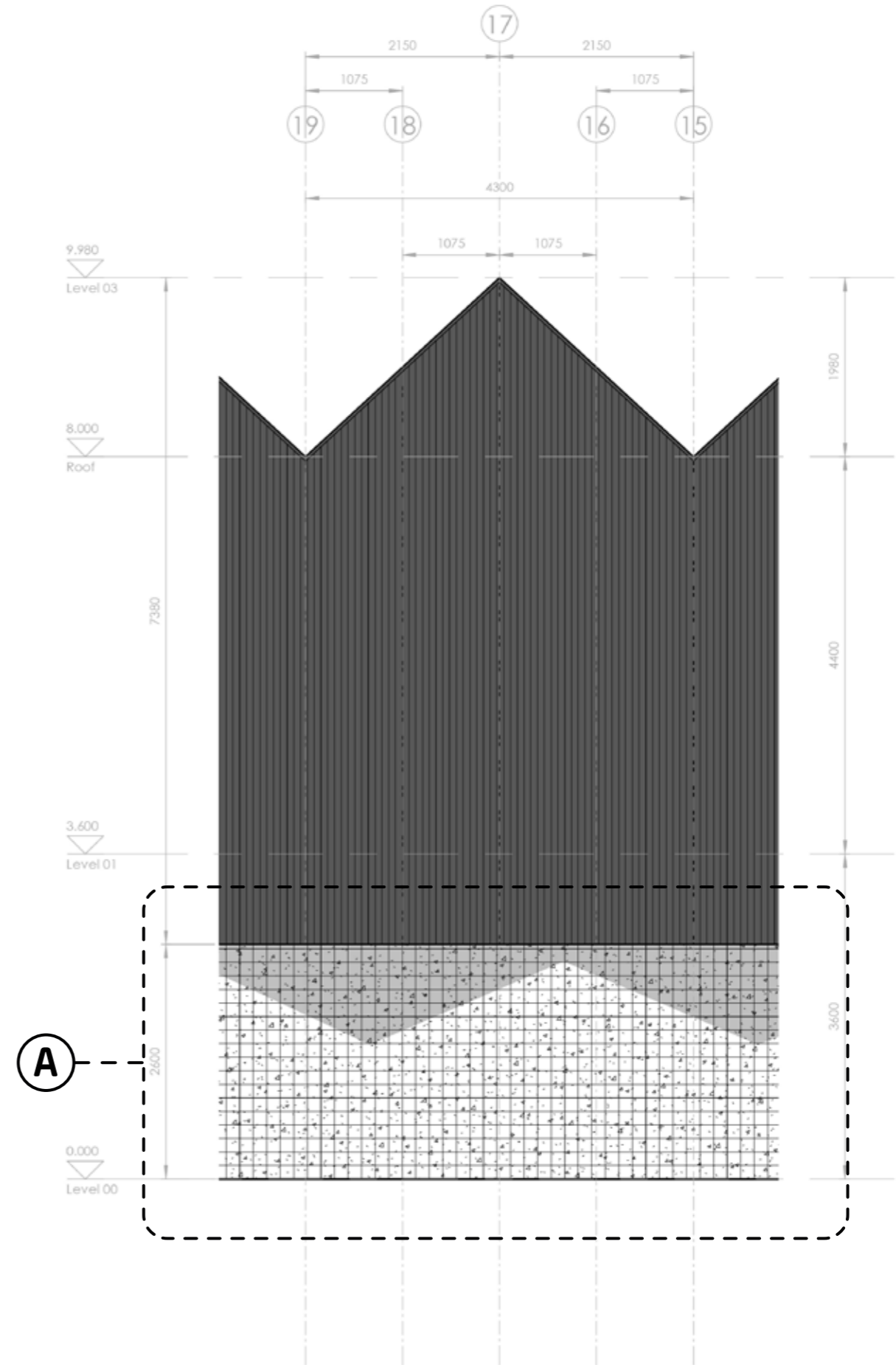


Figure 048 (above): Extract from drawing 3846-FBA-00-XX-DR-A-01\_60



## MATERIALITY - FIRST FLOOR

In contrast to the ground floor with its earthy and natural materials the design team wanted to contrast the first floor.

Echoing the industrial nature of the site and creating a strong and crisp outline the design team have opted to clad the first floor box of the pavilion in an industrial black sinusoidal metal. This will give the crisp form and the striking contrast that the team are after.

This industrial material with its crisp lines and grain will compliment the natural ground floor materials.

The colour has been selected to create a striking silhouette that draws the eye of people using or moving through the ISV without a need for a fussy or overly complicated architectural narrative.

As the metal sheets age they will naturally weather, settling into their environment whilst still being easy to maintain a key consideration for the design team.



Figure 049 (above, top left) Figure 050 (above, top right) Figure 051 (above, bottom left) and Figure 052 (above, bottom right): material samples

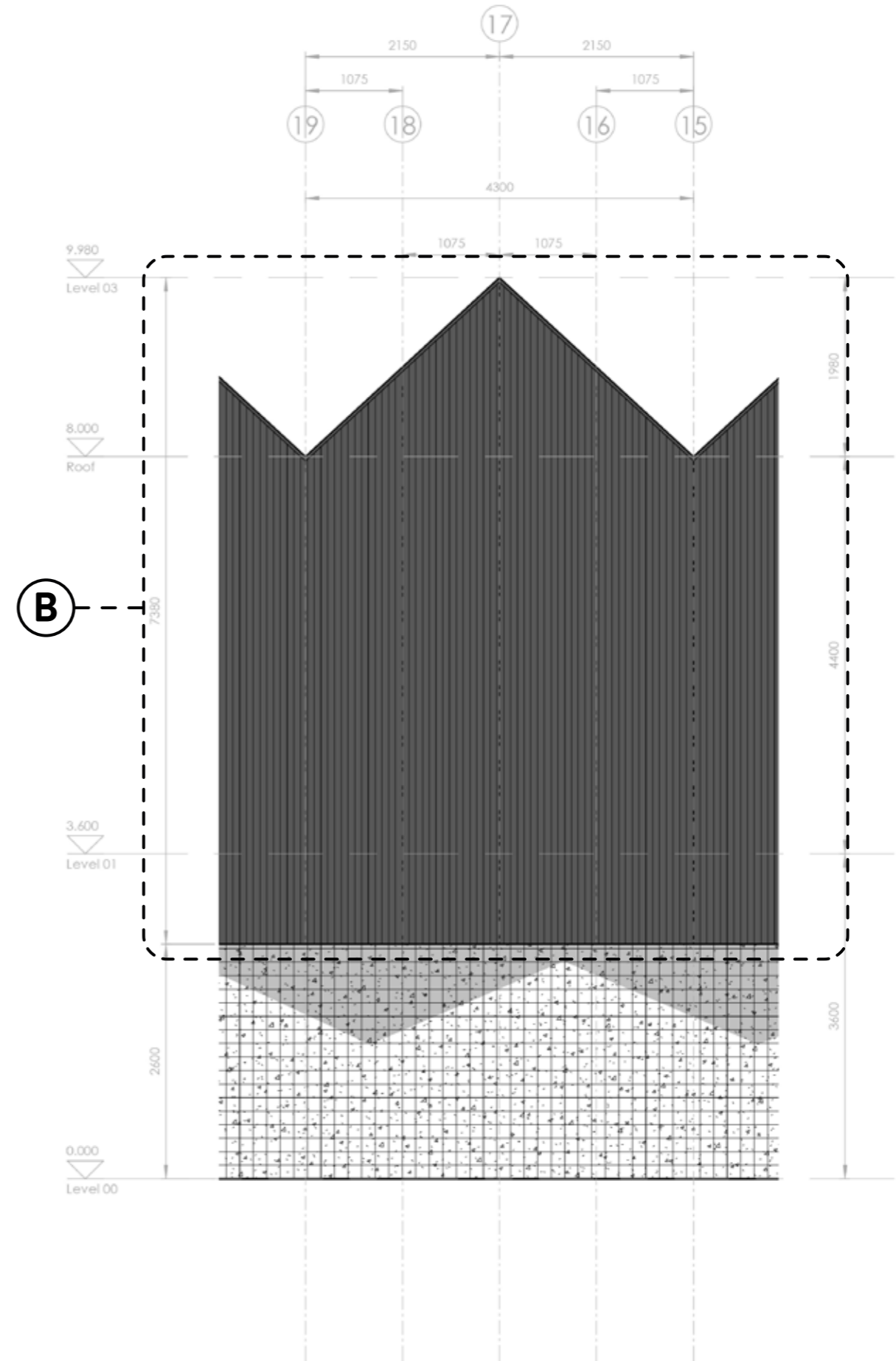


Figure 053 (above): Extract from drawing 3846-FBA-00-XX-DR-A-01\_60



CONSTRUCTION TECHNOLOGY

The following pages outline the aspiration for the construction method and materiality for the building.

