Roberts Limbrick

Shrewsbury Pride Hill Swimming Pool Appraisal

Feasibility Study

Client:	Shropshire Council
Author:	Roberts Limbrick
Reference & Revision:	11981 / Draft Issue P03
Issued:	August 2025

00 Contents

01 Introduction

1.1 Introduction

Shropshire Council is seeking to develop new swimming facilities, along with complementary health and fitness amenities, at the former Pride Hill Shopping Centre in response to a recognised shortfall of leisure provision in the local area. The Council has issued a brief with the intention of aligning the proposed facilities with those planned for Shrewsbury Sports Village, the brief for this project is demonstrated in the following sections.

Roberts Limbrick has been appointed by Shropshire Council to carry out a RIBA Stage 1 feasibility study, exploring the integration of the proposed swimming and fitness facilities within the existing structure of the Pride Hill building. The study will be supported by structural engineers and delivered through the Alliance Leisure Framework, with Alliance Leisure acting as the Council's strategic development partner.

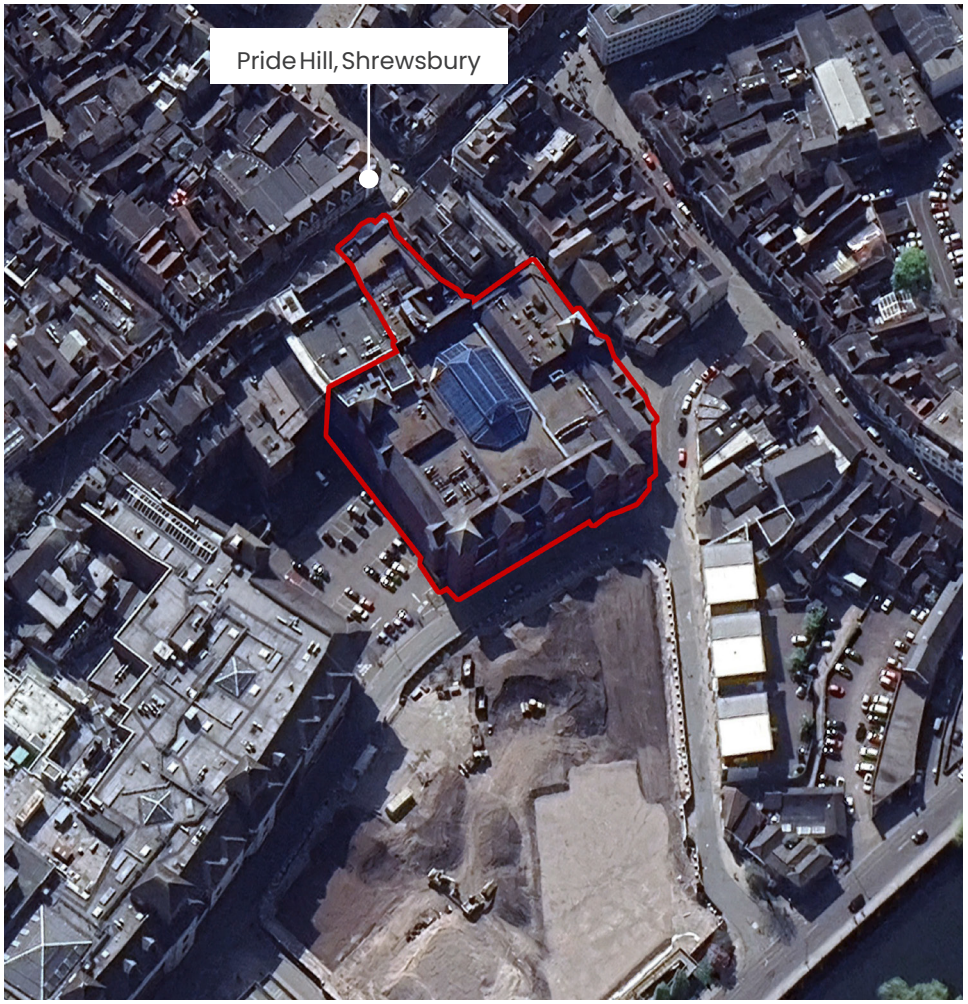


Figure 01: Site location plan with indicative red line boundary

1.2 Brief and Key Client Objectives

Shropshire Council has established the following key objectives for the leisure facilities at Pride Hill:

- Develop new swimming and fitness facilities within the existing structure of the former Pride Hill Shopping Centre;
- Ensure the proposed facilities align with those at Shrewsbury Sports Village.

1.3 Shrewsbury Sport Village Proposals

Shropshire Council is looking to develop new swimming and fitness facilities at Shrewsbury Sports Village, Sundorne Road, to meet the counties needs. Roberts Limbrick are appointed as architects on the project, working under the main contractor. Planning was submitted in July 2025.

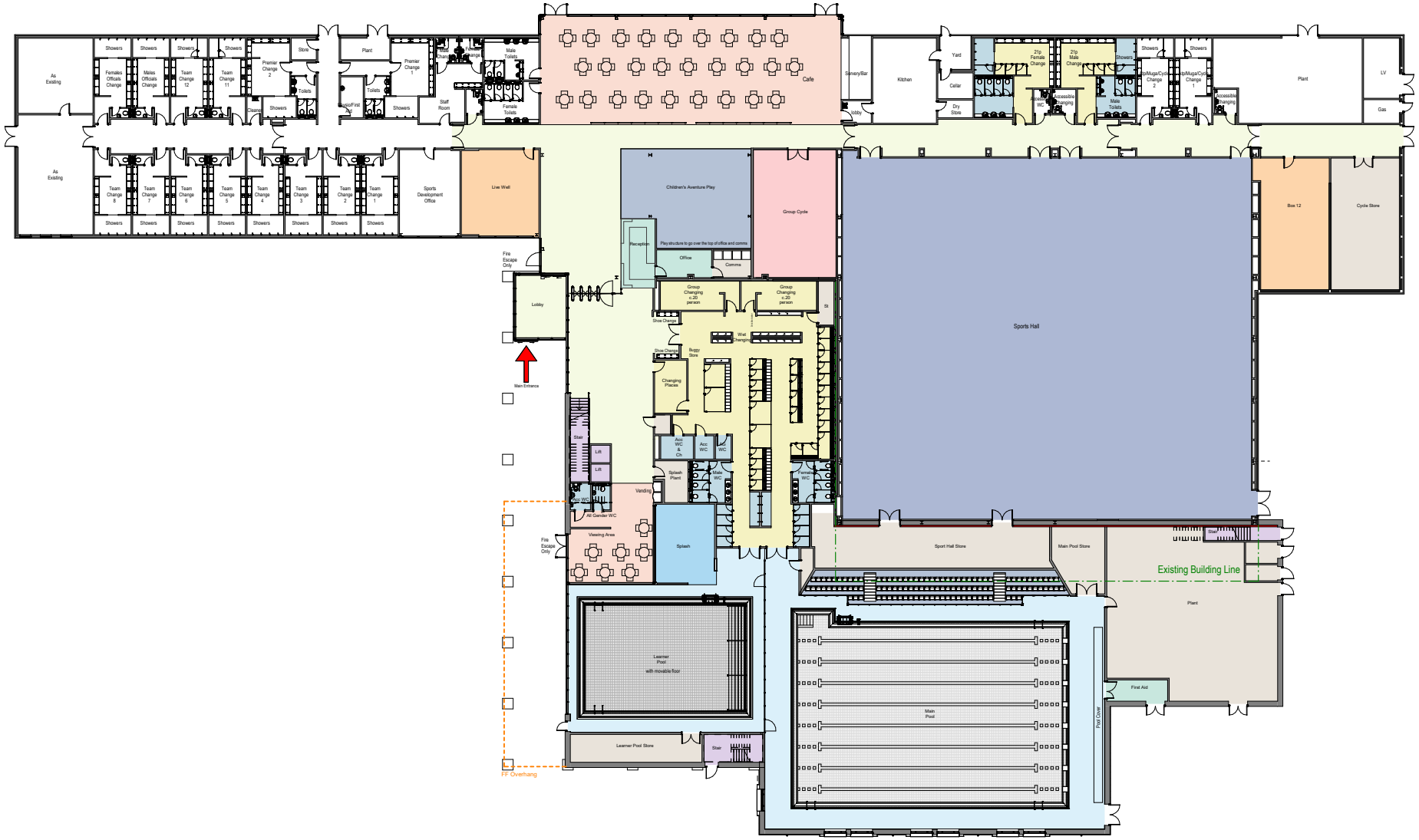
Key objectives include delivering high-quality swimming facilities, expanding leisure options, improving site efficiency, ensuring accessibility, and reducing environmental impact by creating a carbon-efficient health and well-being centre.

Figure 02 highlights the proposed facilities and the basis for the proposed brief.

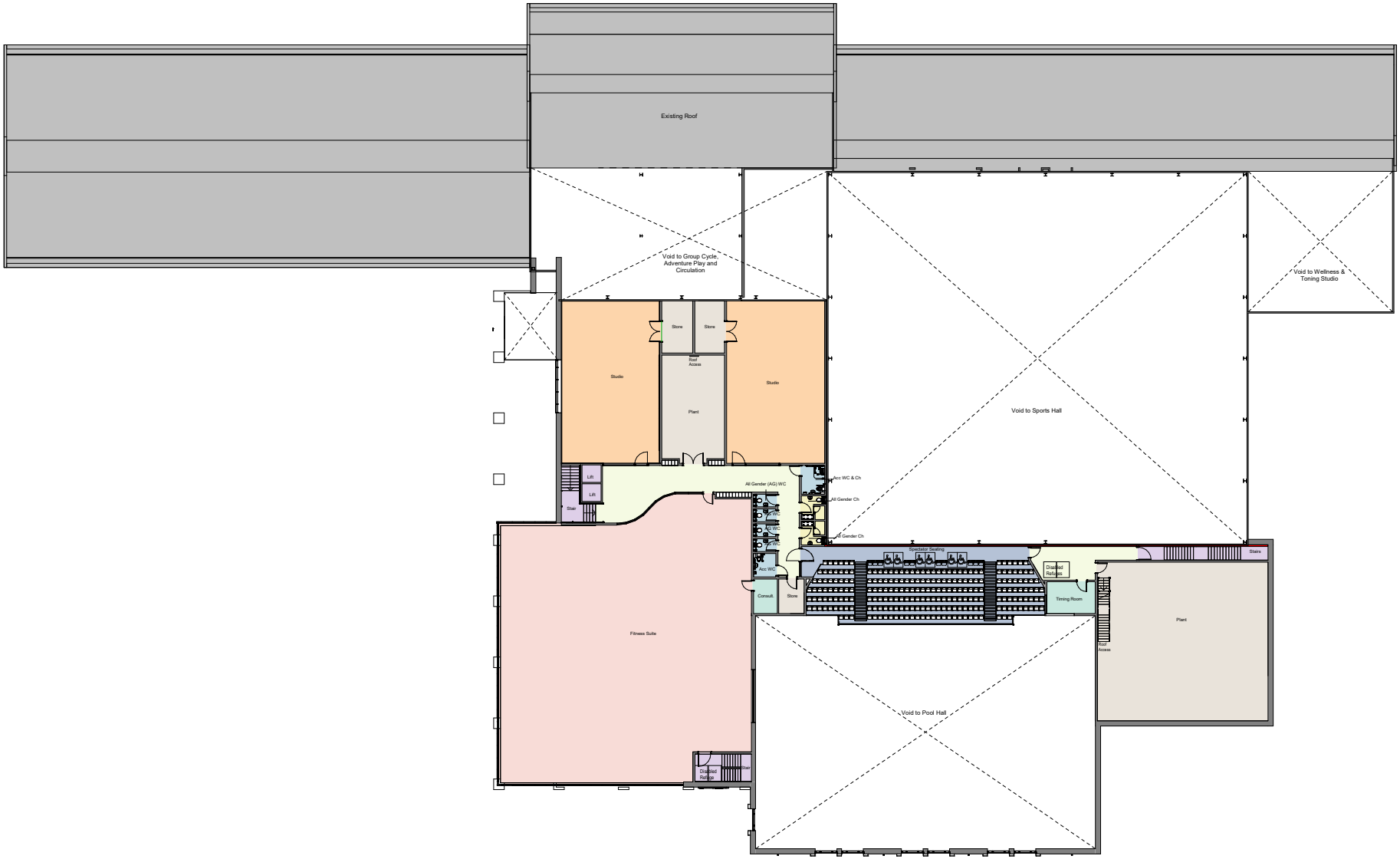
Shrewsbury Sport Village - Area Schedule	
Facility	**Shrewsbury Sport Village**
Dry Side	
Box 12	80 m²
Dry Change - Mens	55 m²
Dry Change - Womens	55 m²
Fitness Suite (130 Station)	590 m²
Group Cycle	95 m²
Live Well	60 m²
Soft Play	105 m²
Studio	140 m²
Studio (Immersive)	140 m²
Dry Side	1320 m²
Wet Side	
25m x 8 Lane Pool	705 m²
Learner Pool 15x10m	265 m²
Spectator Viewing (250)	155 m²
Splash	65 m²
Timing Room	15 m²
Wet Change	300 m²
Wet Side	1505 m²
Grand total: 18	2825 m²

Figure 02: Proposed accommodation schedule at Shrewsbury Sports Village. All areas are indicative and subject to design development.
nb circulation and plant not shown.

1.4 Shrewsbury Existing Ground Floor Plan



1.4 Shrewsbury Existing First Floor Plan



02 Site Analysis

2.1 Background

The Pride Hill Shopping Centre is a prominent, though now-vacant, commercial building located in the heart of Shrewsbury town centre. The building in part lies within Flood Zone 3. Adjacent to the site within the nearby car park is a protected Scheduled Monument consisting of a section of medieval town wall.

Architecturally Pride Hill is characterised by a linear, multi-level layout and glazed roof-light elements that previously contributed to a bright interior. The building's internal organisation follows a typical mall typology, featuring centralised circulation flanked by retail units, with access points to Raven Meadows, Roushill, and Pride Hill.

Today, the structure stands largely empty, with public access restricted. Despite its dormant state, a recent inspection by ARUP confirmed the building remains visibly in good condition, offering a robust shell suitable for adaptive reuse. Its scale, prominent location, and connectivity to surrounding developments establish it as a key opportunity within Shrewsbury's broader urban regeneration strategy.

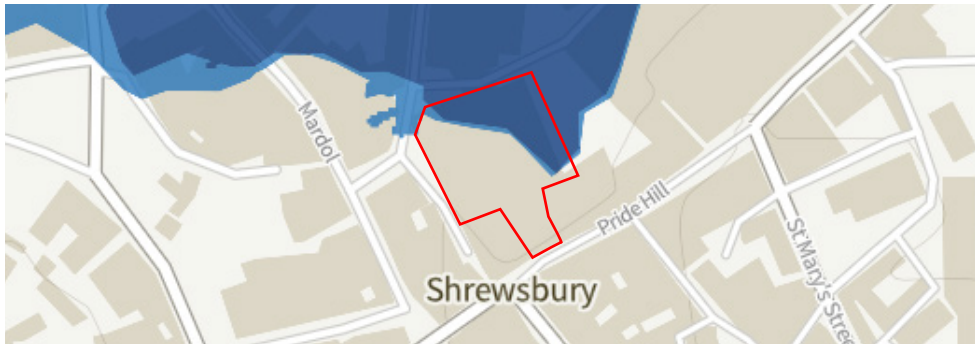


Fig 03 - Flood Risk - Flood Zone 3 (Shown in Blue)

Fig 04 - Scheduled Monument (Shown in Green)

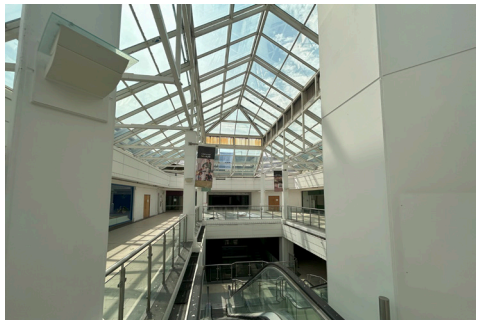


Fig 05 - Site Photo of Atrium


Fig 06 - Site Photo of Retail Unit

2.2 Site Access and Parking Provision

The site has two existing pedestrian access points located along Roushill and Pride Hill, with Pride Hill considered the primary pedestrian entrance. Vehicle access for loading is available via Raven Meadows.

