



OCTOBER 2025, VERSION 1

Cyfarthfa Castle

Urgent Repair Works – Roofs, Facades and Rainwater Goods

Contents

1.0 Overview	03
Introduction and Historic Background	03
2.0 Proposals	04
Summary of the Proposed Works	04
Works to Roofs	
Roof Access Equipment - External	05
Roof Access Equipment - Internal Spaces	06
Works to Flat Roof R.14 - External Works	07
Works to Flat Roof R.14 - Internal Structural Works	08
Works to Pitched Roofs	09
Works to Facades	
Works to Windows	10
Rainwater Goods - Downpipes	11
Rainwater Goods - Hopper Proposals	12
Ecology	13
3.0 Appendices	14
A: Proposed Drawings	15-20
B: Access and Maintenance Report	21-22

1.0 Overview

Introduction

This Design Statement has been prepared on behalf of Merthyr Tydfil County Borough Council to accompany the application for Listed Building Consent for a series of works to the roof of Cyfarthfa Castle, in Merthyr Tydfil. This statement is designed to be read in conjunction with the Heritage Impact Assessment which provides a greater level of detail on the building, its significance, and the impact of the proposed works.

The works contained within this application concern only the eastern wing of the building which houses the Museum and Art Gallery in the Basement and Ground Floor, and some of the former school spaces in the first floor. Works to the former caretaker's house are also included in this application. The works described herein concern the exterior of the building and include works to the roofs, external facades and rainwater goods.

Historic Background

Cyfarthfa Castle is a Grade I listed building, located within a Grade II* listed Registered Park and Garden. Built in 1827, the castle was designed by Robert Lugar for the Crawshay family, a local family who owned and ran the Cyfarthfa Ironworks from 1786-1874. The castle was later bought by the council (in 1908) and converted into a museum and school. At that time, most of the building was demolished, leaving only the south-eastern section.

The Castle now can be considered in three main parts:

- The historic rooms of the former ironmaster's house, preserved within the Museum and Art Gallery in the south-eastern wing. This is the oldest and most significant part of the building.
- The former school, occupying the western wing and first-floor areas of the eastern wing.
- The former Caretaker's House, which occupies a section of the eastern half of the building and retains many historic features.

2.0 Proposals

Summary of the Proposed Works

The proposals contained within this application comprise a package of urgent remedial works intended to halt the ongoing deterioration to the condition of the castle, especially the upper floors which have suffered from long-term water ingress and neglect. The works concern the eastern wing of the building which is deemed to be the most significant and is the only part of the building which is currently in active use. The works can be summarised as follows.

Works to roofs;

- Installation of roof access equipment to deliver a comprehensive access strategy for the safe and regular maintenance of roofs and gutters, including:
 - o Stepped walkways to facilitate safe access to the lead gutters along the southern and eastern façades.
 - o New fixed ladders with integrated lifeline systems for access to tower roofs.
 - o A constant force post and safety line (mansafe) system to all walkways to enable secure and continuous attachment for maintenance personnel
 - o Installation of 1 no. new roof access hatch, allowing internal access to the roofs where external ladder access is not feasible
 - o New walkways within attic spaces to support safe inspection and ongoing monitoring of these areas

Works to facades;

- Replacement of 1 no. boarded-up window with new sash window to reinstate the historic character and appearance of the principle elevations
- Installation of new downpipes (8 no) to improve the management of rainwater on certain roofs. New downpipes and hoppers will be in keeping with existing cast iron goods.
- Rationalisation of hopper types across building to improve the legibility and heirarchy of the facades.

Ecology;

- Installation of a range of bat boxes and access points, as set out in the ecologist's recommendations, to support existing bat populations

Roof Access Equipment

Access to Roofs and Gutters

Outline of Equipment Provision

The proposed works comprise the installation of a comprehensive roof access system across the roofscape. The new system will enable safe and regular access to all gutters and roof areas for cleaning, inspection, and routine maintenance activities.

The introduction of permanent access systems which are safe and require minimal training will ensure that essential maintenance tasks can be carried out more regularly and in accordance with the recommendations set out in the Access and Maintenance Document (Appendix B). This proactive approach to routine maintenance supports the long-term preservation of the historic fabric of the building.

Key elements of the proposals include:

- Replacement of existing ladders to the tower roofs with new fixed ladders incorporating integrated lifeline systems, improving safety and ease of use.
- Installation of stepped walkways to enable access to lead gutters along southern and eastern facades and reduce risk of damage to slates during regular cleaning.
- Gutters that are used as walkways have been designed with code 7 lead used for durability and a minimum width of 500mm to enable safe passage along their length
- Provision of a new constant force post and safety line system along the length of the walkways and gutters which will be fixed back to the timber structure, enabling secure and continuous attachment for maintenance personnel which doesn't rely on the historic parapets (with unknown strength and stability) to provide guarding.
- Installation of 1 no. new access hatch in tower roof R.11, to provide access from internal space to this tower for inspection and maintenance. Provision of a ladder to this tower would not have been appropriate due to its height and visibility from the principle approaches to the castle.

Visual Impact

- Roof walkways will be finished in dark grey (RAL 7024) to match the existing slating
- The location and alignment of the walkways have been carefully considered to ensure they are as discreet as possible, particularly in relation to the principal elevations facing the park
- Views from ground level have been assessed, and due to their placement behind merlons and towers, the walkways will not be visible from the southern or eastern approach

Comprehensive layout of access equipment is provided in drawing **CCRW-PUR-01-RF-DR-A-0202** (Appendix A.2).



Image showing constant force post in slate roof. The post will be fixed through to the timber structure below.. Image taken from MSA Latchways.



Image showing ladder with integrated lifeline. The ladder will be finished in colour to match existing adjacent finish (RAL TBC). Image taken from MSA Latchways.

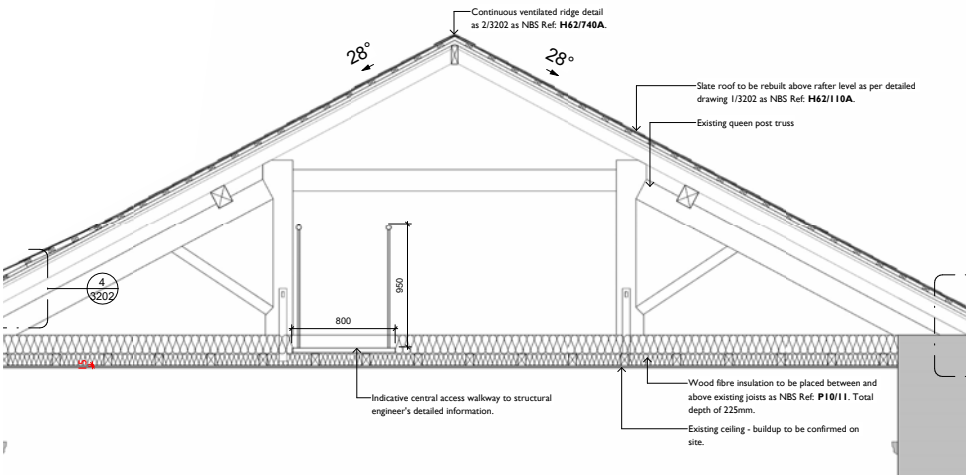


Image showing example of stepped walkway on pitched slate roof. The walkway will be finished in dark grey to match slating. Image taken from MSA Latchways.

Roof Access Equipment

Access to Internal Spaces

To facilitate the ongoing maintenance and inspection of the attic spaces beneath the pitched roofs, the installation of new maintenance walkways is proposed. These walkways will provide safe and secure access for maintenance personnel, enabling regular inspection of the roof structure while protecting the historic trusses from accidental overloading or damage.