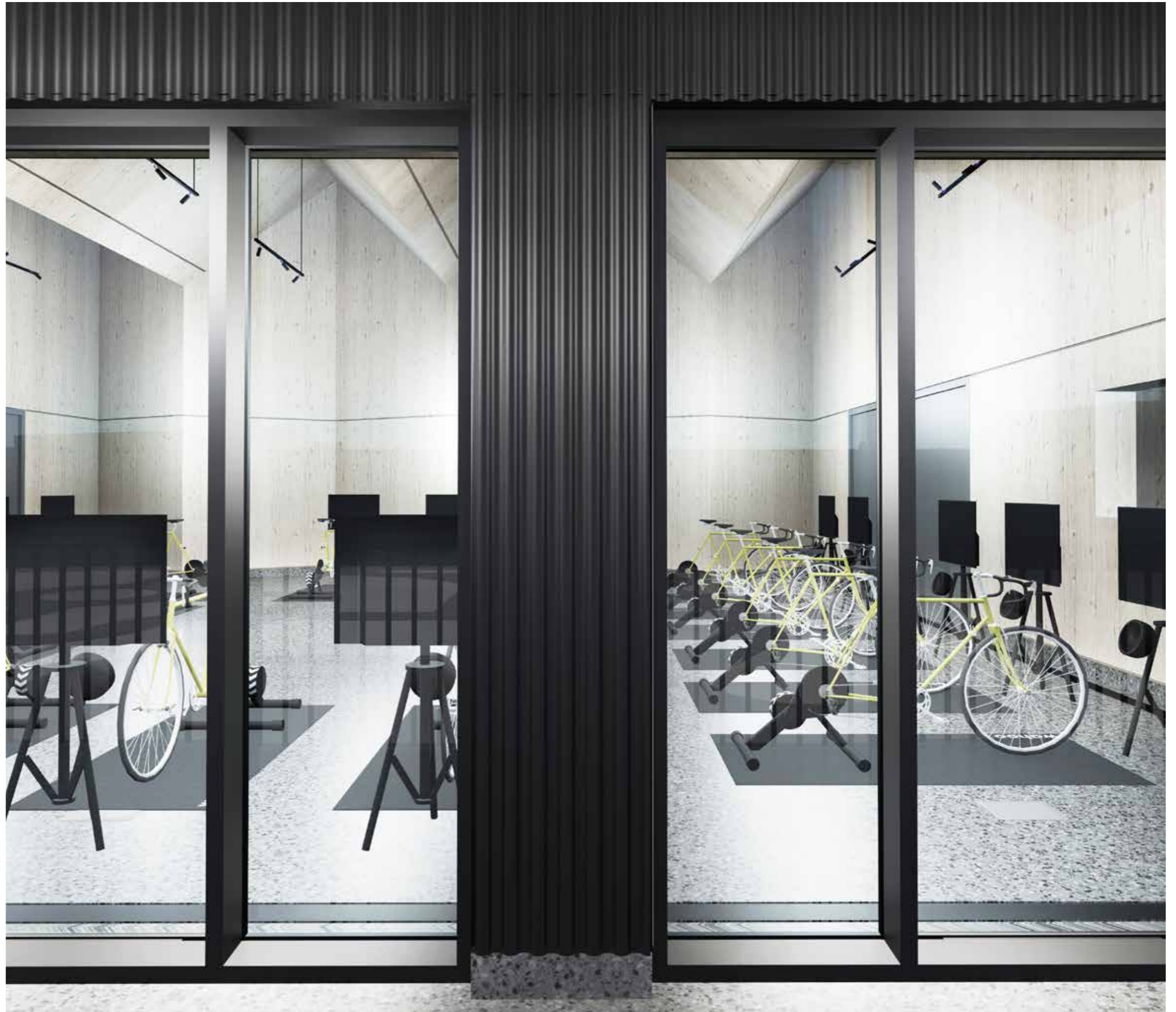


Figure 054 (above): Illustrative CGI showing view into first floor shared space



## CONSTRUCTION TECHNOLOGY

With one eye on the environmental impact of the building the design team are keen to minimise embodied carbon and embrace the use of renewable materials.

With this in mind the design team have aspired to utilise Cross Laminated Timber (CLT) technology to form the framework for the first floor of the pavilion.

CLT is an engineered wood panel constructed with an odd number of softwood layers placed on top of each other at 90 degrees and then bonded together under pressure to form structural panels with exceptional strength, dimensional stability, and rigidity.

Because of CLT's structural properties and dimensional stability, this mass timber product is well suited to walls and roof construction. The benefits of CLT are:

- Shorter construction times;
- Less waste produced;
- Reduced cost;
- Better logistics;
- Increased durability;
- Increased environmental credentials.

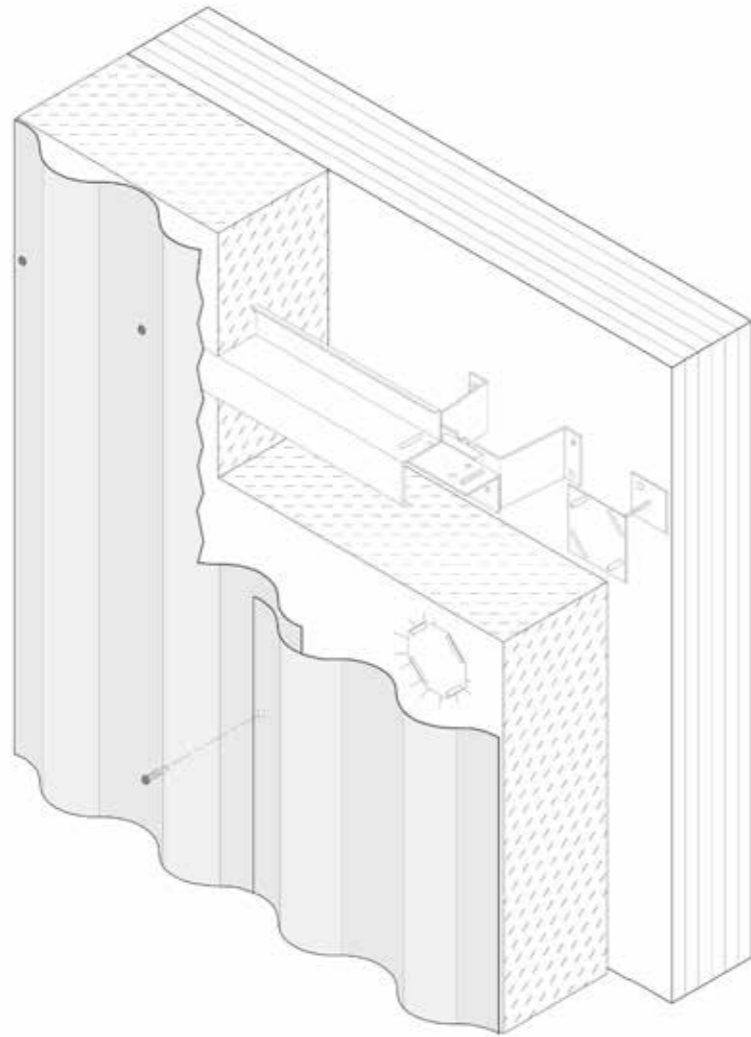


Figure 055 (above, top): 3D CLT material build up study, Figure 056, Figure 057 (above, bottom centre) and Figure 058 (above, bottom right) timber construction methods with exposed timber finish

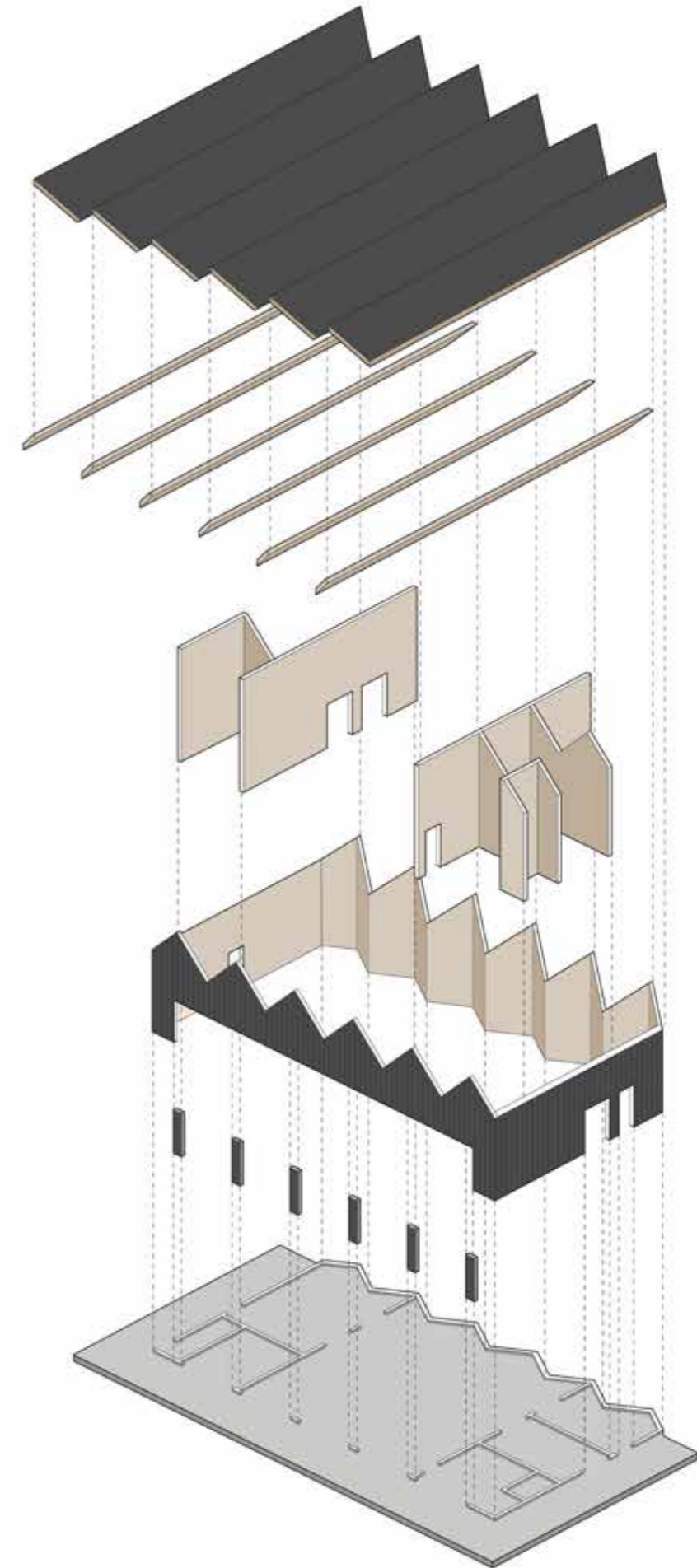


Figure 059 (above): Illustration showing CLT first floor construction



## CONSTRUCTION TECHNOLOGY

The design principles for CLT fall between timber frame and masonry. Like timber, CLT must be placed above the damp-proof level; it will need at least suitable treatment and more likely a protective cladding when used as an external facade. It is also similar to most modern timber-frame buildings in that it is fabricated off site. CLT's similarities to masonry are in its monolithic nature; it forms solid planes without the need for nonstructural infill panels and floor slabs, in a fashion not dissimilar to precast concrete. As the CLT panels quickly provide a dry, weatherproof environment free from temporary props, progress on internal finishes and services can start as soon as the panels are in place.