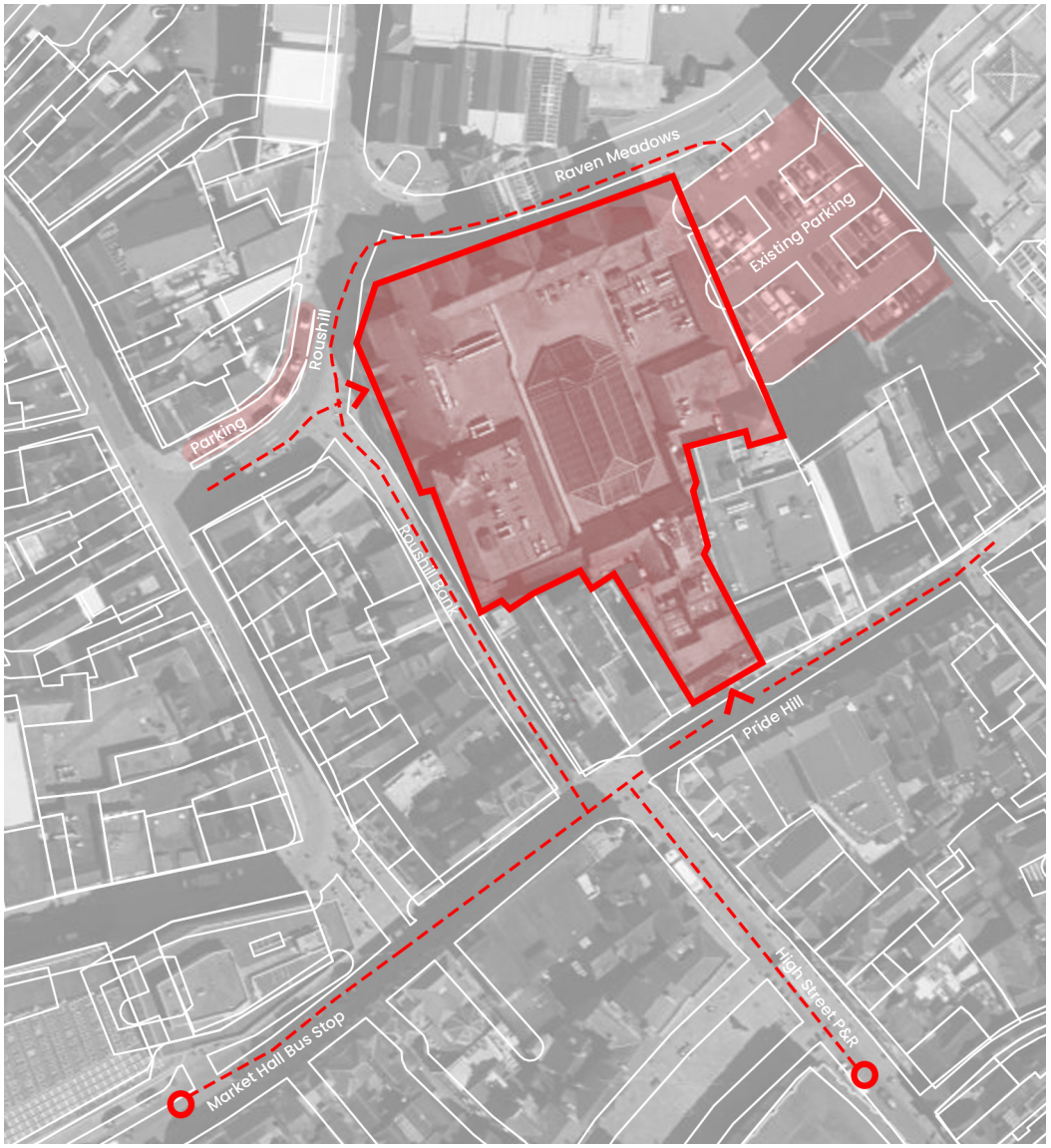
Adjacent to the site, along Raven Meadows Road, is a pay and display car park providing approximately 62 parking spaces. The nearest pedestrian entrance to the building is situated on Roushill Bank, a steep pedestrian street, approximately 110m away (2-minute walk).

Street parking along Roushill Road offers a limited provision of around 10 spaces, including two designated disabled bays. This parking provides direct access to the eastern pedestrian entrance on Roushill Road.

Cycle parking facilities near the site include five cycle racks along Roushill Bank, accommodating up to 10 bicycles. A desktop study using Google images indicate that cyclists also use roadside railings for parking, suggesting a potential shortfall in available cycle parking.

Several bus stops serve the area around Pride Hill Shopping Centre, with the closest being:

- Market Hill Stop, approximately 115m (2-minute walk) from the Pride Hill entrance and 150m (2.5-minute walk) from the Roushill entrance
- High Street Park and Ride, located within 90m (1.5-minute walk) of Pride Hill and 180m (3-minute walk) from the Roushill entrance



2.3 Site Photos

Fig 07 - Site Photo of Raven Meadows Entrance

Fig 08 - Site Photo of Lower Atrium

Fig 09 - Site Photo of Roushill Entrance

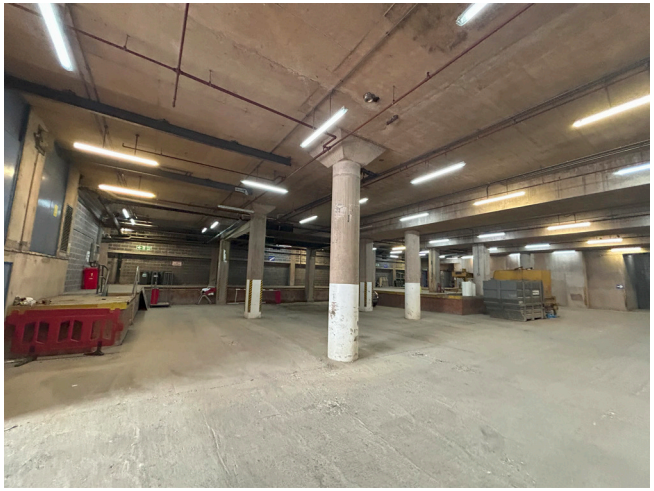
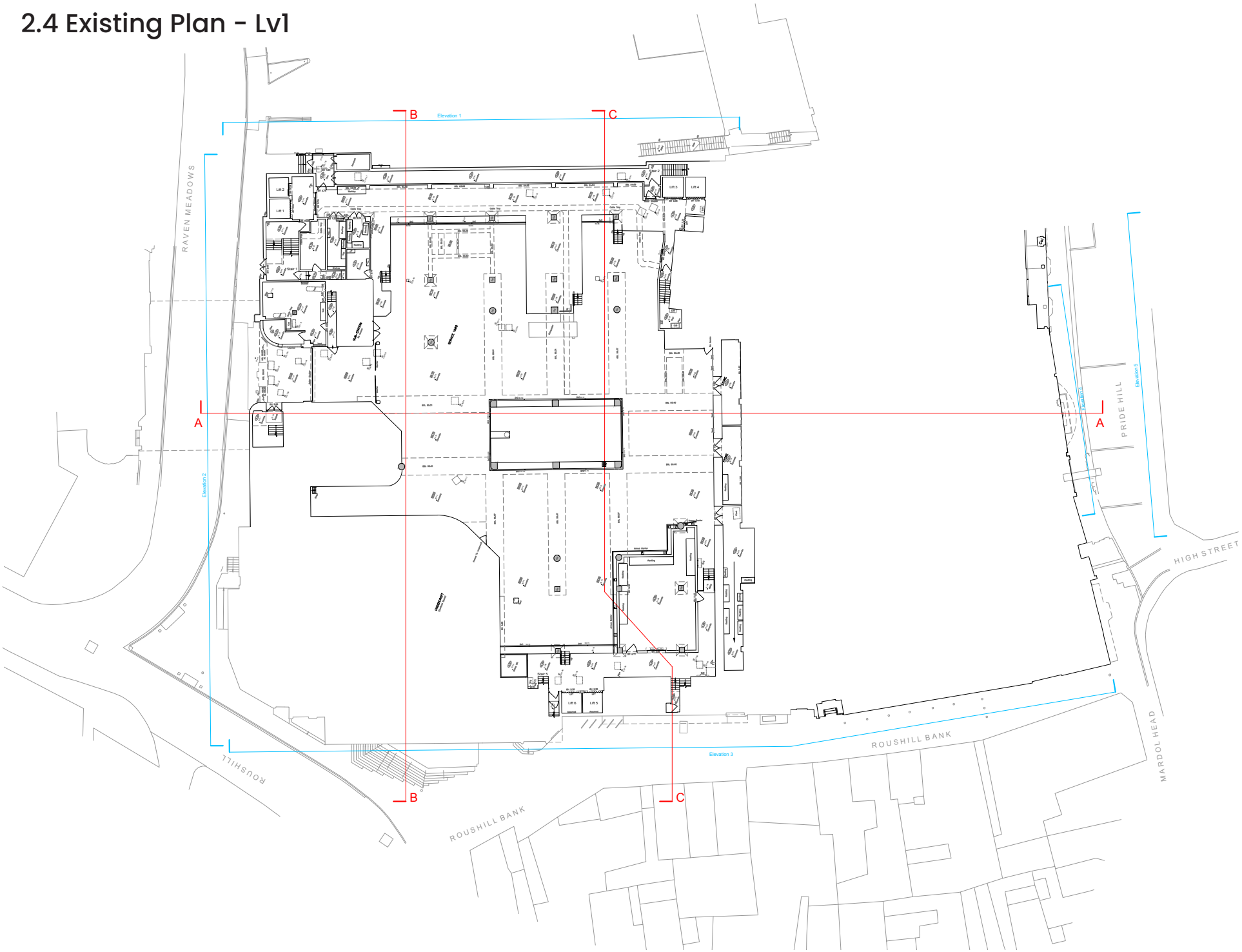


