



MSC PROPERTY AND FACILITIES - *BUILDING MAINTENANCE AND ASSET MANAGEMENT*

ROBERT O'CONNELL

2307460@student.uwtsd.ac.uk

Contents

1.0 Introduction	4
1.1 Limitations of Inspection	4
1.2 Equipment	5
1.3 Weather Conditions	6
1.4 Condition Rating Definitions	6
2.0 Building	7
2.1 About	7
2.2 Access	7
3.0 External Condition	8
4.0 Internal Condition	11
4.1 Ground Floor	11
4.2 First Floor	14
4.3 Boiler House Mechanical & Electrical	16
5.0 Conclusion	17
6.0 Maintenance Strategy	19
6.1 Definition and Importance of Building Maintenance	19
6.2 Maintenance Strategies	19
6.2.1 Statutory Maintenance	20
6.2.2 Planned Preventative Maintenance (PPM)	21
6.2.3 Reactive Maintenance	22
6.2.4 Condition-Based Maintenance	23
7.0 Maintenance Planning	23
7.1 Identification and Prioritisation of Maintenance Needs	23
7.2 Scheduling and Resource Allocation	24
7.3 Maintenance Plan for Elizabeth Williams Clinic	26
7.3.1 Water Safety	27
7.3.2 Electrical Resilience	27
7.3.3 Ventilation Compliance	28
8.0 Challenges and Solutions	28
8.1 Potential Challenges	28
8.2 Suggested Solutions	29

9.0 Portfolio	30
9.1 Specific Building Fit.....	30
9.2 Upscaling Maintenance Across the Portfolio	30
10.0 Conclusion.....	31
11.0 References.....	33

1.0 Introduction

This report has been prepared following a condition survey of the Elizabeth Williams Clinic, undertaken in the capacity of Estates Statutory Compliance Manager for Hywel Dda University Health Board. The survey provides a professional assessment of the building to support the organisation in understanding its current condition and suitability for continued operational use.

The Elizabeth Williams Clinic is a healthcare facility providing outpatient and community based medical services. The building is understood to be of traditional construction, comprising masonry external walls, a pitched roof structure, and a mix of internal finishes typical of NHS clinical environments. As an operational healthcare building, it is subject to ongoing use, which has implications for wear and tear, maintenance requirements, and statutory compliance obligations.

My role as the surveyor is to undertake a visual inspection of the building and to identify defects, deterioration, and potential risks associated with the structure, fabric, and services. The findings of the survey are intended to inform the Health Board's decision making processes in relation to maintenance planning, lifecycle management, statutory compliance, and future investment strategies.

This report evaluates the condition of the building's external and internal elements, along with its services. Defects have been identified and analysed to determine their probable causes and implications. Where appropriate, recommendations for remedial works and further investigation are provided to ensure the building remains safe, functional, and fit for purpose.

This document is a confidential report prepared solely for Hywel Dda University Health Board. It is intended for internal use only and should not be reproduced, distributed, or relied upon by any third party without prior written consent.

1.1 Limitations of Inspection

The inspection was undertaken as a non-intrusive, visual condition survey, with no opening up of the structure or fabric and no specialist testing carried out. The assessment is limited to elements that were readily visible and accessible at the time of inspection.

The survey was carried out outside normal operational hours to facilitate full access to the premises without disruption to clinical services.

Data capture was undertaken using a Matterport scanning system to record internal areas, supplemented by drone imagery to inspect external and high-level elements. The survey was subsequently completed as a desktop assessment, enabling detailed

review of recorded imagery, however, this method remains subject to the same limitations as a visual inspection

Building services have been assessed on a visual basis only. No testing, commissioning checks, or verification of statutory compliance has been undertaken. This report does not constitute a structural survey, mechanical and electrical inspection, or formal compliance audit.

The findings and opinions expressed reflect the condition of the property at the time of inspection only.

1.2 Equipment

The survey was undertaken using a Matterport scanning system to capture detailed internal imagery and spatial data, enabling accurate post-inspection review.

External and high-level elements were inspected using a DJI Mini Pro 4 drone, allowing safe access to areas that would otherwise be difficult to observe from ground level.

The use of this equipment facilitated a comprehensive visual assessment of the building and supported the completion of the survey as a desktop exercise.

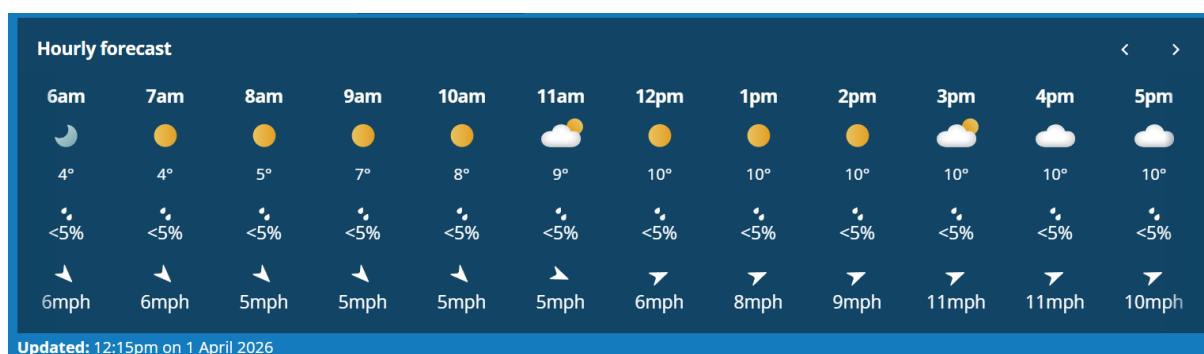
Equipment	Image	Specification	Description
Matterport Pro 3		•Technology: LiDAR-based 3D scanning (indoor & outdoor) •Image Resolution: Up to 134 MP panoramic capture •Field of View: 360° capture •Scan Speed: < 20 seconds per scan •Scan Range: Extended long-range LiDAR •Use Environment: Indoor and outdoor (including bright sunlight) •Capture Type: 3D digital twins, point clouds, and 360° imagery	The Matterport Pro3 is a high-performance LiDAR 3D camera designed for creating accurate digital twins of buildings and environments. It delivers fast, high-resolution scanning both indoors and outdoors, making it ideal for construction, surveying, and facilities management.

Equipment	Image	Specification	Description
DJI Mini 4 Pro Drone Fly More Combo with RC 2 Controller		•Weight: < 249 g •Camera Sensor: 1/1.3-inch CMOS •Photo Resolution: 48 MP •Obstacle Avoidance: Omnidirectional sensing (all directions) •Tracking Features: ActiveTrack 360°, Follow Me, Waypoints •Controller: DJI RC 2 with built-in 5.5-inch HD screen.	The DJI Mini 4 Pro Fly More Combo with RC 2 Controller is a lightweight, sub-250g drone designed for high-quality aerial photography and videography. It features a powerful 48MP camera capable of shooting 4K HDR video, advanced omnidirectional obstacle sensing, and intelligent tracking modes.

1.3 Weather Conditions

The inspection was carried out under weather conditions typical for the time of year. Weather conditions at the time of inspection, as well as preceding conditions, can influence the visibility of certain defects, particularly those relating to moisture ingress, drainage performance, and external building elements.

