Mae'r ddogfen hon ar gael yn Gymraeg

Agenda Item 9

Report to	**North Wales Fire and Rescue Authority**
Date	**21st October 2024**
Lead Officer	**Justin Evans, Assistant Chief Fire Officer**
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Subject	**Proposed New Training Centre for North Wales Fire and Rescue Service**

PURPOSE OF REPORT

This report presents to Members a business case for the development of a new training centre for North Wales Fire and Rescue Service (NWFRS). The business case includes a comprehensive review of existing facilities, outlining existing risk and includes a detailed options appraisal with a recommendation to progress a preferred option.

The business case also outlines residual risks, decision-making gateways, and capital financing considerations necessary for the project's successful delivery.

EXECUTIVE SUMMARY

The Fire and Rescue Services Act 2004, places a statutory duty upon North Wales Fire and Rescue Authority to make provision for training to deal with fires, road traffic collisions, and other prescribed emergencies.

NWFRS faces significant challenges with its current dispersed training facilities, which are aging, inefficient, and do not meet contemporary training standards.

A business case has been developed to address the pressing need for modern and effective training facilities that align with the evolving demands and risks faced by NWFRS.

Investment is necessary to ensure the safety and effectiveness of personnel in responding to emergencies, as well as the need to comply with increasing environmental regulations and sustainability goals.

In evaluating solutions for its training facilities, NWFRS explored several options. The first involves maintaining existing facilities with minor refurbishments, which would fail to address significant operational

inefficiencies and environmental compliance issues. The second option seeks to upgrade existing sites, yet would leave many limitations unaddressed. The third option proposes developing a new centralised training centre, promising enhanced efficiency and modern training environments. Finally, a comprehensive multi-hazard training centre has been considered, but its substantial upfront costs renders it financially restrictive.

The analysis highlights that the third option offers the best balance of operational improvement and fiscal responsibility, leading to its recommendation.

This business case has been presented to the Training Centre Members Working Group, Members Budget Scrutiny Committee and Trade Union Preventives, receiving support in principle from all stakeholders.

RECOMMENDATION

It is recommended that Members:

Approve, in principle, the development of a new centralised training centre (Option 3).

Commit to maintaining momentum in the development of the proposals, with a focus on affordability and sustainable financing options.

Authorise the Chief Fire Officer to pursue capital financing options, including self-funding, Welsh Government support, income generation or collaborative opportunities with partners.

Delegate authority to the Chief Fire Officer to proceed with the next steps in the project.

BACKGROUND

NWFRS currently operates several training facilities including Dolgellau, Rhyl, Wrexham, and Deeside. These sites have historically met the training needs of the service; however, they now present significant operational challenges due to their age, condition, and geographic dispersion.

The existing facilities lack the necessary infrastructure to support modern training requirements, which has led to operational inefficiencies and limitations in the training experience provided to personnel.

A comprehensive review of these facilities revealed that they do not adequately meet contemporary training standards, particularly in terms of immersive and realistic training scenarios.

Issues such as inadequate decontamination processes, insufficient classroom space, and shared facilities with operational stations further exacerbate the challenges.

Additionally, the current facilities fall short in providing adequate welfare facilities with little equality, diversity and inclusion provision. The existing sites also pose environmental risks, as seen with Dolgellau, which is located in a flood-prone area and has drawn complaints related to smoke emissions from local residents.

The need to review training site provision arises from the necessity to create facilities that not only improve operational efficiency and training quality but also comply with emerging environmental regulations and sustainability goals.

Recognising these pressing issues, a detailed options appraisal to evaluate potential solutions has been undertaken. This process involved consultation with key stakeholders, including NWFRS officers and external experts, to ensure a thorough understanding of the service's needs and to align the proposed solutions with the strategic objectives of the Service.

The Authority has a range of statutory duties mandated by legislation, primarily outlined in the Fire and Rescue Services Act 2004. This includes ensuring the provision of effective fire and rescue services, maintaining operational readiness, and providing comprehensive training to personnel to respond to a variety of emergencies.

Additionally, the Authority must comply with regulations and other requirements regarding health and safety, EDI, environmental protection, and public safety standards. The emphasis on training is particularly important, as the Authority is required to equip its firefighters with the necessary skills and knowledge to manage incidents effectively while adhering to legal obligations and best practice guidance.

The development of a new training centre represents a strategic investment in the future of NWFRS, ensuring it can adapt to emerging risks, meet statutory duties and deliver high-quality training to its staff.

INFORMATION

The business case evaluated the costs and benefits of four options:

- **Option 1**: Maintain existing facilities with minor refurbishments.
- **Option 2**: Invest in upgrading existing facilities.
- **Option 3**: Develop a new centralised training centre to meet core training needs.
- **Option 4**: Develop a comprehensive multi-hazard, multi-agency training centre.

The analysis of options in the business case began with a thorough review of NWFRS current training needs and the limitations of existing facilities. Each of the four proposed solutions was evaluated against key criteria, including operational effectiveness, cost, and compliance with statutory obligations.

Qualitative assessments examined the training quality and infrastructure, while quantitative analysis focused on the financial implications and long-term sustainability of each option. Stakeholders were engaged during this process, ensuring a range of views were considered to inform a balanced and informed evaluation of the potential solutions.

Residual Risks

An important aspect of the options analysis was the identification and evaluation of residual risks associated with each proposed solution.

Whilst fully explored in the business case they are summarised here:

Option 1: The risk of ongoing environmental non-compliance, especially at Dolgellau, where proximity to residential areas and flood risks could lead to operational closures. The dispersed facilities also limit training consistency and increase operational inefficiencies.

Option 2: Although investment would extend the lifespan of current facilities, significant site limitations, such as lack of space and outdated infrastructure, remain unaddressed. Planning permission constraints may also hinder necessary upgrades, and the environmental impact at Dolgellau persists.

Option 3: Option 3 significantly mitigates operational inefficiencies and environmental risks and this option is positioned as the most cost-effective. Ongoing financial assessments will be necessary to ensure the project remains within budget and affordable.

Option 4: This comprehensive option carries minimal residual risks but entails significant overall capital expenditure, making it less feasible within current financial constraints.

Recommended Option

Option 3 to develop a new centralised training facility on the land at St. Asaph Business Park to meet core training needs is the preferred option due to its balance between cost-effectiveness, operational improvement, and future-proofing capabilities.

This option addresses the limitations of the current dispersed training facilities by centralising training activities, which will improve logistical efficiency, reduce operational costs, and provide a modern, flexible environment for delivering high-quality, immersive training.

Option 3 offers scalability, allowing for future expansion as training needs evolve, and aligns with NWFRS's sustainability goals by incorporating low-carbon and energy-efficient features.

Key features include:

- A training hub with classrooms, an incident command centre, and welfare facilities.
- A breathing apparatus school with decontamination facilities and provision of facilities to meet the needs of our evolving and diverse workforce.
- Realistic fire training props, including carbonaceous and cold smoke facilities that align with proposed changes to Firefighting Tactics
- Road traffic collision training areas.
- The ability to support multi-agency training exercises, improving joint response capabilities.