Fig 10 - Site Photo of Ground Floor Lvl/2

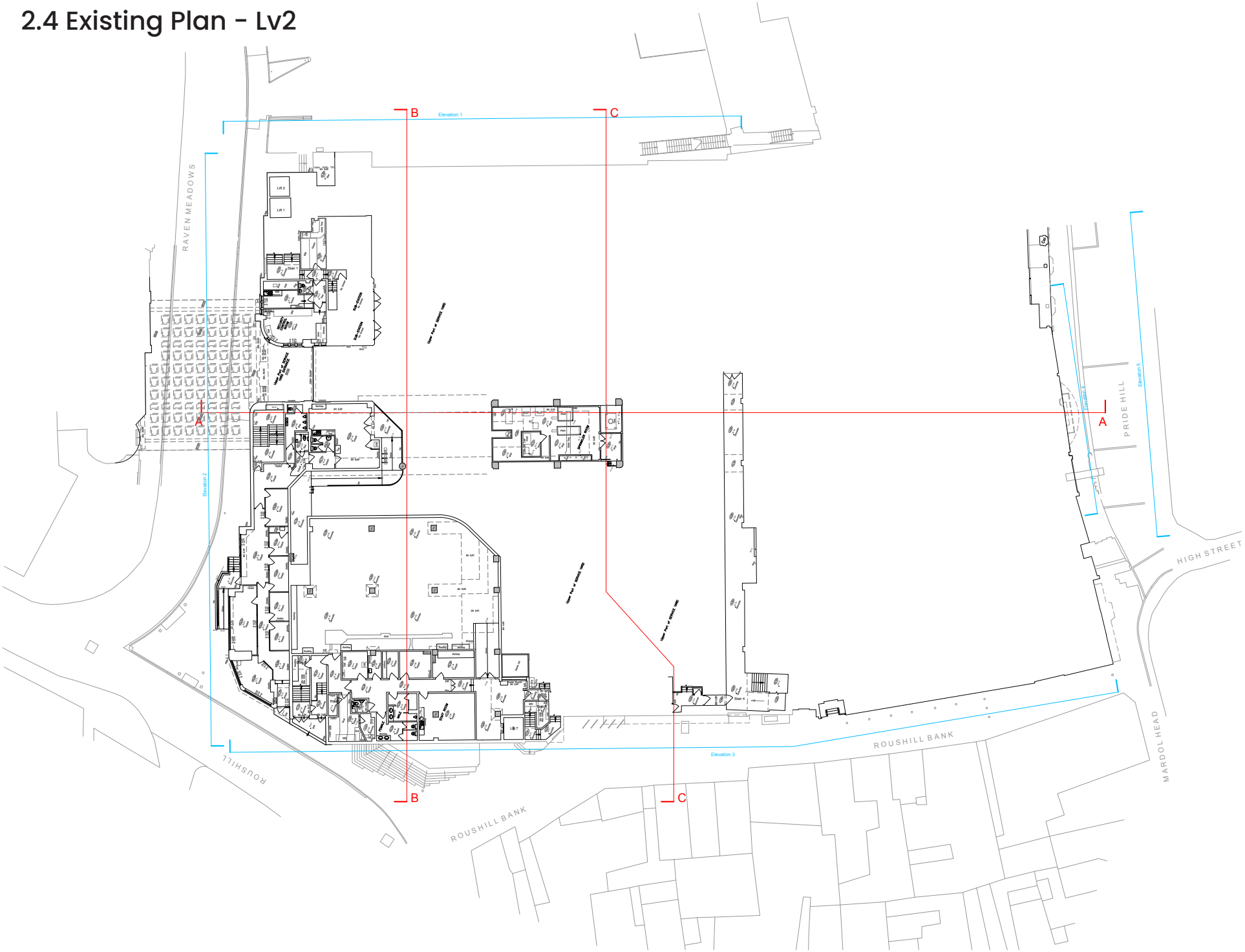
Fig 11 - Site Photo of Upper Atrium

Fig 12 - Site Photo of Pride Hill Entrance

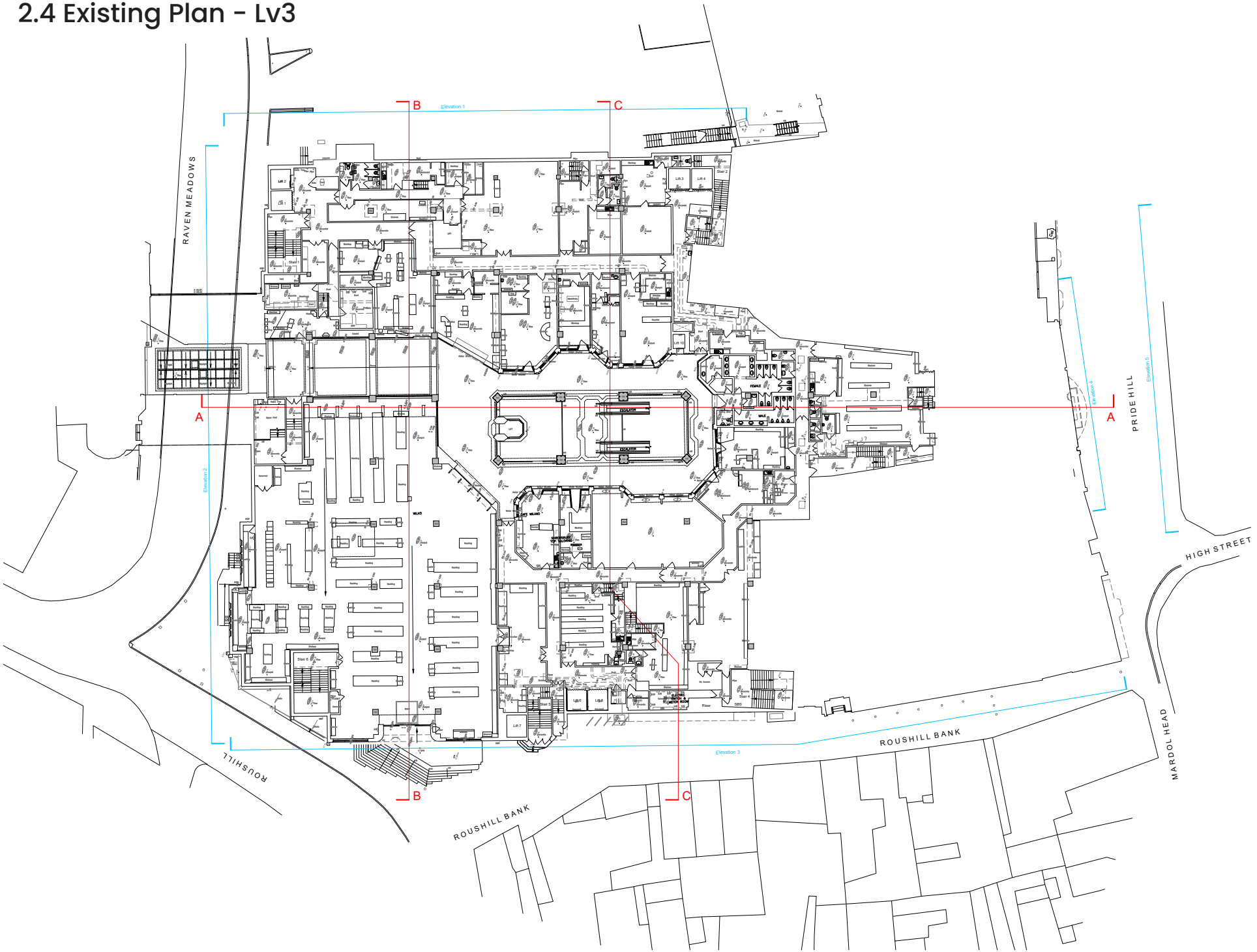
2.4 Existing Plan - Lv1



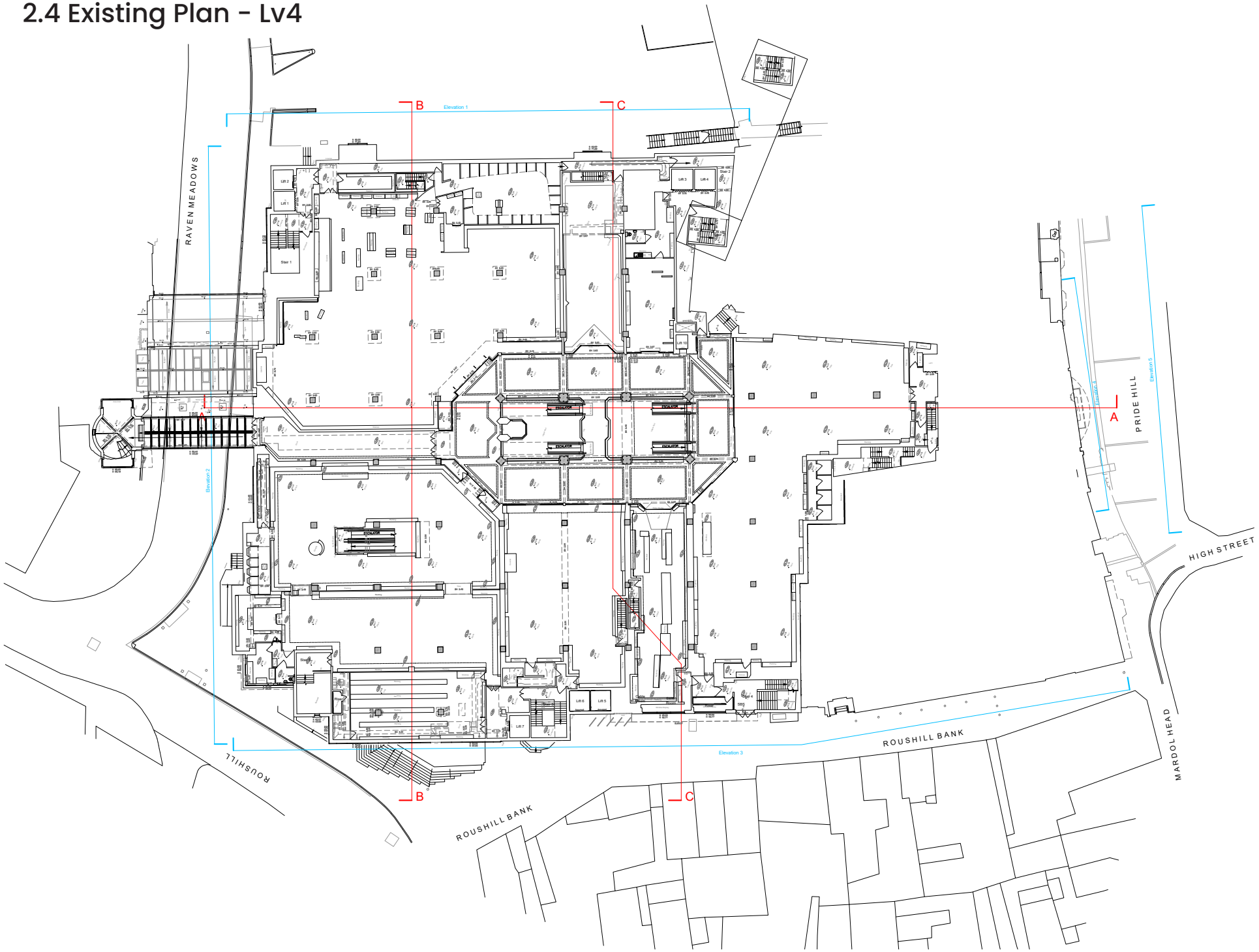
2.4 Existing Plan - Lv2



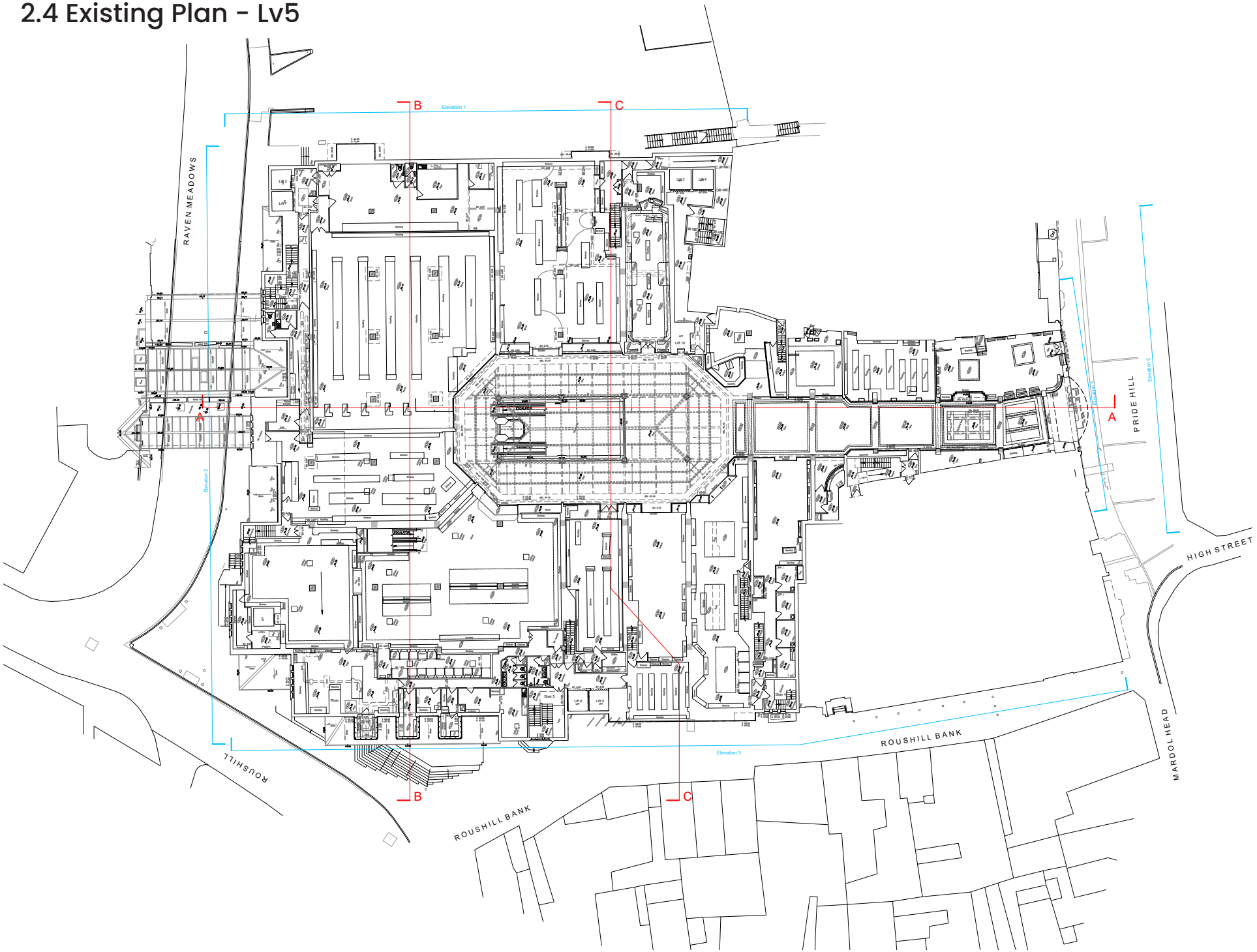
2.4 Existing Plan - Lv3



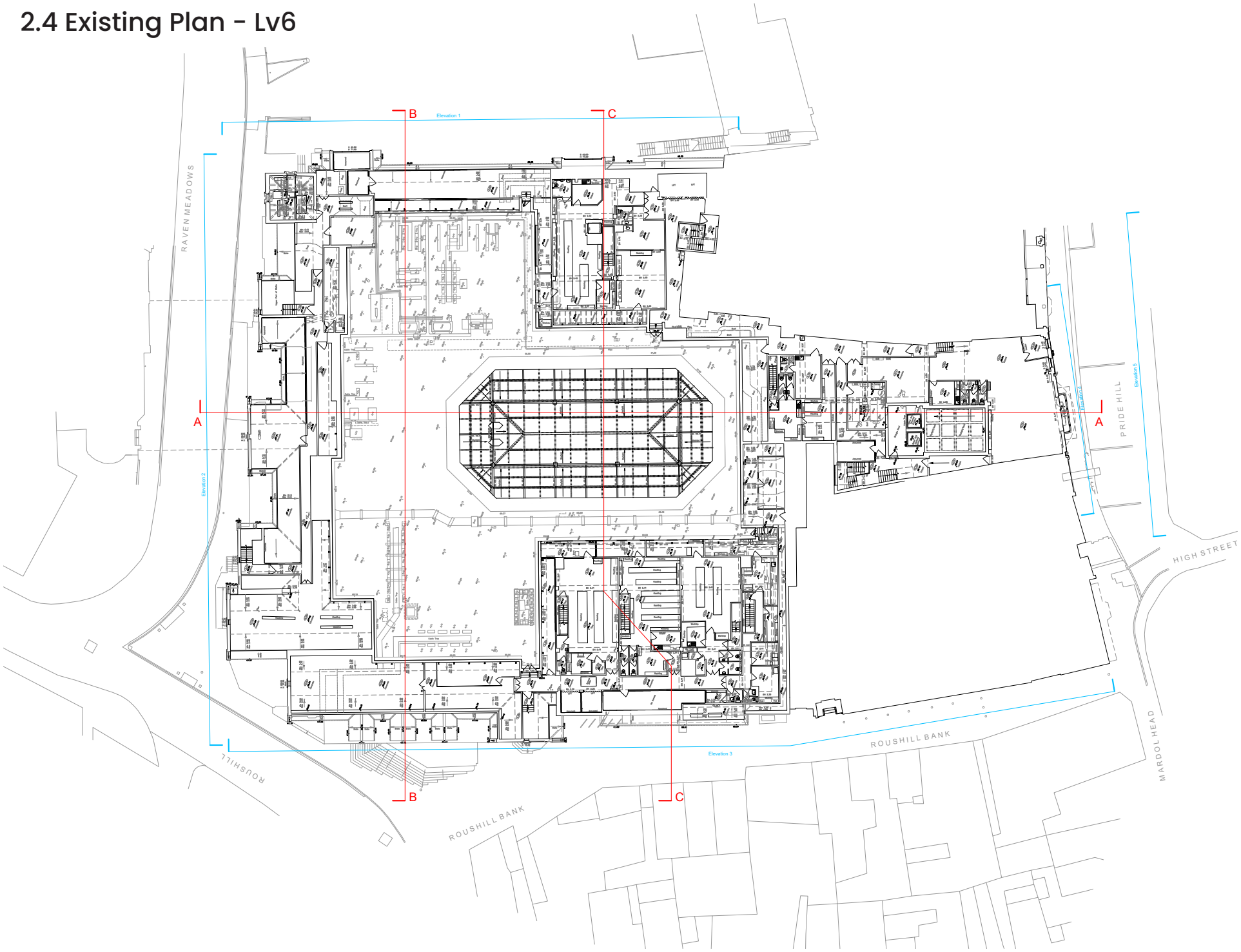
2.4 Existing Plan - Lv4



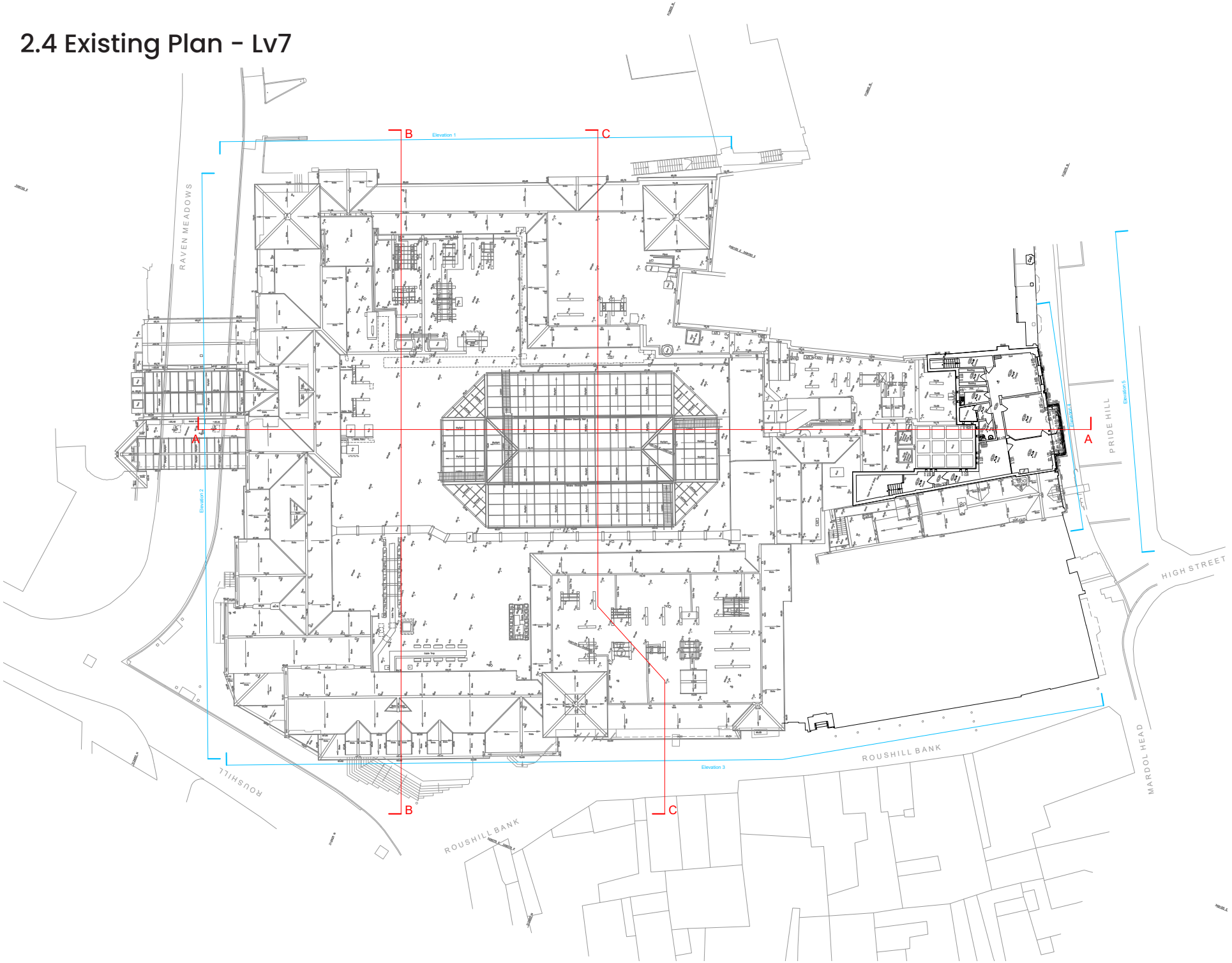
2.4 Existing Plan - Lv5



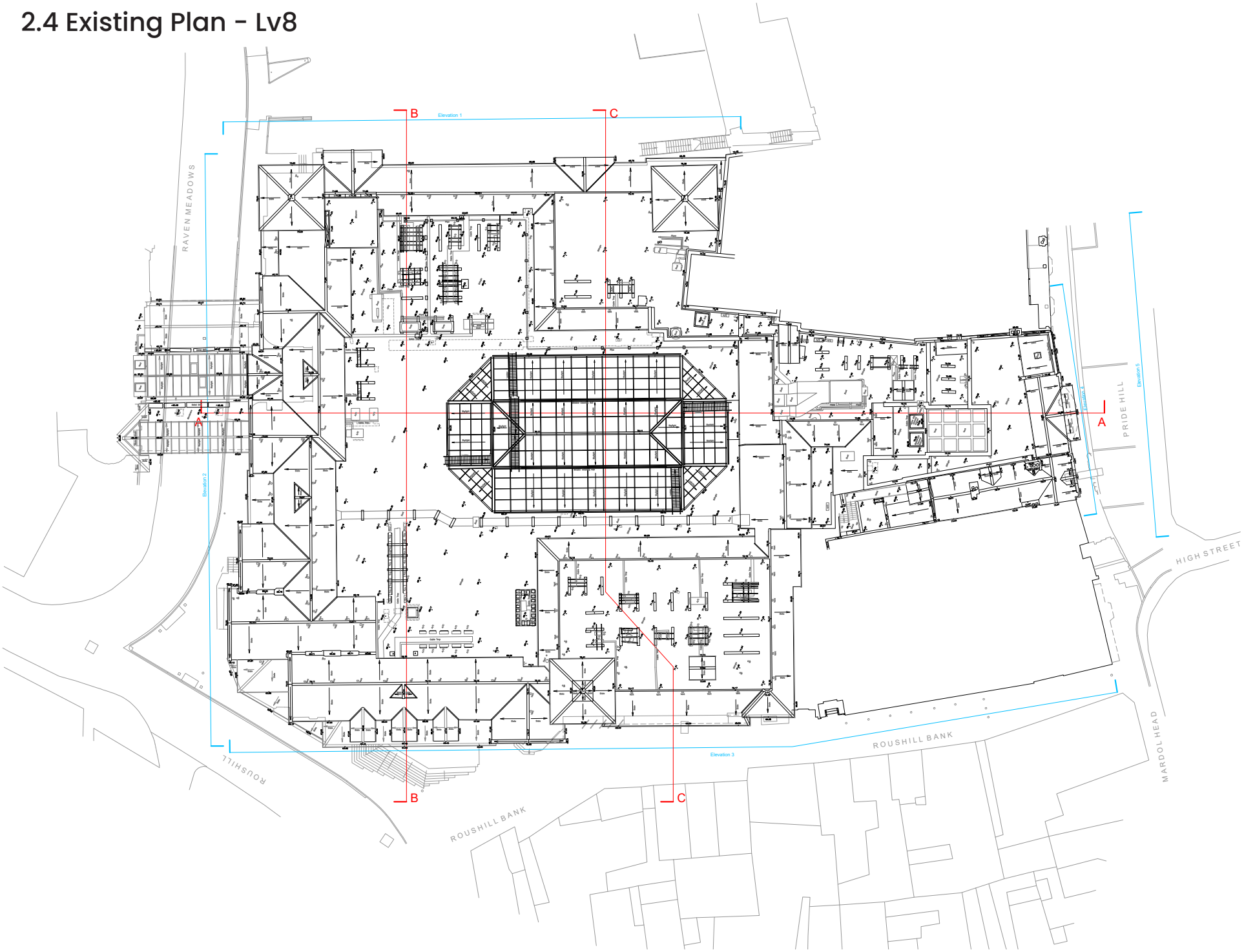
2.4 Existing Plan - Lv6



2.4 Existing Plan - Lv7



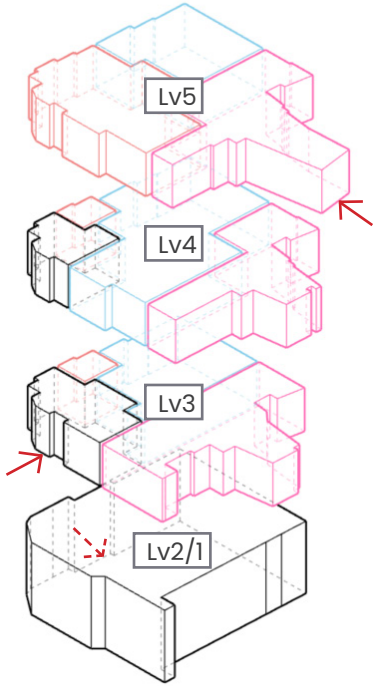
2.4 Existing Plan - Lv8



03 Design Proposal - Option 1

3.1 Proposed Ground Floor Plan - Lv2

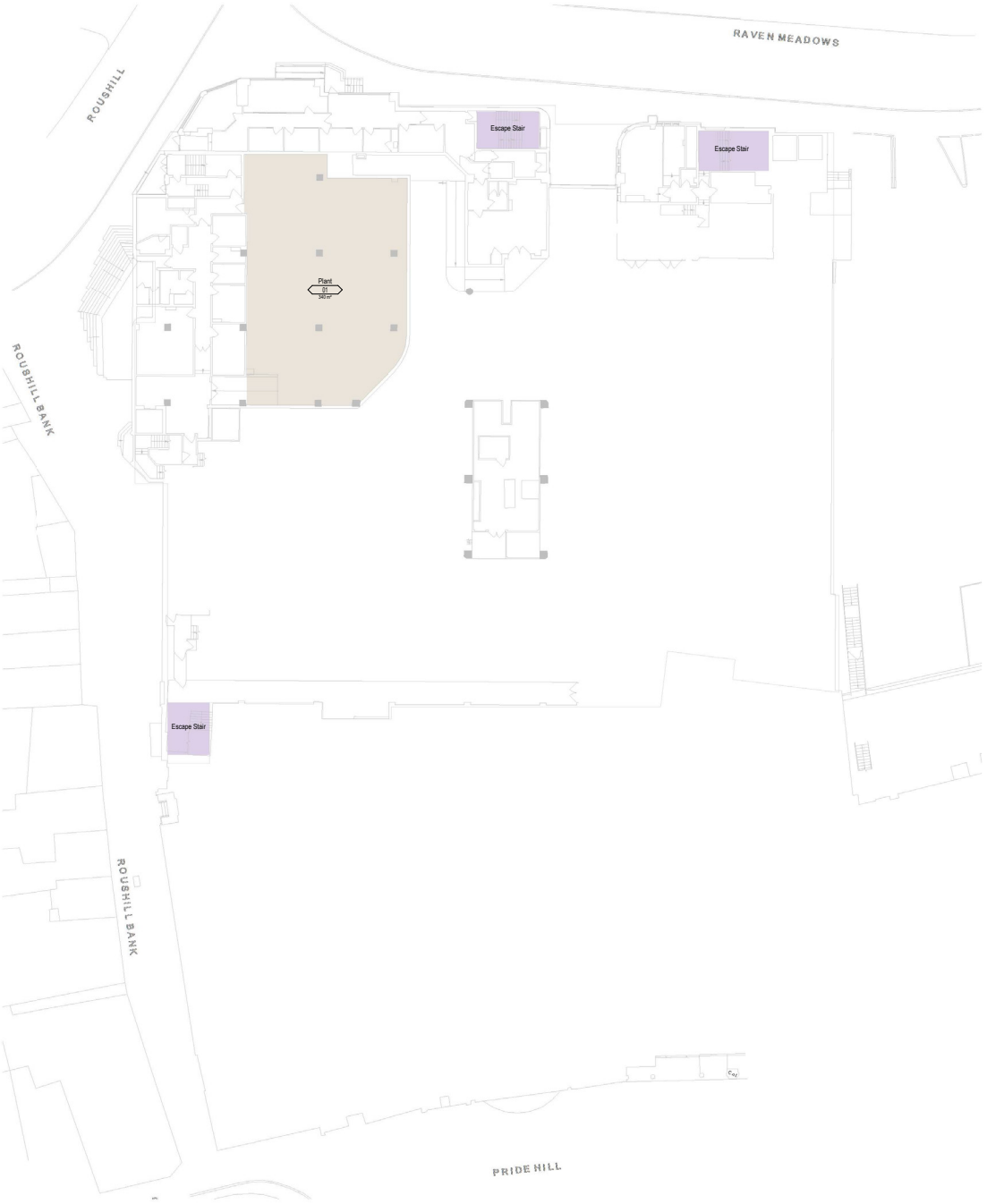
The ground floor, currently accessible to vehicles via Raven Meadow, will continue to function as a loading area and accommodate plant facilities. However, its usability remains uncertain, as additional columns, piles, and other structural interventions may be required to support the increased load from the proposed pools, as advised by the structural engineer. As a result, the design of the ground floor has largely been left unchanged at this stage.



General Arrangement Axonometric

Key

- Dry Side facilities
- Wet Side Facilities
- Retail
- Other
- Access points



3.2 Proposed First Floor Plan - Lv3

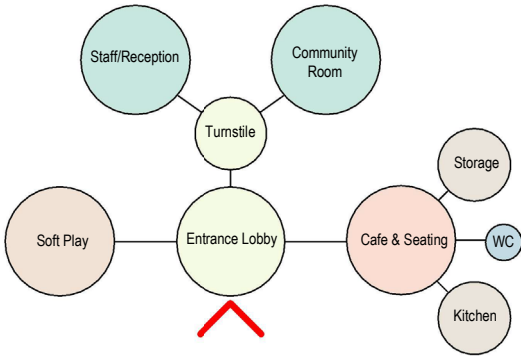
In this proposal, site access is provided via Roushill, which is suitably located to make use of the existing parking facilities near the site albeit on a steep pedestrian street.