It should be noted that defects such as dampness, leaks, or drainage issues may not be fully apparent during periods of dry weather, and some defects may be less evident following prolonged dry conditions. The observations within this report are therefore made in the context of the conditions at the time of inspection.



1.4 Condition Rating Definitions

A condition rating system has been adopted within this report to provide a clear and consistent assessment of the building elements. The ratings are defined as follows:

Condition Rating 1 (CR1): Element is in good condition with no significant defects. Routine maintenance only is required.

Condition Rating 2 (CR2): Element is in fair condition, showing signs of minor deterioration or defects. Repair or maintenance is required, but the issues are not considered urgent.

Condition Rating 3 (CR3): Element is in poor condition with significant defects or deterioration. Urgent repair, replacement, or further investigation is required.

2.0 Building

2.1 About

The Elizabeth Williams Clinic operates as a multi-disciplinary outpatient and community healthcare facility providing a broad range of integrated clinical services to the local population. The clinic supports the delivery of Child Health and Development Services, including consultant-led community paediatric clinics, child development assessments, and wider healthcare support for children and young people (Hywel Dda University Health Board, 2025). In addition, the facility accommodates physiotherapy and occupational therapy services, delivering both adult and paediatric rehabilitation, assessment, and therapeutic intervention programmes designed to support patient mobility, development, and functional independence (NHS Wales, 2024).

The clinic also provides Community Dental Services, including special care dentistry and treatment for vulnerable or priority patient groups, alongside a range of Sexual Health Services such as contraception, sexually transmitted infection (STI) testing and treatment, pregnancy advice, and psychosexual counselling. Collectively, these services support the wider NHS Wales strategy of delivering accessible, patient-centred healthcare within community-based settings (Welsh Government, 2023).

2.2 Access

Access to the property is gained directly from Mill Lane via a surfaced entrance serving a dedicated parking and circulation area. The site benefits from established vehicular and pedestrian access routes, with step free entry provided to the entrance, see figure 2 below. The arrangement appears suitable for its intended healthcare use, accommodating patients, staff, and service vehicles, including those requiring accessible or assisted entry.

3.0 External Condition

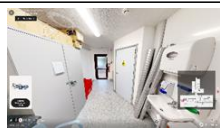
Area	Photographs / Images	Comments	Recommendation	Condition Rating
Roof Area & Solar PV	     	At the time of inspection, the roof coverings were clean and free from moss or organic growth. PV panels were present; however, tree branches were observed overhanging the installation. Rooflights/skylights were clean and appeared to be in good condition, with no visible defects noted. Solar	Carry out routine roof inspections on a cyclical basis (typically annually or bi-annually). Maintain roof cleanliness, inspect rooflights, and undertake periodic vegetation management to prevent overhanging branches from affecting the solar PV system.	CR1

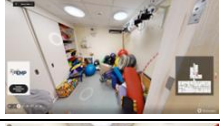
	  			
Facade	   	Generally, in fair condition with localised defects. Evidence of age-related deterioration. No significant structural distress observed at the time of inspection. The defects noted were limited to cosmetic issues. Graffiti was present to areas of the façade, and the entrance door exhibited paint deterioration requiring redecoration. Drainage components were observed and appeared free-flowing with	No reactive repairs are required. It is recommended that graffiti removal and redecoration of the entrance door are incorporated into the planned preventative maintenance programme to maintain visual standards and prolong the life of external finishes. Carry out routine drainage inspections on a cyclical basis (typically annually or bi-annually). Clean gullies and outlets as required	CR2

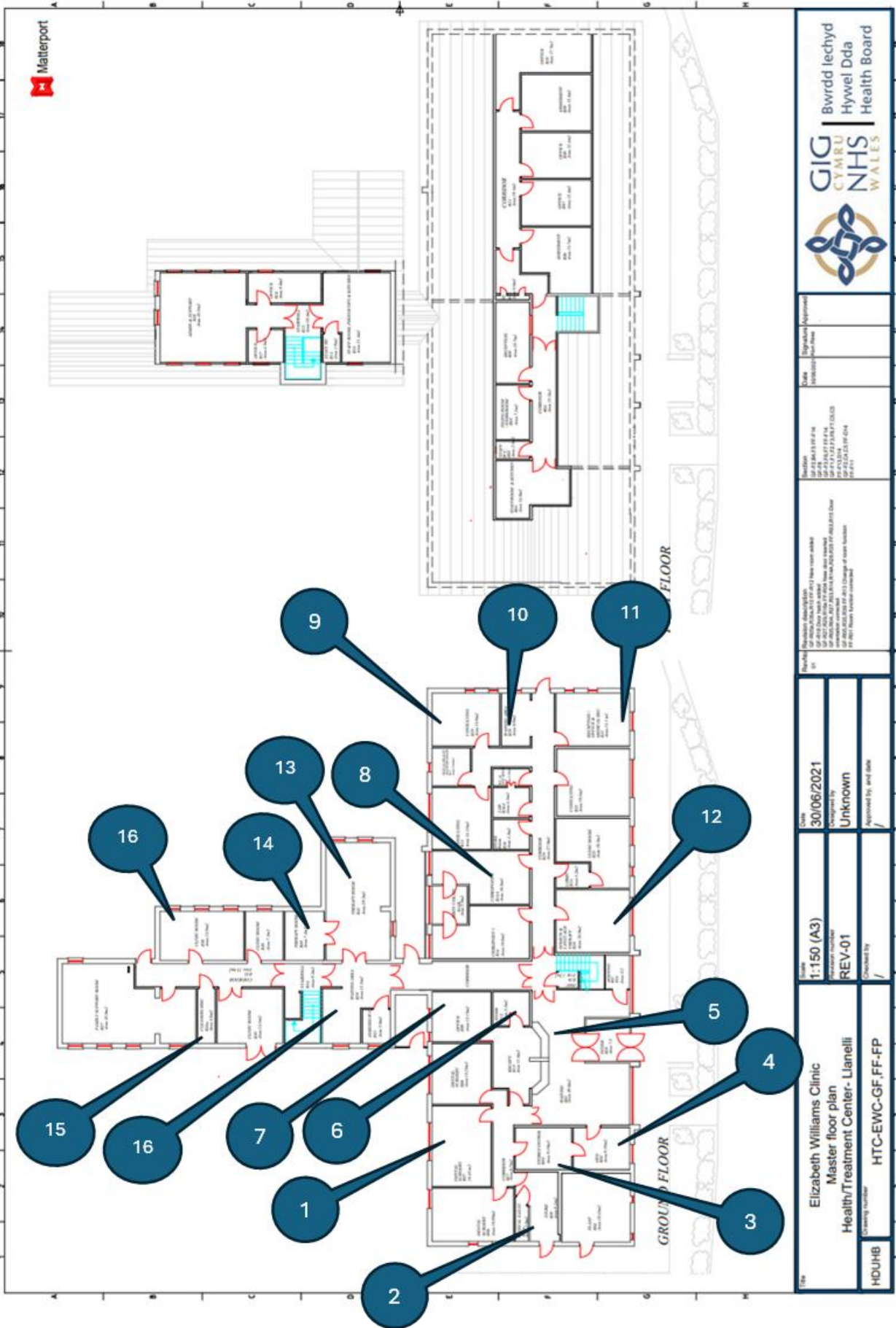
		no obvious signs of blockage.		
Grounds & Garden	  	The grounds and garden areas were generally found to be in good condition at the time of inspection. No significant defects were identified. Noted issues were cosmetic only, including deterioration of the painted finish to the boundary fence. Soft landscaping areas appeared well maintained.	Undertake routine grounds maintenance, including regular grass cutting and inspections. Redecorate waste compound fencing on a cyclical basis (typically every 5–7 years) as part of the planned preventative maintenance programme	C2
Car Park	  	The car park was generally found to be functional at the time of inspection. Vegetation growth was observed in localised areas, along with the accumulation of surface debris. Existing road markings were worn and poorly defined, and disabled parking bays were not clearly designated.	No immediate structural repairs are required. It is recommended that routine vegetation control and debris clearance are carried out as part of planned maintenance, together with re-lining of parking bays and the formal marking of disabled bays to support accessibility compliance and safe use.	CR2