Financial Aspects of Option 3

The Authority previously decided to invest in the development of draft Training Centre design proposals and the purchase of a suitable land parcel at St. Asaph Business Park.

Support of the recommendations within this paper represents a continued commitment to maintaining momentum in the development of this proposal, with affordability at the forefront of decision-making.

The overall capital cost of Option 3 is £37.417m. Commitment to this option would not require immediate full capital funding.

Cashflow for the project would see initiation costs of circa £0.4m in 24/25, with further capital costs of £1.27m in 25/25 and £1.27 26/27.

With the bulk of capital expenditure projected for 27/28, the financing of this project requires substantial work over the next two years to design and secure the most appropriate funding model.

NWFRS will explore options that include:

Self-funding: Reviewing existing budgets and considering capital financing options aligned to the Authorities Treasury Management Plan.

Welsh Government Support: Engaging with the Welsh Government to explore opportunities for financial assistance, grants, or joint funding initiatives to offset the capital costs.

Collaborative Partnerships: Identifying opportunities to work with other public sector organisations or private partners to share the costs and benefits of the new facility.

Decision-Making Gateways

The project includes financial gateway reviews, detailed within the business case, to be undertaken throughout the project's development to consider the project's affordability.

With an assumption around the project start date, these reviews are expected to take place in December 2025 and December 2026.

- Initial Approval: Agreement in principle to pursue Option 3 based on its cost-effectiveness and operational benefits.
- Design and Planning Gateway: Once capital financing options are clarified; the first gateway will involve securing planning permission and finalising the design to meet statutory requirements and NWFRS operational needs.
- Construction and Implementation Gateway: The final gateway will involve the formal approval to proceed with construction, contingent on the successful completion of the previous stages and confirmation of financing and planning approvals.

These gateways will assure the Authority that capital financing decisions are aligned with long-term financial sustainability and consider any other financial implications.

IMPLICATIONS

Well-being Objectives	This project aligns with NWFRS's long-term objectives, improving training quality and operational readiness while promoting sustainability.
Budget	The total capital cost for Option 3 is £37.417m, with life cycle costs of £3.820m over 25 years. Securing the necessary financing will require careful planning and consideration over the next two years, with potential savings through operational efficiencies and reduced facility leases.
Legal	The new facility will ensure compliance with statutory training and environmental requirements, mitigating the legal risks associated with the current sites.
Staffing	No additional staffing requirements are expected. The new facility will improve training conditions and reduce logistical challenges, enhancing overall efficiency.
Equalities/Human Rights/ Welsh Language	The facility will be designed with inclusive features, ensuring a high level of compliance with equality and diversity standards.
Risks	Key risks include securing planning permissions and managing construction timelines. However, the centralised facility reduces long-term risks related to environmental non-compliance and operational inefficiencies.

Proposed New Fire Training Centre

North Wales Fire and Rescue Service

12th September 2024

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Executive Summary & Recommendation

Summary of Report

North Wales Fire & Rescue Service (NWFRS) faces significant challenges regarding its current training facilities. These dispersed facilities, spread across multiple locations, impose limitations on training capabilities, introduce operational inefficiencies, and fail to meet contemporary training standards. Recognising the pressing need for a transformative shift in training infrastructure, NWFRS conducted a comprehensive options appraisal, considering four distinct proposals, detailed within this report, to address these challenges. Recent changes to environmental law mean the location of the current training facility exposes the Service to considerable legal risk.

Option 1, which involves maintaining existing facilities with minor refurbishments, carries inherent risks such as environmental vulnerability, flooding, infrastructure inadequacy, operational disruptions, accessibility constraints, health and safety concerns and suboptimal training conditions.

Option 2, focusing on enhancing existing facilities, seeks to extend their operational lifespan and address certain deficiencies. However, it remains susceptible to persistent limitations in facilities, health and safety concerns, insufficient parking, flooding issues, and limited progress in equality, diversity, and inclusion (EDI) provisions.

Option 3, advocating the development of a new central training centre, emerges as a compelling choice when compared to Options 1 and 2. This option promises an enhanced flexible, training environment: that is a transformative leap in training quality, providing realistic and immersive scenarios. This starkly contrasts with the limitations inherent in NWFRS's existing dispersed training facilities, as outlined in Options 1 and 2.

By centralising training activities to provide a ‘hub and spoke’ approach to training staff, Option 3 effectively addresses logistical inefficiencies, streamlining the transportation of staff, equipment, and resources to multiple locations. This enhances training delivery efficiency compared to the continued complexities of Options 1 and 2.

Option 3 ensures consistency and standardisation with a uniform and standardised approach to training across NWFRS, eliminating the fragmented training methodologies and content delivery detailed in Options 1 and 2.

Cost Savings: While Options 1 and 2 may necessitate substantial investments in existing facilities, Option 3 offers a cost-effective solution. It avoids unnecessary expenditure on refurbishments that might still leave NWFRS with inadequate training facilities for many years to come.

Option 4, proposing the development of a new multi-hazard, multi-agency Training Centre, is comprehensive. However, it must be considered within the context of current financial constraints, including significant upfront costs and ongoing maintenance commitments.

Recommendation

Considering the benefits of Option 3 over Options 1 and 2, and while acknowledging the financial constraints associated with Option 4, it is recommended that NWFRS pursue Option 3, the development of a new Training Centre. This option strikes a balance between improving training quality and addressing NWFRS's fiscal responsibilities. This option meets the core training requirements of a modern fire and rescue service whilst providing flexibility and provision for future expansion and development of the facilities.

Option 3 aligns with NWFRS's need for modernised, centralised, flexible training facilities and offers an efficient solution whilst limiting the full financial commitment of Option 4. It ensures that NWFRS can enhance training quality, maintain cost-effectiveness, and allocate resources sensibly, safeguarding the organisation's long-term sustainability and importantly, firefighter’s health and safety.

1.0 Introduction & Background

1.1 Project Vision and Outline of Need

1.1.1 Project Vision

The vision for the new training centre for NWFRS is rooted in a commitment to excellence and innovation in operational training and development. NWFRS envisions a future where its firefighters are equipped with the best knowledge and skills to enable them to respond safely and effectively to the evolving challenges of fires and emergencies in our communities.

1.1.2 Outline of Need

There is no comprehensive training venue serving NWFRS, rather a number of disconnected locations across the NWFRS estate that are utilised for specific training activities. These facilities are longstanding, developed at a time when a simpler approach to firefighter development was employed, when the risks within our communities were different from those faced today. To this end, the existing training facilities at Dolgellau and Rhyl Fire Stations have effectively served NWFRS, meeting past training demands. However, as the service plans for the future, it is clear that investment is needed in training facilities to address the current and forthcoming training needs of an organisation contending with an evolving risk landscape. This arises not simply to sustain existing standards of operational and command training, but to enhance them.

The envisioned training and development centre is designed as a modern, practical, and immersive facility, equipping NWFRS firefighters with hands-on experience essential for the challenges of their risk-critical roles. By replicating a diverse array of emergency scenarios mirroring real-life events within our communitiesy, the centre will enable firefighters to respond safely, confidently and competently.