The timber also provides a good substrate for first- and second-fix items throughout, using simple screwing with self-tapping wood screws. Compared with masonry, which requires pre-drilling and plugging of holes for fixings, the process should be considerably faster. Another advantage is that lintels are not usually required.

External CLT panels generally require additional insulation. As a solid wall construction, this can be formed either externally or internally, with external insulation being more typical. A traditional rainscreen cladding is being utilised here to make better use of the robust substrate that CLT provides. The details on this page illustrate how the first floor will be clad with insulation and a vented cavity with external cladding.

Due to the relatively positive tolerances of the factory-made panels, airtightness can be achieved through the use of pre-compressed foam and/or vapourpermeable tape across outside joints. External insulation also retains the limited thermal mass of the CLT within the building, although this would not have a significant effect.

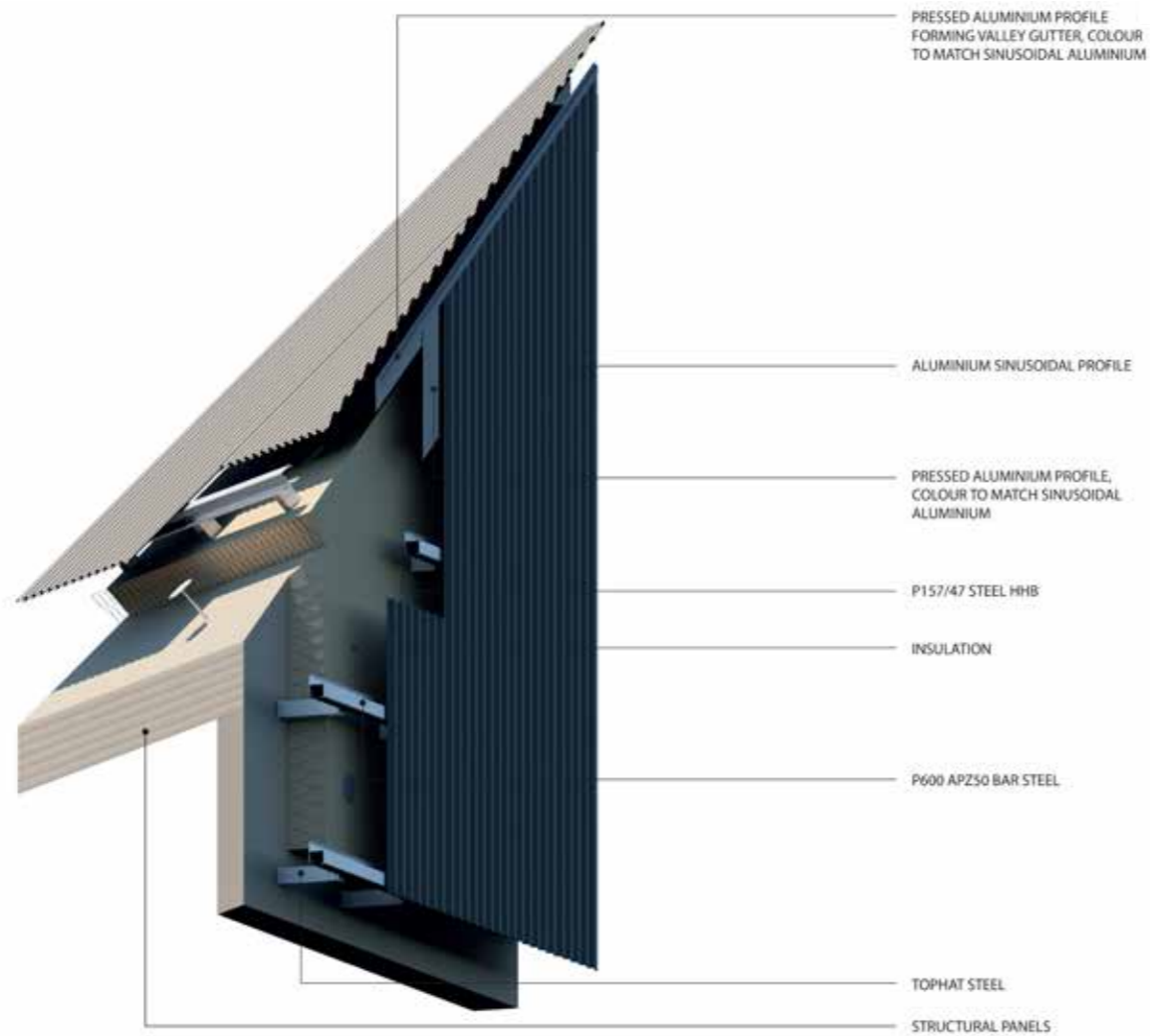


Figure 060 (above): Extract from drawing 3846-FBA-00-XX-DR-A-01\_86

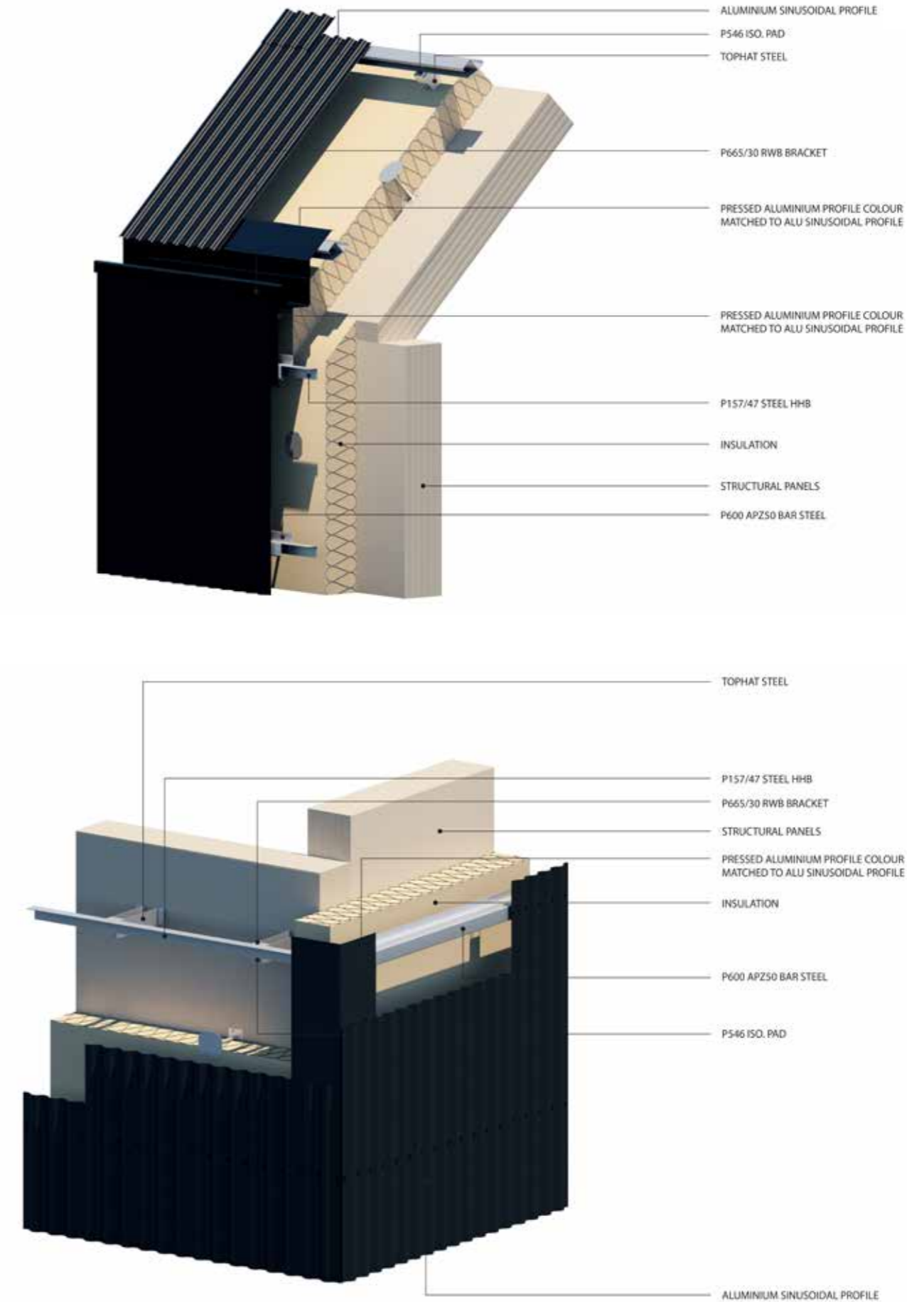


Figure 061 (above, top): Extract from drawing 3846-FBA-00-XX-DR-A-01\_85, Figure 037 (above, bottom): Extract from drawing 3846-FBA-00-XX-DR-A-01\_81



## CARDIFF VELODROME - INTERIOR

The focal point of the pavilion design is the shared multi-use space at the heart of the first floor. This space offers exceptional views of the velodrome and provides a flexible space that can be utilised by a number of different community groups.

The following pages illustrate the flexibility of the space and highlight several different configurations that could benefit different community groups, bringing a constant activity, use and purpose to the pavilion building.