4.0 Internal Condition

4.1 Ground Floor

Area / Room	Photographs / Images	Comments	Planned Preventative Maintenance (PPM) Recommendation	Condition Rating
1 - Dental Clinic		Secure gas cylinders using compliant wall-mounted restraints and review water outlet fittings and ventilation systems.	Implement routine flushing regime for infrequently used outlets and quarterly cleaning of ventilation grilles.	CR2
2 - Storage Area		Increase storage provision through installation of fixed shelving and secure storage systems.	Undertake regular housekeeping inspections to prevent overloading and obstruction of circulation routes.	CR2
3 - Dental Equipment Storage		Upgrade storage conditions with temperature and humidity monitoring systems including data logging capability.	Introduce routine environmental monitoring and inspection of stored equipment conditions.	CR2
4 - X-Ray Room		No immediate upgrades required; continue compliance monitoring of imaging environment.	Maintain routine servicing and statutory testing of radiographic equipment.	CR1
5 - Reception Area		Upgrade lighting provision to improve visibility, patient comfort, and energy efficiency.	Carry out regular lighting inspections and lamp replacement programme.	CR2

Area / Room	Photographs / Images	Comments	Planned Preventative Maintenance (PPM) Recommendation	Condition Rating
6 - Server Room		Install improved cable management systems including cable trays and remove combustible storage materials immediately.	Undertake quarterly inspections of electrical containment, housekeeping, and fire safety arrangements.	CR3
7 - Office Room		Increase storage capacity with additional cabinetry and review fire door condition.	Implement routine fire door inspections and general housekeeping checks.	CR2
8 - Chiropody Clinic Room		No significant upgrades currently required.	Continue routine cleaning, servicing, and environmental inspections.	CR1
9 - Consulting Room		No immediate upgrade works identified.	Maintain standard room inspections and reactive maintenance procedures.	CR1
10 - Waiting Area		No significant defects observed; monitor finishes and seating condition.	Routine cleaning and inspection of finishes, furniture, and accessibility provisions.	CR1
11 - Sexual Health Office		No immediate upgrade requirements identified.	Continue routine maintenance and environmental monitoring.	CR1
12 - Speech and Language Room		No significant upgrades currently required.	Routine maintenance and inspection of finishes and equipment.	CR1
13 - Physiotherapy Room		Review flooring, ventilation, and therapy equipment provision to support long-term operational demand.	Implement regular inspection of therapy equipment, flooring, and ventilation systems.	CR2
14 - Store Room		Improve storage layout and organisation to maximise space utilisation and reduce fire loading.	Regular housekeeping inspections and storage management reviews.	CR2
15 - Sluice Room		Review finishes and fittings to ensure continued compliance with infection prevention standards.	Routine inspection and servicing of plumbing, drainage, and ventilation systems.	CR2
16 - Children's Clinic Room		No immediate upgrades required.	Continue routine inspection and maintenance of finishes and fittings.	CR1
17 - Children's Waiting Area		Consider refurbishment of finishes and furniture to improve patient environment and durability.	Routine inspection of seating, finishes, and safety features.	CR2



Bwrdd Iechyd
Hywel Dda
Health Board



Revision

Date

Author

Check

Approved

Approved By

Approved Date

Revision

Date

Author

Check

Approved

Approved By

Approved Date

Revision

Date

Author

Check

Approved

Approved By

Approved Date

Revision

Date

Author

Check

Approved

Approved By

Approved Date

Revision

Date

Author

Check

Approved

Approved By

Approved Date

4.2 First Floor

Area / Room	Photographs / Images	Comments	Planned Preventative Maintenance (PPM) Recommendation	Condition Rating
1 - Staff Room		No immediate upgrade requirements identified.	Continue routine maintenance and welfare area inspections.	CR1
2 - WC Room		Upgrade sanitary fittings and improve ventilation where necessary.	Routine plumbing inspections, cleaning, and ventilation servicing.	CR2
3 - First Floor Corridor		No significant defects observed.	Continue routine inspection of flooring, lighting, and fire safety provisions.	CR1
4 - Office		No immediate upgrade works required.	Routine maintenance and environmental inspections.	CR1
5 - Corridor		No immediate upgrade requirements identified.	Routine inspection of circulation areas and emergency lighting.	CR1
6 - Office		No significant defects identified.	Continue planned maintenance and housekeeping inspections.	CR1
7 - Kitchen		Upgrade kitchen finishes and appliances as required to improve welfare provision and energy efficiency.	Routine servicing of appliances and inspection of plumbing and ventilation systems.	CR2
8 - Office		No immediate upgrade requirements identified.	Continue routine maintenance procedures.	CR1
9 - Staircase Area		Review decorative finishes and handrail condition to maintain safe access and egress standards.	Routine inspection of stair finishes, handrails, and emergency lighting.	CR2

4.3 Boiler House Mechanical & Electrical

Area	Equipment / System	Upgrade Recommendation	Planned Preventative Maintenance (PPM) Recommendation	Condition Rating
Boiler House	DHW Circulating Pump 	Consider replacement with energy-efficient variable speed pump.	Quarterly inspection, lubrication, and operational checks.	CR2
Boiler House	LTHW Primary Pumps 	Urgent replacement recommended due to age and deterioration.	Increase inspection frequency to monthly until replacement is completed.	CR3
Boiler House	DHW Direct-fired Hot Water Heater 	Plan replacement within medium-term lifecycle programme to improve efficiency.	Annual servicing, combustion testing, and safety inspections.	CR2
Boiler House	LTHW Heating Boilers 	Urgent boiler replacement recommended to maintain operational resilience and energy efficiency.	Annual servicing, combustion analysis, and increased monitoring until replacement.	CR3
Boiler House	LTHW Main Heating Pumps 	Upgrade pumps with energy-efficient variable speed units during future refurbishment works.	Annual servicing and inspection of seals, bearings, and controls.	CR2
Boiler House	Flue Gas Dilution Fan 	Urgent replacement required due to risk of operational failure and safety implications.	Monthly inspections and servicing until replacement is undertaken.	CR3
Boiler House	Three-port Control Valves 	Replace ageing actuators and valves where performance issues are identified.	Annual calibration and inspection of valve operation and controls.	CR2