The architectural principles of a developed, modern training centre are ones that adopt a thematic approach, establishing discrete zones that mirror current and anticipated risks in North Wales. These dedicated sectors will be thoughtfully interconnected, allowing simulations of complex emergency scenarios to unfold within a secure training domain. This comprehensive approach guarantees that every NWFRS team member benefits from thorough, practical, and realistic training.

The project also acknowledges NWFRS's responsibilities beyond firefighting, encompassing activities such as fire control room operations, fire investigation, fire prevention and protection, hazardous materials, medical trauma response, and collaboration with other emergency service and third sector partners.

A modern training and development facility's design places a premium on the well-being of both trainees and instructors. Ample space for classrooms and training simulation props assures the facility's ability to meet the educational requirements of its personnel. Additionally, the project integrates solutions for effective contamination management, drawing insights from NWFRS's contamination group and academic research concerning fire contaminants.

The development of a dedicated training and development site represents NWFRS's commitment to elevating the skills, preparedness, and adaptability of its firefighters. This vision embraces realism, innovation, and safety, affording NWFRS the means to serve North Wales's community with the highest levels of competence and professionalism.

1.2 Centre of Excellence for Welsh Multi Agency Response

In addition to enhancing the skills of NWFRS personnel, the training and development centre offers a unique opportunity to advance collaborative training and development efforts among emergency service professionals.

The various incident zones and simulation equipment at the facility will closely replicate the risks and challenges encountered by emergency service workers in built environments. This setting provides an ideal platform for joint training initiatives, where firefighters can train alongside their counterparts from other emergency services.

For emerging risks and those that cannot be simulated in the built environment the centre will establish a modern Incident Command Training Suite. This suite will redefine how Incident Commanders in NWFRS develop their command expertise and experience.

The command suite will serve as a hub for operational learning and innovation, utilising technology and interactive scenarios to provide a platform for Joint Emergency Services Interoperability Programme (JESIP) training. This allows emergency personnel to enhance their skills, coordination, and decision-making in a safe, immersive environment.

The centre envisions a union of efforts by inviting partners from the North Wales Local Resilience Forum to engage in multi-agency training and collaboration. This integration aims to promote synergy among different emergency responders and establish a framework for the effective implementation of JESIP principles. This collaboration aligns with the evolving landscape of emergency response, emphasising joint efforts to ensure public safety and effective crisis management.

The proposed training and development centre holds significant potential for advancing all-Wales training initiatives and fostering collaboration with partners from across Wales. With its strategic location and facilities, it has the capacity to become a central hub for coordinating comprehensive training programs.

This vision entails establishing a platform that strengthens collaborative efforts among emergency responders across Wales and extends a hand of cooperation to our colleagues across many organisations. By facilitating joint training exercises, the centre aims to enhance the preparedness and coordination of emergency response personnel. These training programs would be designed to address regional and cross-border challenges, ensuring a harmonised response to major incidents.

Publication of the Grenfell Tower Phase 2 report reaffirms the importance of education and training to nationally approved standards. Development of this new training centre will ensure that NWFRS is best placed to deliver practical training and develop competent incident commanders to ensure an effective response for the safety of firefighters and the public.

1.3 Key Facts: Operational Training Needs and Considerations

1.3.1 Continually changing Landscape of Fire and Rescue Services:

In the evolving landscape of modern fire and rescue services, substantial changes have transpired over the past decade. One noteworthy shift has been the decline in operational incidents. This decline can be largely attributed to the resounding success of preventative measures within communities. However, this reduction directly impacts firefighters' exposure to a diverse array of risks crucial for developing operational competencies. Realistic scenario-based training, therefore, holds a pivotal role in cultivating and upholding firefighter safety, operating skills, risk awareness, and the capacity to effectively address emergency situations.

1.3.2 Legal Framework:

The Fire and Rescue Services (FRS) Act 2004, sets the requirements that the Fire and Rescue Authority must make provision for. These mandate training provisions for addressing fires, road traffic collisions (RTCs), and dealing with other prescribed emergencies. Further, the Fire and Rescue Services (Emergencies) (Amendment) Order 2017 makes training regarding water and flooding incidents in Wales a statutory duty.

Chief Fire and Rescue Advisor for Wales Thematic Review of Training

The findings and recommendations outlined in the Chief Fire and Rescue Advisor for Wales' (CFRA) October 2022 thematic review, highlighted several critical aspects related to training, some of which resonate deeply with the challenges faced by NWFRS. The thematic review underscores the importance of evidence-based training analysis and addresses challenges related to firefighter availability and training standardisation. These insights align with the considerations presented in this business case, highlighting the need for a transformative approach to effectively address NWFRS's existing training facility challenges. Within the UK, there is currently a focus on reviewing the effectiveness of firefighting tactics which may result in the need to adapt training facilities, to suit any changes implemented. Therefore, there is a need for facilities to be flexible to adapt to these and any subsequent future changes.

The CFRA is presently reviewing firefighting tactics employed at operational incidents. It is anticipated that this review may recommend alternative techniques which cannot be delivered with the existing facilities.

1.3.3 Geographical Diversity and Complex Risk Profile:

NWFRS encompasses a predominantly rural geography, encompassing coastal towns, tall structures, significant industrial sites, historical sites, and major transportation arteries. The diverse risk landscape encompasses challenges such as wildfires, residential fires, RTCs, flooding, and hazardous materials incidents. To address this broad spectrum of operational risks, a national operational competency model was developed, forming the basis for National Operational Guidance, Training Specifications, and Fire Standards by the National Fire Chiefs Council (NFCC).

1.3.4 Evolution of Incident Management:

Incident command has seen significant evolution, with a heightened focus on risk assessment, situational awareness, and collaborative principles. This evolution aligns closely with the established standards for command competence, as outlined by Skills for Justice, which form the basis of NWFRS Incident Command Strategy and delivery plans.

1.3.5 Learning from Incidents and National Guidelines:

In the context of the proposed development, it's important to recognise the significance of Joint Organisational Learning (JOL) and National Operational Learning (NOL) in the evolution of incident management. JOL involves collaborative learning efforts among emergency service organisations, emphasising the sharing of insights, best practices, and lessons learned from real incidents to enhance preparedness and response.

Likewise, NOL focuses on a national scale, systematically collecting and disseminating knowledge from significant national incidents. This shared experience informs policies, procedures, and training practices on a national level, benefiting all emergency services across the country. Operational learning can only be effective if it can be assimilated in to the day to day activities of Fire and Rescue Services.

The proposed training and development centre align perfectly with these principles. By providing a facility for joint training and simulations, it promotes collaboration, knowledge exchange, and collective improvement among emergency responders. This not only enhances local readiness but also contributes to national goals of improving emergency response across the sector.

Importance of Refresher Training and Assessment:
Incident command refresher training and assessment are indispensable to ensure the readiness of Incident Commanders in critical situations. This practice ensures the dissemination of lessons learned and offers exposure to virtual simulations to close the learning loop.