### PURPOSE

Public exhibition, gallery and outreach space.

### ILLUSTRATED SET UP

The image opposite illustrates the scheme as a public exhibition space, in this case the space is set up for a public consultation.



Figure 063 (above): Illustrative CGI showing first floor shared space



## CARDIFF VELODROME - INTERIOR

### PURPOSE

Public talks, meetings and presentations.

### ILLUSTRATED SET UP

The image opposite illustrates the scheme set up to host a public talk.



Figure 064 (above): Illustrative CGI showing first floor shared space



## CARDIFF VELODROME - INTERIOR

### PURPOSE

Exercise classes, community groups and outreach programmes.

### ILLUSTRATED SET UP

The image opposite illustrates the scheme set up for an exercise class, in this case the space is set up for a yoga session.

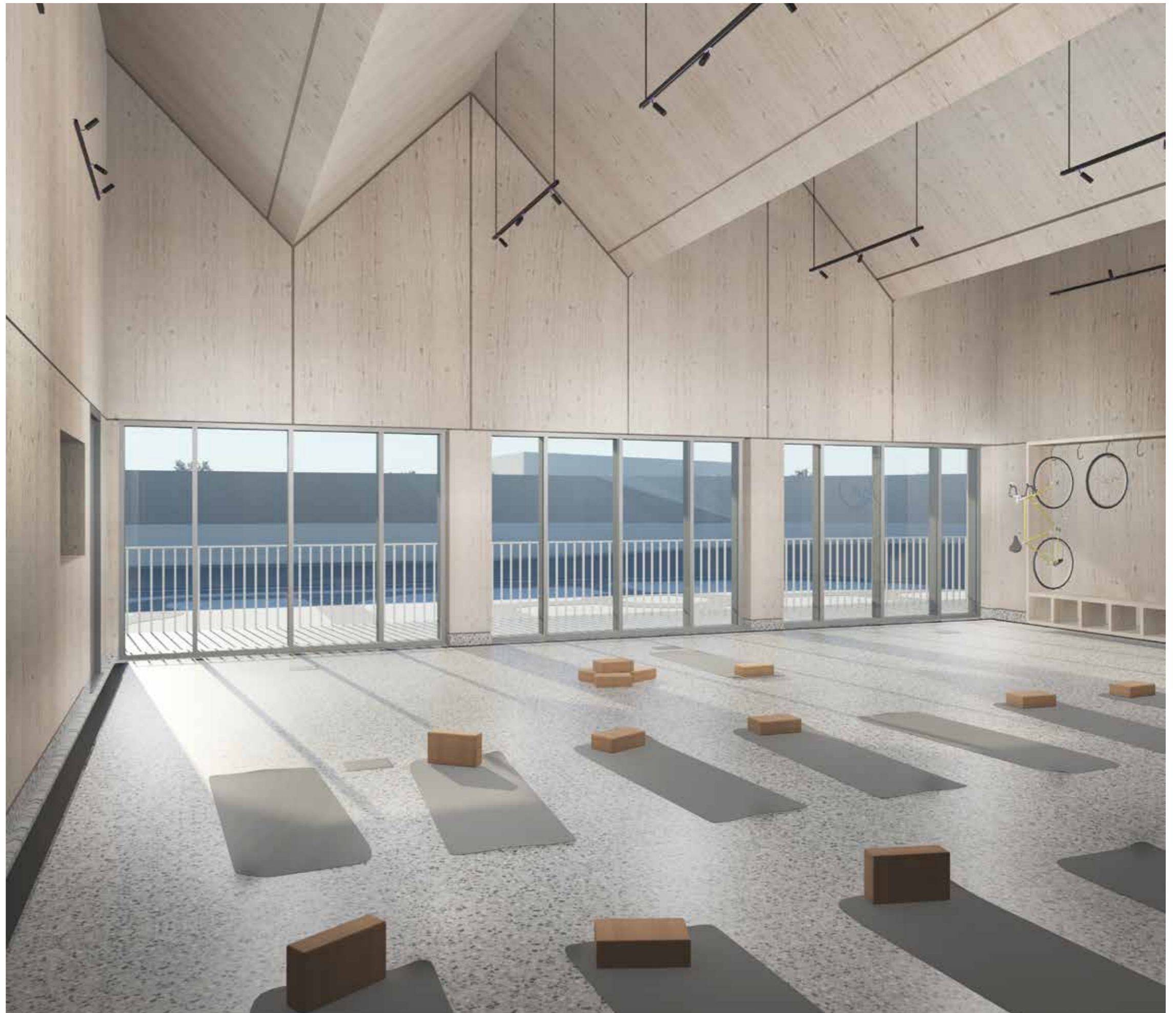


Figure 065 (above): Illustrative CGI showing first floor shared space



## CARDIFF VELODROME - INTERIOR

### PURPOSE

Training sessions, cycle club sessions and fitness groups.

### ILLUSTRATED SET UP

The image opposite illustrates the scheme set up for an indoor training, in this case the space is set up for a cycle club turbo session.



Figure 066 (above): Illustrative CGI showing first floor shared space



## WIND BREAK

The design team were tasked to create a safe, secure and well lit velodrome with an optimised environment with an iconic look and appearance that would help increase participation in cycling a sport.

Initially conceived as a canopy concept, covering part of the track the design team developed their thinking to produce an iconic design that resolves all the requirements.

## THE ICON

The design team visited the existing velodrome at Maindy and it was quickly noted the impact the surrounding trees had on creating a bowl like atmosphere within the track space. Part of the challenge of moving the existing velodrome

to a new site is to capture and recreate a new and modern interpretation of the outdoor velodrome "bowl".

## THE CONCEPT

The design team developed a concept that addressed all the above points, combining the requirement for lighting, security, environmental control and iconicity.

## THE CHALLENGE

With the above considerations the challenge facing the design team was how we could answer these challenges whilst maintaining an efficient and controlled solution.

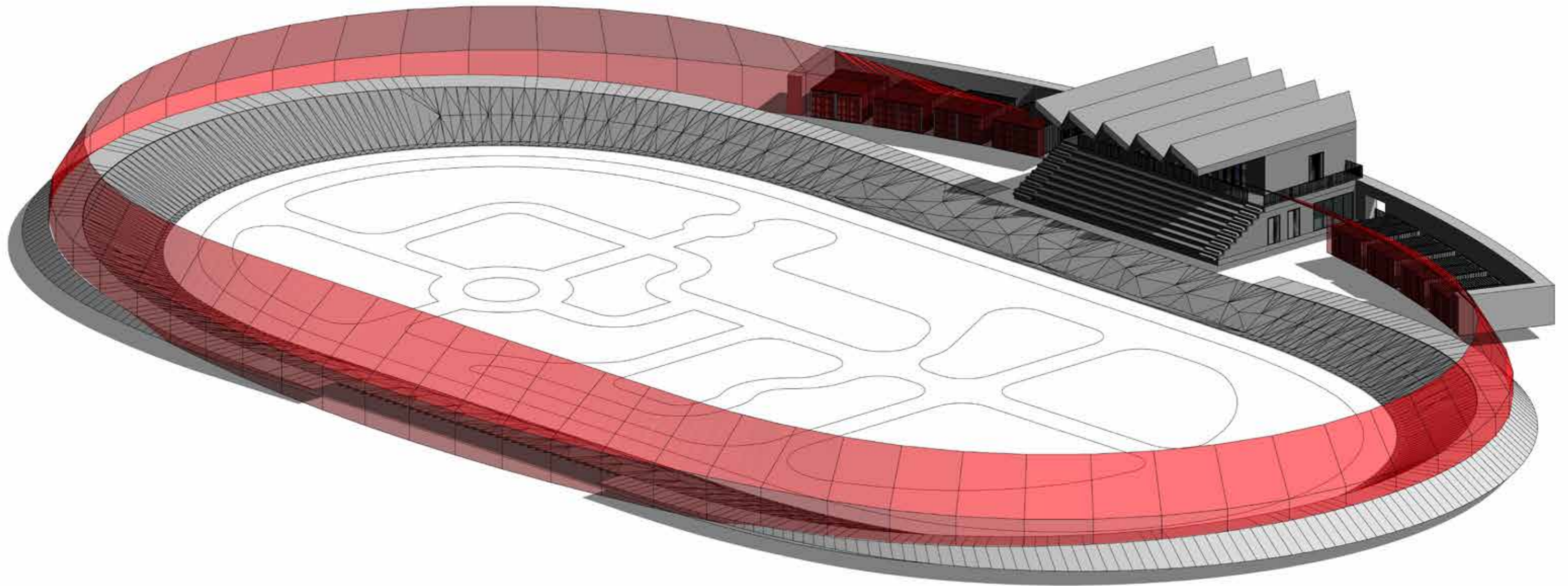


Figure 067 (above): Wind break component illustration



## THE DESIGN

The solution developed by the design team is a series of timber columns that warp the perimeter of the velodrome at roughly 6 meter intervals, these house the track lighting and reflect the woodland environment that is experienced at the current Maindy site. Between these posts spans a wire mesh, this provides the required security and safety aspect. The mesh then offers the design team an opportunity to adjust the density to manage wind movement across the scheme creating a better and more optimised environment.

## THE OPPORTUNITY

Utilising a technology developed in the Netherlands and illustrated on the opposite page the team has the opportunity to treat the skin of the wind break as a canvas to project and depict the successes of Welsh cycling while managing environmental conditions.