Proposed section showing new walkway in attic spaces. Detailed design is to be according to structural engineer's info.



Image of roof space below R.7 where access walkway is proposed to enable safe access to roof space for maintenance and inspection.

Works to Flat Roof R.14

External Works

Outline of Proposed Changes

The existing single ply flat roof covering is to be replaced with a new tapered insulation system and bituminous membrane covering. This upgrade will address the existing issues of pooling on this roof by improving falls, thereby reducing the risk of future leaks. U-values will also be improved to 0.15W/m²K making the interior spaces more comfortable and suitable for museum use.

The introduction of the new tapered insulation scheme will increase the overall depth of the roof covering to approximately 450 mm above the existing concrete deck at its highest point. As a result, several associated modifications are proposed to ensure the roof functions effectively:

- **Parapet height adjustment:** The top of the parapet will be raised to 150 mm above the highest point of the new insulation and finished with a coping stone. This will provide a robust waterproof junction and ensure effective rainwater discharge to the downpipes.
- **Replacement of clerestory windows:** The clerestory windows along the southern edge of the roof will be replaced and their cills raised to accommodate the increased roof build-up. The new windows will match the style and detailing of the existing units, including glazing bars, and will be fitted with actuators to provide natural ventilation to the internal spaces below.
- **Installation of edge protection:** Roof R.14 will be fitted with a new freestanding guardrail system set back from the roof edge. This system has been chosen as an economical system, due to the long-term plan to enclose the courtyard, after which the guardrail will be removed.

Information on the extent of the works can be found in the following drawings (Appendices A.3, A.4):

CCRW-PUR-01-ZZ-DR-A-0211

CCRW-PUR-01-RF-DR-A-0202

Visual Impact

The proposed works will not be visible from the exterior of the building. Within the courtyard, the only noticeable change proposed will be the slight increase in parapet height, which is expected to have minimal visual impact on the overall character of the space. The installation of the new guardrail system replaces the existing face-fixed and visually intrusive provision. By setting the guardrail back from the parapet, its visibility from ground level will be greatly reduced.

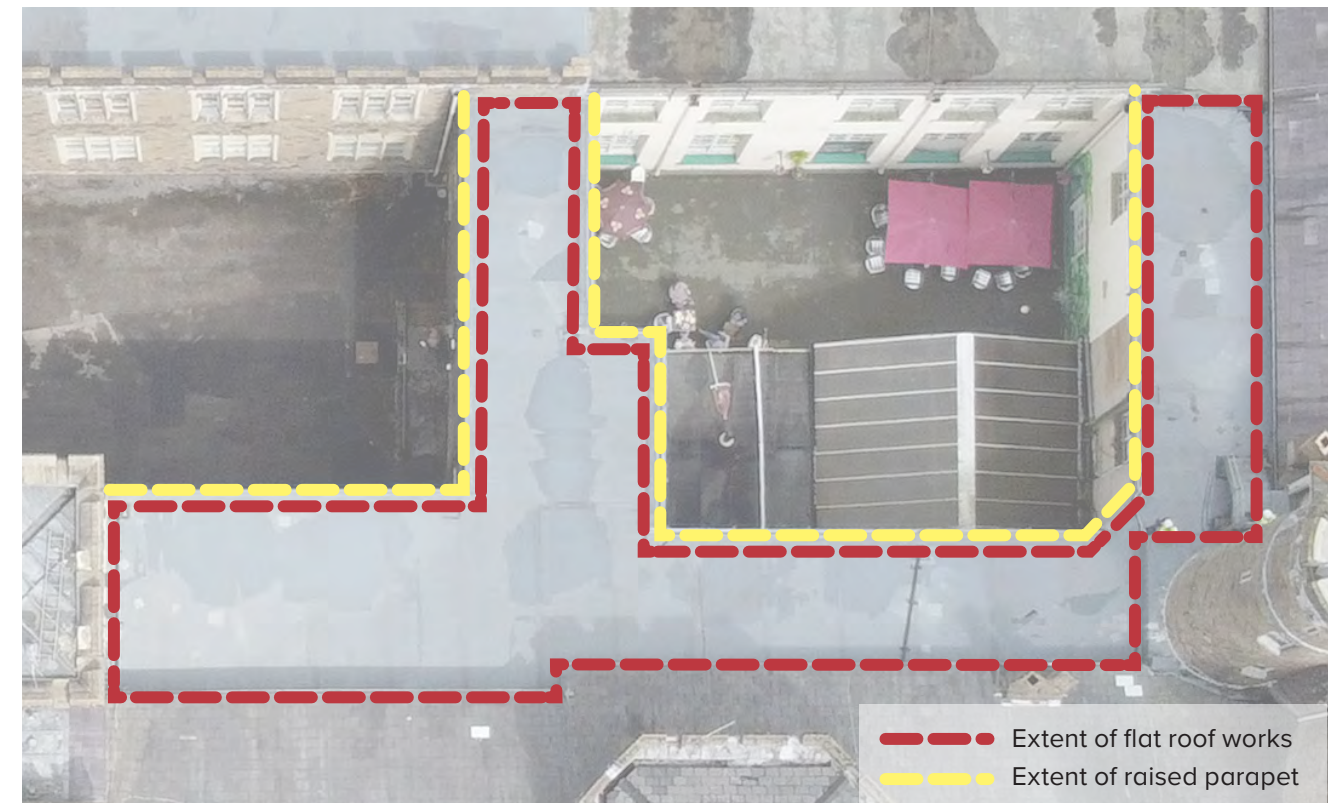
The proposed change to the window cill heights will have a limited impact on four first-floor rooms, with no effect on the overall legibility of the spaces. The alterations are considered minor and proportionate to accommodate the improved roof build-up while preserving the character of the spaces.



Image showing 4 of 5 no. windows to be replaced with new windows with raised cill. Proposed windows will feature glazing bars to mirror existing casement proportions and actuators to allow windows to be opened easily and ventilate internal spaces. Existing poor quality face-fixed guarding will be removed and replaced with freestanding guardrail.



Indicative image of proposed guardrail system which will provide protection to edge of flat roof. Image by Alumasc.



Works to Flat Roof R.14

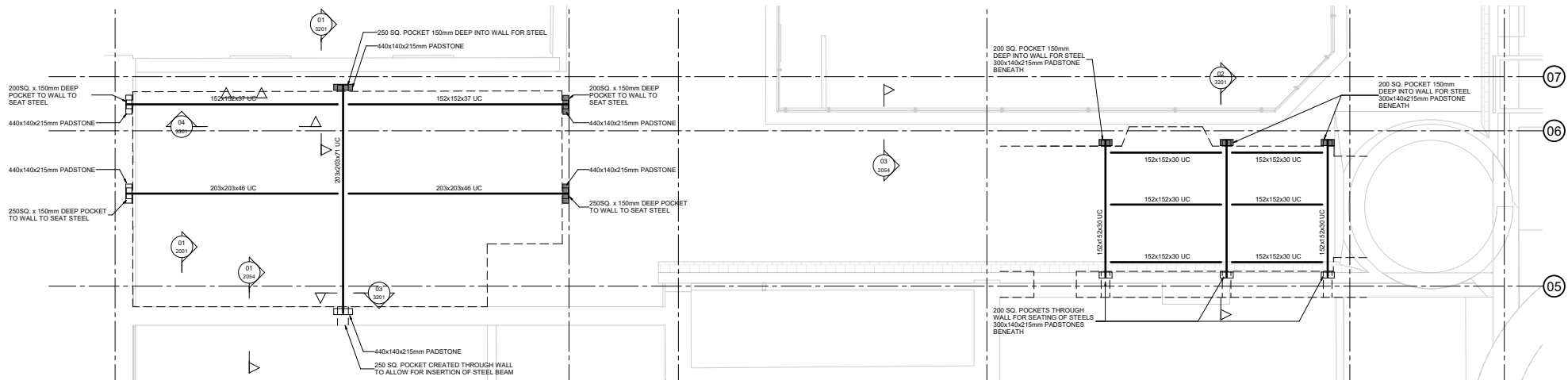
Internal Structural Works

The existing filler joist flat roof structure has been compromised due to historic water ingress and subsequent corrosion of steelwork. In order to ensure the roof will be safe for future access and capable of supporting plant equipment, it is proposed to install new steel beams beneath the existing structural deck. There will be a new gypsum dropped ceiling to conceal the steelwork within the first floor spaces.