Following the recommendations of the structural engineer, the learner and main swimming pools are proposed to be constructed on top of the existing Level 3 structure, allowing for additional structural support to be incorporated below. Access to these pool facilities would then be provided from Level 4.

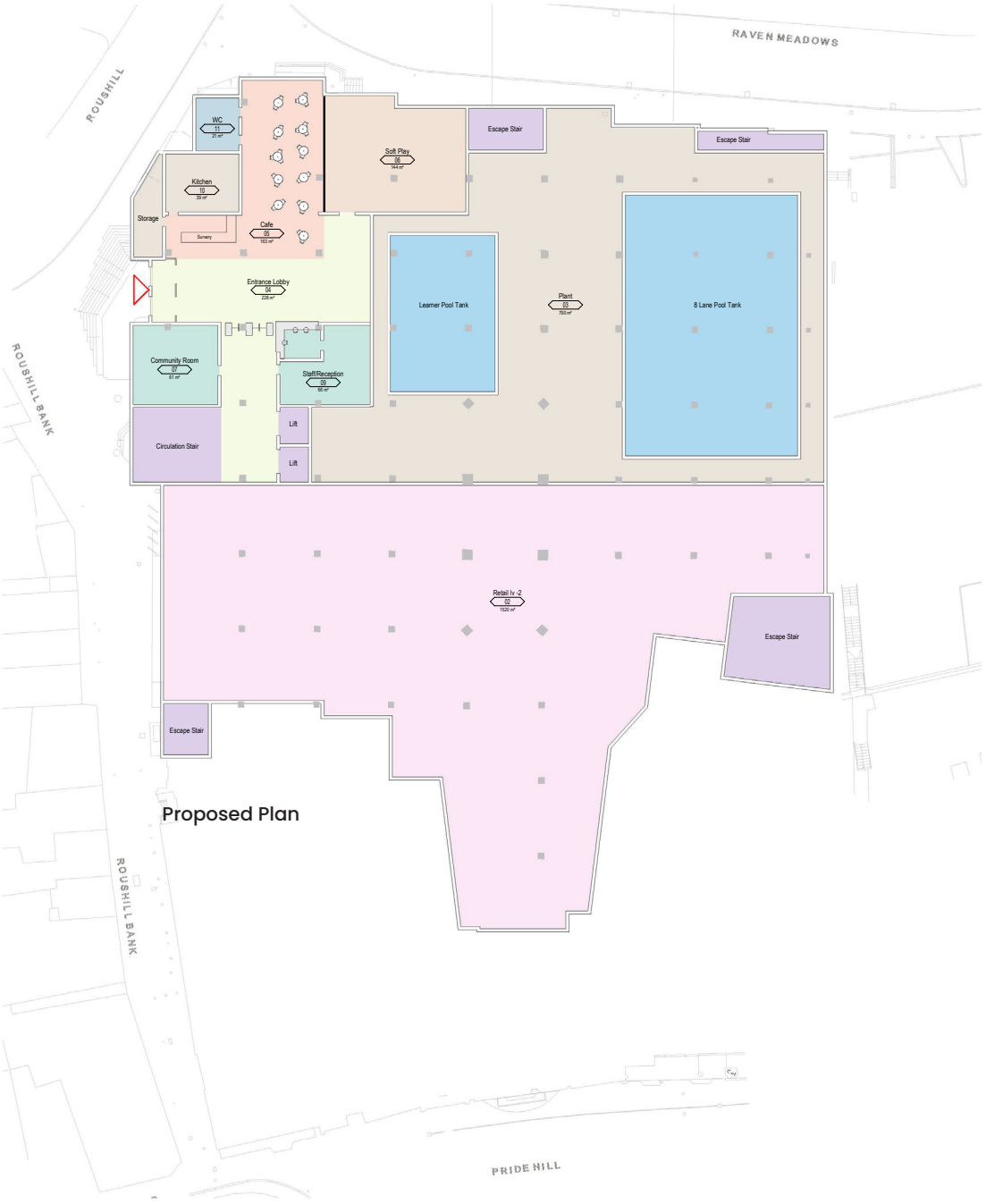
Plant equipment will be placed around the pool tanks on Level 3 to support their operation.

The southern part of the floor area is not required to meet the project brief and is therefore proposed for retail or other use. This area includes access to two emergency exits to meet safety requirements.

First Floor – Spatial Adjacency Diagram



First Floor - LV 3



Proposed Plan

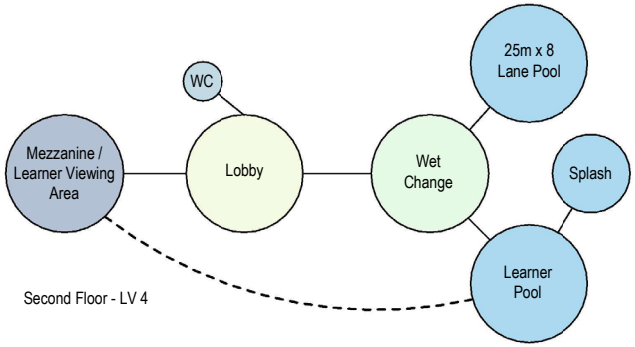
3.3 Proposed Second Floor Plan - Lv4

In this proposal, Level 4 is designed to accommodate the wet side facilities, including a mezzanine, wet change area, splash zone, and main and learner pools—aligning with the requirements outlined in the brief.

To make space for these facilities and provide the necessary headroom for both the pool and entrance lobby, the northern portion of the Level 4 floor plate will need to be demolished. As advised by the structural engineer, this intervention will result in the removal of the floors above due to the loss of vertical structural support.

The inclusion of retail extends to Level 4, aiming to utilise space that would otherwise remain vacant.

Second Floor – Spatial Adjacency Diagram



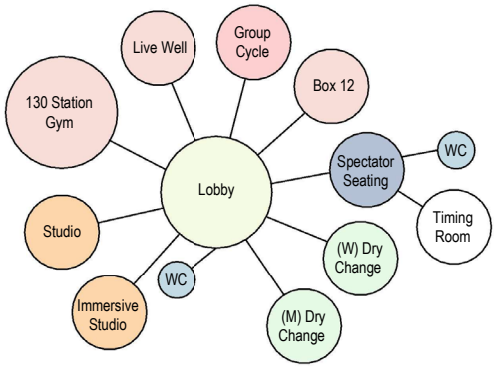
3.4 Proposed Third Floor Plan - Lv5

In this option, Level 5 accommodates the dry side facilities and provides access to spectator seating, accessible via a central lobby and corridor. All spaces required by the brief are included, with some facilities offering an increase in area compared to the initial brief to make use of spaces that would otherwise be isolated.