Figure 068 (above): Wind break 3D bay study

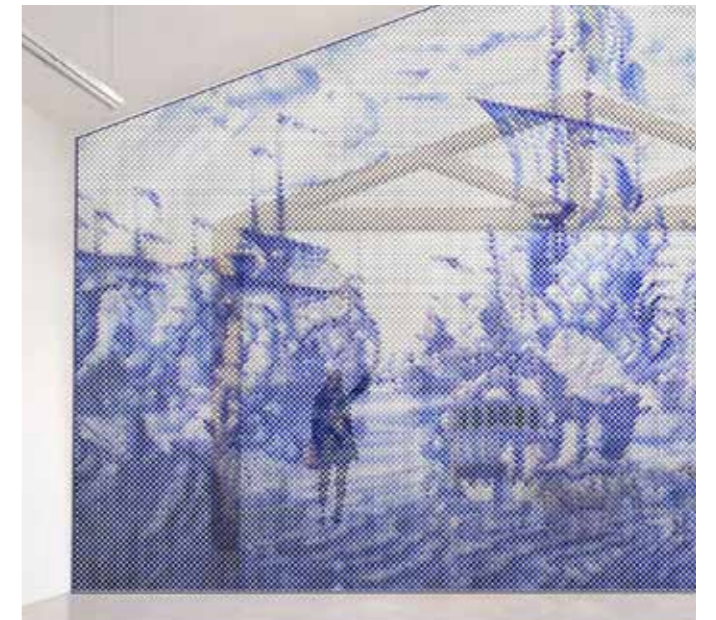
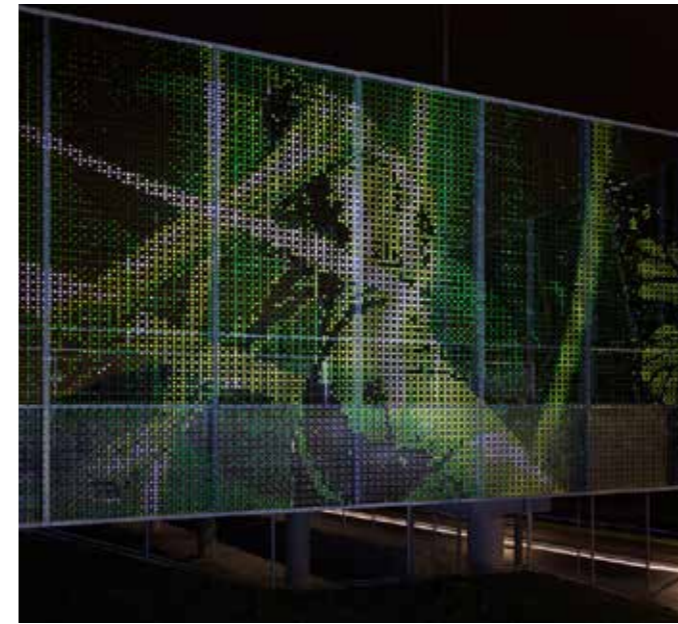


Figure 069 (above, top left), Figure 070 (above, middle left), Figure 071 (above, bottom left), Figure 072 (above, top right), Figure 073 (above, middle right) and Figure 074 (above, bottom right): Wind break imagery system examples



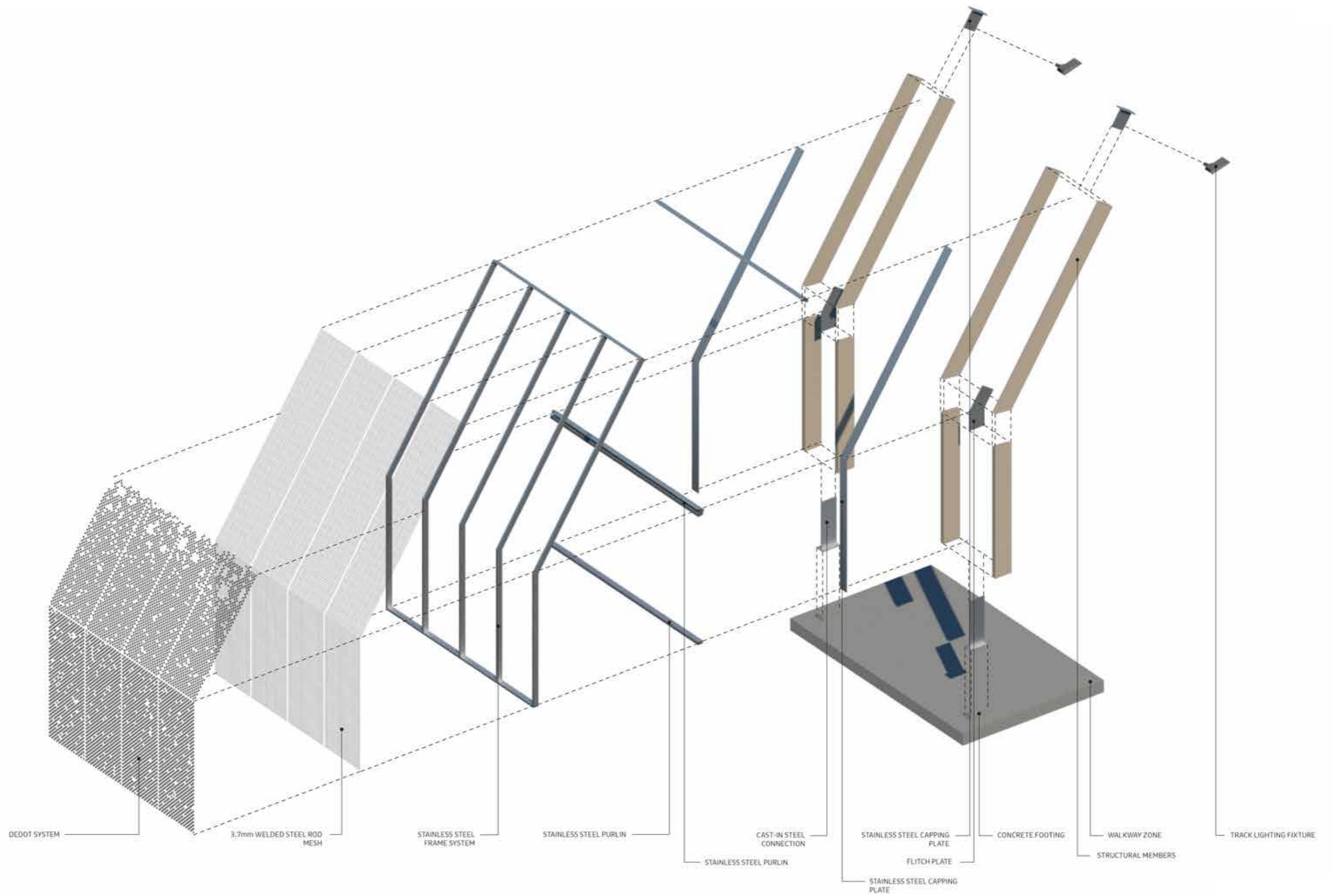


Figure 075 (above): Windbreak construction studies



## PIXILATION

The artwork has to be created using thousands of small clip on ball like components that when viewed from distance create an image. This pixilation can be used to create the desired artwork.

## DENSITY

The design team have run test on the density of the pixels to create the optimum condition within the velodrome, this is based on a mixed density approach across the screen to allow for the creation of the imagery.

The variations in density are limited to the grid of the mesh and the location of the attached pixels.

As the 6 sample panels below indicate, a wide variety of densities can be achieved through the spread and placement of the pixels. This can range from 50 to 0 percent density across the panel.

Based on the studies below it should be possible to create and animate the skin of the velodrome with the desired imagery.

## ARTWORK

The following page illustrates how the variation in density can be utilised to create imagery across the surface of the mesh.

Varying location, placement and colour of the pixels allows the artist to create a composition. The nature of this approach means that the artwork can be updated, altered or recommissioned in the future.

The aspiration is to approach and involve a young local Welsh artist or community group and involve them in the detailed design of the artwork.