Area	Equipment / System	Upgrade Recommendation	Planned Preventative Maintenance (PPM) Recommendation	Condition Rating
Boiler House	Distribution Board for Building 	Include within planned electrical upgrade programme.	Annual inspection and preventative maintenance including thermal imaging.	CR2
Boiler House	Distribution Board – A 	Replace ageing board and protective devices in medium term.	Annual inspection, testing, and cleaning of internal components.	CR2
Boiler House	Distribution Board – D & External Distribution Board 	Upgrade distribution board and protective devices within medium-term capital programme.	Complete annual thermographic surveys, routine inspection, testing, and tightening of electrical connections.	CR2
Boiler House	PV Array Controls 	No immediate upgrade required; continue monitoring performance and inverter efficiency.	Annual servicing and monitoring of generation performance and electrical connections.	CR1
Boiler House	LTHW Main Control Panel 	Upgrade controls to modern BMS-compatible systems to improve energy efficiency.	Annual calibration, controls testing, and routine inspection of electrical components.	CR2

5.0 Conclusion

In conclusion, the condition assessment of the Elizabeth Williams Clinic across mechanical and electrical systems, internal areas, and external elements indicates that the building is generally in a fair to good overall condition, with the majority of elements classified as Condition Rating 1 (CR1) or Condition Rating 2 (CR2). This suggests that the facility remains operationally fit for purpose, with no widespread or critical structural deficiencies identified at the time of inspection. The presence of several CR1 elements demonstrates that key building components are performing as intended and are subject only to routine maintenance requirements.

However, a consistent number of elements across all three tables fall within CR2, highlighting areas of minor deterioration, ageing infrastructure, and operational inefficiencies. These are not immediately critical but require planned maintenance interventions and targeted upgrades to prevent further degradation. Typical issues identified include inadequate storage provision, minor defects to finishes, ageing building services components, and external environmental wear.

Of greater significance are the isolated Condition Rating 3 (CR3) elements identified within the building services infrastructure, including key plant such as boilers, pumps, and ventilation-related components. These represent higher-risk items that may impact operational resilience, energy efficiency, and statutory compliance if not addressed. As such, these elements should be prioritised within the short-term capital investment programme, with consideration given to replacement, system upgrades, and integration with modern Building Management Systems (BMS) where appropriate.

Externally, the building envelope and surrounding areas are generally performing adequately, although localised defects and maintenance requirements, such as façade redecoration, vegetation management, and car park marking improvements, were noted. While these do not present immediate risks, they contribute to the overall asset condition, user experience, and long-term durability of the estate.

Overall, the findings support the conclusion that the Elizabeth Williams Clinic remains a functioning and serviceable healthcare facility, but requires ongoing investment and robust asset management practices to sustain performance. A risk-based approach to maintenance and capital planning, aligned with NHS Wales requirements and RICS best practice, is recommended to prioritise resources effectively, address backlog maintenance, and support the continued delivery of safe, compliant, and high-quality healthcare services (Royal Institution of Chartered Surveyors, 2021).

6.0 Maintenance Strategy

6.1 Definition and Importance of Building Maintenance

Building maintenance can be defined as a structured combination of technical, managerial and administrative activities undertaken to ensure that a building and its associated engineering services remain safe, functional and operationally effective throughout their lifecycle. In healthcare environments, maintenance extends beyond routine repair activities and forms a core component of clinical governance and organisational risk management. Welsh Health Technical Memorandum (WHTM) guidance identifies healthcare engineering systems as fundamental to the safe operation of healthcare facilities and stresses the importance of robust governance arrangements across the lifecycle of healthcare assets (NHS Wales Shared Services Partnership – Facilities Services, 2014).

The Elizabeth Williams Clinic, provides outpatient and community healthcare services within Carmarthenshire. While smaller in scale than acute hospital settings, the clinic remains highly dependent on resilient engineering infrastructure to support safe and effective service delivery. Essential systems include electrical distribution, domestic water services, ventilation, fire safety systems and medical-gas installations. Failure or degradation of these systems may disrupt clinical activity and expose patients, staff and visitors to increased risks related to infection control, electrical safety and fire protection.

Building maintenance within healthcare premises therefore carries significant statutory and operational importance. WHTM 06-01 emphasises the critical role of resilient electrical infrastructure in maintaining safe healthcare environments and highlights that loss of electrical supply may lead to serious consequences for patient care and operational continuity (NHS Wales Shared Services Partnership – Specialist Estates Services, 2018). Similarly, WHTM 04-01 identifies that safe and well-maintained water systems are essential to meet hygiene standards, support infection prevention and enable clinical treatment activities (NHS Wales Shared Services Partnership – Specialist Estates Services, 2016a).

6.2 Maintenance Strategies

A comprehensive maintenance strategy for the Elizabeth Williams Clinic incorporates several complementary maintenance approaches, each designed to achieve safe operation, legal compliance and long-term asset sustainability.

6.2.1 Statutory Maintenance

Statutory maintenance within Hywel Dda University Health Board (HDUHB) is managed as a strategic function designed to ensure legal compliance, manage clinical risk and maintain safe operational environments across the estate. In relation to the Elizabeth Williams Clinic, statutory maintenance is undertaken in accordance with legislative requirements and Welsh Health Technical Memorandum (WHTM) guidance, reflecting the Health Board's duty of care to patients, staff and visitors. The approach recognises that failure of critical engineering systems within community healthcare premises can have direct implications for patient safety, service continuity and regulatory compliance.

HDUHB's statutory maintenance strategy is founded upon adherence to national legislation and mandatory healthcare engineering standards. In line with WHTM 05-01, the Health Board ensures that fire safety systems at the Elizabeth Williams Clinic are subject to proportionate and risk-based maintenance arrangements, supported by effective fire safety management and testing regimes (NHS Wales Shared Services Partnership – Specialist Estates Services, 2019). Similarly, electrical systems are maintained in compliance with WHTM 06-02, which confirms that duty holders retain legal responsibility for ensuring electrical infrastructure is managed safely in accordance with the Electricity at Work Regulations 1989 (NHS Wales Shared Services Partnership – Specialist Estates Services, 2023a). These requirements inform the statutory maintenance framework applied at the clinic and ensure that compliance obligations are embedded within operational estates management.

At the Elizabeth Williams Clinic, statutory maintenance is delivered through a structured programme of planned inspections, testing and servicing of safety-critical engineering systems. This programme includes fire alarm testing, emergency lighting inspections, fixed wire electrical inspections, legionella monitoring and water hygiene management, pressure system inspections, medical gas maintenance and routine water temperature monitoring. These activities are prioritised within the maintenance strategy due to their direct impact on patient safety and regulatory compliance. For example, legionella monitoring supports safe water management in accordance with WHTM 04-01 requirements (NHS Wales Shared Services Partnership – Specialist Estates Services, 2016b), whilst medical gas systems are maintained in line with HTM 02-01 operational management guidance to ensure the safe delivery of clinical gases (Department of Health, 2006b).

The statutory maintenance strategy for the Elizabeth Williams Clinic also emphasises the importance of robust governance, assurance and documentation processes. HDUHB requires all statutory maintenance activities to be supported by accurate records, including planned maintenance schedules, inspection reports, compliance certificates and logbooks. In accordance with WHTM 06-03, Authorised Person

documentation and system logbooks are maintained to demonstrate accountability, operational control and compliance with healthcare engineering standards (Department of Health, 2006d). These records provide both internal assurance and evidence to shared services authorising engineers (AE) that statutory obligations are being met.