1.3.6 NWFRS Competency Model:

NWFRS must continuously train and develop its staff to ensure that operational competence is maintained, to this end the training centre will offer dedicated training programs tailored to the specific needs outlined in the established competency model. This will encompass comprehensive refresher training for road traffic collision incidents, work-at-height protocols,

advanced fire-fighting tactics, initial Hazmat training for on-call personnel, all-staff hazmat refresher courses, water awareness refreshers, and specialised incident command refresher training across all command levels. Through the utilisation of cutting-edge training methodologies, interactive scenarios, and modern technology, the centre will ensure that NWFRS personnel are well-prepared to respond effectively to a wide range of operational challenges.

1.3.7 National Standards and Operational Guidance

Many of the training and development programmes that NWFRS creates must be aligned to national standards. For example, crews who are trained to work in or near water will be trained to meet the Defra Flood Rescue Concept of Operations. These standards come from several high-profile national flooding events where that were examined in the Pitt Review (2007) where shortfalls in capability against planning assumptions were identified.

The Guidance and Compliance Framework for Compartment Fire Behaviour Training, 2000 (CFBT) provides specific requirements and guidelines for fire services in the UK regarding training in heat and smoke, particularly in the context of CFBT. Fire services are required to have suitable CFBT facilities that replicate realistic compartment fire scenarios. These facilities must include provisions for generating and controlling heat, smoke, and fire conditions. The framework emphasises live fire training scenarios where trainees experience actual heat, smoke, and fire conditions within controlled environments. This hands-on experience is essential for developing practical firefighting skills. Safety, realism, and compliance with established guidelines are crucial in conducting effective and safe CFBT. Fire services are expected to follow these requirements to ensure that their training programs adequately prepare firefighters for the challenges they may face in the field.

The Management of Health and Safety at Work Regulations place a duty on the employer to make an appropriate assessment of the risks to the health and safety of their employees, and to record the significant findings of this assessment. The Health and Safety Executive sets out how it applies health and safety legislation to the fire and rescue service in striking the balance between operational and health and safety duties in the Fire and Rescue Service.

National Operational Guidance States:

'Fire and rescue services must train and assess operational personnel so they are able to carry out their roles and responsibilities. Personnel must understand these responsibilities, be

given sufficient time and facilities to practise their skills so they are suitably equipped with the operational knowledge needed to resolve the full range of reasonably foreseeable incidents and be able to adapt to those that are not.'

1.3.8 Specialist Skills Development:

The training centre will facilitate the delivery of specialist skills training, including mass decontamination, ship firefighting, and wildfire response, which is crucial for addressing unique and evolving incident scenarios. By providing accessible training sessions and E-Learning packages, NWFRS will ensure that its personnel have the skills and knowledge required to excel in these specialised areas. This aligns with the collaborative efforts led by Tactical Advisors and national lead roles to establish and maintain robust training protocols within Service. Tactical Advisors such as National Incident Liaison Officers or Hazardous Materials and Environmental Protection Officers not only maintain their skills to respond to incidents within North Wales but can be called upon in times of need to support incidents regionally and nationally. It is essential that these roles can train and prepare in realistic and immersive environments.

1.3.9 Environmental considerations

Following the passage of The Environment (Air Quality and Soundscapes) (Wales) Act 2024 into law, all hot smoke facilities operated by the Service must meet variable targets for airborne particulate matter concentration in the ambient air surrounding each site. This is measured by determining the concentration of particles at a size of 2.5 microns or above in diameter (PM 2.5).

The location of the existing hot smoke Training Facility in Dolgellau is very close to the town centre, at the bottom of a valley. The smoke emissions have already drawn a number of complaints, and continued operation of this facility is likely to expose NWFRS to risk of prosecution and/or enforcement action necessitating the closure of the facility at short notice.

Additionally, the Service has a duty to reach net zero carbon emissions by 2030. Given the age and condition of the current facilities, it is not considered prudent to incur the considerable expense of retrofitting a low carbon systems to meet this date if the intention is solely to temporarily extend its operational lifespan.

1.4 Current Training Facility(s) and why they are unsuitable

The Authority currently has training provision at a number of sites around the Authority area.

- Dolgellau
- Rhyl
- Wrexham
- Deeside
- and limited use of a facility at Airbus for Fire Behaviour Training.

These facilities are limited in the scope of training that they can offer and the geographic spread of these locations, causes inefficiencies in the delivery of the training services with the trainers available.

In many cases the facilities are of an age where their continued life expectancy is short, and they are unable to offer the full range of training activities in a realistic and immersive training environment that modern firefighting requires.

All sites are poorly equipped with welfare and storage facilities, which is often shared with the adjacent station. This can interfere with station operations and means that often equipment must be transported from other areas. This occurs just prior to an exercise and is removed shortly afterwards, for use elsewhere, leading to inefficiencies in the use of this equipment and unnecessary transportation costs.

Transportation of equipment and course materials presents challenges around care, maintenance and servicing, as well as logistical and inventory management.

The inflexibility to further develop the sites has an impact on contamination management.

None of the sites offer a full range of training activities as an area-based training model would require.

Water training does not occur at any of these sites as it is provided in specialised Class 1 and 2 water at locations across North Wales, this element of training is not part of this business case as it will be unaffected by these proposals.

The following options appraisal sets out the shortcomings and investment required at each site.

1.5 The benefits of a new training centre

1.5.1 Enhanced Training Environment:

A new, purpose-built training centre represents a leap in the quality of training offered to NWFRS personnel. By creating a centralised hub equipped with contemporary facilities, the training centre will enable the development of realistic and immersive training scenarios. Trainees will be exposed to simulated emergency situations that closely mirror real-world challenges, fostering a higher level of preparedness and adaptability. The inclusion of dedicated teaching, catering, welfare and decontamination facilities will ensure that trainees receive comprehensive support, contributing to an all-encompassing training experience.

1.5.2 Operational Efficiency and Cost Savings:

Centralised training activities eliminates the current inefficiencies associated with transporting training staff, equipment, and resources to multiple locations. The new training centre's central location will significantly reduce travel impacts and logistical complexities, allowing trainers to allocate more time to training itself. This streamlined approach increases the efficiency of training delivery and savings of resource duplication, improving time management.

1.5.3 Consistency and Standardisation:

A central training centre ensures a consistent and standardised approach to training across NWFRS. Uniformity in training methodologies, content delivery, and evaluation methods becomes readily achievable when all training activities are housed under one roof. This ensures that every firefighter, regardless of their base location, receives the same high-quality training experience. By unifying training practices, the training centre promotes a shared understanding of best practices, ultimately enhancing the overall competency of the NWFRS workforce.

1.5.4 Adapting to Technological Advancements:

The new training centre is designed to accommodate the integration of modern technologies and tools. As the emergency services sector continues to evolve, embracing advancements such as virtual reality simulations and data-driven training approaches becomes paramount. The training centre's modern, flexible infrastructure will readily support the incorporation of these innovations, equipping firefighters with the skills needed to navigate the ever-changing

landscape of emergency response and allow the Service to easily respond to future adaptations.