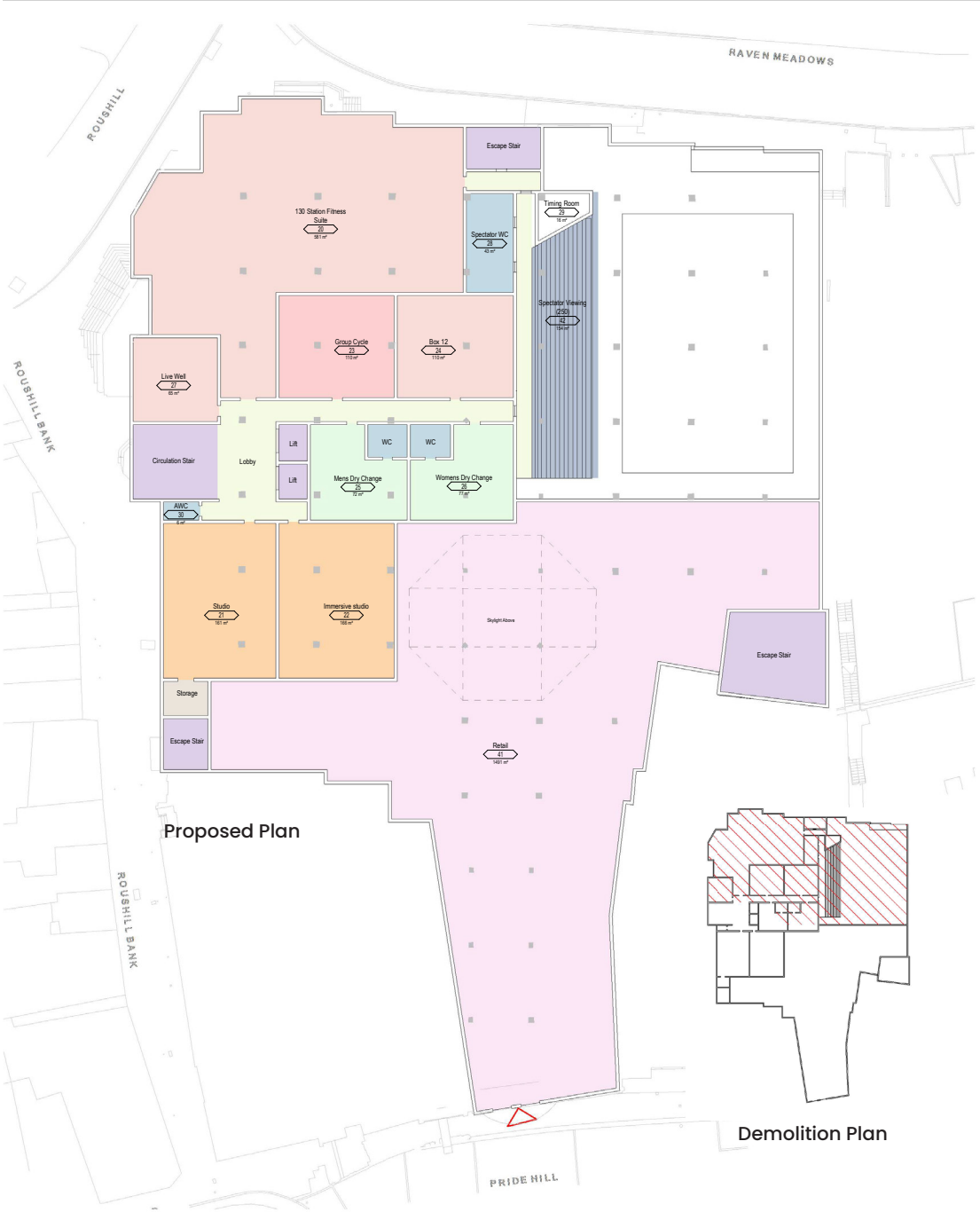
As a result of the demolition of the northern portion of the floor plate, necessitated by the removal of the floor below, the north western section of Level 5 will need to be rebuilt to house the 130-station fitness suite and associated facilities.

In the southern part of the site, the retail entrance is retained from Pride Hill. The proposal also suggests utilising the existing roof opening to introduce a skylight, enhancing natural light at the retail entrance level.

Third Floor – Spatial Adjacency Diagram



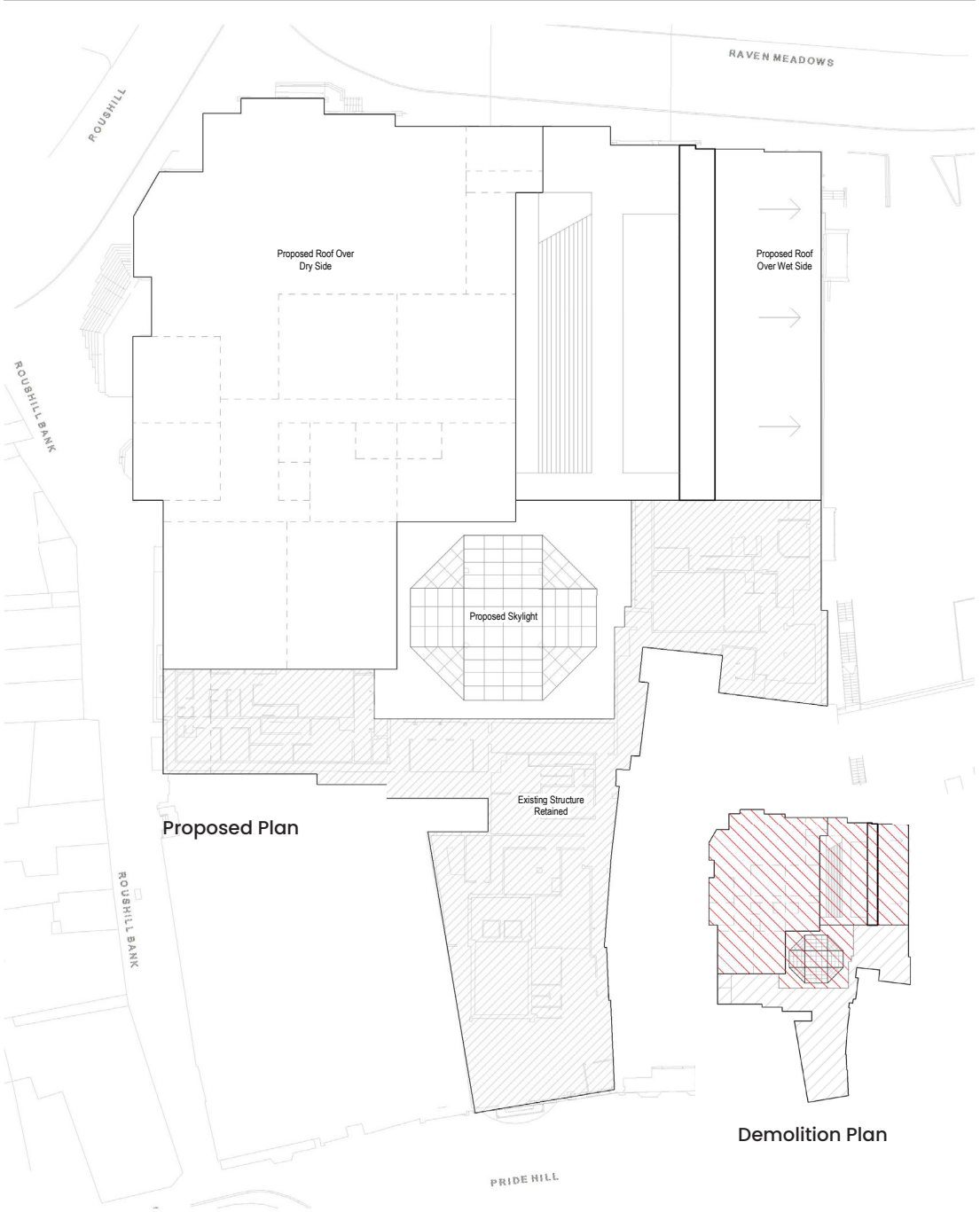
Third Floor - LV 5



3.5 Proposed Roof Plan - Lv6

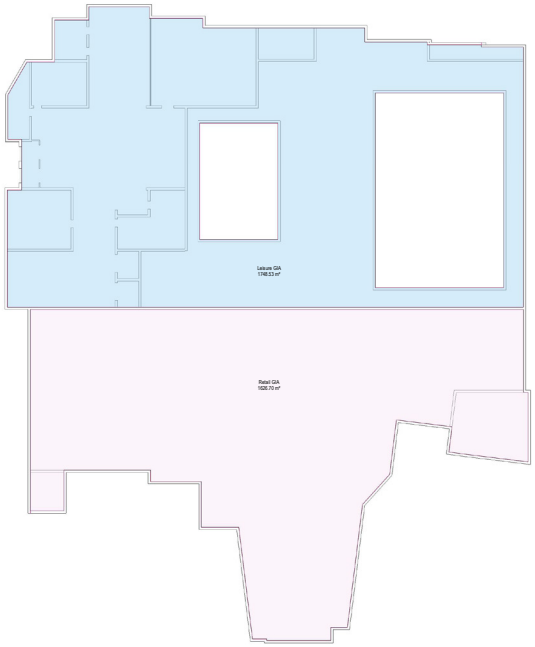
The roof plan of the building illustrates the extent of demolition required to implement this proposal, indicating areas where new roofing is likely to be necessary while also highlighting the structural elements that are to be retained. Within the retained areas, the extent of internal demolition remains uncertain, as does the potential for future use within this existing space.

With regard to plant, this level is proposed to accommodate equipment (AHU's, ASHP's, PV's etc) to support the building's services and functions.



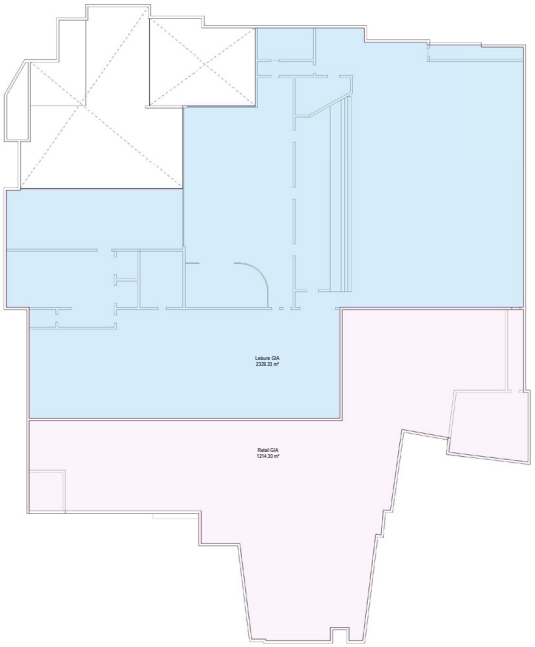
3.6 GIA Plans - First Second and Third Floor - Lv3, 4 & 5

First Floor - Lv3



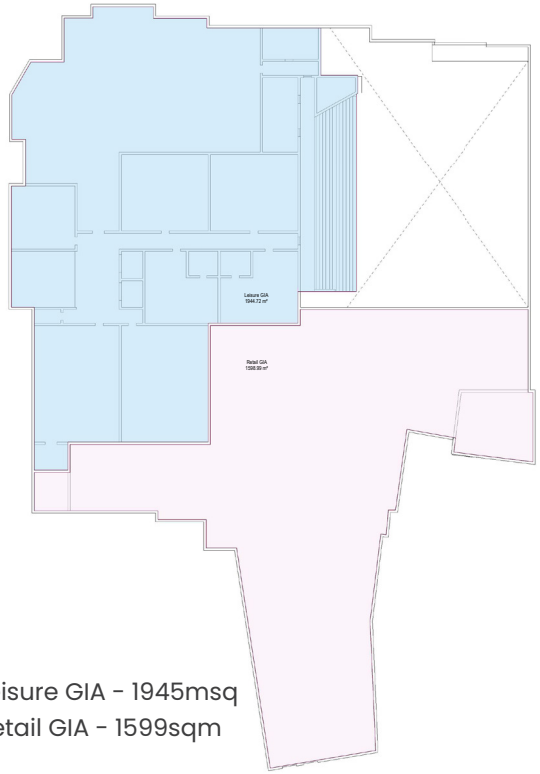
Leisure GIA - 1749msq
Retail GIA - 1627sqm

Second Floor - Lv4



Leisure GIA - 2329msq
Retail GIA - 1214sqm

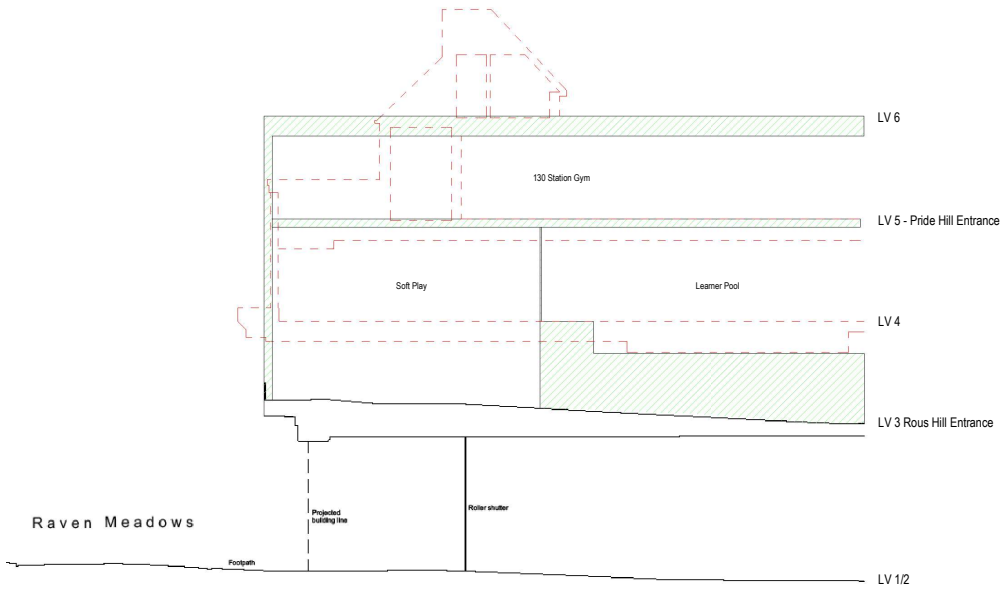
Third Floor - Lv5



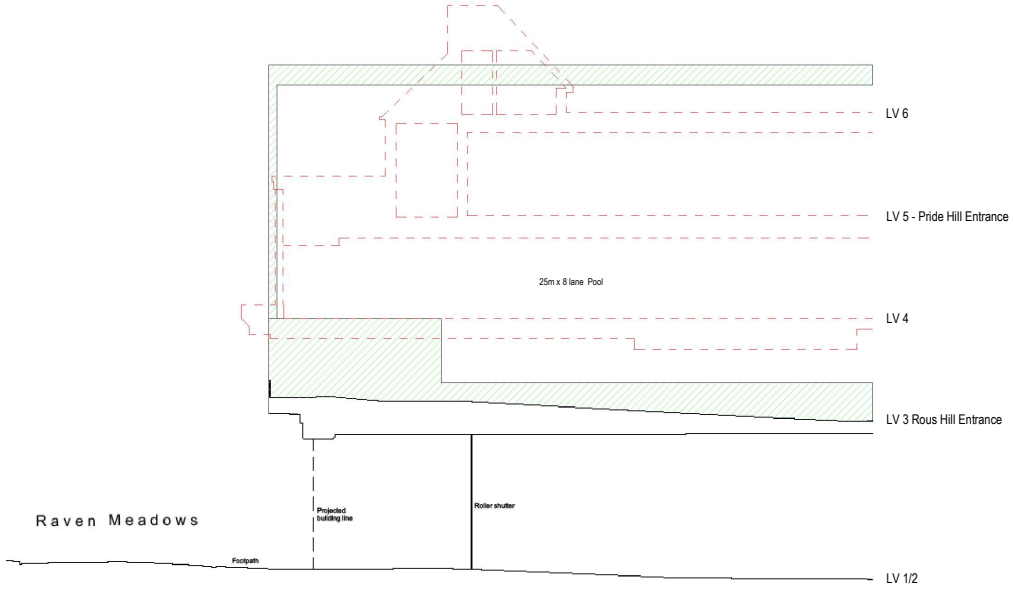
Leisure GIA - 1945msq
Retail GIA - 1599sqm

All areas are indicative and based on surveys provided by the client.

3.7 Indicative Sections



Section 1 - Through Learner Pool



Section 2 - Through 25m x 8 Lane Pool

04 Design Proposal - Option 2

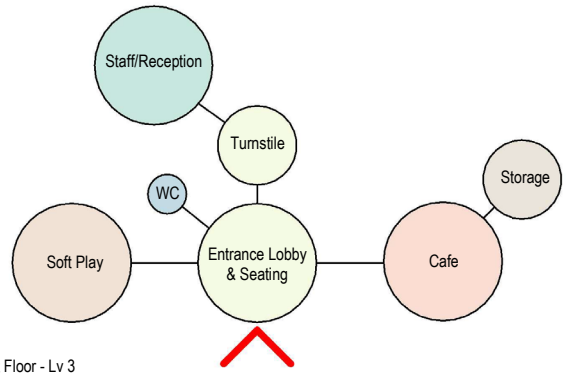
4.1 Proposed Ground & First Floor Plan - Lv2 & 3

The ground floor (level 2) is as Option 1.