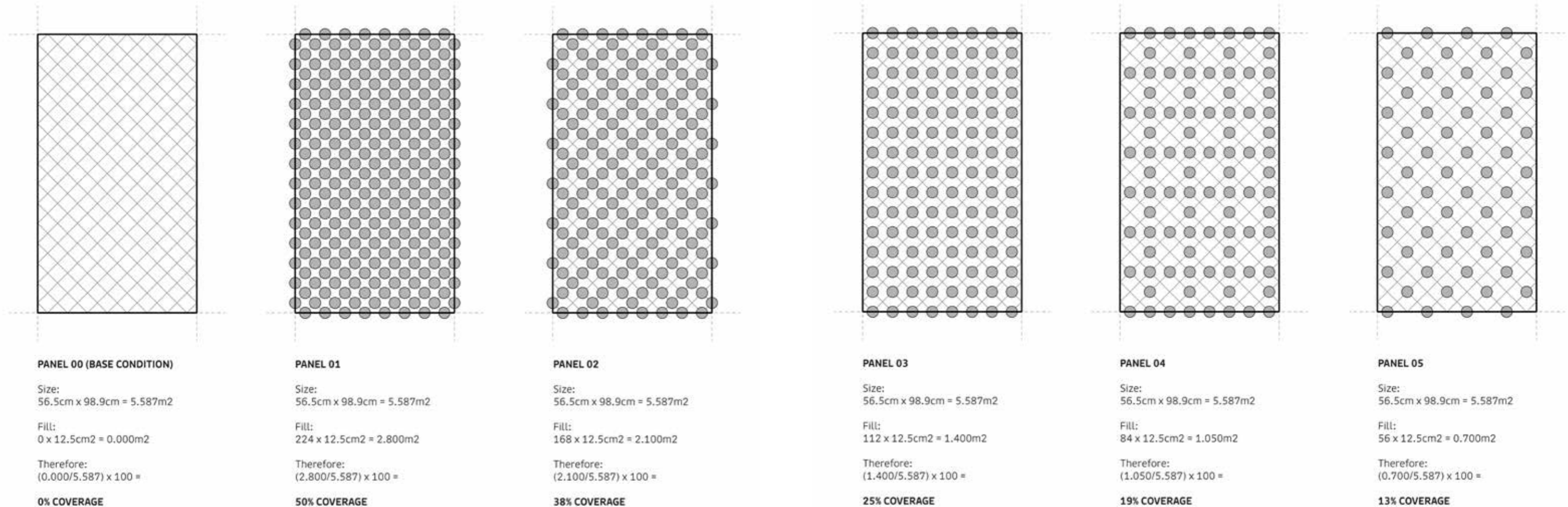


Figure 076 (above): Windbreak density studies





Figure 077 (above): Indicative artwork example



Figure 078 (above): Indicative artwork bay example



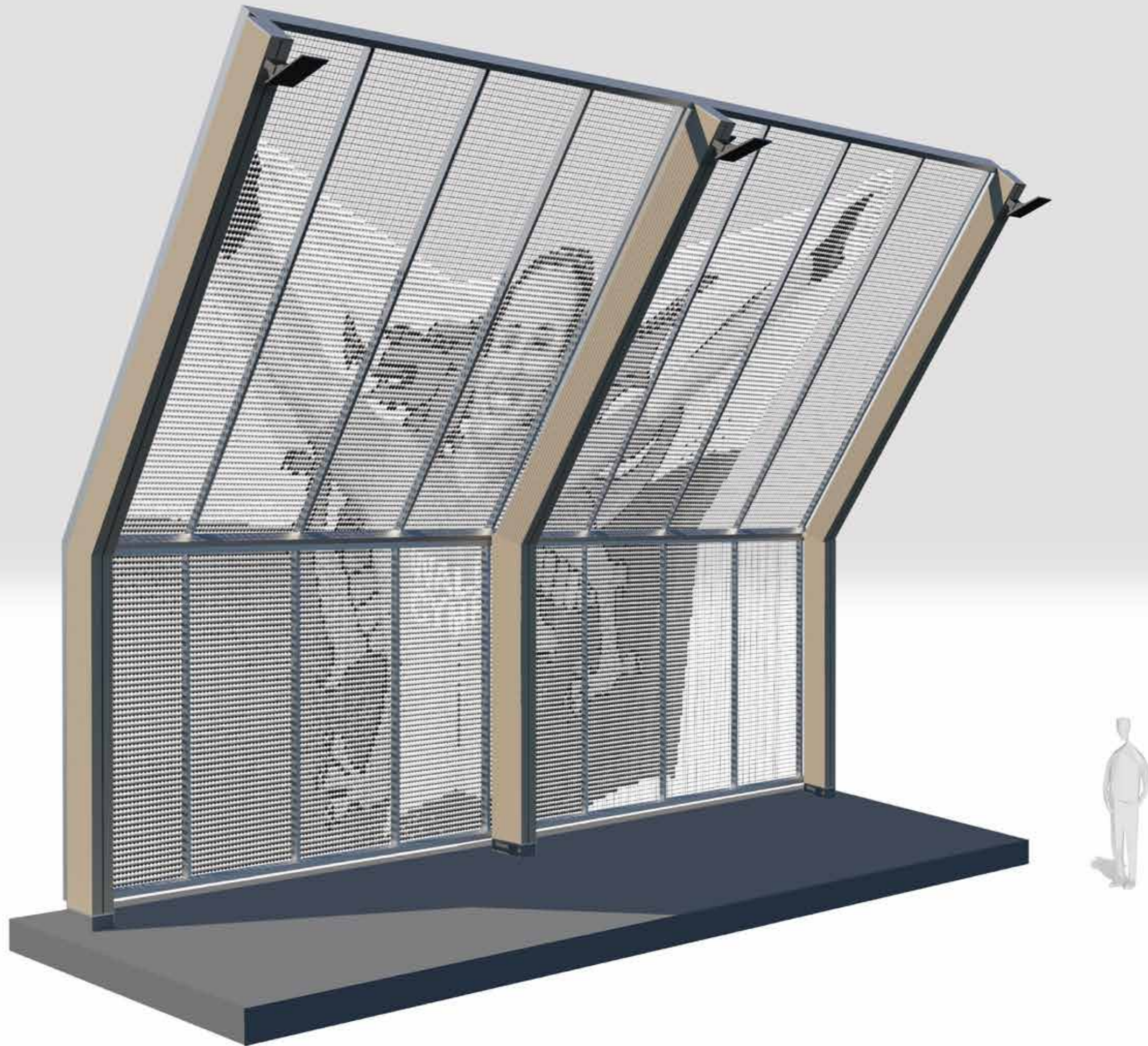


Figure 079 (above): Indicative artwork example





## TRACK LIGHTING

The primary function of the internal lighting scheme within the velodrome is to ensure a safe and usable track and infield which will be illuminated to a level that provides a safe environment for cycling.

It is well established that whilst lighting cannot prevent or eliminate rider negligence it can ensure no incidents occur as a result of badly planned or unsafe environments.

The lighting can also provide people with the confidence to use a facility and increase or prolong the hours of use. The ideal solution to providing this level of illuminance is to create a bright enough environment by having enough dedicated lighting. High level lighting is technically and environmentally the only possible solution to lighting the track surface.

The concept is to place the lights at the highest level of the wind break stations thus the deck will be lit to a maintained average illuminance sufficient for cycling. A similar approach to this was taken at the redeveloped Herne Hill site in London and is illustrated in the images on the opposite page.

As British cycling does not currently have any guidance on the minimum illuminance levels required at the surface of the velodrome the design team have assessed the current illuminance levels against other high levels sports requirements. This will potentially be much brighter than the surrounding area however the light sources will be positioned in a way that the light will be thrown down onto the riding surface rather than out into the bay.

While the illuminance of the track surface is the primary and predominant purpose for providing the lighting, the nature of lighting will go a long way to creating an iconic and recognisable destination within the bay. With the lighting sitting within the velodrome bowl there will be an inadvertent effect of back lighting the wind break structure creating a new illuminated canvas that can act as an instantly recognisable and distinctive object within the wider bay.

Lighting will be controllable and measured to ensure there is no negative impact on surrounding wildlife and natural habitats.

A separate lighting report has been provided as part of the velodrome application.

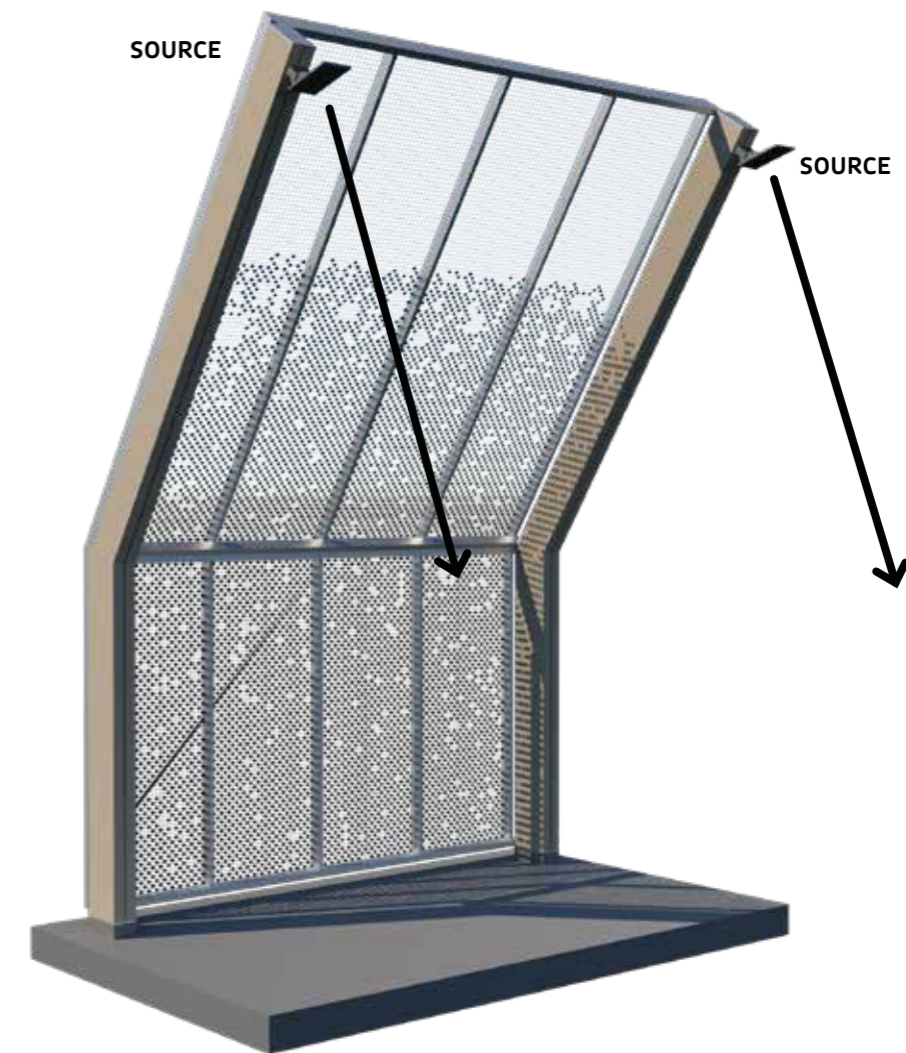


Figure 080 (above, top left), Figure 081 (above, top right), Figure 082 (above, middle left), Figure 083 (above, middle right), Figure 084 (above, bottom left), and Figure 085 (above, bottom right): Herne Hill velodrome lighting precedents, sources vary

Figure 086 (above): 3D Bay study illustrating the approach to lighting the velodrome track