Refer to drawing CCRW-PUR-01-01-DR-A-0220 - Proposed First Floor RCP (Appendix A.6) for locations of works and Mann Williams information for details.



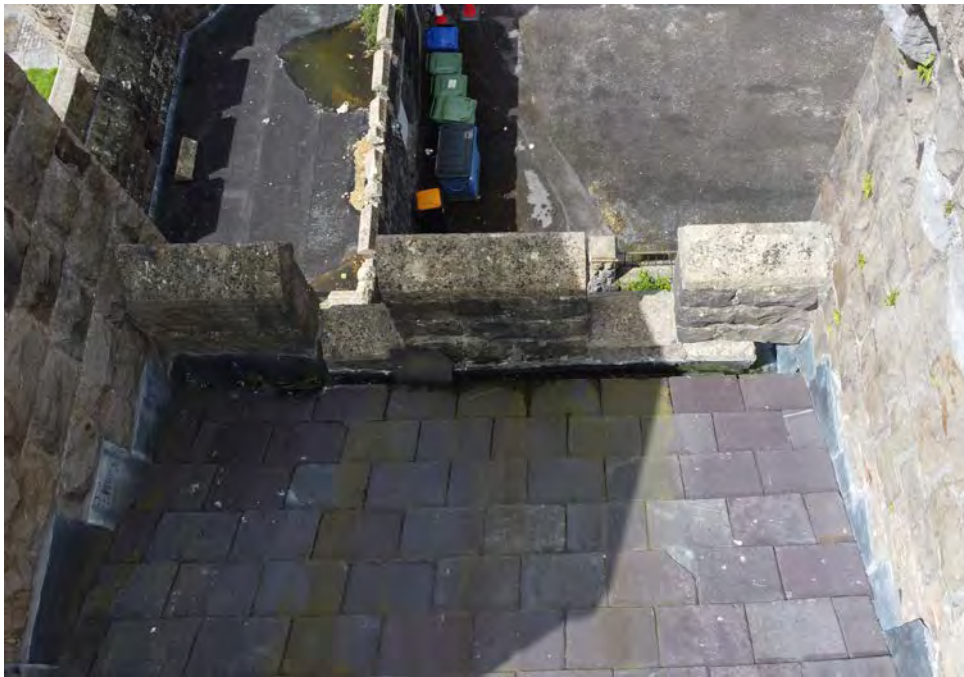
Image from opening up works showing corroded condition of existing steelwork. New steels have been designed to keep depth to a minimum and ensure interventions sit above the window reveals.



Extract taken from Mann Williams drawings showing the extent of the proposed works.

Parapet Height to Roof R.22 Increased

The parapet to Roof R.22 will be raised to achieve a 150 mm upstand from the new lead gutter to the DPC course below the coping stone, creating a robust waterproofing detail and preventing rainwater from running down the façade and causing staining or deterioration. The parapet will be carefully dismantled, numbered, photographed, and rebuilt to ensure its appearance is not altered. Any required new stone will be sourced to match existing.



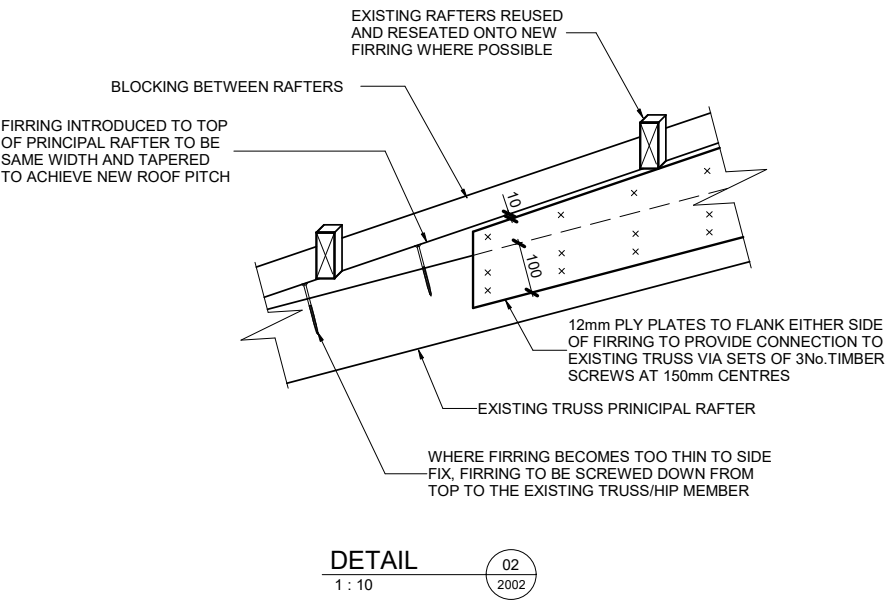
Parapet to increase in height to facilitate installation of DPC course below coping stone at a minimum of 150mm above gutter.

Pitch of Roof R.9 Increased

The pitch of Roof R.9 will be increased from 20° to 25° to improve weathering performance and enhance the roof’s ability to shed water, reducing the risk of long-term water ingress. This will be achieved by introducing furring to the top of the principle rafters before the slate roof buildup is placed. This alteration may result in a slight increase in the area of roof visible between the crenellations, although this is considered a very minor visual change with negligible impact on the overall appearance of the building.



Roof pitch to be increased from rafters and slate roof above rebuilt.



Extract from Mann Williams detail drawing showing how rafters will be modified to accommodate increase in pitch

Replacement of Blind Window on Principle Elevation

The existing blind window to the ground floor of the caretakers house is to be replaced with a sash window, to match with the existing ground floor windows on the principle elevation. This will restore visual consistency to the façade. The restoration of this window will also improve thermal condition and water tightness and improve the internal condition of the room.

For drawing refer to **CCRW-PUR-01-XX-DR-A-0213** (Appendix A.5)



Existing boarded up window to caretaker's house (marked on image) is to be replaced with sash window to match adjacent ground floor windows.

Restoration of Historically Modified Windows

Several windows on the courtyard elevations have been altered historically, with the introduction of vents and blank infill panels. Where these elements are now redundant, the infill panels will be removed and replaced with glazing, and the original window frames will be repaired. This work will reinstate the original appearance of the windows.

For drawing refer to **CCRW-PUR-01-XX-DR-A-0211** (Appendix A.3)



Example fo location where glass has historically been replaced with an infill and is to be reinstated.