1.5.5 Positive Impact on Recruitment and Retention:

The proposed training centre can have a positive impact on recruitment and retention in NWFRS. It will enhance the organisation's attractiveness to potential recruits by showcasing its commitment to comprehensive training and professional development, including leadership and managerial skills. Prospective Operational and Corporate Services staff will be drawn to the prospect of receiving ongoing training, ensuring their safety and career advancement.

For retention, the centre will nurture the professional growth of existing personnel, enhancing their job satisfaction and fostering loyalty. Overall, the centre's impact on recruitment and retention will enhance NWFRS's position as an employer of choice.

1.6 Alignment with Wellbeing Goals and the Future Generations Act

The proposed training centre project by NWFRS is more than a facility dedicated to training and skills development; it is a strategic initiative that aligns seamlessly with the goals and principles of the Future Generations Act in Wales. The Act envisions a Wales where current and future generations thrive, ensuring that today's decisions positively impact the wellbeing of generations to come. Through the establishment of a fire and rescue service training centre, NWFRS aims to make a significant contribution to the Act's seven wellbeing goals:

1.6.1 A Prosperous Wales

A well-trained, competent workforce is a cornerstone of prosperity. By investing in the training centre, NWFRS is equipping its operational and control room staff with the skills and knowledge necessary to respond effectively to emergencies, contributing to the overall safety and prosperity of Welsh communities. Moreover, the integration of advanced technologies in training programs ensures that our staff are prepared to tackle modern challenges through technological advancements, promoting prosperity through adaptability and innovation.

1.6.2 A Resilient Wales

Resilience is at the heart of emergency services. The training centre project directly contributes to enhancing the resilience of communities by providing our staff with the tools to respond adeptly to a diverse range of incidents, from fires to hazardous material emergencies. Realistic

simulations, practical exercises, and collaboration with other emergency services foster a culture of joint working and preparedness, reinforcing Wales' collective resilience to potential crises.

1.6.3 A Healthier Wales

Safety is a fundamental aspect of wellbeing. The comprehensive training provided by the training centre will directly contribute to creating a safer environment for both our operational staff and the communities they serve. By improving operational response, enhancing coordination, and minimising risks through effective training, the project ensures a healthier Wales, where lives are safeguarded and emergencies are managed efficiently.

1.6.4 A More Equal Wales

Equity in safety and emergency response is a priority. The training centre project fosters equal access to high-quality training opportunities for all of our staff, that translates to high quality services in our communities. This commitment to inclusivity aligns with the Act's goal of creating a more equal Wales, and one where everyone can contribute to and benefit from improved emergency services.

1.6.5 A Wales of Cohesive Communities

Community engagement and trust are vital for successful emergency response. Through the training centre, NWFRS promotes cohesion by offering opportunities for collaborative training and community involvement. Open days, awareness programs, and joint exercises with local communities strengthen the bonds between emergency services and the public, promoting a Wales of cohesive communities.

1.6.6 A Wales of Vibrant Culture and Thriving Welsh Language

Cultural sensitivity is paramount in emergency response. The training centre project embraces diversity, will be created with cultural sensitivity in mind and the importance of cultural competence in delivering effective services. By fostering cultural awareness and understanding, NWFRS ensures that all staff can interact with and support diverse communities, nurturing a vibrant culture of respect and inclusivity.

1.6.7 A Globally Responsible Wales

The training centre project is not only responsive to local needs but also aligned with global responsibilities. By preparing our staff to tackle emerging challenges, such as environmental incidents or fresh threats, the project contributes to a globally responsible Wales that addresses local and international issues, setting an example for sustainable emergency response practices.

The establishment of the Training Centre by NWFRS directly aligns with and supports the wellbeing goals of the Future Generations Act in Wales. By equipping our operational and control room staff with the skills, knowledge, and capabilities necessary for effective emergency response, the project fosters a safer, more resilient, and prosperous Wales for current and future generations.

1.7 2024-2029 Community Risk Management Plan

The Service has developed a 2024-2029 Community Risk Management Plan (CRMP) based on these goals with principles focussed on people and response. This has been developed with consideration of the 5 year Training and Development Department objectives which focus on achieving Training that delivers excellence, leadership capabilities that are well prepared to navigate and guide the service through the evolving landscape of the Fire and Rescue Service, training and people development that harness technology for efficient delivery, having equality, diversity and inclusivity throughout all our initiatives, fostering a culture of inclusivity, respect and diversity in every aspect of our work, having a physically fit and mentally resilient workforce and training programmes that meet our current and anticipated community risks

2.0 Options Appraisal – Qualitative Analysis

2.1 Option 1: Maintain Existing Facilities on a Care and Maintenance Basis including continued compliance with statutory requirements

Existing sites:

Set out below is a commentary on the existing sites, detailing their condition and noting some significant issues which will not be addressed should Option 1, be adopted. The budget calculation for this option assumes regular minor refurbishments and includes an increasing allowance for repairs and maintenance year on year as the building condition deteriorates.

Dolgellau:

This is NWFRS's only hot smoke facility, built in 1992. This facility provides training in realistic fire conditions. This is achieved through carbonaceous burns and the use of synthetic smoke generators. It Is not fitted with any form of smoke cleaning device, smoke that is generated during exercising produces smoke that is not contained within the facility. The site does not support the use of training foam, nor is the fire house suitable for training in medium to high-rise building firefighting techniques.

The location of the existing hot smoke Training Facility in Dolgellau is very close to the town centre, at the bottom of a valley. The smoke emissions have already drawn a number of complaints, and continued operation of this facility is likely to expose NWFRS to risk of prosecution and/or enforcement action necessitating the closure of the facility at short notice.

Additionally, the Service has a duty to reach net zero carbon emissions by 2030. The age and condition of the current facilities, are such that this premise cannot support this aspiration, without significant investment.

The site is situated in a flood zone and regularly floods, leading to it being unusable for significant periods of time. This results in both cancelled training and subsequent clean-up demands. This flooding risk at the site requires all developments to be erected on stilts above ground level, additionally there is no capacity to store or leave equipment, training props and vehicles at ground level for a significant period of the year.

The nature of the use of the site is such that the surfaces within the fire house and surrounding facility are heavily smoke contaminated, although unlikely, in times of flood this could potentially cause river contaminants to enter the nearby river. The whole of the surface water drainage system in the yard area drains into the nearby river, which creates a risk of contamination to the water course.

Despite the recent addition of a number of washrooms in a temporary building the decontamination facilities remain very much a “make do and mend” and are barely adequate. There is no training classroom on site that can be used by personnel for practical activities whilst wearing fire kit, which leads to students using the Appliance Bay as a classroom, with inadequate heating during the winter, and absence of other classroom-based facilities. This appliance bay is occupied by the Dolgellau Fire Station Fire appliance, when this appliance responds to incidents exhaust fumes from the appliance remain within the bay potentially exposing staff to diesel fume particulates.

Considering the wider training facilities, the site does not have suitable facilities for Incident Command, Hazmat or RTC Training, nor is it large enough to support multi-agency training exercises.