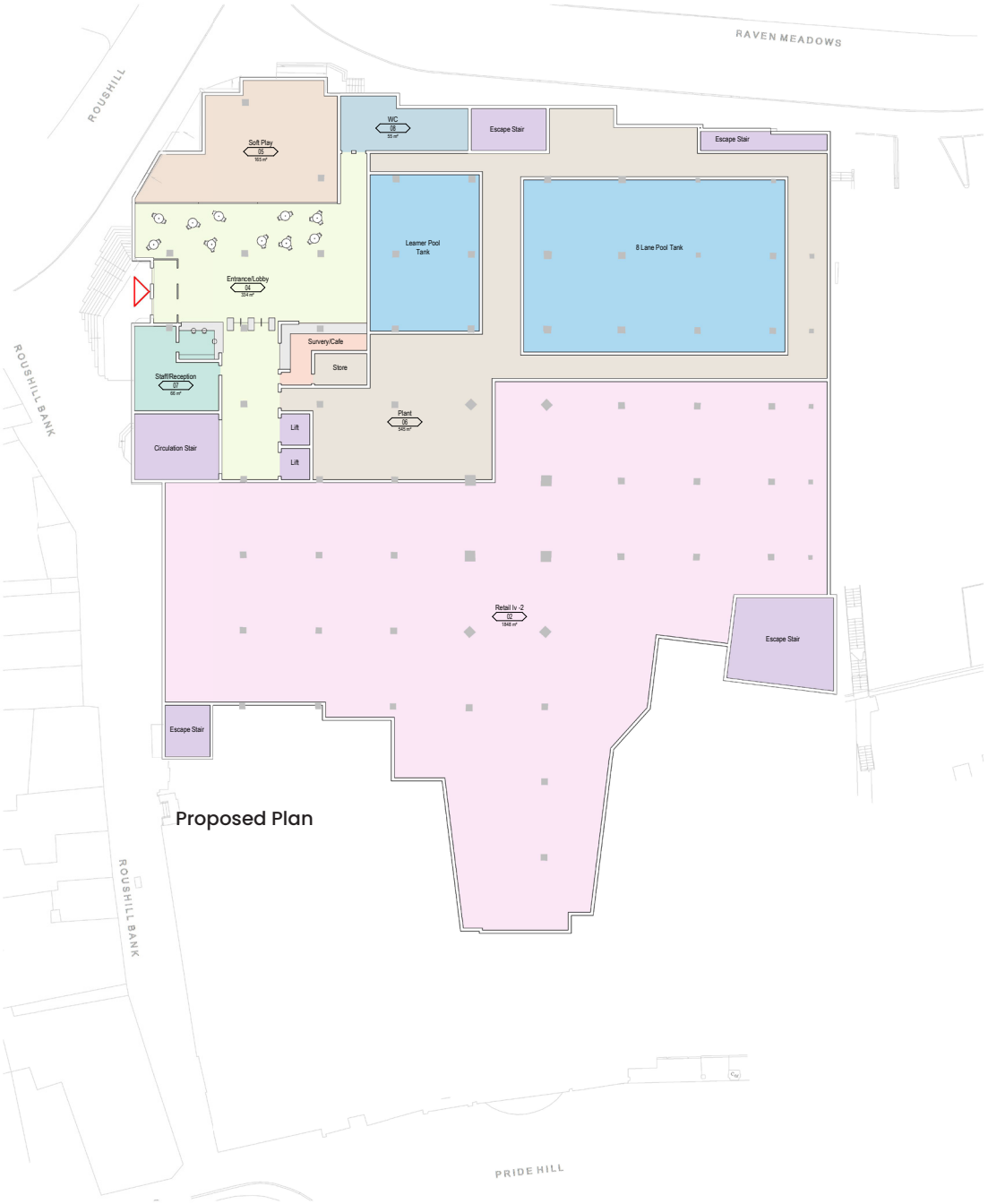
The primary distinction between Option 1 and Option 2 lies in the positioning and orientation of the wet-side facilities. In Option 2, the pools and spectator seating have been rotated to optimise access to northern daylight and enhance overall spatial efficiency.

Additionally, internal spatial arrangements have been reconfigured. Key changes on this level include an expanded soft play area and the strategic relocation of support functions—such as the staff/reception area, public toilets, community room, and café.

First Floor – Spatial Adjacency Diagram



First Floor - Lv 3



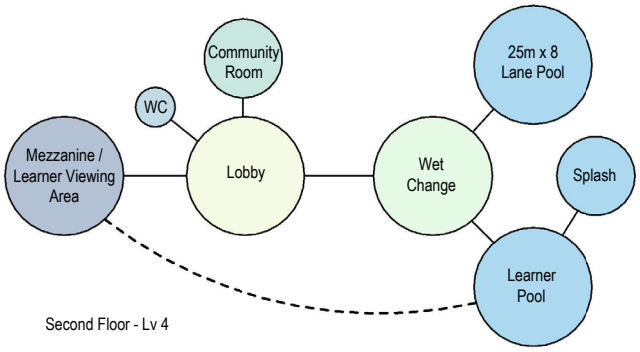
Proposed Plan

4.2 Proposed Second Floor Plan - Lv4

The Level 4 floor design in Option 2 follows the same core principles as Option 1, with minor adjustments to the internal layout. Notable changes include the relocation of the community room to this level and a revised mezzanine design, aimed at enhancing the overall viewing experience onto the learner pool.

A key improvement in Option 2 is the slight reduction in required floor structure demolition, which helps to minimise the impact on the existing building structure.

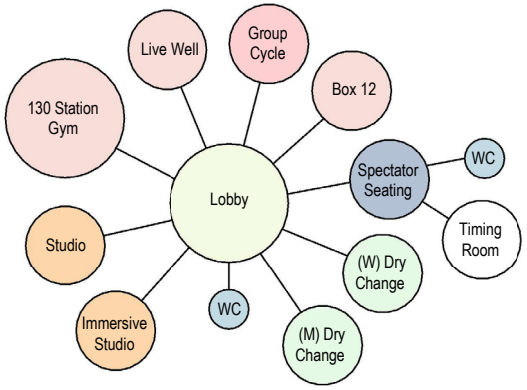
Second Floor – Spatial Adjacency Diagram



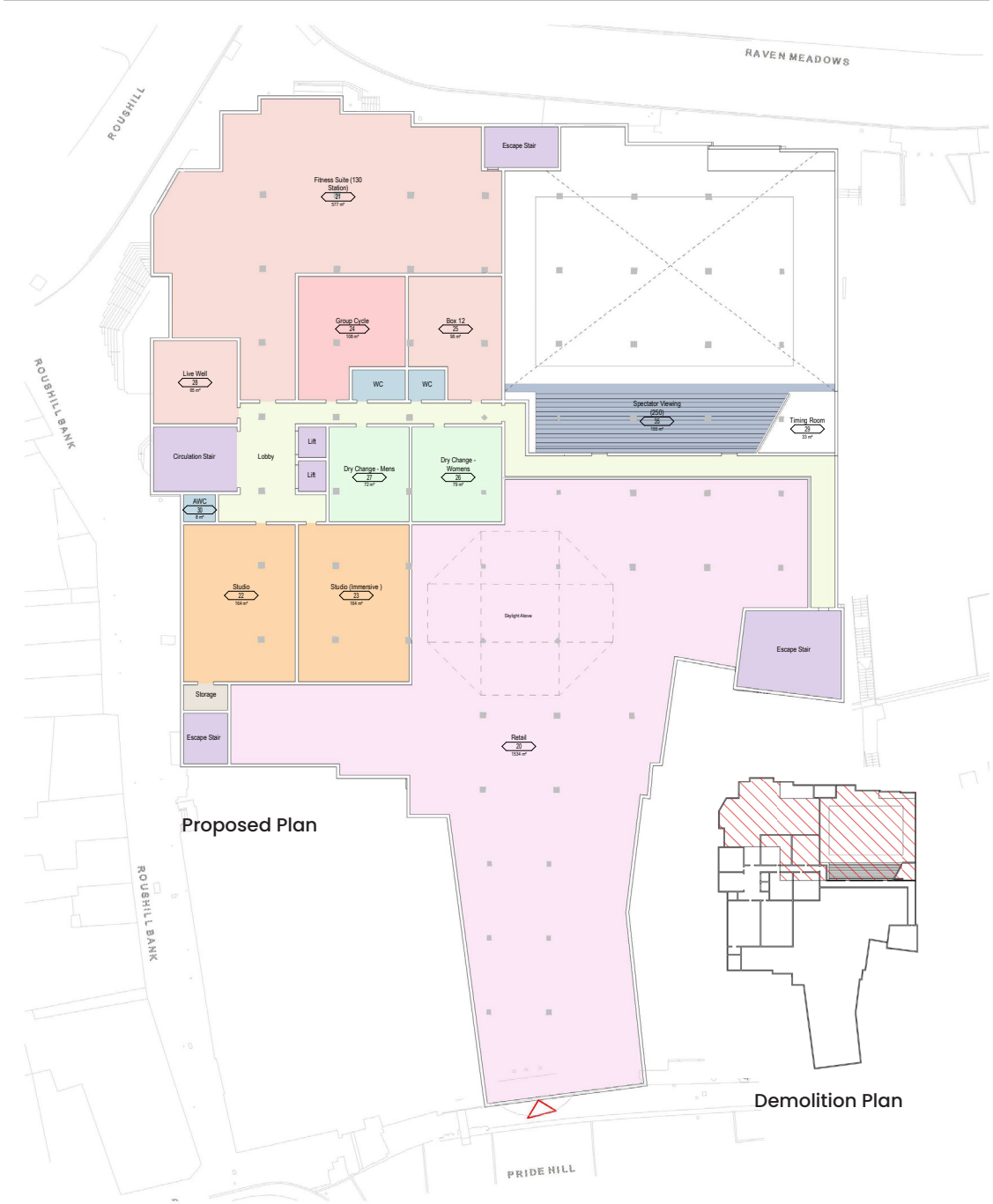
4.3 Proposed Third Floor Plan - Lv5

The Level 5 floor plan follows the same overall strategy as in Option 1, with the primary modification being a revised fire escape route for the spectator seating area.

Third Floor – Spatial Adjacency Diagram



Third Floor - Lv 5



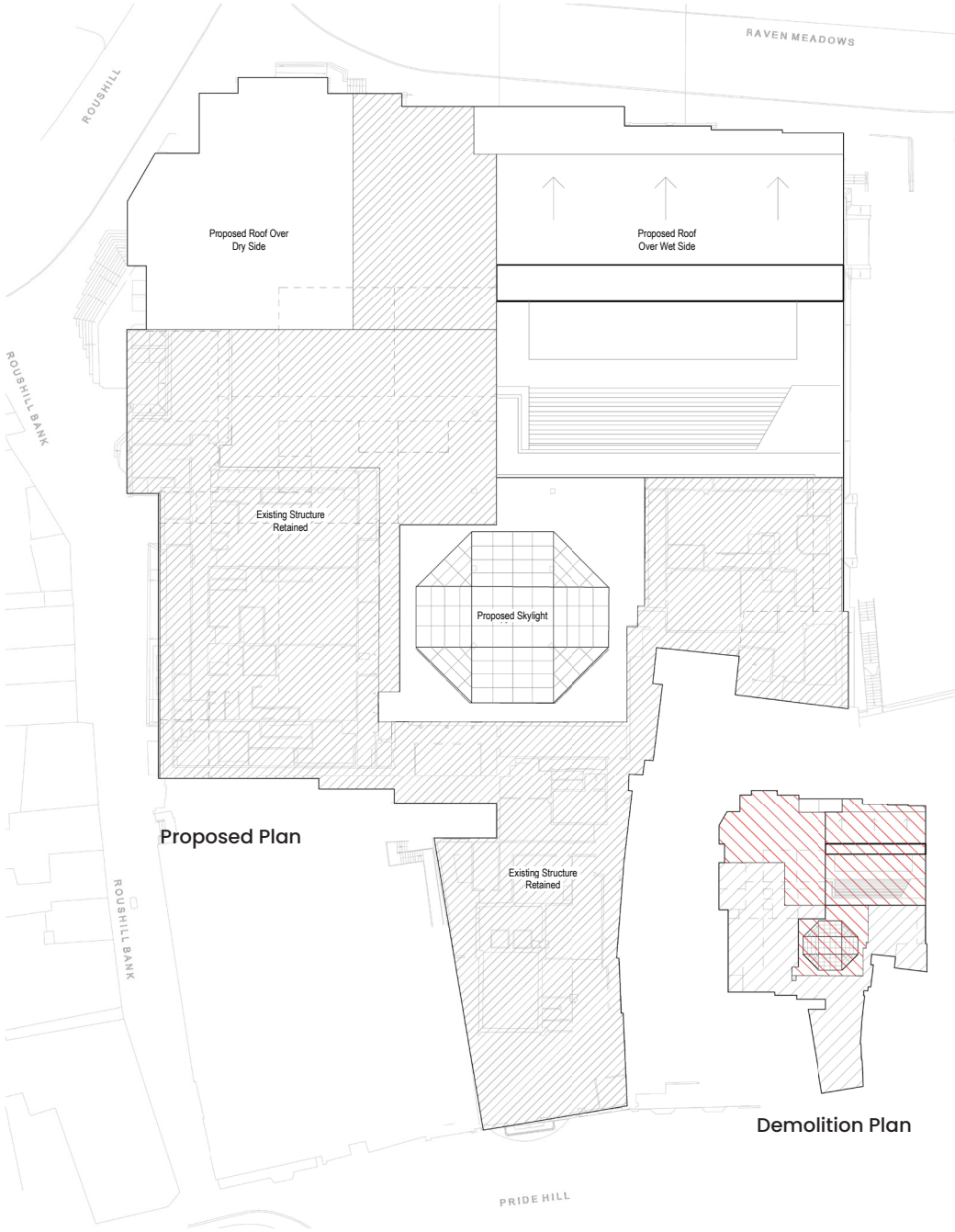
Proposed Plan

Demolition Plan

4.4 Proposed Roof Plan - Lv6

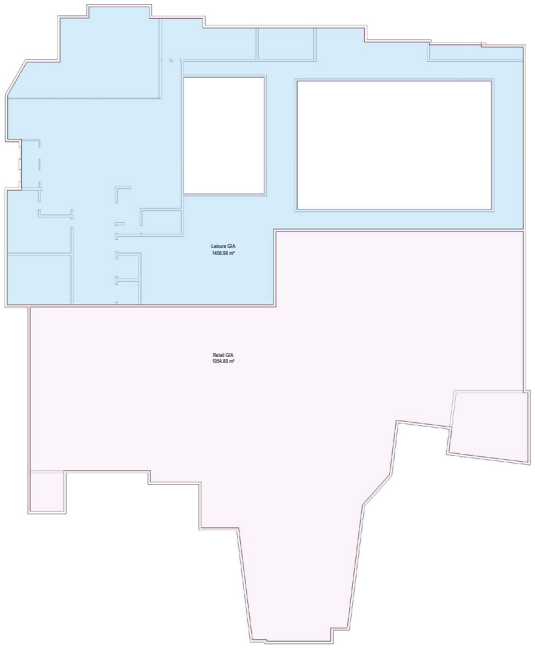
The Level 6 plan in Option 2 includes several minor adjustments from Option 1. Most notably, the orientation and placement of the proposed swimming pool roof has been revised to align with the arrangement of spectator seating.

Another key change is reflected in the demolition plan. This version aims to retain as much of the existing roof structure as possible, thereby reducing the overall impact on the existing building. At this stage, the proposed demolition area is indicative and will require confirmation by a structural engineer if proposals are developed.