New Downpipes

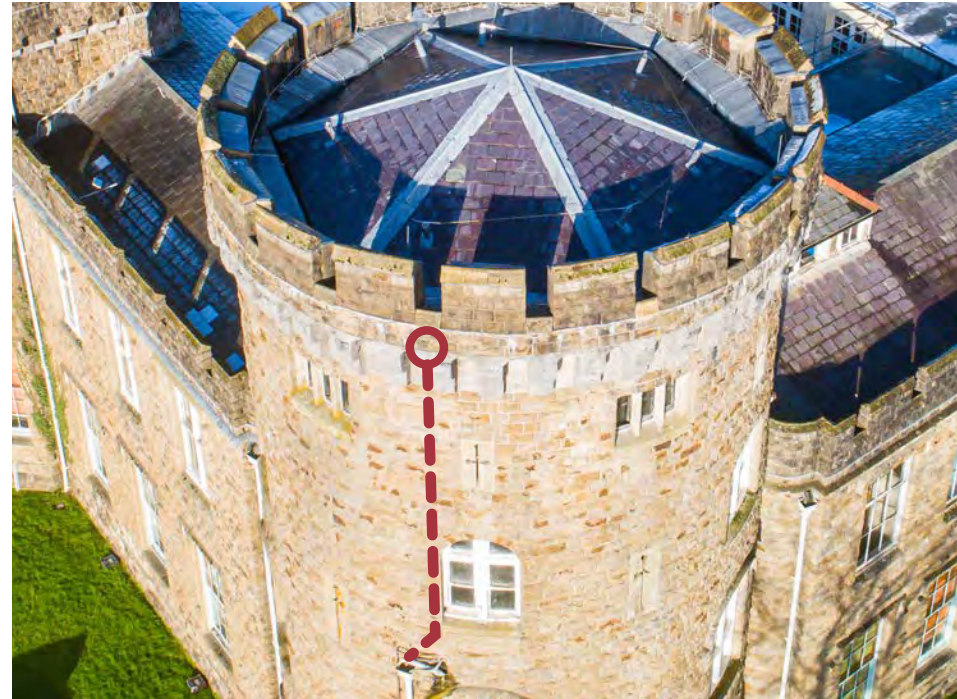
Additions to Rainwater Goods Provision

A total of eight new downpipes and 5 no. associated hoppers are proposed to improve the management of rainwater from specific roof areas. These works are intended to enhance the building's drainage capacity and protect façades from water damage and staining. All new downpipes and hoppers will be cast iron and bespoke to match the existing historic rainwater goods, as per the proposals on the following page.

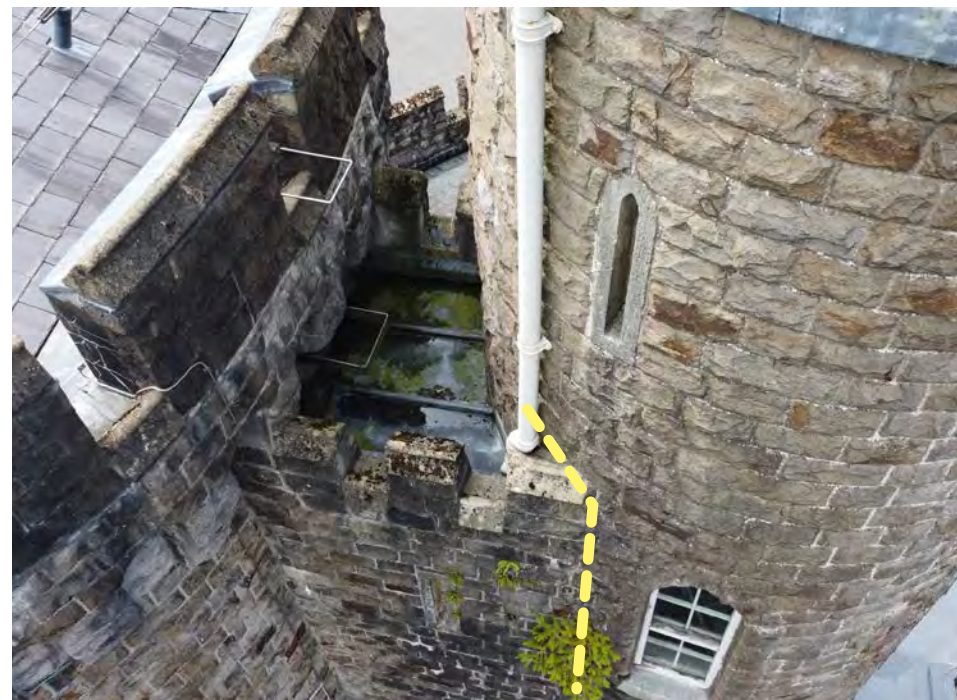
Proposed works include:

- **RWDP 11A (SE Tower):** Re-routing the existing internal downpipe to an external location, eliminating the need for a penetration through the wall. This provides a more robust and accessible drainage solution that reduces the risk of internal water ingress.
- **RWDP 28A:** Re-routing of rainwater away from Roof R1.12, which is difficult to access, thereby reducing future maintenance requirements and improving system reliability.
- **RWDP 43, 44, 45, 46, 49, 50:** These roof areas currently lack dedicated downpipes, resulting in uncontrolled water run-off. The installation of new downpipes will improve rainwater management, direct flows away from the façades and increase drainage capacity.

Refer to **Proposed Drawings 0202-0213 (Appendices A.2-A.5)** for plan and elevational drawing of proposed rainwater goods



New rainwater pipe **RWDP 11A** to be installed from roof level and connect to the existing pipe from first floor level as indicated with red dashed line. Existing penetration through wall to be infilled. New chute will be required at roof level in location indicated by circle.



New rainwater pipe **RWDP 28A** to connect to RWP28 from upper roof level and redirect water onto R.7 as indicated with yellow dashed line..



New RWPs 44 & 45 to direct water flow off towers thus preventing run off onto facade causing staining.



RWP 43: New chute, hopper and downpipe to manage water flow off flat roof area thus preventing water spilling over facade.

Hopper Proposals

Proposed Rationalisation of Hopper Types

In order to enhance the legibility of the façades and rationalise the existing hopper provision, it is proposed that, as part of the rainwater goods renewal works, a number of the existing hoppers and downpipes are replaced or reconfigured. Drawing on the four existing hopper types present across the building, a coordinated and hierarchical approach is proposed to achieve greater visual consistency while respecting the building's historic character.

- The primary elevations will adopt a single consistent hopper type ('**Type D**', as opposite), which will be newly recast based on the existing historic examples.
- The secondary elevations will incorporate the simpler historic hopper type ('**Type A**', as opposite), either reused from replacements the primary elevations and restored, or newly manufactured to match the existing profile as required.
- Where required (to fit within niches in stonework), the smaller existing '**Type C**' hopper will be reused.
- In two locations, the existing '**Type B**' hoppers will be restored and retained in situ, recognising their historic value.

These proposals, together with the wider rainwater goods strategy, have been developed in line with the overall rainwater management approach for the building. The works will provide a robust and effective rainwater disposal system while simultaneously reinstating clarity and coherence to the façades and reinforcing their historic appearance.