Compliance with EDI policies at this site are poor, with minimal separation of facilities, and no faith / quiet room provision.

General fitness, welfare and catering facilities are shared with the fire station and at busy times when both station staff, students and trainers are present it is inadequately sized, with no private space available for students wishing to study or for station-based firefighters wishing to undertake refresher training.

The impact on day to day fire station operations is heavily impacted by the presence of the training school, with the Fire Appliance needing to be parked outside (off charge) when the Appliance Bay is being used as a classroom. Also, the Appliance Bay stores a considerable amount of training equipment such as the entanglement simulator, which simply impedes the normal day to day station activities as well as creating risks of trips and falls.

The site is also used by the Welsh Ambulance Service, as a deployment point, and Citizens Advice which simply adds further pressure to the site. Car Parking on site is inadequate for all the users, particularly when training is taking place and users generally have to park on the adjacent supermarket car park, which can impact on their customers and local community.

Uniquely in North Wales, this facility is equipped with overnight accommodation of 10 bedrooms, however this needs modernisation and refurbishment. The provision is of a very low standard and would not reach that expected of even the most basic of budget accommodation.

The considerable distance of this site from the main trunk road network also results in considerable costs and delivery delays in the provision of cars for cutting, timber for burning, site consumables and obtaining contractors to maintain some of the more specialist equipment.

Despite recent investment this is a “sticking plaster” to provide a short-term life extension to this facility which has approximately 5 years life left in it before requiring major investment just to maintain the existing inadequate facilities and ensure compliance with statutory requirements.

Whilst the options appraisal will place a cost on maintaining these facilities on a care and maintenance basis for a 25-year period, with necessary upgrades to meet statutory minimum requirements, in reality the age and condition of the building, combined with the health and safety concerns, EDI challenges, inadequate firefighter contamination and smoke management processes, along with the continued flood risk mean that this is not a viable long-term option for consideration.

Rhyl:

This site was developed in 1988, as a cold smoke house and training facility attached to the Fire Station. This site has a larger training yard, allowing its use for National Fire Fighting Selection Tests and Driver Manoeuvring Training, which cannot be accommodated on any other training centre sites.

The Fire House is a cold smoke facility only, with no carbonaceous burning taking place, however it is not fitted with a built-in smoke machine or suitable distribution ductwork, making it difficult to create suitable conditions throughout the building to simulate a real environment. The building is not equipped with the minimum safe systems of work, such as smoke extraction, safety lighting and emergency alarms. There is no medium to high-rise facility within the props available.

As with other sites much of the facilities for welfare are shared with the fire station, resulting in inadequate locker storage for visiting students and inadequate shower and welfare facilities.

At this site, adherence to EDI policies falls below contemporary standards, as there is limited segregation of facilities, and no designated space for faith or quiet activities.

General fitness, welfare and catering facilities are shared with the fire station and at busy times when both station staff, students and trainers are present it is inadequately sized, with limited spaces available for students wishing to study or for station-based firefighters wishing to undertake refresher training. With no dedicated changing space on site for potential recruits or visiting students, classrooms that should be designated as clean space areas are regularly used to change into structural firefighting PPE and breathing apparatus.

The training facilities are also shared with the crews at Prestatyn and St Asaph and often training department needs lead to the core training of all three stations being disrupted.

This site benefits from access to seven meeting rooms, which are shared with the rest of the service and are fitted with dated AV equipment, however, there is no equipment storage, leading to the previously described scenario of equipment having to be brought to and removed from site for use in training scenario. The majority of these training rooms are above ground floor level and are designated as clean areas, precluding students on practical courses, such as breathing apparatus or road traffic collision courses, from using the space.

Whilst the site also benefits from a larger training yard, its use for multiple activities reduces the ability to undertake space intensive training uses such as Pumps and Ladder, RTC and Hazmat training. Training Foam cannot be used on site.

The site is equipped with a small Incident Command Training Facility but this is also reaching the end of its life with a major technology and system upgrade required. The rooms are also of a poor quality in comparison to newer facilities, with enhanced immersion and simulation.

Overall, this property, with a current lifespan of approximately 10 years, requires considerable investment to bring it to a standard where it will have a long-term life, after which further major investment will be required just to maintain the existing inadequate facilities.

Whilst the options appraisal will place a cost on maintaining these facilities on a care and maintenance basis for a 25-year period, in reality the age and condition of the building, combined with the absence of adequate facilities meeting contemporary EDI standards mean that this is not a viable long-term option for consideration.

Due to the proximity of local housing and the current usage of the site by the station, it is unlikely that site could ever be used for carbonaceous burning, hence it would not be a suitable alternative to Dolgellau.

Wrexham:

Wrexham site was developed in 2016 and like Rhyl was developed as a cold smoke fire house attached to the fire station.

Unlike Rhyl this site is not sufficiently large to be used for National Fire Fighting Selection Tests and Driver Training, and despite being newer, suffers most of the shortcomings identified above for the Rhyl site.

Wrexham also has the added disadvantage that due to planning permission constraints the site cannot be used from noon on Saturday until Monday morning. This loses a substantial training opportunity for on-call fire fighters and recruits.

Wrexham is positioned on a shared site with the Welsh Ambulance Service Trust (WAST). The site is owned by WAST with NWFRS as a tenant. The training facilities at Wrexham were designed to meet the needs of the operational crews deployed at the site and have limited scope beyond basic training scenarios. Any consideration to redevelop the facilities beyond their current use would require support and agreement from WAST and would potentially impact upon the wider design and use of the site.

Overall, whilst this property, has a current lifespan of in excess of 25 years, it will require a “half life refurbishment” 25 years after construction. In addition, it would require a considerable investment to bring it to a standard where it will would be suitable for use beyond basic station training activities. Any potential redesign of the training site would invariably still be restricted by the limited support facilities such as teaching rooms and welfare facilities available within the existing joint ambulance and fire station.

Whilst the options appraisal will place a cost on maintaining these facilities on a care and maintenance basis for a 25-year period, in reality the facilities are such that this should be viewed as a fire station training facility for the maintenance of competency, not as a service wide training centre.

Due to the proximity of local housing, the restriction on use and the current usage of the site by the station, it is unlikely that site could ever be used for carbonaceous burning, hence it would not be a suitable alternative to Dolgellau.

Deeside:

Deeside site was developed in 2016 and very much like Wrexham was developed as a cold smoke house attached to the fire station.

As a consequence, much like Wrexham many of the constraints previously described also apply to this site, although Deeside does not have the same usage restrictions.

As with Wrexham, this property, has a current lifespan of in excess of 25 years, however it will require a “half life refurbishment” 25 years after construction, as well as continued investment over that period to keep in this condition. As stated above, in reality the facilities are such that this should be viewed as a fire station training facility for the maintenance of competency, not as a service wide training centre.

Due to the proximity of local housing, a school and the current usage of the site by the station, it is unlikely that site could ever be used for carbonaceous burning, hence it would not be a suitable alternative to Dolgellau.