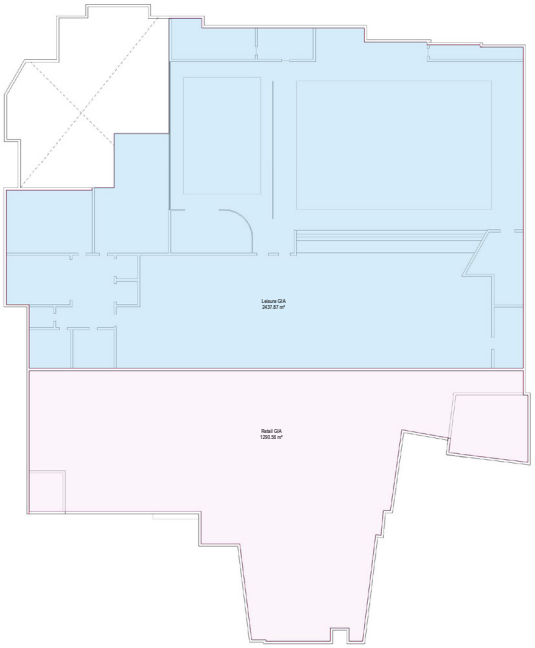
4.5 GIA Plans - First Second and Third Floor - Lv3, 4 & 5

First Floor - Lv3



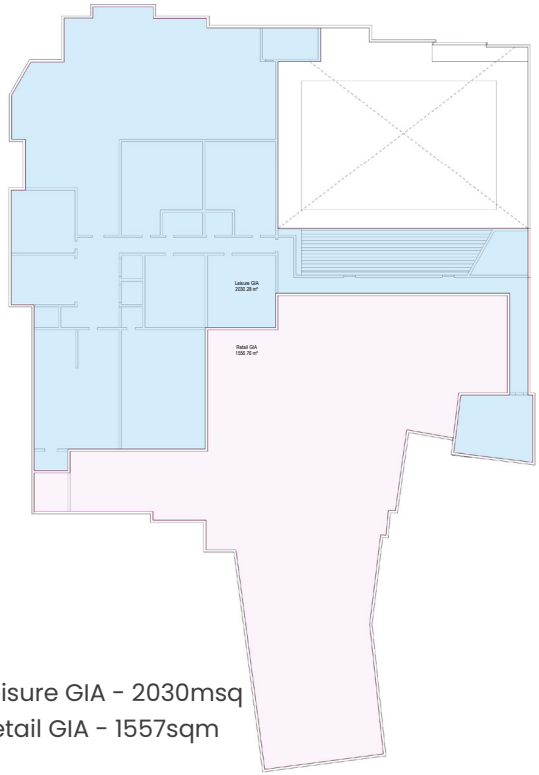
Leisure GIA - 1407msq
Retail GIA - 1955sqm

Second Floor - Lv4



Leisure GIA - 2438msq
Retail GIA - 1291sqm

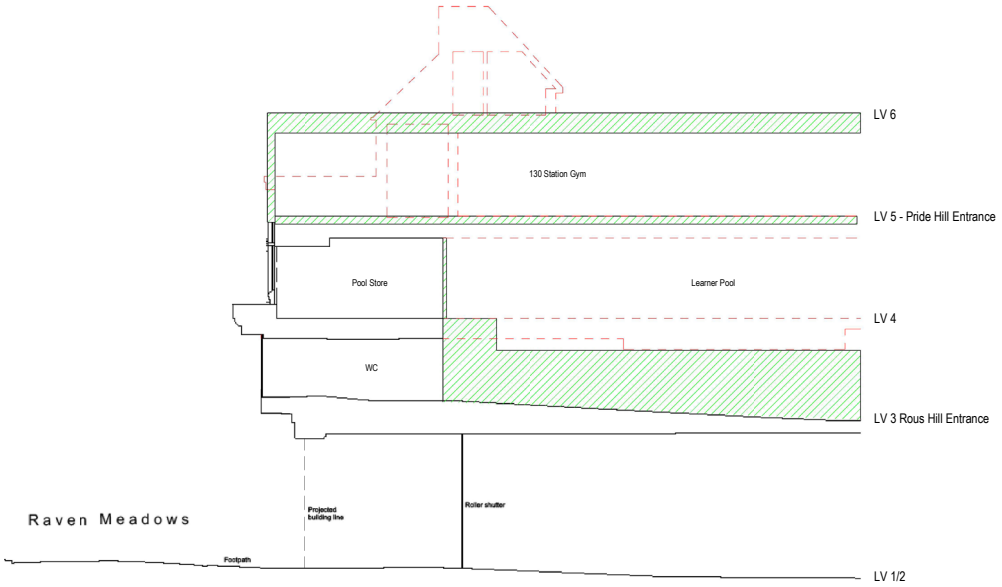
Third Floor - Lv5



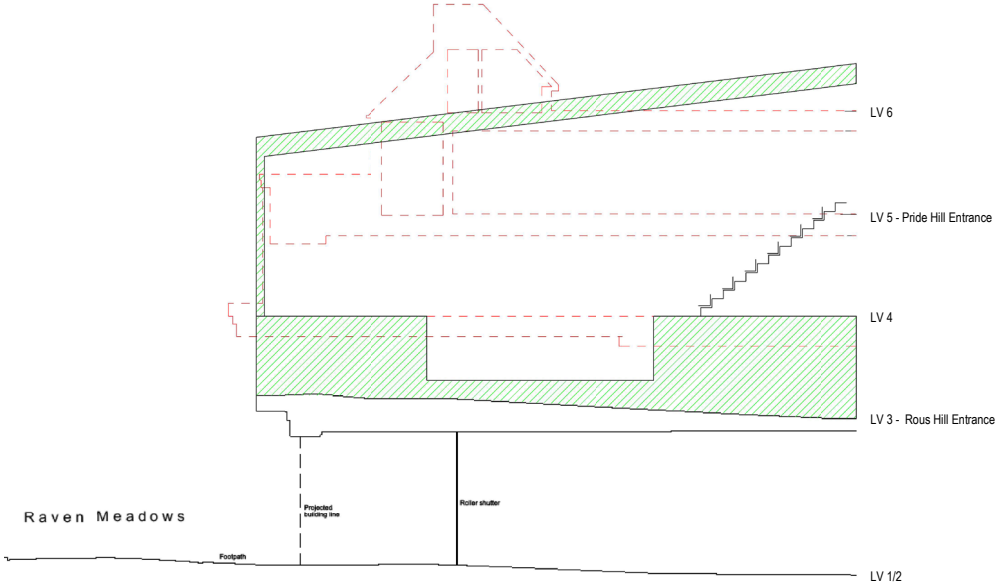
Leisure GIA - 2030msq
Retail GIA - 1557sqm

All areas are indicative and based on surveys provided by the client.

4.6 Indicative Sections



Section 1 - Through Learner Pool



Section 2 - Through 25m x 8 Lane Pool

05 Evaluation

5.1 Area Schedule Comparison

Due to the complex nature of the existing building, a minimum tolerance of 10% has been applied to the proposed areas to allow for flexibility during design development.

Area Comparison to Shrewsbury Sport Village

An analysis of the proposed design options in relation to the base target areas yields the following conclusions:

Dry Side Facilities:
- Option 1: 12% increase
- Option 2: 15% increase

Wet Side Facilities:
- Option 1: 30% increase
- Option 2: 36% increase

Total Provided Area, including Retail:
- Option 1: 274% of base target
- Option 2: 296% of base target

Examining the individual facilities, it is important to note that both the proposed 130-station fitness suite and splash area fall below the expected minimum size due to constraints in the building layout.

Comparing the two design options, Option 2 provides increased space for both facilities and retail compared to Option 1. This is largely achieved through the reorientation of the swimming pool, which optimises the use of floor area. However, the additional space in Option 2 comes at the cost of a reduced plant area on Level 3 compared to Option 1, highlighting a key design trade-off.

To maximise the efficiency of the layouts both Options 1 and 2 result in a staggered layout across floor plates with changing and other uses overlapping with retail on floors below. This will result in drainage and other services running through other demises. Acoustics, especially structural borne noise, will need to be considered subject to the uses.

Shrewsbury Pride Hill Area Schedule			
Facility	**Shrewsbury Sport Village**	**Option 1**	**Option 2**
Dry Side			
Box 12	80 m²	110 m²	96 m²
Dry Change - Mens	55 m²	72 m²	72 m²
Dry Change - Womens	55 m²	77 m²	79 m²
Fitness Suite (130 Station)	590 m²	581 m²	577 m²
Group Cycle	95 m²	110 m²	108 m²
Live Well	60 m²	65 m²	65 m²
Soft Play	105 m²	144 m²	165 m²
Studio	140 m²	161 m²	164 m²
Studio (Immersive)	140 m²	166 m²	164 m²
Dry Side	1320 m²	1486 m²	1491 m²
Retail			
Retail	0 m²	1491 m²	1534 m²
Retail Lv -1	0 m²	1082 m²	1185 m²
Retail lv -2	0 m²	1520 m²	1848 m²
Retail	0 m²	4093 m²	4567 m²
Wet Side			
25m x 8 Lane Pool	705 m²	827 m²	814 m²
Learner Pool 15x10m	265 m²	319 m²	268 m²
Spectator Viewing (250)	155 m²	154 m²	155 m²
Splash	65 m²	57 m²	55 m²
Timing Room	15 m²	16 m²	33 m²
Wet Change	300 m²	523 m²	674 m²
Wet Side	1505 m²	1896 m²	2000 m²
Grand total: 18	2825 m²	7475 m²	8058 m²

Fig 13 - Shrewsbury Pride Hill Area Schedule. **All areas are indicative and subject to design development.**

5.2 GIA Comparison (msq)

Floor	Level	Existing GIA	Option 1 GIA		Option 2 GIA	
			Leisure	Retail	Leisure	Retail
Ground	1	2454	N/A	N/A	N/A	N/A
Ground	2	1093	N/A	N/A	N/A	N/A
First	3	3913	1749	1627	1407	1955
Second	4	3910	2329	1214	2438	1291
Third	5	4110	1945	1599	2030	1557
Fourth	6	2390	N/A	N/A	N/A	N/A
Fifth	7	168	N/A	N/A	N/A	N/A
Total area		18038	6023	4440	5875	4803

Existing GIA Total - Lv3,4&5	11933		
Proposed GIA Total - Lv3,4&5		10463	10678

Area variation Discrepancies

Option 1	**Total GIA + double-height/atrium**
Existing	12143
Proposed	12358.5
Difference	215.5

Option 2	**Total GIA + double-height/atrium**
Existing	12143
Proposed	12352.5
Difference	209.5

Notes

The areas listed are indicative and based on surveys provided by the client. Please note that both existing and proposed double-height, atrium spaces and pool tanks are excluded from the Gross Internal Areas (GIAs). Additionally, the proposed building line may differ from that shown in the existing plans.

5.3 Structural and Civil Engineering

The following has been taken directly from the Furness Structural and Civils Feasibility Report and is included to highlight the potential risks associated with the proposed design options.

- **Existing Foundations**: There is a high risk that the foundations cannot accommodate the significant change to the superstructure with out detrimental affect to the movement and settlement of the existing structure. To proceed with the design options an allowance for installing deep piled foundations through the basement slab. This may not be possible with the height in the basement space so elements of Level 3 may need to be removed to accommodate.

- **Retaining Wall Stability**:The upper slabs may well have played a part in the lateral stability of the retaining walls so any changes to the superstructure need to be reviewed with the substructure.

- **Lateral Stability**: If significant sections of the existing building are to be removed then the overall lateral stability of the building needs to be considered. Modifications to the existing frame are likely to be needed.

- **Existing Building Structural Condition**:The building is nearing 40 years old; it will have undergone modifications and refurbishments in that time. There is a risk that the building condition is not suitable to accommodate and additional 50 years of design life.

- **Adaption of Existing Structure**: Whilst the general thought is that the frame can accommodate most of the proposed options and uses, there are some specific areas, pool tanks, plant and service routing that may be more tricky to incorporate.

- **Floatation**: As the water table is not known and the site is in flood zone, water table and water ingress is a design and construction risk.

FURNESS
Consulting Engineers

PRIDE HILL SPORTS CENTRE – SHREWSBURY

L3248

FEASIBILITY REPORT

JULY 2025

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This report has been prepared for the sole benefit, use and information of the Client, for the purposes described and the liability of Furness Partnership Ltd. in respect of the information contained within the report will not extend to any third party.

Revision	Date	Issue Status	Prepared by	Checked by
P01	23/07/25	FEASIBILTY	C HENRY	L WALTER

CONTENTS

1 INTRODUCTION

Furness Partnership has been appointed as the Structural and Civils Consultant for a feasibility study for incorporating leisure facilities into Pride Hill Shopping Centre in Shrewsbury

This report is on behalf of Shropshire County Council: The Shirehall Abbey Foregate, Shrewsbury SY2 6ND

The report reviews/considers the following aspects;

- Existing information available for the site,
- Proposed superstructure and substruction scheme
- Next phase investigations required to progress the design.

This report is a high-level site overview to assess whether the site can house the required facilities, what impact that may have on the building operation and structurally whether the proposals can be accommodated. We will also review risks and build issues.

2 SITE INFORMATION

2.1 SITE LOCATION & BOUNDARIES

The proposed development is located on the site of the existing Pride Hill Shopping Centre. It is located in Shrewsbury town centre.

The report is to assess the feasibility of incorporating within the building a new 8 lane swimming pool and learner pool adjacent, with associated plant rooms adjacent to the new pools. The extension also includes the construction of a new fitness suite, café, and soft play area. The alterations will require some reconfiguring of existing room layouts, along with some altered egress points. The site proposals will require some alterations to the existing car parking scheme.

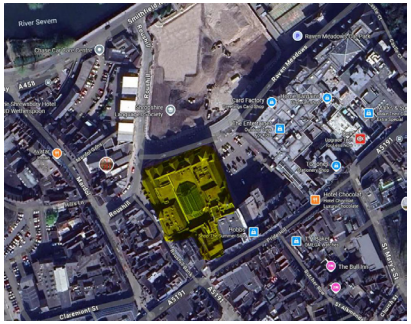

Figure 2-1 – Arial view of existing site

The information and options provided by Robert Limbricks Architects to be read in conjunction with this report.

2.2 EXISTING BUILDINGS

The existing building was constructed in the late 1980s. The existing building is a 6-storey building comprising of predominantly retail accommodation. The frame is constructed using reinforced concrete with masonry cladding.

The structural form seems to comprise a concrete frame on a 7.2m grid, there is a central atrium. The columns are supported on a reinforced concrete raft foundation slab.

The slabs are designed as flat slabs with some areas of deeper beam strips and column heads.

The site slopes and the building can be accessed from 3 levels, Level 0, Level 3 and Level 5.

Sheet pile and concrete retaining walls run around the perimeter to support the external ground levels.

2.3 SITE INVESTIGATION & GROUND CONDITIONS

There is no site investigation available for the building, this would have to be undertaken to confirm ground conditions and overall foundation load capacities.

No structural intrusive or testing surveys have been completed for this report.

It is understood that the site is founded upon water bearing clay/silt subsoils.

2.3.1 Foundation Recommendations

The existing drawings provided show that the building is founded on a reinforced concrete raft foundation.

The raft is utilised to spread the loading over the founding strata below and to reduce the impact of any isolated point loading.

A key risk item in this assessment it ensuring the integrity of the existing raft foundation. It is key that the existing pressures are not exceeded and that the load distribution remains the same as in the current state to avoid any settlement risks.

The existing building calculations are not available for assessment, at this stage the loading allowances are based on the British Standard guidance from the time of construction.

For our review whilst the vertical loadings for the proposed options should be able to be accommodated in the raft, with structural modifications in the heavy loaded areas, it is unlikely that the load spread will remain the same pattern and ratios as the existing frame.

The uneven loading would cause the raft to settle differentially both temporarily and in the permanent state.

This will lead to movement within the structure that remains and is being remodelled.

3 BASIS OF STRUCTURAL DESIGN

3.1 DESIGN LOADS

The loading criteria will form the basis for the developed structural design and has been derived in accordance with the statutory requirements of Building Regulations Part A and Eurocode BS EN 1991-1 + NA

In the following sections there is an assessment of the existing and proposed loadings.

In summary from purely a loading perspective the building could generally accommodate the proposals suggested in options 1 & 2. The main area of loading would be the deep pool, this is proposed to be in the region of 1.8m plus a movable floor, this equates to a load of 24kN/m² water.

The areas of deep water are likely to required structural modification to be able to accommodate the water load and spread load out to ensure the existing frame and foundations can accommodate the increase isolated loading.

The advantage of having the pool located off Level 3 is that additional columns and frame can be taken down in the basement area, an unoccupied space.

3.1.1 REVIEW OF EXISTING ACTIONS

Upper floors existing L3, L4 and L5 loads taken as 13.8 kN/m² made up as follows;

- 325mm thick slab = 7.8 kN/m²
- 75mm screed = 1.8 kN/m²
- Services allowance = 0.2 kN/m²

Additional allowance of 1.0kN/sqm allowed for partitions

- Imposed - retail and circulation = 4 kN/m²

Roof - Concrete slab

- Roof with access = 13.8 kN/m² as above
- Roof with plant = 17.3 kN/m² (includes 7.5kN/sqm imposed)

3.1.2 REVIEW OF PROPOSED ACTIONS

Proposed Permanent Actions

UPPER FLOOR PERMANENT ACTIONS		
Area	**Assumed Buildup**	**Load**
Floor construction		
First floor composite slab	Kingspan MD V50 Metal Decking &150mm Slab	3.45 kN/m²
Floor finishes		
Typical internal	Finishes	0.10 kN/m²
Studios	Timber sprung floor	0.30 kN/m²
Suspended ceiling & services		
Typical internal	Plasterboard ceiling & lightweight services	0.25 kN/m²

ROOF PERMANENT ACTIONS		
Area	**Assumed Buildup**	**Load**
Roof construction		
Roof Construction	Typical flat roof & waterproofing	0.50 kN/m²
Roof superimposed		
PV allowance		0.15 kN/m²
Typical internal	Plasterboard ceiling & lightweight services	0.25 kN/m²

EXTERNAL / INTERNAL WALLS PERMANENT ACTIONS		
Area	**Assumed Buildup**	**Load**
External walls/cladding		
Rainscreen cladding	Rainscreen panel	0.50 kN/m²
Glazing	Patent double glazing, transoms & mullions	0.50 kN/m²
Brick-block cavity wall	100mm brick, 100mm block & insulation	4.20 kN/m²
Internal partition walls		
Masonry	140mm blockwork, (assumed to be painted only)	2.24 kN/m²
Cavity Wall	2 x100mm brick, insulation	3.6 kN/m²

Glazing	Glazing panels, transoms & mullions	0.50 kN/m²
Lightweight	Lightweight metal stud partitions, load included in imposed load	

3.1.3 Variable Actions – Gravity Loads

Variable actions adopted for design of new structural elements have been derived in accordance with appropriate categories as specified in BS EN 1991-1 + NA.