Type A



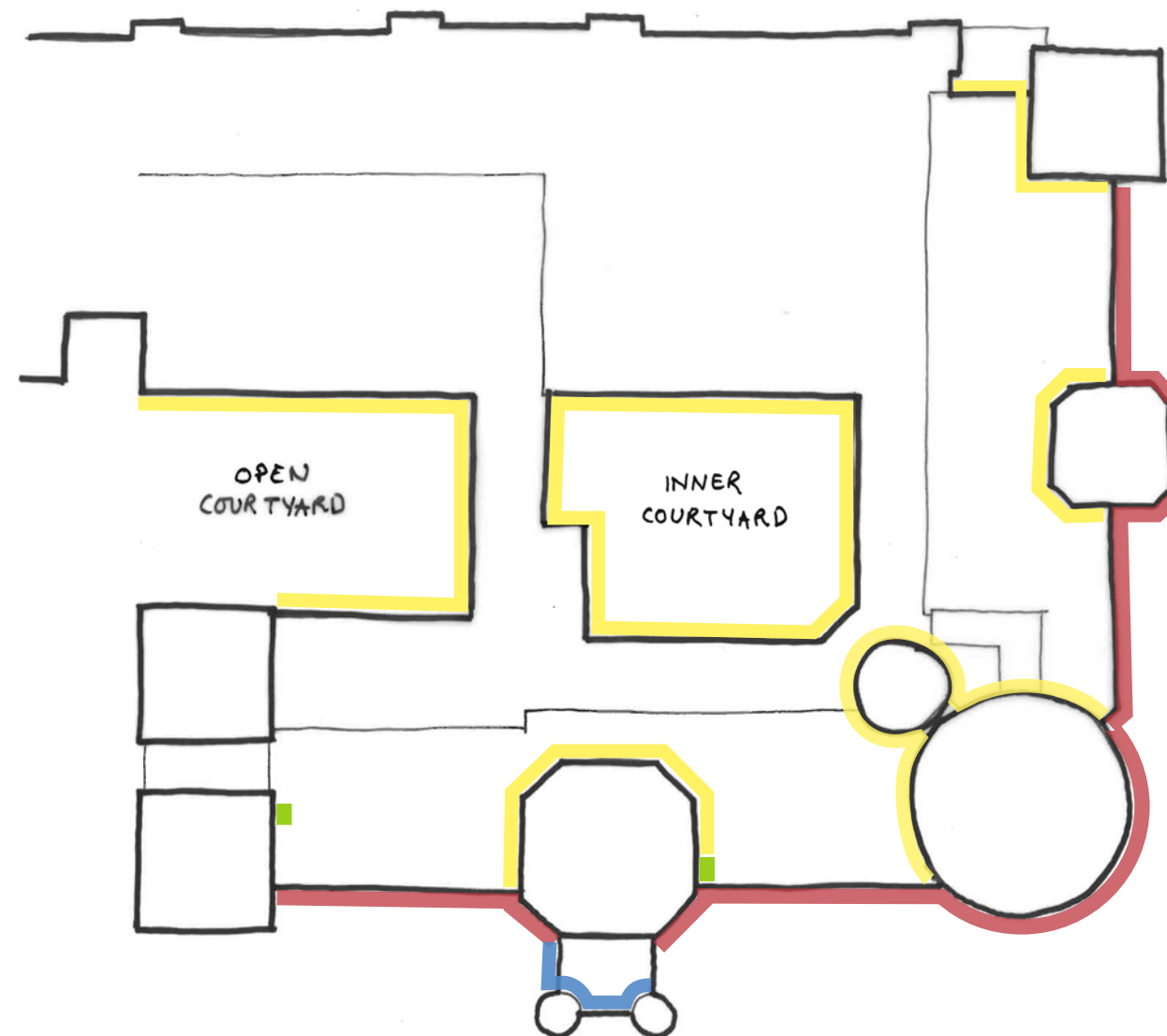
Type B



Type C



Type D



Bat Boxes and Access Provision

Installation of a number of bat boxes and new access points provided, as set out in the ecologist's recommendations, to support existing bat populations. There are several types of provision included in the proposal;

- External wall mounted bat boxes (2 no.), adjacent to existing.
- Bat entry holes in slate tiles
- Bat entry holes in soffits

For detailed setting out of all bat provisions please refer to Ecology Plan - **CCRW-PUR-01-RF-DR-A-0201 (Appendix A.1)**



Image showing existing location of bat boxes on external wall of caretaker's house, new external bat boxes to be placed alongside existing. Location is only visible from roof.

3.0 Appendices

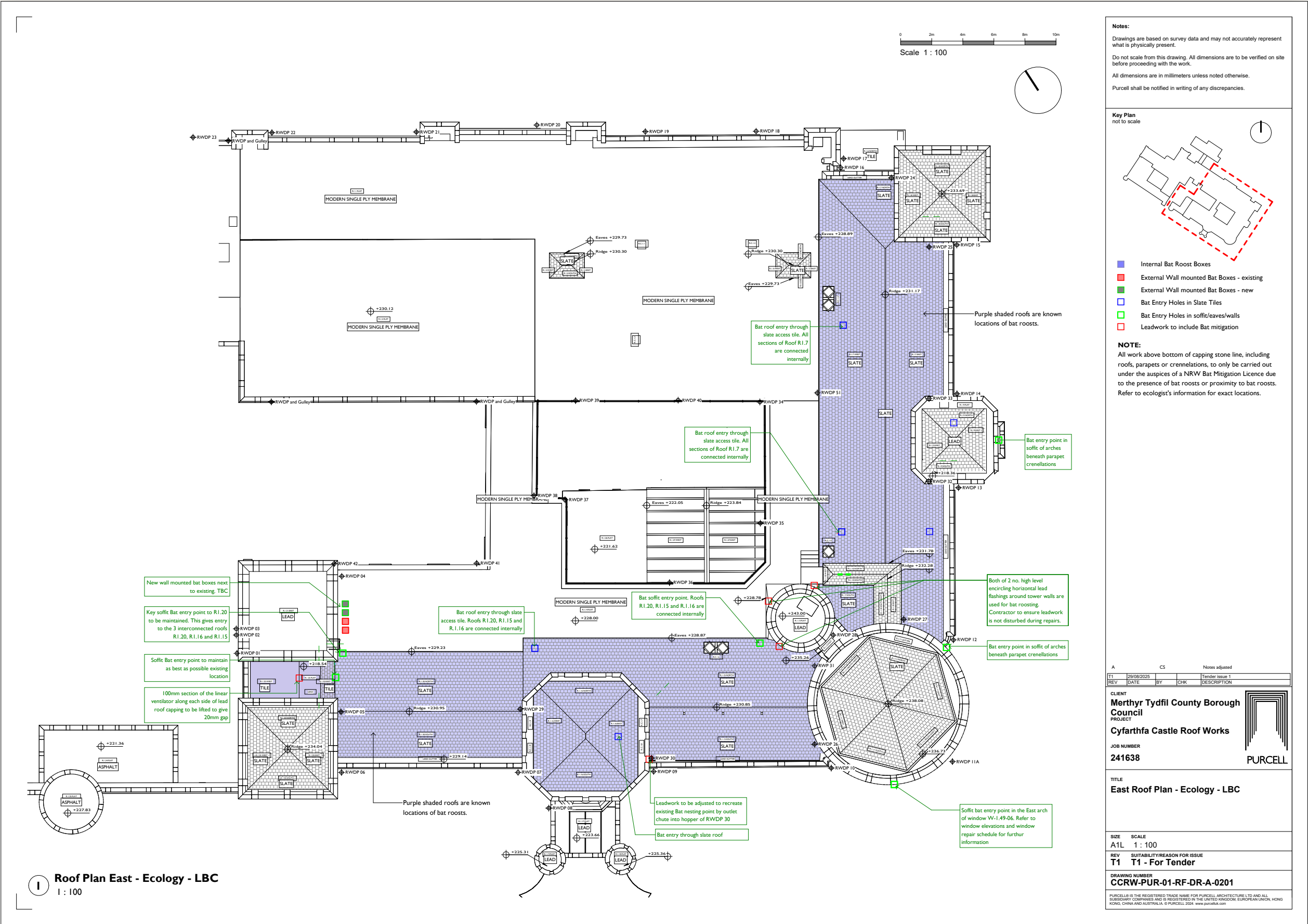
Appendix A: Proposed Drawings

- A.1: 0201 - Ecology Plan
- A.2: 0202 - Access and Maintenance Plan
- A.3: 0211 - Courtyard Elevations
- A.4: 0212 - South-East and North-East Elevations
- A.5: 0213 - South-West Elevations
- A.6 0220 - Proposed First Floor RCP