6.2.2 Planned Preventative Maintenance (PPM)

Planned Preventative Maintenance (PPM) within Hywel Dda University Health Board (HDUHB) is implemented as a proactive maintenance strategy designed to maintain asset condition, reduce the risk of system failure and ensure the continued safe operation of healthcare facilities.

The PPM strategy for the clinic is developed using manufacturer recommendations, statutory requirements, asset condition data and risk-based assessments aligned with Welsh Health Technical Memorandum (WHTM) guidance. This approach recognises that failures of engineering systems within community healthcare environments can adversely affect infection prevention, environmental conditions and patient safety. Consequently, safety-critical systems are prioritised within the PPM programme to ensure reliable and compliant operation.

PPM activities include routine inspection, servicing and maintenance of key building systems. These activities include, ventilation servicing, thermostatic mixing valve (TMV) servicing, fire door inspections, and water system flushing and monitoring. Collectively, these tasks support system performance, compliance and user safety. For example, regular ventilation servicing assists in maintaining indoor air quality and environmental control, while TMV servicing ensures hot water temperatures remain within safe limits, reducing scalding risk for patients and staff.

The PPM strategy is informed by WHTM 04-01, which promotes a holistic and risk-based approach to water safety through the implementation of Water Safety Groups and Water Safety Plans (NHS Wales Shared Services Partnership – Specialist Estates Services, 2016b). The guidance highlights the importance of routine monitoring and maintenance activities to manage risks associated with stagnation, contamination and system degradation, reinforcing the role of PPM in supporting infection prevention and patient safety at the clinic.

In addition to improving safety and compliance, the PPM strategy contributes to effective asset management and financial sustainability. Planned interventions are typically less disruptive and more cost-effective than reactive repairs, as emerging defects can be addressed before significant failure occurs. Through structured PPM delivery at the Elizabeth Williams Clinic, HDUHB supports estate longevity, reduces backlog maintenance pressures and enhances operational resilience within community healthcare settings.

6.2.3 Reactive Maintenance

Reactive maintenance refers to unplanned maintenance activities undertaken in response to equipment failure, reported defects or unexpected system breakdowns. Unlike Planned Preventative Maintenance (PPM), reactive maintenance occurs after asset performance or availability has already been affected. While reactive maintenance remains an unavoidable element of estates management, excessive reliance on breakdown repairs is inefficient, disruptive and unsustainable, as defects are addressed only after failure has occurred.

Poorly managed reactive maintenance presents significant clinical and operational risks. Failures affecting safety-critical engineering systems may disrupt patient care, compromise infection prevention controls and reduce service resilience. Welsh Health Technical Memorandum (WHTM) guidance consistently highlights the importance of resilient infrastructure, particularly in relation to electrical systems, ventilation and fire safety, to support safe healthcare delivery (NHS Wales Shared Services Partnership – Specialist Estates Services, 2018; NHS Wales Shared Services Partnership – Specialist Estates Services, 2019).

Hywel Dda University Health Board (HDUHB) manages reactive maintenance through a risk-based prioritisation framework to ensure that resources are allocated in accordance with operational risk and potential impact on patient safety. Reactive maintenance requests are categorised as follows:

Priority 1 – Urgent (within 1 day): Immediate risk to life, patient care or critical operations

Priority 2 – Medium (within 3 days): Significant defects requiring prompt intervention

Priority 3 – Low (within 7 days): Non-urgent issues with limited operational impact

This approach enables effective control of maintenance workloads while ensuring that high-risk defects are addressed as a priority.

Priority 1 reactive maintenance issues may include electrical supply failures, flooding incidents, fire alarm faults, ventilation failures within clinical areas and medical gas system alarms or breakdowns. Such defects have the potential to cause immediate service disruption and pose direct risks to patient safety. For example, ventilation failures may undermine infection prevention measures, while electrical or medical gas failures could interrupt essential clinical equipment and treatment delivery.

Effective reactive maintenance at the clinic relies on clear fault reporting procedures, responsive engineering support and appropriate escalation arrangements. Defects must be logged, monitored and resolved within defined response times to maintain compliance with healthcare engineering standards and organisational governance

requirements. However, while reactive maintenance remains necessary, HDUHB's estates management strategy recognises that sustained service resilience is best achieved through proactive maintenance planning.

6.2.4 Condition-Based Maintenance

Condition-Based Maintenance (CBM) within Hywel Dda University Health Board (HDUHB) is applied as a targeted maintenance strategy that utilises asset condition information to inform maintenance intervention. Rather than relying solely on fixed time-based service intervals, CBM focuses on identifying signs of deterioration through inspection, monitoring and assessment, allowing maintenance activity to be aligned with the actual condition and risk profile of assets.

Condition surveys form a key component of CBM at the clinic, enabling estates teams to assess the physical condition and remaining life expectancy of building fabric and engineering systems. Findings from these surveys are used to inform maintenance planning, prioritise interventions and support backlog maintenance management. In parallel, routine water quality and environmental monitoring supports risk-based decision-making in relation to water safety, ventilation performance and internal environmental conditions, which are critical within healthcare environments.

This approach provides operational benefits by reducing unnecessary maintenance activity while maintaining safety, compliance and service resilience. Maintenance interventions can be scheduled based on identified need rather than assumed deterioration, supporting more efficient use of estates resources while minimising disruption to clinical services delivered from the clinic.

Welsh Health Technical Memorandum 06-01 emphasises the importance of ongoing condition assessment, performance review and lifecycle management of healthcare engineering systems (NHS Wales Shared Services Partnership – Specialist Estates Services, 2018). This supports the application of CBM principles within HDUHB estates management, particularly where proportionate monitoring and inspection regimes are used to inform proactive maintenance decisions.

7.0 Maintenance Planning

7.1 Identification and Prioritisation of Maintenance Needs

Maintenance planning at the Elizabeth Williams Clinic is based on the use of an operational asset register, which provides a structured record of building fabric, engineering systems and plant equipment across the site. The asset register supports effective estates management by enabling assets to be monitored, maintained in line with statutory requirements and reviewed for future maintenance or replacement needs.

The asset register typically includes the following information for each asset:

- Asset identification number
- Location within the building
- Manufacturer and model information
- Installation and commissioning dates
- Expected service life
- Maintenance requirements
- Condition rating
- Statutory and compliance responsibilities

This information allows the Estates Department to monitor asset performance, identify deteriorating systems and prioritise maintenance before failures occur. The register also supports lifecycle planning by highlighting assets approaching the end of their expected service life, allowing replacement or refurbishment works to be planned as part of longer-term maintenance and capital programmes. Welsh Health Technical Memorandum 03-01 highlights the importance of maintaining accurate inventories and clear identification of healthcare engineering systems to support effective operational control and maintenance management (NHS Wales Shared Services Partnership – Specialist Estates Services, 2022b).

Maintenance priorities are identified using the DATIX risk management system. This system allows reported defects to be assessed and prioritised based on their potential impact on patient safety and service delivery. Risk assessments take account of several factors, including the severity of the potential consequence, likelihood of occurrence, impact on clinical activity, statutory implications and level of operational disruption.

This risk-based approach ensures that maintenance resources are directed towards the most critical issues before lower-priority defects are addressed. In a healthcare setting, this is particularly important as failures affecting engineering systems may directly impact patient care. For example, defects affecting ventilation systems in clinical areas would normally receive a higher priority than minor fabric defects due to the associated infection prevention and environmental control risks. Similarly, failures involving electrical systems, fire safety installations or medical gas infrastructure would require urgent attention because of their safety and compliance implications.