VARIABLE ACTIONS		
Area	**Category/Description**	**Load**
Typical floor area at ground and first floors	Category C33 [Institutional building subject wheeled vehicles incl. trolleys], Category C35 [Institutional building subject to crowds], Category C41 [Dance halls and gymnasia], or lower loaded areas (Categories B2 & C11) with a 1.0 kN/m² allowance for lightweight moveable partitions.	5.00 kN/m²
Swimming pool	To suit depth of water	10 kN/m³
Pool hall & pool surround	Category C41	5.00 kN/m²
Administration & office spaces	Category B2	3.00 kN/m²
Changing facilities & toilets	Category C11	2.00 kN/m²
Plant rooms	Category E213	7.50 kN/m²
Roof (no access)	No access except for maintenance	0.60 kN/m²

[1]Plant loading TBC subject to confirmation of mechanical plant weights.

3.2 DESIGN LIFE & DURABILITY

The proposed structure will be designed and specified for the indicative design working life. This is defined as 'the period for which a structure or part of it is to be used for its intended purpose with anticipated maintenance but without major repair being necessary'.

The design working life of new structures for the proposed development will be 50 years (category 4) in accordance with Table 2.1 of BS EN 1990.

Structural concrete will be designed and specified with inherent durability for the relevant design working life. The building is already 40 years old and as such will need a survey to confirm its condition and ability to extend its design life

All structure within the pool environment, including the pool hall and changing village and plant room will need to be suitable for a C4 environment. There is an advantage in the existing frame comprising concrete as this is more inherently suitable to accommodate this. Checks would be needed to confirm the concrete cover to the reinforcement and if there are any existing concrete defects.

ENVIRONMENT CATEGORIES (per BS EN ISO 12944: Part 2)		
Areas	**Category**	**Risk**
Café, reception, soft play, administration	C1	Very Low
Sports hall, gym, studios, squash courts, dry change	C2	Low
Pool halls, wet change, health suite	C4	High

3.3 DESIGN FOR ROBUSTNESS

The proposed structure will be designed and detailed as sufficiently robust for the avoidance of disproportionate collapse in accordance with Building Regulations.

The proposed building is categorised as Consequence Class 3 with respect to disproportionate collapse in accordance with Table 11 in Approved Document A, as it is a building to which the public is admitted with floor area between exceeding 5000m² per floor. The design requirements with respect to consequences class are summarised in the below table with further detailed provisions specified in the relevant material codes.

It can be assumed for the feasibility that the building has been suitable designed for its current use and remains the same consequence class, therefore there is limited risk in this section.

It is noted however if sections of the building are to be demolished then the ties and disproportional collapse elements need to be reassessed for the new frame and to ensure the stability of the building remains.

Consequence Class	**Structural Design Requirements**
CC3	A systematic risk assessment of the building should be undertaken considering all normal hazards that may reasonably be seen, together with any abnormal hazards. Critical situations for design should be selected that reflect the conditions that can reasonably be foreseen as possible during the life of the building. The structural form and concept and any protective measures should then be chosen and the detailed design of the structure and its elements undertaken. Provision of effective horizontal ties together with provision of effective vertical ties in all supporting columns and walls. Including tie force determination, together with the design approaches for checking the integrity of the building following the notional removal of vertical members and the design of key elements.

3.4 FIRE RESISTANCE

The requirements for fire resistance of structural elements are expected to be defined within the Fire Strategy Report in accordance with Building Regulations Approved Document B.

Standard methods for fire protection of structural elements of typical construction materials are as follows:

Note the substation, if integral, will require four hours fire protection which is typically achieved using an additional insitu reinforced concrete slab supported on brickwork walls to form a 'box within a box'.

Given that the existing building is predominantly in situ concrete this will provide inherent fire protection through appropriate structural design and specification, the checks are needed to confirm the concrete cover to the reinforcement but for the feasibility stage it is considered low ris

3.5 SERVICEABILITY CRITERIA

3.5.1 Movement & Tolerances

The structure will be designed to control deflections to acceptable limits according to the relevant Eurocodes and their National Annexes. In general, imposed load deflection will be limited to span/360. Special consideration will be needed for any glazed façades, any cantilever elements, and long span elements over the sports and pool halls.

Horizontal deflections due to lateral loading will be limited to height/300 both for total deflection and inter-storey drift, subject to cladding requirements.

Given the existing frame is design to accommodate a shopping centre and is constructure using reinforced concrete then this element can be considered low risk for the proposed options

3.5.2 Vibration

All structural beams will be designed for limiting vertical natural frequencies as tabulated below. This is based on stiffness under full permanent load and 10% imposed load.

Area	Minimum Natural Frequency	Source
All beams unless noted otherwise	4.0 Hz	Traditional approach in the UK
Beams supporting gym/fitness suite, squash courts, and sports hall	6.0 Hz	Based on Furness Partnership experience and engineering judgement
Beams supporting studios	8.4 Hz	Clause NA.2.1.2, UK N.A. to BS EN 1991-1-1

Given the existing frame is design to accommodate a shopping centre and is constructure using reinforced concrete then this element can be considered low risk for the proposed options.

4 SCHEME PROPOSAL

The layout for both proposed options comprises an open pool hall and learner pool adjacent with required plant room. It also has a new café and wet change facilities on the ground floor with a new gymnasium, studios and associated toilets and changing rooms etc on the first floor. The main drivers governing the structural design solutions are:

- Large roof span over pool area and fitness suite
- Interaction of the new steel frame to the existing building
- Required services above and below ground
- Foundation / ground floor design requirements
- Pool tank construction, including integration with new and existing foundations
- Lateral stability of proposed building frame and existing building stability lateral stability

4.1 PROPOSED SUBSTRUCTURE

4.1.1 Foundations

These would have to be formed off the exiting building upper floor levels and then in turn off the existing raft foundation.

As mentioned in the earlier section, it is likely that the existing building can accommodate the majority of the proposed uses, with structural modification for the heavy isolated loads, however the load distribution are liely to cause issues with settlements and movement of the existing raft foundation.

4.1.2 Pool Tanks & Balance Tanks

Concrete pool tanks would not be suitable for use with these options, the tanks would need to be constructed from a lighter weight frame, stainless steelwork pool tanks would be more suitable.

Settlements are also key for the filtration systems, so all suspended floors would have to be designed with this in mind.

It would be recommended that any filtration vessels would be housed in the basement area, on raised platforms out of the flood zone.

4.2 PROPOSED SUPERSTRUCTURE

The proposed leisure centre building would have to be formed out of a new, likely to be steelwork frame, on top of the existing concrete upper slabs.

The Architects options show formation off Level 3 or Level 4. The existing building would need to be demolished above these levels to accommodate the new building.

The new frame would need to span back to the existing columns on the 7.2m grid.

Loading wise this is feasible with modifications in the heavy load areas, however temporary works and overall stability are a high risk.

4.2.1 Suspended floors

The upper levels are primarily assigned as gym space with some additional areas for dry changing facilities and administration. The floor structure will be constructed from steel frame and composite metal deck with insitu 150mm concrete slab, looking to keep the mass to a minimum while considering the frequency of the activites.

Beams within the studios and fitness area are subject to rhythmic loading and have been designed for a natural frequency of 8.4Hz and 6.0 respectively, see plan sketch in Appendix B.

4.2.2 Roof structure

The light weight roof covering the pool and fitness areas is proposed to comprise of a structural metal deck, supporting the roof build up and finishes. Within the pool hall, the structural roof deck is aluminium to resist corrosion due to the pool environment, and is perforated to aid the acoustics of the pool hall.

4.2.3 Structural Stability and Serviceability

For all the buildings, lateral loads will be transferred to foundations using vertical cross bracing and plan bracing in the lightweight roof structure.

These loads will need to go back through the existing building, utilising the existing load paths where possible.

5 FLOOD RISK SUMMARY

Considering the Environment Agency Flood Mapping, the site is generally shown to be located within an area of very low risk of flooding due to rivers or seas, which is defined in the National Planning Policy Framework (NPPF) Planning Practice Guidance (PPG) as Land having a chance of flooding of less than 0.1% per year from river or seas.

The site is also predominantly in Flood Zone 1, an area of very low risk from surface water flooding, which is defined as land having a chance of flooding of less than 0.1% per year from surface water. However, there are some localised areas across the northern section of the building fall into Flood Zone 2/3, they are also at risk of river flooding. These are the basement, Level 0, areas of the building, generally unoccupied spaces in the existing building. We understand that there has been flooding in the basement of up to around 2m high in recent times

The basement area of the site is at risk of local flooding from surface water issues.

Figure 5-1 – Flood risk map for Zones 2 & 3

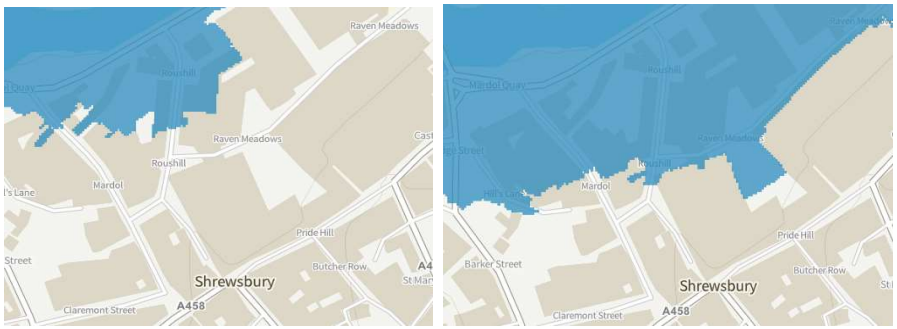

Figure 5-2 – Flood map for risk from river flooding, without and with climate change

Figure 5-3 – Flood risk map for 1:100-year surface water

6 EXISTING DRAINAGE

The existing drainage systems are not known; these would have to be surveyed at the next design stages to allow incorporation of a drainage design into the scheme.

7 PROPOSED DRAINAGE

7.1 FOUL WATER

Discharge Method

The existing system has a strategy that will need to be updated for the proposed system. The proposed strategy needs to be agreed with the Local Authority prior to start on site. Formal approval to connect into the public drainage network will be agreed through the submission of an S106 application during the works.

Design Criteria

New foul drains will be provided to serve all foul producing appliances within the proposed development. All drains will be designed in accordance with BS EN 752:2017 and Building Regulations Approved Document H.

All adoptable foul water drainage will be designed and constructed to 'Sewerage Section Guidance (SSG) Codes for Adoption' standards, in accordance with the SSG Design & Construction Guidance document.

Trade Effluent

'Trade effluent' is classified as foul waste and must be connected into the proposed foul network. Formal approval is required to discharge trade effluent, and a trade effluent agreement will need to be arranged between the site operator and the operator's chosen water retailer. The trade effluent agreement will stipulate the frequency, volume, and maximum rate at which the operator will be able to discharge trade effluent from their site.

In addition, a pre-development enquiry will be submitted to the local water authority to confirm whether there is capacity within their foul network to accommodate the trade effluent discharge. This drainage strategy will be updated once a response is received however for the purposes of this report it has been assumed that the network will have available capacity.

It is likely that the proposed discharge rate and discharge volume from the backwashing facilities will be restricted as part of the trade effluent agreement as it is unlikely that the public network would be able to accommodate the unrestricted backwash rate. Trade effluent from the swimming pool filters will therefore discharge into an isolated foul drainage network and make a separate connection into the main foul drainage network, downstream of a dedicated sampling chamber. The trade effluent network will have a suitably sized backwash storage facility and a mechanism to restrict the flow rate into the main foul drainage network in accordance with the approved trade effluent agreement.

7.2 SURFACE WATER

Surface Water Discharge Hierarchy

The recommended surface water discharge hierarchy set out in the CIRIA SuDS Manual is to utilise soakaways, or infiltration as the preferred option, followed by discharging to an appropriate watercourse. If these options are not feasible then the final option is to discharge to an existing surface water sewer, followed by discharge into a combined public sewer. The strategy is to be completed in the next stage.

SuDS Considerations

SuDS will be considered when producing this drainage strategy in an effort to provide effective surface water treatment and slow down the rate of surface water runoff in accordance with National Planning Policy recommendations and the lead local flood authority SuDS Design Guidance. The following sustainable drainage systems will be considered:

Infiltration Systems: – not likely on this site

Porous Pavements: - not likely to be affective on this site

Design Criteria

All private surface water drains will be designed and constructed in accordance with BS EN 752:2017 and Building Regulations Approved Document H. All adoptable surface water drainage will be designed and constructed to 'Sewerage Section Guidance (SSG) Codes for Adoption' standards, in accordance with the SSG Design & Construction Guidance document.

of the external works are to remain, and the landscaping required where existing structure has been demolished will tie into what already exists.

8 CONCLUSION

The below are a summary of identified high design risks which will need further consideration during subsequent design phases to either remove, mitigate:

- **Existing Foundations:**
  There is a high risk that the foundations cannot accommodate the significant change to the superstructure with out detrimental affect to the movement and settlement of the existing structure.
  To proceed with the design options an allowance for installing deep piled foundations through the basement slab. This may not be possible with the height in the basement space so elements of Level 3 may need to be removed to accommodate.
- **Retaining Wall Stability:**
  The upper slabs may well have played a part in the lateral stability of the retaining walls so any changes to the superstructure need to be reviewed with the substructure.
- **Lateral Stability:**
  If significant sections of the existing building are to be removed then the overall lateral stability of the building needs to be considered. Modifications to the existing frame are likely to be needed
- **Existing Building Structural Condition:**
  The building is nearing 40 years old; it will have undergone modifications and refurbishments in that time. There is a risk that the building condition is not suitable to accommodate and additional 50 years of design life.
- **Adaption of Existing Structure:**
  Whilst the general thought is that the frame can accommodate most of the proposed options and uses, there are some specific areas, pool tanks, plant and service routing that may be more tricky to incorporate.
- **Floatation:**
  As the water table is not known and the site is in flood zone, water table and water ingress is a design and construction risk.

07 Conclusion

This Stage 1 feasibility study confirms that the former Pride Hill Shopping Centre offers sufficient spatial capacity to accommodate the proposed swimming and fitness facilities. However, both design options significantly exceed the base area targets outlined in the initial brief and achieved at Shrewsbury Sports Village proposals. Despite some spatial constraints—particularly in the fitness and splash areas both options demonstrate the potential for a leisure facility within the retained building. Noting the user experience and management will be compromised by the layouts, especially with access at level 3 and no visual connection between the main facilities and entrance.

Option 2, in particular, presents a more efficient internal layout through the reorientation of the swimming pool, resulting in increased usable space for leisure and retail. However, both proposals rely on a substantial level of demolition, raising important questions around the overall feasibility and cost-effectiveness of the intervention.

The conversion of the existing retail building into a high-quality leisure facility introduces several architectural and technical challenges. These include the age and condition of the structure, uncertainties regarding the performance and capacity of existing foundations, issues of lateral stability, the potential requirement for deep piling, and the complex adaptation of the existing frame to accommodate new plant, services, and pool infrastructure. In addition the acoustic implications and servicing (especially drainage) will need to be assessed. Further work is also required on transport and servicing including cycle parking, parking, coach parking and drop-off. This would include access for competitions and schools. The suitability of access for wheelchair and ambulant disabled users off Roushill Bank will need to be assessed as level access is not available elsewhere on the site.

In summary, while the building provides a generous spatial envelope and both design options appear viable (subject to significant abnormal costs) at this early stage, the successful realisation of the scheme will depend on the resolution of complicated structural and environmental risks.


Roberts Limbrick