Appendix B: Access and Maintenance Report

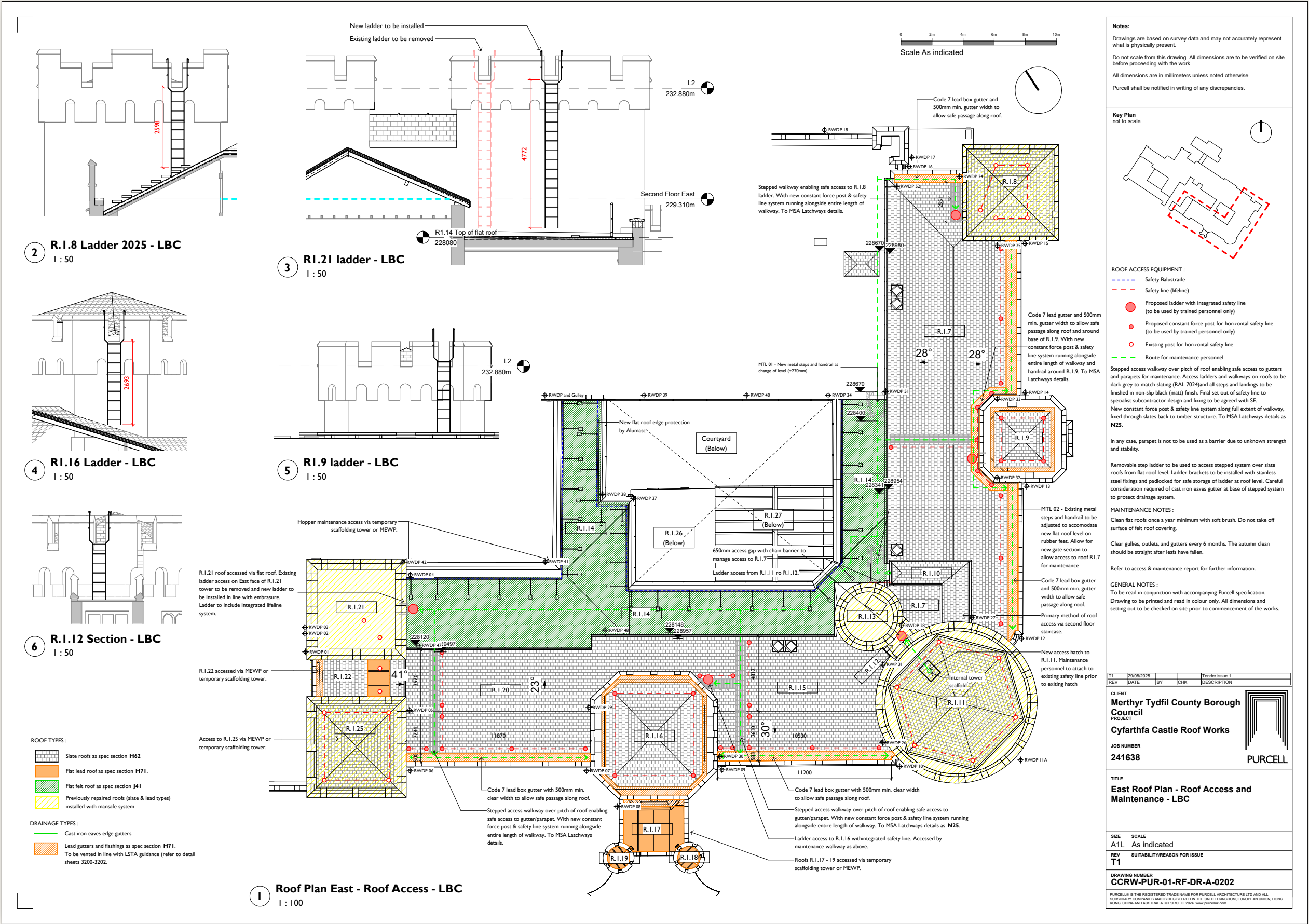
Appendix A: Proposed Drawings

A.1: 0201 - Ecology Plan

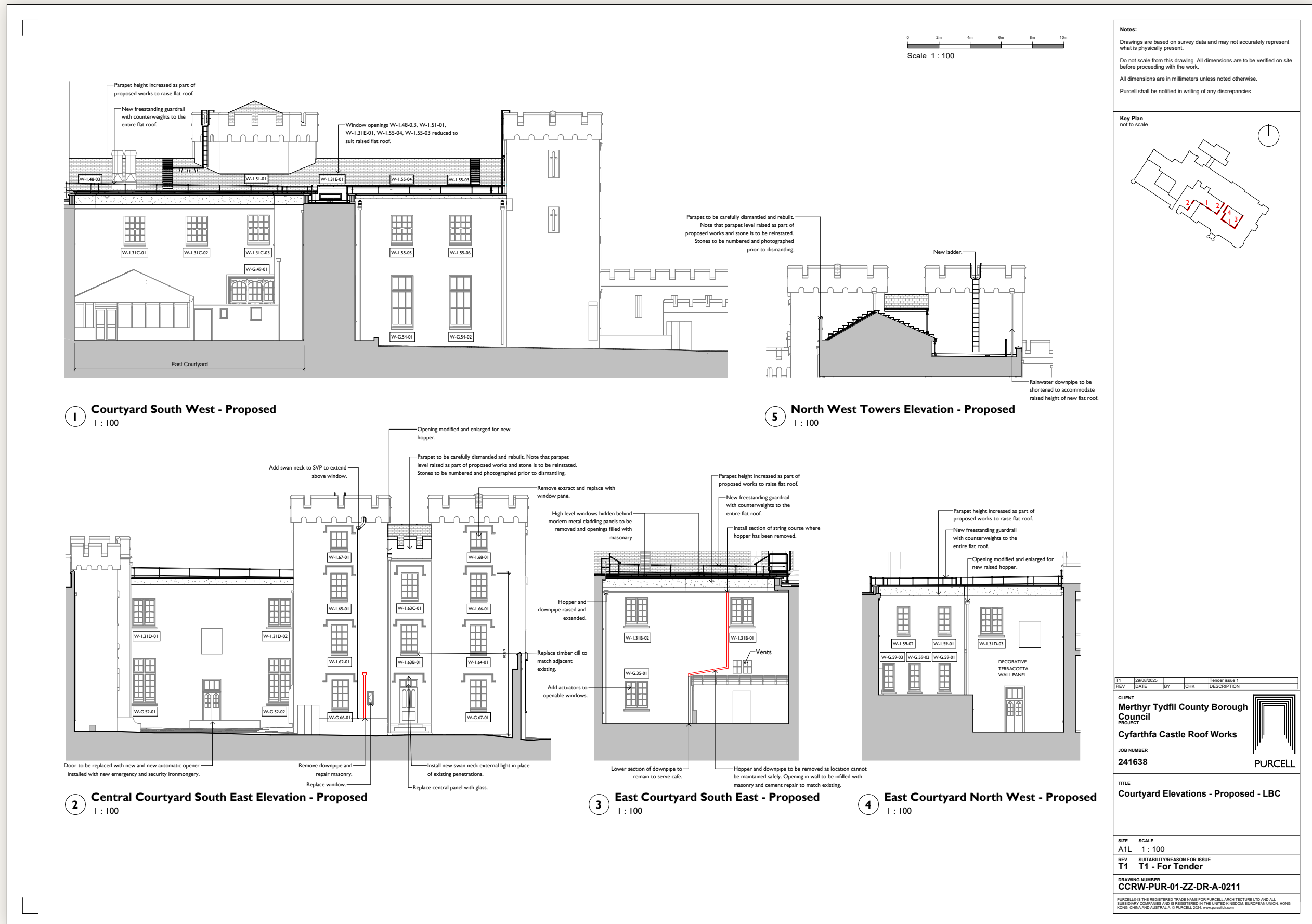


Appendix A: Proposed Drawings

A.2: 0202 - Access and Maintenance Plan

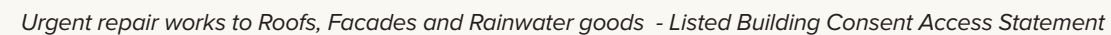


A.3: 0211 - Courtyard Elevations

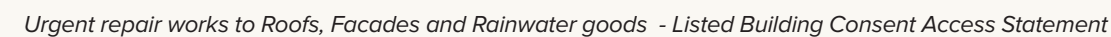


A.4: 0212 - South-East and North-East Elevations

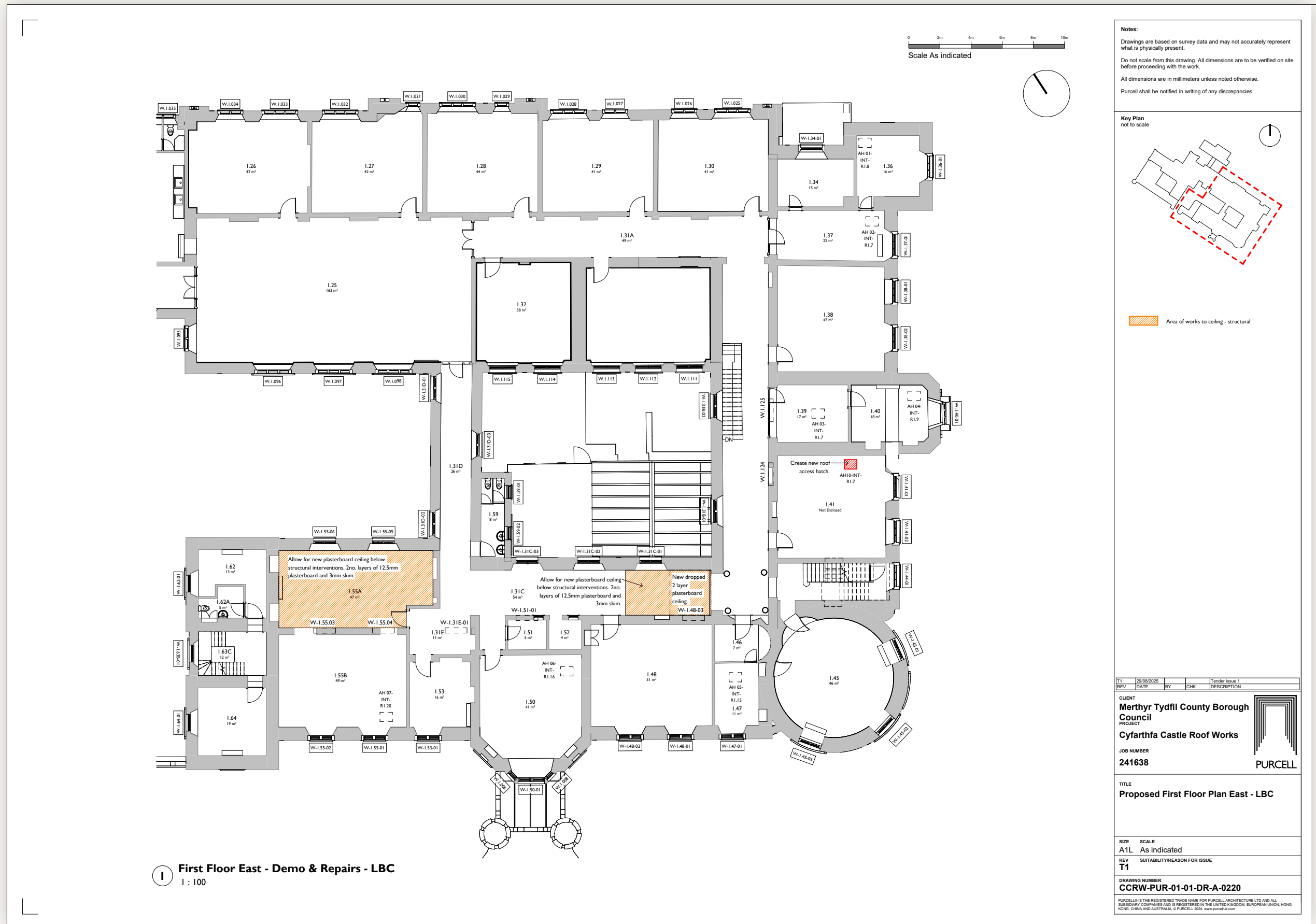
A.4: 0212 - South-East and North-East Elevations



A.5: 0213 - South-West Elevation



A.6: 0220 - Proposed First Floor Plan



Appendix B: Access and Maintenance Report

Page 1 of 2

INTRODUCTION

This document describes the design for the access & maintenance of exterior cleaning and general building maintenance for the roofs and windows refurbished in 2025-2026. This is the south and east wing of the 'mansion' side of the castle.

This document is to be read in conjunction with "Cyfarthfa Castle Building Maintenance Plan June 2023".

RISK ASSESSMENTS

The client is to carry out their own risk assessment prior to undertaking any maintenance task, taking note of weather conditions and any deterioration of the building fabric. The client is to ensure that personnel involved in inspections and maintenance are adequately trained and competent to perform their tasks safely and effectively. Training on hazard identification, safe work practices, and the use of personal protective equipment as necessary to be provided.

INSPECTION OF ACCESS ITEMS

Where edge protection, stairs/ladders or other items have been provided to enable access for maintenance, these are to be inspected biannually, or as advised by the item's manufacturer.