7.2 Scheduling and Resource Allocation

Maintenance scheduling at the Elizabeth Williams Clinic is managed using a Computerised Maintenance Management System (CMMS). The CMMS provides a central system for planning maintenance activities, issuing Planned Preventative Maintenance (PPM) schedules, recording completed work and monitoring statutory compliance. Within healthcare estates management, the use of a CMMS is essential to

maintain control, improve visibility of maintenance performance and provide auditable records that support governance and assurance requirements.

Maintenance schedules within the CMMS are developed using a combination of national guidance and site-specific risk considerations. Key factors used to determine maintenance frequency and scope include Welsh Health Technical Memorandum guidance, manufacturer servicing instructions, asset criticality, risk assessment outcomes and statutory compliance requirements.

Maintenance work at the clinic is delivered through a combination of in-house Estates and Facilities staff, specialist framework contractors and appointed Authorised Persons (APs) and Competent Persons (CPs). Welsh Health Technical Memorandum 06-03 identifies the role of Authorised Persons as critical in establishing safe systems of work and ensuring effective operational control of engineering systems (Department of Health, 2006d). Similarly, works associated with water safety, ventilation and medical gas systems require competent personnel with appropriate training and experience.

Higher-risk maintenance activities are managed using formal Permit-to-Work systems. Welsh Health Technical Memorandum 06-02 identifies Permit-to-Work arrangements as a key control measure when undertaking electrical isolations and other high-risk activities (NHS Wales Shared Services Partnership – Specialist Estates Services, 2023a). Activities typically requiring permits include electrical isolation, hot works, roof access, confined space entry and medical gas shutdowns. Permit systems ensure that risks are assessed, authorised and communicated before work commences.

Maintenance scheduling must also take account of clinical service requirements. Intrusive or disruptive maintenance activities may affect patient treatment, infection prevention measures or clinical equipment if not carefully coordinated. As a result, such works are often planned outside normal clinical hours or during agreed shutdown periods following consultation with clinical teams. This approach enables essential maintenance to be completed while minimising disruption to patient care and maintaining service continuity at the Elizabeth Williams Clinic.

7.3 Maintenance Plan for Elizabeth Williams Clinic

F		G		H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	BI
1		Scheduled Maintenance Plan for Hywel Dda UHB/Elizabeth Williams Clinic																							
2		Work Order Status Key: Pending Notification Due Open																							
3																									
4																									
5																									
6		Schedule	PPM Priority Code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Total Duration
7		HP-PPM - 3M Bacteria Water Sampling Collect 250ml of Hot & Cold Water per sample for bacteriological analysis Remove tap outlet spray Run water for 2 minutes prior to taking samples Sterilise tap outlet using glass blow lamp Collect hot and cold water HP-PPM - 1Y Emergency Lighting Test Emergency Lighting Systems should be inspected and tested in accordance with BS5839	High Risk PPM									1													
8		Monthly - Function Test Establish that luminaires respond to simulated power failure Allow to operate for no more than 5 minutes HP-PPM - 1M Emergency Lighting Test Emergency Lighting Systems should be inspected and tested in accordance with BS5839	High Risk PPM					0																	
9		Monthly - Function Test Establish that luminaires respond to simulated power failure Allow to operate for no more than 5 minutes HP-PPM - 1W Run off External Outside Taps Run tap into drain for a minimum of 2 minutes Complete Log Sheet or log book Report any defects to Engineer Location: Boiler House	High Risk PPM	0				0				0						0				0			
10		HP-PPM - 1W MCP Fire Alarm Test Fire Alarm Test should be carried out in accordance with BS5839 Part 1 Notify the telephone exchange Disable alarm and plant Operate the designated manual call point Ensure Sounders are operating	High Risk PPM	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	71
11				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Asset Group	Maintenance Activity	Frequency	Resource Required	Guidance Reference
Water Systems	Legionella sampling, outlet flushing, TMV servicing	Weekly / Quarterly / Annual	AP (Water) & Competent Person	WHTM 04-01
Electrical Systems	Generator testing, UPS inspections, fixed wire testing	Monthly / Annual / 5-Year	AP (LV) & Skilled Person	WHTM 06-01
Ventilation Systems	Filter replacement, airflow verification, fire damper testing	Quarterly / Annual	AP (Ventilation) & CP	WHTM 03-01
Fire Safety Systems	Fire alarm testing, emergency lighting tests, extinguisher inspections	Weekly / Monthly / Annual	Competent Fire Contractor	WHTM 05-01
Medical Gas Systems	Alarm testing, pressure checks, manifold inspections	Daily / Weekly / 5-Year	AP (MGPS) & QC	HTM 02-01
Building Fabric	Roof inspections, rainwater goods inspections, external fabric surveys	Bi-Annual / Annual	Building Surveyor	RICS Guidance
HVAC Plant	Belt checks, lubrication, fan inspections	Monthly / Quarterly	Mechanical Contractor	Manufacturer Guidance
Security Systems	CCTV testing, access control inspections	Quarterly / Annual	Specialist Contractor	BS Standards

7.3.1 Water Safety

Water systems require strict management due to the risks associated with waterborne bacteria such as *Legionella pneumophila* and *Pseudomonas aeruginosa*. Healthcare users are often more vulnerable to infection because of age, illness or compromised immune systems, meaning poor water system management can present serious risks to patient safety and service delivery. Water Safety Groups and Water Safety Plans, are in place to control contamination, stagnation and system deterioration (NHS Wales Shared Services Partnership – Specialist Estates Services, 2016b).

Water management is a key part of the statutory maintenance and compliance programme. A range of planned monitoring and control measures are in place to maintain safe water quality and minimise the risk of bacterial growth. These measures include weekly flushing of infrequently used outlets, routine hot and cold water temperature monitoring, annual servicing of Thermostatic Mixing Valves (TMVs).

WHTM 04-01 also emphasises the importance of clear governance arrangements, defined responsibilities and ongoing monitoring in managing healthcare water systems effectively (NHS Wales Shared Services Partnership – Specialist Estates Services, 2016a; 2016b). Management is therefore supported through planned maintenance activities, routine monitoring, risk assessment processes and appropriate estates oversight, helping to ensure compliance and maintain a safe environment for patients, staff and visitors.

7.3.2 Electrical Resilience

Electrical failures can disrupt treatment, affect fire safety and emergency systems, and compromise the operation of essential clinical equipment. For this reason, electrical infrastructure within healthcare settings must be effectively maintained and monitored to reduce the risk of failure and ensure continuity of service. Welsh Health Technical Memorandum (WHTM) 06-01 emphasises the importance of minimising the likelihood of electrical supply failures that could impact patient safety or critical healthcare functions (NHS Wales Shared Services Partnership – Specialist Estates Services, 2018).

Electrical safety and resilience are achieved through a structured planned maintenance and inspection regime. Routine inspection, testing and servicing of electrical systems are undertaken to reduce the likelihood of unplanned failures and ensure the electrical infrastructure remains safe and compliant.