Airbus:

The Airbus facility is used only for Compartment Fire Behaviour Training (CFBT). However, this still presents shortcomings as there is limited access to site, the timing of which is in the control of Airbus.

NWFRS have invested in the fire behaviour facilities that are located at the Airbus site, and despite the significant costs of provision and maintenance these facilities are not readily accessible.

Frequent high levels of security mean that the site is inaccessible at short notice. There is limited access to classroom and welfare facilities and it often has to be used in conjunction with Deeside Fire Station as a base where the classroom and welfare facilities can be provided.

With a drive towards the management of contaminants, operating across two sites risks the transportation of personnel and equipment in a contaminated state, this does not align with the

Service's or the Sector's ambition for a healthy and fit workforce. There has been a significant academic research that extol the benefits of a 'shower within the hour' to reduce the risk of contaminants to firefighter health and the development of illnesses and diseases such as cancer.

Maintenance is also difficult as the site is subject to "airport security" restrictions limiting access for maintenance personnel. There is also shared usage with Airbus which additionally restricts the days this can be used.

The containers that make up this facility were renewed in 2022 by NWFRS, with an expected lifespan of between 5 and 8 years.

There is no work proposed at this site, in this option other than a cyclical replacement of the containers as they wear out.

Generally:

NWFRS as a whole, doesn't have access to a conference centre for large gatherings, such as pass out parades, Authority Meetings etc, with such large gatherings currently held in Rhyl Appliance Bay, using hired in chairs and AV equipment or external venues.

Basic recruit training is currently done on multiple sites and "fitted in" around service training, with "On call" recruit training largely undertaken at weekends. Most recruit fire fighter's first impression of NWFRS is the drill yard at Rhyl and the Fire House at Dolgellau, neither of which portray an appropriate image or set appropriate standards.

Equipment storage and facilities for trainers are generally of a poor quality or non-existent, consequently equipment is being transported around between sites, as required for an exercise. This is leading to equipment damage and an inefficient usage of both equipment and staff resources.

The fitness team currently have no main base and are mobile, this results in there being no defined consistent site where health, fitness and wellbeing support can be provided to staff who are recovering from illness or injuries.

Generally, across the service the facilities are not complex, realistic and immersive, nor do they offer the flexibility to vary the training scenario, leading more advanced fire fighters to

become “familiar” with training scenarios. There is also very limited opportunity for multiple pump or multi agency exercises.

Due to the spread of training facilities and the over reliance on station-based competency training, it is often inconsistent which is unacceptable for a safety critical role.

Looking at the property portfolio, it should also be noted that this option makes no enhancement to the low carbon credentials of any of the estate other than ensuring statutory compliance with current legislation.

Key residual risks from the implementation of Option 1:

Short Lifespan: The Dolgellau training site and the Airbus Site both have a limited lifespan of approximately 5 years before they will require major investment and replacement.

Planning Permission Constraints: It should be noted that it is unlikely that the structures required for some improvements, such as smoke cleaning devices will receive planning permission at the Dolgellau site. This limitation would hinder the implementation of planned enhancements to ensure statutory compliance.

Environmental Impact: The Dolgellau training site poses significant environmental risks due to its flooding issues and potential pollution from smoke and contaminants within the Snowdonia National Park. Continued operation of this facility is likely to expose NWFRS to risk of prosecution and/or enforcement action necessitating the closure of the facility at short notice. There's also a risk of river contamination if floodwater mixes with site contaminants. This could lead to regulatory and public relations issues.

Infrastructure Inadequacy: All existing facilities have poor decontamination, welfare, and fitness facilities, which can affect the well-being of personnel. The lack of modernisation and refurbishment of overnight accommodation and other amenities poses risks in terms of comfort and safety.

Operational Disruption: The presence of training facilities within fire stations can disrupt day-to-day operations, including fire engine storage, equipment management, and station activities. Shared facilities with stations can lead to inefficiencies and potential hazards.

Accessibility and Usage Restrictions: Sites like Wrexham and Deeside have limitations on usage due to planning constraints or local housing proximity. Such restrictions hinder the flexibility and utility of these sites for training.

Inadequate Training Conditions: Current training facilities do not provide realistic and immersive scenarios, limiting the quality of training. The lack of space for complex exercises, multi-agency training, and advanced scenarios hampers the development of firefighting skills and preparedness.

Low Carbon Credentials: Maintaining existing facilities without enhancements does not align with low-carbon goals, and this option doesn't contribute to improving the estate's environmental footprint. There is a statutory requirement to achieve net zero by 2030 which this option will fail to deliver.

Costly Short-Term Solutions: The short-term life extension of existing facilities is costly, considering the need for major investments within the next decade to maintain inadequate facilities. This financial burden may not be sustainable.

Security and Accessibility: Sites shared with external entities like Airbus can become inaccessible due to high-security measures, impacting training schedules and maintenance efforts.

Lack of Adequate Equipment Storage: The lack of proper equipment storage facilities leads to inefficient transportation, equipment damage, and compromised resource management.

Inadequate Diversity and Inclusion Facilities: EDI compliance is a concern, with poor separation of facilities and the absence of faith or quiet rooms at several sites.

Continued Use of Airbus Site: This site is made available by Airbus on a limited lease and continued occupancy is subject to Airbus having no requirement for the site for their operations which are constantly evolving. There is a high risk that this site could become unavailable for NWFRS use at short notice.

Overall, maintaining existing facilities without significant improvements poses environmental, operational, and infrastructure risks, affecting both training quality and the well-being of personnel.

2.2 Option 2: Invest in existing facilities and develop as far as the sites will allow.

The concept of this option is that all facilities receive major investment to guarantee them a minimum 25-year life and to address the shortcomings identified above in Option 1, as far as the site constraints will allow.

In most cases this will allow an enhancement of the facilities provided but will not address the identified shortcomings of the wider site.

Dolgellau:

At this site, this option will provide the following:

a. A full refurbishment of the fire house

b. Fitting the fire house with a smoke cleaner

c. Refurbishing the car park and the fitting of a new drainage system

d. Replacement of the existing temporary ablutions building with a suitable permanent facility and creation of an additional store's facility.

e. The refurbishment of the existing fire station and accommodation facilities, and the addition of an additional floor to the whole building to provide classrooms etc.

It should be noted that it is unlikely that Items b, d and e will get planning permission, which is reflected in the Qualitative Scores in Section 2.5.

The site would also require the purchase of additional land to facilitate the redevelopment proposed in this option. The nature and land use of the surrounding area is such that this land in unlikely to be available.

Rhyl:

At this site, this option will provide the following:

a. A full refurbishment of the smoke house and training yard.

b. Construction of ablution facilities for use by the trainers and students.

c. Construction of a small storage and BA servicing facility.

d. Refurbishment of the existing training spaces in the fire station and other buildings on site.

Wrexham:

At this site, this option will provide the following:

a. A medium level refurbishment of the fire house to address some of the shortcomings.

b. Construction of ablution facilities for use by the trainers and students, including the provision of a classroom

c. Construction of a small storage facility.

Deeside:

At this site only a light refurbishment of the fire house will be undertaken as there is insufficient room on site to provide any further enhanced facilities.