Roof and gutter maintenance must be undertaken with at least two persons.

FALL ARREST SYSTEMS / FALL RESTRAINT SYSTEMS

Refer to drawing 2002, East Roof Plan – Roof Access & Maintenance for extent of fall arrest system. All vertical ladders are aided by an integrated safety line. Where provided to enable access for maintenance, these are to be inspected periodically as advised by the item's manufacturer. As stated in BS EN 365:2004, components of the fall arrest / restraint system should be examined at least annually. However, refer to manufacturer's information in the case of recommendations for greater frequency of inspections.

VEGETATION

Any vegetation growth within the building fabric should be promptly and safely removed to avoid any further damage. Holes should be repointed with lime mortar.

MASONRY

Masonry is to be visually inspected to identify any signs of deterioration, damage or structural issues every 6 months (Eg: Loose bricks or mortar, cracks or instability) and more formally as part of a 5 yearly quinquennial survey.

ECOLOGY

Bat boxes have been installed and approved by the planning officer. These are not to be removed unless prior consent has been sought from Merthyr County Council and advice received from a suitable ecologist.

The contact details for the ecologist used in this project are as follows:

01275 391297
Abricon Ltd
2 Chapel Court
Long Ashton Business Park
Yanley Lane
Long Ashton
Bristol
BS41 9LB

WINDOW & FAÇADE CLEANING & MAINTENANCE

For access to windows for cleaning and maintenance, refer to maintenance elevation drawings 2101, 2102, and 2103.