## SITE LEVELS

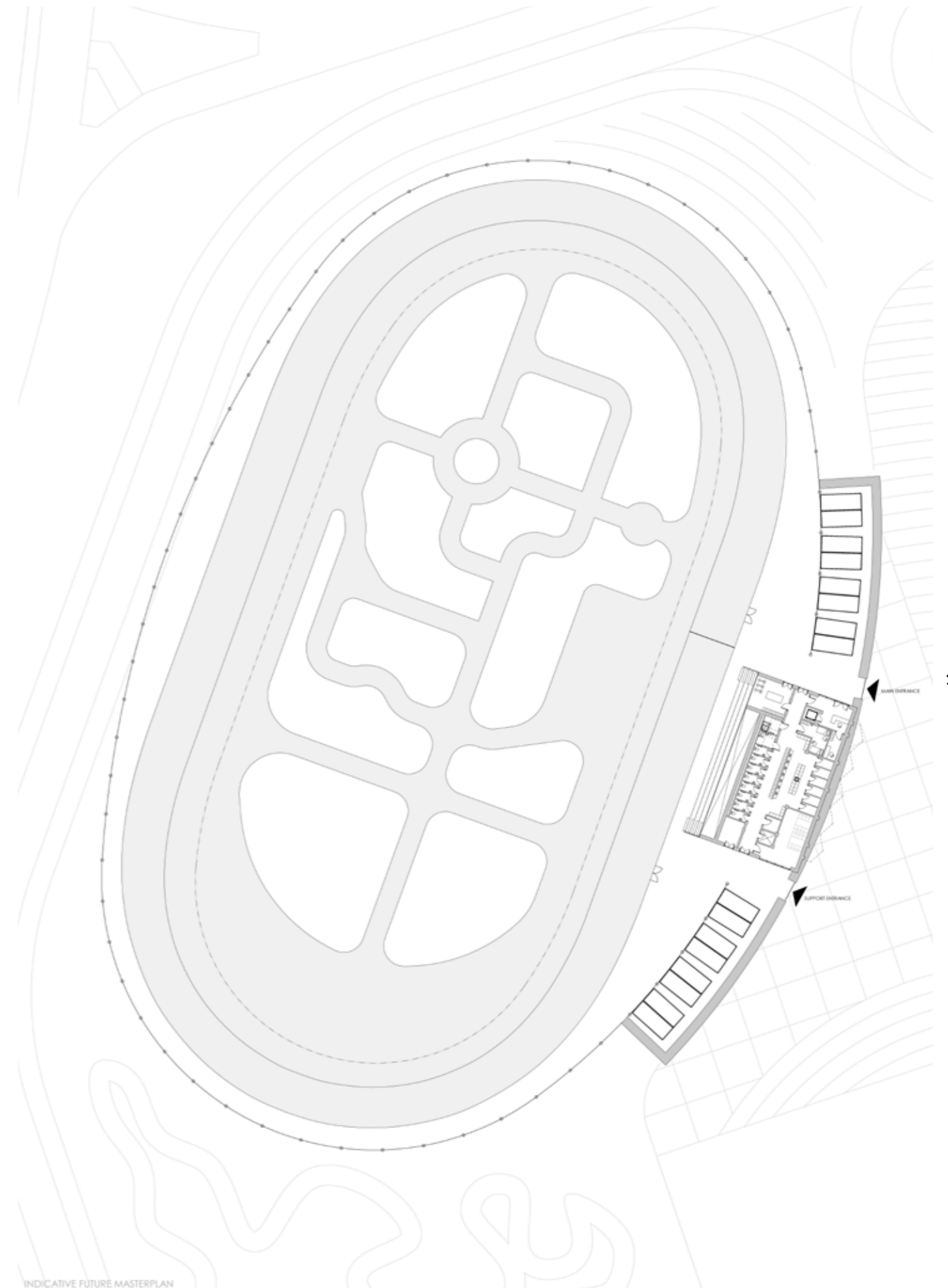
Level changes will be managed within the immediate surrounding of the velodrome to ensure a safe and accessible route into the building from the existing public realm.

To the north and south of the velodrome, landscape works will be required to account for the earth bund that will be needed to support the track at its highest point midway around the bend. These zones will be sown with wild grass and will contribute to the bio diversity of the development and the wider ISV.

The track centre will be sunk to ensure accessibility this will ensure emergency access to track centre via an over track access point located on the back straight of the velodrome can be maintained.



Figure 087 (above, top left), Figure 088 (above, top right), Figure 089 (above, bottom left) and Figure 090 (above, bottom right): Bio diversity planting examples, sources vary.



INDICATIVE FUTURE MASTERPLAN

Figure 091 (above): Extract from drawing 3617-FBA-00-XX-DR-A-01001



# ACCESS & INCLUSIVITY





# 5.0

## Access & Inclusivity

Accessibility has been considered from an early stage of the design of the proposed velodrome, indeed the accessibility has been tied from the start to the success of the velodrome and the placemaking contribution it will bring to the new quarter of the ISV.

Detailed design of items such as lighting, fixtures, fittings, communication systems and other aspects that will contribute to the success of the design will need to be developed in the future.

### ACCESS WIDTH

The main access to the velodrome has been designed to have a considerable clear width to cater for large volumes of pedestrian and cycle access in both directions during events and training sessions when peaks visitor movements are high.

At the point of entrance into the velodrome there are two clear openings either side of the main building, to the north and south. It is intended that the entrance point to the north will be the primary access point and function as the main touch down space. The entrance to the south provides access to storage, for maintenance and as means of escape.

The design and scale of the openings has been considered to give a clear indication of the access points whilst making for a more pleasant and enjoyable user experience.

### SURFACE

The proposed surface finish to all public spaces will conform to slip regulations and all external spaces will be adequately drained.

### GRADIENTS

The level difference across the site falls predominantly from a high point to the north to a low point at the south, this is in the region of two meters, the average level of site sits roughly around +11.00mAOD.

To ensure the velodrome is as accessible, user friendly and unobtrusive as possible the design team have based the design development with nominal gradients across the public realm to integrate the levels into the existing and surrounding landscape. To maintain a level transition from public realm to track side and beyond and onto the track the velodrome has been sunk to ensure transitions are removed and easy access can be maintained.

### BALUSTRADE

At the first floor there is a requirement to provide a balustrade to prevent falls from height. As there is no realistic expectation for there to be a need to cycle around the external space provided at the first floor the design team concluded there is no need for the handrail to be provided at increased fall protection of 1400mm. However a continuous balustrade will be provided at 1100mm above finished floor level around the external perimeter of the first floor space and along the edge of the external seating space to protect against fall. The balustrade will comprise of extruded metal bars at no more than 100mm centres.

### LIGHTING

Lighting has been designed to provide a constant wash across the surface of the velodrome track from a high level position located on the stantions of the windbreak structure. In conversation with the local authority conservation and planning teams it was felt this would provide the best illuminance while minimising the amount of light spill into the wider context.

### CYCLISTS

Due to the nature and aspiration of the ISV to provide a significant new access to cycling, the velodrome has been designed with the movement and gathering of cyclists in mind. Large gathering spaces flank the track space to the north and south of the pavilion, while grandstand seating offers great unrestricted views of the velodrome track. Bike storage has been provided adjacent to these spaces and will be available to hire or under specific club or management control. This is primarily to create a sense of destination and togetherness for the users but to also reduce any conflict between pedestrians and cyclists moving through the adjacent public realm prior to events or sessions.

### SUPPORT DRAWINGS

Supporting drawings can be found as part of the drawings pack that supports this application.



## SAFETY AND SECURITY

### Gates

In contrast to the existing site at Maindy it is not proposed that the velodrome will be open and accessible 24 hours a day. However the velodrome will require closing for the following situations:

- maintenance;
- control and security;
- controlled events.

In order to manage the closure and security of the site, gates are provided at both entrances to the velodrome. These can be used as part of the closure routine and as a secure line when the velodrome is shut for prolonged periods of time, such as during festive periods or periods of unsafe weather.

The gate will be built into the body of the foundation formwork and provide a permanent anti-vehicle bollard as well as providing the gate line. Due to the complexities of the velodrome and the recent requirements for more significant movement control (following the outbreak of Covid-19) the gates will open in a butterfly fashion from the central post, engaging with the closure walls on either side of the opening, this will indicatively suggest a notional in and out direction.

The height of the gate will match the balustrade top rail from the first floor at a height of 1100mm above grade, and when closed will form a continuous secure line in conjunction with the gabion walls and the wind break structure.

Although the context varies slightly across the two entrances, the closure gate will in essence be identical at both points. An extract from a support drawing can be found opposite.

### Lighting

Lighting of the velodrome track will be provided by fittings integrated into the wind break structure, and will be switched on during the darker hours. Visibility will therefore be maintained during the darker hours making users feel safer and will extend the hours of operation during the winter months. Additional information on the lighting of the velodrome is supplied in a separate document submitted as part of the application.

### CCTV

CCTV monitoring will be provided by a camera mounted within the scheme.

## ENVIRONMENTAL SUSTAINABILITY

The purpose of the velodrome is to encourage cycling and fitness through the city by enabling a better connection between the Bay Loop and the facilities outlined in this report. It is hoped that the new facility will encourage and foster a new sense of togetherness across several sporting communities in and around Cardiff.

The velodrome will have a significant design life. The main concrete and timber structure will seek to minimise

embodied energy using recycled aggregates and responsibly source timber. The materials for the project have been chosen for their efficiency and longevity.

Surface water run off from the track and other non porous surfaces will be allowed to make its way into the SUDs system as agreed with the engineering team.

The construction process has also been carefully considered to minimise environmental impact on the site and surrounding environment. Any material removed as part of the construction process will be placed on the site and will be utilised to create future infrastructure project in an attempt to minimise contamination spread from the sites former uses.

Equally the current intention is to minimise impact on the surrounding wildlife and ecology by maintaining a safe distance from any adjoining wildlife corridors or zones.

## ECOLOGY

The design of the velodrome, the gabion walls and the location of the internal lighting has been considered to minimise light spill into and across the surrounding site - an important consideration in the context of the potential bat habitat within the immediate tree cluster to the west of the site.