Electrical maintenance activities at the clinic include fixed wire inspections and testing, distribution board inspections, emergency lighting testing, and checks of electrical protection devices. These activities help identify defects such as overheating components, insulation deterioration or protection failures before they present a risk to safety or operations. Emergency lighting systems are particularly important, as they support safe evacuation and continued occupancy in the event of a power failure.

WHTM 06-02 highlights the importance of effective electrical safety management arrangements, including safe systems of work, competent personnel and robust control procedures within healthcare environments (NHS Wales Shared Services Partnership – Specialist Estates Services, 2023a). Higher-risk electrical works are therefore managed through appropriate isolation procedures and permit-to-work controls to protect staff, patients and building occupants.

7.3.3 Ventilation Compliance

Ventilation systems play a key role in supporting infection prevention and maintaining suitable internal environmental conditions within healthcare premises. Welsh Health Technical Memorandum (WHTM) 03-01 highlights the importance of appropriate ventilation arrangements in healthcare settings, particularly where patients may be more vulnerable to airborne infection risks. As a result, routine airflow checks and regular filter replacement are essential to ensure ventilation systems operate effectively, maintain air quality and support safe clinical environments.

8.0 Challenges and Solutions

8.1 Potential Challenges

One of the main challenges affecting maintenance delivery within healthcare estates is the lack of accurate “as-fitted” drawings and complete historic asset information. Outdated or missing documentation can delay fault finding, make system isolation more difficult and reduce the efficiency of planned maintenance activities. This is particularly problematic in healthcare buildings, where engineering systems are often complex, interconnected and altered over time.

Welsh Health Technical Memorandum (WHTM) 03-01 highlights the importance of maintaining accurate asset records, system inventories and identification arrangements to support safe operation and maintenance of healthcare engineering systems (NHS Wales Shared Services Partnership – Specialist Estates Services, 2022b). Gaps in asset information can therefore increase operational risk and reduce the effectiveness of maintenance planning.

Resource constraints also present ongoing challenges within healthcare estates management. Maintenance workloads continue to increase as assets age, while financial budgets and in-house staffing levels remain limited. As a result, estates department may rely heavily on external contractors to deliver statutory inspections, planned works and reactive repairs.

Access to clinical areas also presents challenges when planning and delivering maintenance works. Many activities require system shutdowns or intrusive inspections that may disrupt patient care, infection prevention arrangements or clinic operations.

Estates teams must therefore carefully coordinate works with clinical staff, and intrusive activities are often scheduled outside normal working hours or during agreed shutdown periods to minimise disruption.

Backlog maintenance is a further challenge across healthcare estates, driven by ageing infrastructure and limited capital investment. Deferred replacement of plant and systems can increase the likelihood of failure, lead to higher levels of reactive maintenance and reduce overall estate reliability. Where assets continue operating beyond their intended lifespan, risks increase, particularly for critical systems such as ventilation, electrical infrastructure and water services.

8.2 Suggested Solutions

To address issues associated with incomplete asset information and historic building records, Hywel Dda University Health Board should develop an in-house estates management portal to act as a single source of information for record drawings, asset data and maintenance documentation. A centralised digital portal would allow Estates teams to securely store, update and access current “as-fitted” drawings, system schematics and asset records for the Elizabeth Williams Clinic. Improving access to accurate information would support maintenance planning, fault diagnosis and safe system isolation, while reducing delays caused by missing or outdated records.

An internal estates portal would also improve governance and compliance by ensuring that statutory documentation, inspection reports and maintenance records are maintained in an auditable and structured format. Welsh Health Technical Memorandum guidance highlights the importance of accurate asset records and system documentation to support the safe operation and maintenance of healthcare engineering systems (NHS Wales Shared Services Partnership – Specialist Estates Services, 2022b). Over time, a well-maintained portal would also support lifecycle planning and capital investment decisions by providing improved visibility of asset condition and replacement priorities.

Investment in training and workforce development should be progressed alongside improvements in information management. As engineering systems become more complex, Estates staff must maintain appropriate technical knowledge and compliance awareness to manage assets safely and effectively. Targeted training would help improve in-house capability, support operational resilience and reduce reliance on specialist external contractors where appropriate.

Together, the development of an in-house estates management portal and continued investment in training would strengthen maintenance delivery.

9.0 Portfolio

Hywel Dda University Health Board is responsible for a large and varied healthcare estate serving a predominantly rural population across West Wales. The estate includes major acute hospitals, such as Glangwili General Hospital, Withybush General Hospital, Bronglais Hospital and Prince Philip Hospital, community hospitals and a wide range of outpatient and primary care facilities.

Managing such a diverse portfolio presents ongoing challenges, particularly where older buildings continue to support modern clinical activity. Differences in building age, condition and complexity require maintenance strategies that are flexible but consistently underpinned by statutory compliance and patient safety principles.

This portfolio context highlights the importance of risk-based estates management, where maintenance resources and investment are prioritised according to clinical impact and asset condition. The Elizabeth Williams Clinic reflects the wider challenge faced across the Health Board estate: maintaining safe, compliant and functional healthcare environments within financial, workforce and infrastructure constraints.

9.1 Specific Building Fit

The Elizabeth Williams Clinic forms part of the wider healthcare estate managed by Hywel Dda University Health Board. The clinic provides outpatient and community healthcare services and therefore occupies an important position within the Carmarthenshire healthcare network.

Although the clinic does not require the same level of engineering resilience as an acute hospital, it remains subject to identical statutory obligations and corporate governance requirements.

9.2 Upscaling Maintenance Across the Portfolio

Upscaling maintenance across the Hywel Dda University Health Board estate is challenging due to differences in building size, age and clinical function. Acute hospitals require complex engineering systems, including high-voltage electrical infrastructure, standby power, specialist ventilation and extensive medical gas installations, which demand higher levels of resilience and technical oversight.

Community facilities operate simpler systems but remain subject to the same statutory and governance requirements. Maintenance approaches must therefore be proportionate to risk while ensuring compliance and patient safety.

To manage specialist systems efficiently, the Health Board uses Authorised Persons across multiple sites. While cost-effective, this approach depends on accurate asset information and clear communication. Increased standardisation of engineering

systems across the estate can further support maintenance delivery by simplifying procurement and improving workforce competence.

10.0 Conclusion

This assignment has examined the maintenance strategy applied at the Elizabeth Williams Clinic within the wider Hywel Dda University Health Board estates portfolio. It demonstrates that effective healthcare estates management relies on the integration of statutory compliance, risk-based decision-making and structured asset lifecycle planning. Through the use of statutory inspections, planned preventative maintenance, controlled reactive maintenance and proportionate condition-based monitoring, the clinic is able to maintain safe, compliant and reliable engineering systems that support clinical activity and patient safety.

National healthcare engineering guidance, including the Welsh Health Technical Memorandum and Health Technical Memorandum frameworks, provides a consistent structure for managing critical systems such as water services, electrical infrastructure, fire safety and ventilation. While the Elizabeth Williams Clinic operates simpler engineering systems than acute hospital sites, it remains subject to the same governance and compliance requirements, reinforcing the need for maintenance strategies that are proportionate to risk but robust in application.

Looking forward, several improvements could further strengthen maintenance performance and long-term resilience at the clinic and across the wider estate. The continued development of in-house digital asset management solutions, including a centralised estates information portal and improved asset tagging linked to the CMMS, would enhance access to accurate records, improve maintenance planning and support lifecycle decision-making. Improved information quality would also reduce delays during fault response and support safer system isolation procedures.