In most cases, windows can be cleaned through the combination use of a reach and wash system and MEWP access. Refer to maintenance elevation drawings for windows in hard-to-reach areas of the courtyard, which should be cleaned from inside.

Windows up to 10m from the external floor level can be accessed using a standard reach and wash system. Windows above 10m may be accessed using a carbon fibre water-fed pole; however additional care is required. Refer to maintenance elevation drawings for windows where MEWP access is recommended for cleaning.

Where ground level access is required, care must be taken to clear obstacles first where relevant ahead of any maintenance works. All ground conditions are to be assessed prior to the use of any equipment over them.

External paint finishes should be redecorated every 10 years, and every 7 years in more exposed areas. If flaking paint is visible prior to this period, it should be sanded back prior to redecoration within 3 months. Window cills are particularly vulnerable and should be inspected every 6 months.

ROOF CLEANING & MAINTENANCE

ALL ROOFS

All roofs must always be clear of debris to avoid damage, blockages or potential trip hazards. Where an area of roof is not accessible for inspection, a periodic drone is recommended. Maintenance activities to roof areas are to involve at least 2 no. members of trained and authorised personnel at all times.

GUTTERS

Gutters to be inspected biannually. Access required to clear all debris. Check gutters for minor defects, make holding repairs if necessary and report any defects.

Appendix B: Access and Maintenance Report

Page 2 of 2

Keep gutters clear of debris to ensure proper drainage and prevent water buildup on the roof surface. Clean gutters regularly and repair any leaks or damage to prevent water ingress into roof structure.

500mm min. width to lead gutters behind parapets and flat roof access to cast iron eaves gutters provides reasonable proximity access to full extent of gutters.

Access to lead gutter of R.I.22, and R.I.17-19 via MEWP or temporary scaffolding tower. Refer to drawing 2002, East Roof Plan – Roof Access & Maintenance for further information.

CHIMNEYS

Conduct regular visual inspections of the chimney structure, both internally and externally, at least once a year. Look for signs of damage, such as cracks, loose bricks or mortar, deteriorated flashing, and vegetation growth. Ensure roof level vents are clear and ventilating.

DOWNPIPES & OUTLETS

Conduct regular visual inspections of downpipes and outlets to check for signs of damage, blockages, or leaks. Inspect both the interior and exterior of the pipes for any issues.

Clear rainwater goods of debris and ensure overflows are clear. Regular vigilance required to check whether overflow pipes are being used. Rod if necessary. Check that any leaf guards are secure. Repair or replace any cracked sections. Inspection of underground chambers also required. Repair any damage to downpipes or outlets promptly to prevent water leakage or structural issues. This may include patching.

Check the associated brackets supporting the downpipes or hoppers in place for signs of wear, corrosion, or damage. Replace any damaged supports and tighten loose fasteners to prevent sagging, misalignment or holes, replacing damaged sections, or resealing joints as needed.

Inspect hoppers or outlets where downpipes discharge water into drainage systems or ground-level channels. Ensure that hoppers are clear of debris and functioning correctly to facilitate proper water drainage.

Gullies at the base of the rainwater pipes are particularly prone to blocking due the location within the park. This should be checked monthly and cleared as necessary.

LEAD ROOFS

Conduct frequent inspections of the lead roofs to identify any signs of damage, deterioration, or potential issues. Inspections should be performed at least annually, with additional checks after severe weather events.

Keep the lead surface clean by removing debris, dirt, and organic matter that can accumulate over time. Use a soft brush or broom to gently sweep away loose debris and rinse the roof with water to remove stubborn dirt. Engage a trained / suitable contractor to repair any damage to the lead roof promptly to prevent water ingress and further deterioration. Common issues may include cracks, splits or punctures in the lead sheets, which can be repaired using specialised lead repair techniques. Check the joints and seams of the lead roof for signs of deterioration in the mortar or sealant. Repoint any loose or damaged mortar joints and reseal seams as necessary to maintain a watertight seal.

Inspect the lead roof for signs of corrosion such as white or powdery deposits (known as “white rust”) or reddish-brown stains (known as “red rust”). Treat any areas of corrosion with an appropriate rust inhibitor to prevent further degradation. Ensure that the roof’s drainage system, including gutters and downpipes, is clear and functioning correctly to prevent water buildup and potential damage to the lead roof.

For complex repairs or maintenance tasks, such as large-scale repairs or replacements of lead sheets, consult with a professional roofing contractor experienced in working with lead roofing materials.

SLATE ROOFS

Conduct thorough inspections of the slate roofs at least annually, preferably before and after the winter season. Look for signs of damage such as cracked, broken or missing slate tiles, as well as loose or damaged flashing and deteriorated mortar.

During biannual gutter cleaning, visually inspect roofs for broken, slipped, and missing slates tiles, and arrange roofing contractor to replace with new tiles to match existing. Visually inspect all ridges for missing mortar, displacement, and fractures. Replace any

cracked, broken, or missing slates promptly to prevent water ingress and further deterioration of the roof structure. Use slate hooks or nails to secure replacement slates in place, ensuring they match the size, colour, and texture of the existing slates.

Keep the slate roof clean by removing debris, leaves, and moss that can accumulate over time. Use a soft brush or broom to gently sweep away loose debris and avoid using pressure washers or harsh cleaning chemicals that may damage the slate surface.

If moss or algae growth is present on the slate roof, it can be removed using a gentle cleaning solution and a soft brush. Avoid scraping or scrubbing the slate surface aggressively, as this may cause damage.

Inspect the flashing around chimneys, fall restraint system fixings, and other roof penetrations for signs of damage or deterioration. Repair or replace damaged flashing as needed to maintain a watertight seal and prevent water intrusion.

Check the mortar joints of ridge tiles for signs of erosion or cracking. Repoint any loose or damaged mortar joints to ensure a secure and weatherproof seal along the ridge line.

FELT ROOFS

Conduct frequent inspections to identify any signs of damage, deterioration, or potential issues. Inspections should be performed at least annually, with additional checks after severe weather events.

Keep the surface clean by removing debris, dirt, and organic matter that can accumulate over time. Use a soft brush or broom to gently sweep away loose debris and rinse the roof with water to remove stubborn dirt. Particular care must be taken to ensure that the top surface of the felt roofing system is not damaged when gently sweeping with a soft brush or cleaning gently with water/hose. Engage a trained / suitable contractor (Alumasc approved contractor) to repair any damage to the felt roof promptly to prevent water ingress and further deterioration. This roof has a 40-year warranty with Alumasc.

All rights in this work are reserved. No part of this work may be reproduced, stored or transmitted in any form or by any means (including without limitation by photocopying or placing on a website) without the prior permission in writing of Purcell except in accordance with the provisions of the Copyright, Designs and Patents Act 1988. Applications for permission to reproduce any part of this work should be addressed to Purcell at info@purcelluk.com.

Undertaking any unauthorised act in relation to this work may result in a civil claim for damages and/or criminal prosecution. Any materials used in this work which are subject to third party copyright have been reproduced under licence from the copyright owner except in the case of works of unknown authorship as defined by the Copyright, Designs and Patents Act 1988. Any person wishing to assert rights in relation to works which have been reproduced as works of unknown authorship should contact Purcell at info@purcelluk.com.

Purcell asserts its moral rights to be identified as the author of this work under the Copyright, Designs and Patents Act 1988.

Purcell® is the trading name of Purcell Architecture Ltd.

© Purcell 2025

A team of experienced consultants from Purcell jointly contributed to the completion of this Report.

Name	Position
Clare Phillips	Associate
Lucy Salter	Part II Architectural Assistant

Date	Revision	Issue