The proposed external lighting has been designed to further minimise disturbance to bats and other nocturnal fauna by utilising a controllable management system that will allow the lights to be dimmed or completely turned off during the darkest hours.

The use of gabion walls has also been considered to provide a habitat for smaller insects and local wildlife within a significantly urban zone.

A separate ecology report has been provided as part of the footbridge application.

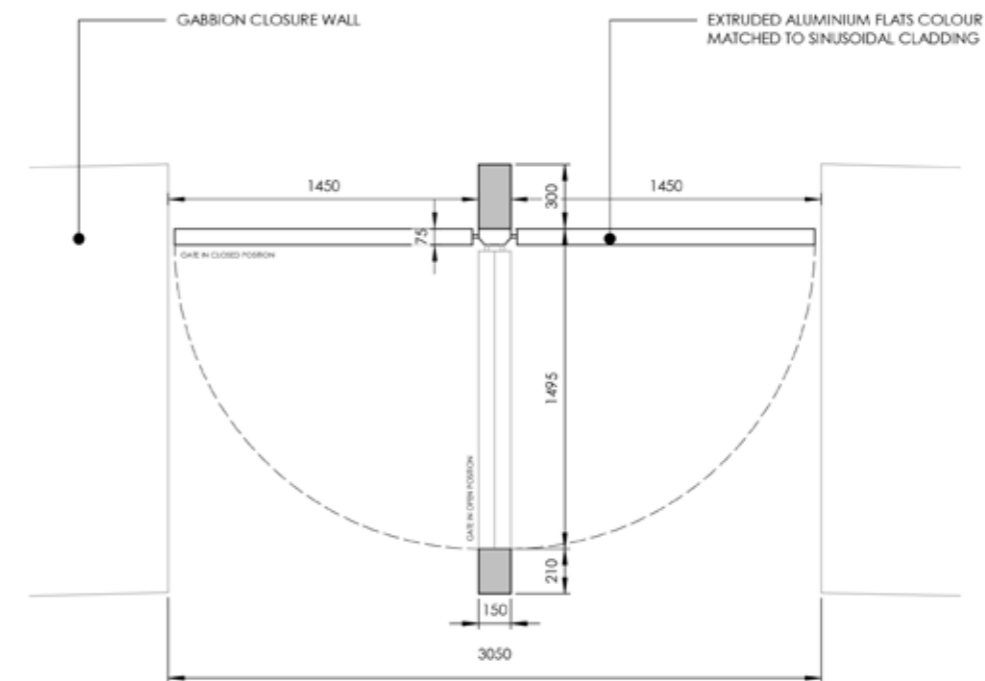
## ACCESS CONTROL

The approach to both entrances will be through the public realm to the east of the scheme, some minor landscape alterations as outlined previously in this document will need to be made to ensure level access is provided to the building.

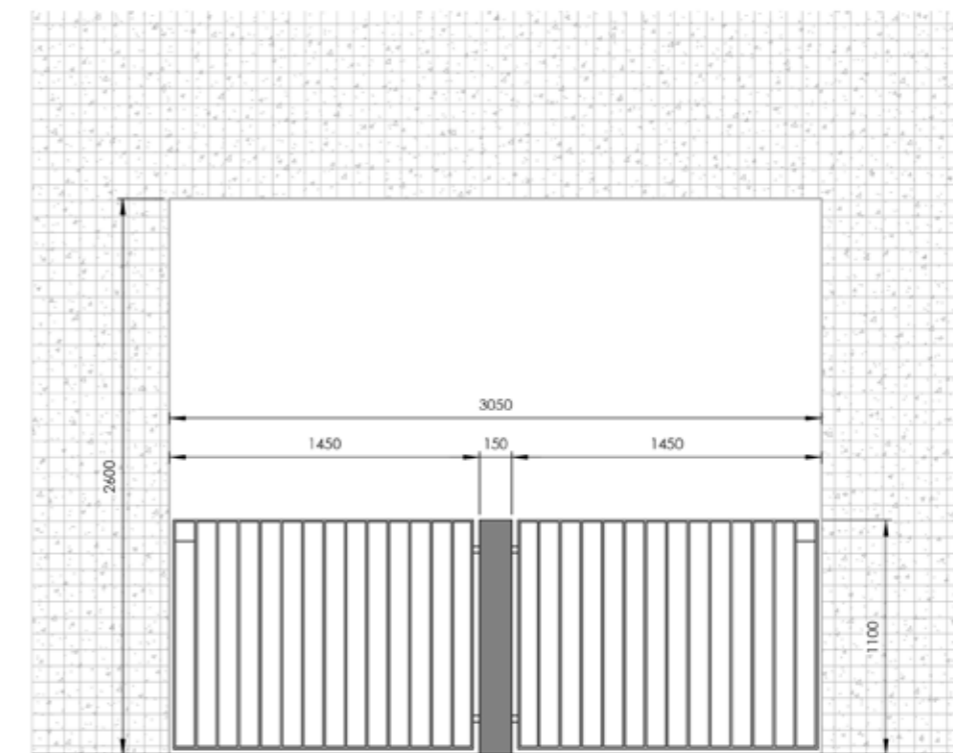
Within the public realm the materiality and feel of the space will be as existing with the insertion of the new building and velodrome.

The gabion walls will indicate the entrance to the velodrome and facilities and as such it is not envisaged that excessive signage or way finding will be required or incorporated into the immediate landscape between the velodrome and Olympian Drive.

When open the access gates will sit in the centre of the opening, perpendicular to the gabion wall, this is to minimise the impact on the pedestrian zone outboard of the velodrome and to minimising the velodrome footprint. It also acts as movement and access control to those accessing the facility, encouraging them to slow down and dismount rather than accessing the shared space at speed which may make for an uncomfortable experience.



VELODROME ENTRANCE PLAN

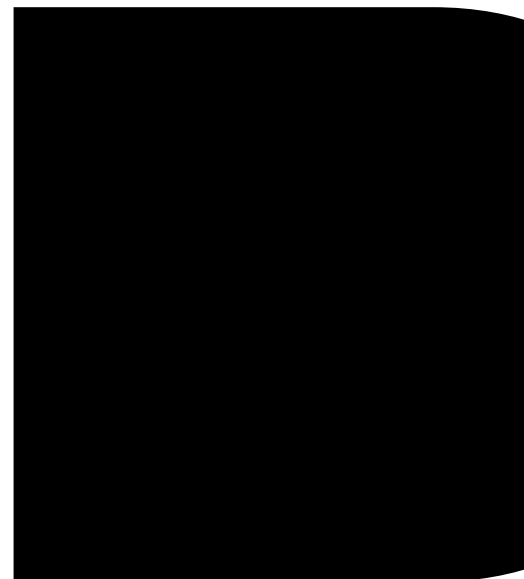
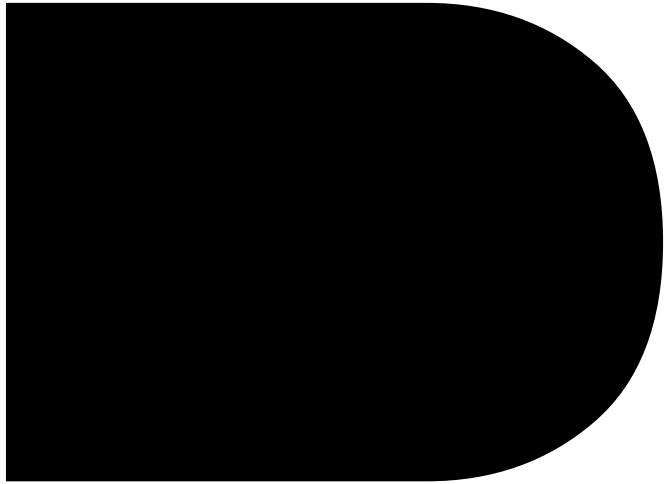
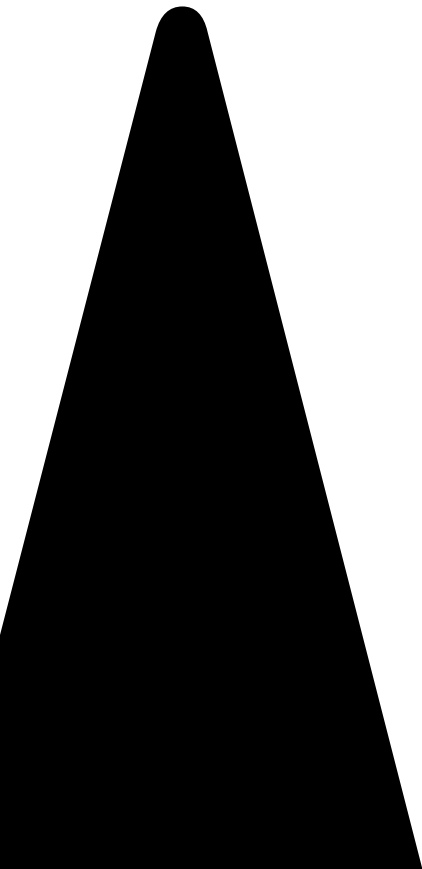


VELODROME ENTRANCE ELEVATION

Figure 092 (above): Extract from drawing 3846-FBA-00-XX-DR-A-01\_70



**FAULKNERBROWNS  
ARCHITECTS**



FaulknerBrowns LLP  
Dobson House  
Northumbrian Way  
Killingworth  
Newcastle upon Tyne  
NE12 6QW

+44 (0)191 268 3007

[info@faulknerbrowns.com](mailto:info@faulknerbrowns.com)  
[faulknerbrowns.com](http://faulknerbrowns.com)

FaulknerBrowns LLP is a Limited Liability Partnership registered in England and Wales. Registered number OC386918.  
Registered office: Dobson House, Northumbrian Way, Killingworth, Newcastle upon Tyne, NE12 6QW