Ongoing investment in lifecycle replacement funding remains essential to addressing backlog maintenance and reducing reliance on reactive repairs. Risk-based prioritisation methods, including DATIX scoring, should continue to be used to ensure that limited capital resources are directed towards assets presenting the greatest risk to service continuity and patient safety.

Improved collaboration between Estates teams and clinical departments would further support safe and efficient maintenance delivery, particularly where intrusive works or service interruptions are required. Early engagement and joint planning can help minimise operational disruption while maintaining continuity of patient care.

Finally, continued investment in workforce development is critical. Strengthening in-house technical capability through training, competency development and

succession planning will improve operational resilience and reduce dependence on external contractors.

Overall, the maintenance strategy for HDUHB reflects the wider challenges faced across the estate. By maintaining a balanced focus on compliance, asset management and staff capability, the Health Board can continue to support safe, sustainable and resilient healthcare environments across both community and acute settings.

11.0 References

Department of Health (2006a) Health Technical Memorandum 02-01: Medical gas pipeline systems – Part A: Design, installation, validation and verification. Available at: https://www.england.nhs.uk/wp-content/uploads/2021/05/HTM_02-01_Part_A.pdf

(Accessed: 11 May 2026).

Department of Health (2006b) Health Technical Memorandum 02-01: Medical gas pipeline systems – Part B: Operational management. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whtms-library/htm-02-01-medical-gas-pipeline-systems-part-b-operational-management-pdf/>

(Accessed: 11 May 2026).

Department of Health (2006c) Health Technical Memorandum 05-03: Operational provisions – Part B: Fire detection and alarm systems. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whtms-library/htm-05-03-firecode-operational-provisions-part-b-fire-detection-and-alarm-systems-pdf/>

(Accessed: 11 May 2026).

Department of Health (2006d) Health Technical Memorandum 06-03: Authorised Person's logbook. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whtms-library/htm-06-03-authorised-persons-logbook-pdf/>

(Accessed: 11 May 2026).

DJI (n.d.) Camera drone and remote controller: product overview. Available at: <https://www.dji.com>

(Accessed: 13 May 2026).

Hywel Dda University Health Board (2023) Operational Maintenance Policy (Policy 144). Carmarthen: Hywel Dda University Health Board.

Hywel Dda University Health Board (2025) Community and Outpatient Services. Available at: <https://hduhb.nhs.wales>

(Accessed: 12 May 2026).

Matterport (n.d.) Matterport Pro2 3D Camera. Available at: <https://matterport.com>

(Accessed: 13 May 2026).

NHS Estates (2003) HTM 2022 Supplement 1: Dental compressed air and vacuum systems. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whtms-library/htm-2022-medical-gas-pipeline-system-supplement-1-dental-compressed-air-and-vacuum-systems-pdf>

(Accessed: 11 May 2026).

NHS Wales (2024) Community Healthcare Services in Wales. Available at: <https://www.nhs.wales>

(Accessed: 12 May 2026).

NHS Wales Shared Services Partnership – Facilities Services (2014) Welsh Health Technical Memorandum 00: Policies and principles of healthcare engineering. Cardiff: NHS Wales Shared Services Partnership. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whtms-library/whtm-00-policies-and-principles-of-healthcare-engineering/>

(Accessed: 11 May 2026).

NHS Wales Shared Services Partnership – Specialist Estates Services (2016a) Welsh Health Technical Memorandum 04-01: Safe water in healthcare premises – Part A: Design, installation and commissioning. Cardiff: NHS Wales Shared Services Partnership. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whtms-library/whtm-04-01-safe-water-in-healthcare-premises-part-a-design-installation-and-commissioning-pdf/>

(Accessed: 11 May 2026).

NHS Wales Shared Services Partnership – Specialist Estates Services (2016b) Welsh Health Technical Memorandum 04-01: Safe water in healthcare premises – Part B: Operational management. Cardiff: NHS Wales Shared Services Partnership. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whtms-library/whtm-04-01-safe-water-in-healthcare-premises-part-b-operational-management-pdf/>

(Accessed: 11 May 2026).

NHS Wales Shared Services Partnership – Specialist Estates Services (2016c) Welsh Health Technical Memorandum 04-01: Safe water in healthcare premises – Part C: Pseudomonas aeruginosa – advice for augmented care units. Cardiff: NHS Wales Shared Services Partnership. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whtms-library/whtm-04-01-safe-water-in-healthcare-premises-part-c-pseudomonas-aeruginosa-advice-for-augmented-care-pdf/>

(Accessed: 11 May 2026).

NHS Wales Shared Services Partnership – Specialist Estates Services (2018) Welsh Health Technical Memorandum 06-01: Electrical services supply and distribution. Cardiff: NHS Wales Shared Services Partnership. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whtms-library/whtm-06-01-electrical-services-supply-and-distribution-2018-edition-pdf/>

(Accessed: 11 May 2026).

NHS Wales Shared Services Partnership – Specialist Estates Services (2019) Welsh Health Technical Memorandum 05-01: Managing healthcare fire safety. Cardiff: NHS Wales Shared Services Partnership. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whtms-library/whtm-05-01-firecode-managing-healthcare-in-fire-safety-pdf/>

(Accessed: 11 May 2026).

NHS Wales Shared Services Partnership – Specialist Estates Services (2022a) Welsh Health Technical Memorandum 03-01: Specialised ventilation for healthcare premises – Part A: The concept, design, specification, installation and acceptance testing of healthcare ventilation systems. Cardiff: NHS Wales Shared Services Partnership. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whtms-library/whtm-03-01-specialised-ventilation-for-healthcare-premises-part-a/>

(Accessed: 11 May 2026).

NHS Wales Shared Services Partnership – Specialist Estates Services (2022b) Welsh Health Technical Memorandum 03-01: Specialised ventilation for healthcare premises – Part B: The management, operation, maintenance and routine testing of existing healthcare ventilation systems. Cardiff: NHS Wales Shared Services Partnership. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whrms-library/whtm-03-01-specialised-ventilation-for-healthcare-premises-part-b/>

(Accessed: 11 May 2026).

NHS Wales Shared Services Partnership – Specialist Estates Services (2023a) Welsh Health Technical Memorandum 06-02: Electrical safety guidance for low voltage systems. Cardiff: NHS Wales Shared Services Partnership. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whrms-library/whtm-06-02-electrical-safety-guidance-for-low-voltage-systems/>

(Accessed: 11 May 2026).

NHS Wales Shared Services Partnership – Specialist Estates Services (2023b) Welsh Health Technical Memorandum 06-02: Electrical safety handbook. Cardiff: NHS Wales Shared Services Partnership. Available at: <https://nwssp.nhs.wales/ourservices/specialist-estates-services/specialist-estates-services-documents/whrms-library/whtm-06-02-electrical-safety-handbook-v3-pdf/>

(Accessed: 11 May 2026).

Royal Institution of Chartered Surveyors (2021) Global professional statement: Building surveying and maintenance guidance. London: RICS. Available at: <https://www.rics.org>

(Accessed: 12 May 2026).

Welsh Government (2023) A Healthier Wales: Long Term Plan for Health and Social Care. Available at: <https://www.gov.wales>

(Accessed: 12 May 2026).