Airbus:

No work is to be undertaken at this site as part of this option, other than the cyclical replacement of the containers on an 8 yearly replacement programme.

Generally:

This investment would fail to address some significant issues such as lack of car parking on the sites, periodic flooding at Dolgellau, failing to create a medium to high-rise training facility, inability to use training foam, any improvements in low carbon credentials, addressing the ability to hold large multi-agency or multi pump exercises and the provision of a conference centre. Whilst it will make provision to enhance the EDI credentials in a limited manner, this will only seek to improve the current position, not create a contemporary standard of EDI compliance.

Whilst this option will create an improved storage facility at each site, it will not eliminate the need to transport training equipment between centres.

This option will also fail to address the issues of disparate training centre locations and the inefficiencies of this. As well as failing to adequately address the interference of the usage of these facilities by the station crews.

As noted earlier, due to the need for additional land area and the likely difficulties of obtaining planning permission for these proposals in the national park, this is not a deliverable option.

Key residual risks from the implementation of Option 2:

Planning Permission Constraints: As mentioned, it is unlikely that the structures required for some improvements, such as smoke cleaning devices and additional floors for classrooms, will receive planning permission at the Dolgellau site. This limitation would hinder the implementation of planned enhancements.

Wider Site Limitations: The option focuses on refurbishing existing structures but does not address the identified shortcomings of the wider sites. Issues like car parking, periodic flooding at Dolgellau, and creating a high-rise training facility remain unaddressed, posing ongoing operational and environmental risks.

Medium to High-rise Training Facility: The inability to create a medium to high-rise training facility is a significant limitation, as it restricts training opportunities for scenarios involving tall buildings, which are common in urban firefighting. Whilst NWFRS does not have a significant number of high-rise buildings within its geographic boundaries there are many complex medium-rise buildings in our coastal towns, such as hotels, boarding houses and properties in multiple occupation.

Training Foam Use: The option does not allow for the use of training foam, which limits training realism and preparedness for specific firefighting scenarios.

Low Carbon Improvements: This investment doesn't substantially enhance the low carbon credentials of the facilities, falling short of sustainability goals.

Multi-Agency and Multi-Pump Exercises: The option still lacks provisions for large multi-agency or multi-pump exercises, limiting the scope for integrated emergency response training. Without collaboration and coordination between different emergency services achieved during multi-agency training, communication and response effectiveness during real emergencies is impacted.

Conference Centre: The absence of a conference centre for large gatherings remains an issue, potentially affecting the efficiency of meetings and events.

Enhanced EDI Compliance: While some enhancements to EDI provision are planned, this option may not create a comprehensive EDI-compliant facility, potentially falling short of addressing all EDI concerns.

Continued Container Replacement: At the Airbus site, the cyclical replacement of containers still poses maintenance challenges due to security restrictions and shared usage.

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Continued Use of Airbus Site: This site is made available by Airbus on a limited lease and continued occupancy is subject to Airbus having no requirement for the site for their operations which are constantly evolving. There is a high risk that this site could become unavailable for NWFRS Use at short notice.

Despite the investment, there may still be residual shortcomings in facilities, potentially impacting the quality of training, safety, and the ability to meet modern training standards.

In summary, while the "Invest in Existing Facilities" option provides necessary upgrades, it leaves several residual risks and unaddressed issues that may impact the effectiveness, safety, and sustainability of training facilities

2.3 Option 3: Develop a new Training Centre to meet Core Training Needs

This proposal sets out to create a new whole service, centralised training centre on part of a site being acquired in St Asaph Business Park.

The proposed training centre is intended create realistic and immersive training facilities and is detailed in the plan attached in Appendix B. This provides sufficient training facilities to meet the core training requirements of NWFRS.

This includes the provision of:

- Training Hub – comprising classrooms, Incident Command Training Centre, Trainers Offices and Refreshment Area. The building is multi-functional and flexible to allow the classrooms and refreshment area to be combined in various combinations to cater for larger functions and meetings.

- BA School – Breathing Apparatus Training School, comprising specialist classrooms, gender neutral shower rooms and full decontamination facilities, fire ground prop store, kit storage, RTC Training Classroom and undercover car cutting facility.

- Section of dual carriageway for RTC Training

- Drill Yard – with sufficient space for two bleep tests, rural tests, recruit fitness testing, two drill towers, deep lift water pit.

- BA Training – Cold Smoke Fire House for initial BA Training

- Appliance Garage for four training appliances

- Row of two terraced houses equipped with LPG Training Props such as window fire, verge fire, flashover, overheated TV and overheated hair straighteners. The building will also allow roof ladder training and be equipped with simulated PV panels.

- Five storey carbonaceous fire house, incorporating different building types, such as loft, student bedsits, hotel rooms, simulated house, spongy floor and confined space. The building is equipped to simulate medium to high rise firefighting and will be equipped with temperature monitoring equipment, sprinkler pump set, emergency smoke evacuation and alarm systems.

- CFBT Containers – these will comprise attack, demonstration and window fire containers, all situated under a “smoke hood” which will be used to collect smoke and funnel it to a smoke cleaner.

- Fire Fighting Foam – The site is expected to be able to support the use of Training or Fire Fighting Foam, though this cannot be confirmed until the completion of the next stage of the design process and will require further engagement with Welsh Water to confirm.

With diverse training scenarios and props, this option provides highly realistic and immersive training experiences. This realism helps personnel develop the skills, decision-making abilities, and confidence necessary to handle complex and high-stress situations effectively.

This option has high provision for multi-hazard, multi-agency training. It enables collaboration and coordination between different responders in realistic settings. Training in a multi-agency environment improves interagency communication and response effectiveness during real emergencies.

Overall, the development will also feature a large car parking area, equipped with EV car charging facilities, a large area of PV panels which will ensure that the site is zero carbon and the Training Hub and BA School will achieve a BREEAM Rating of Excellent.

The Training Hub, RTC Building, BA School and Appliance Garage will be equipped with OH1 sprinklers. The site will also benefit from an internal fire hydrant system, ensuring sufficient training water is available at all times at the required pressure.

The proposed development will only utilise approximately 80% of the site and has been set out in such a way to allow the further development of the remainder of the site with additional props in the future as the training needs of the service evolve and develop. The surplus site will be left fallow at the conclusion of this development. Some aspects of this option, such as

the drainage attenuation and services supplies will be oversized to allow for the future expansion. This will ensure that any future extension does not require expensive and intrusive remedial works to the developed site.

Key residual risks from the implementation of Option 3:

This option meets the core training requirements of a modern fire and rescue service with limited residual risks.

Training Foam Use: The option may not allow for the use of training foam, which would limit training realism and preparedness for specific foam related firefighting scenarios.

Reduced Training Scenarios: The range of props and facilities provided under this option will facilitate a broad range of commonly experienced scenarios, However, the site will contain specialist props to replicate less common scenarios, which would only see a very small usage, such as those encountered in specialist transport and industrial settings.

2.4 Option 4: Develop a new multi hazard, multi-agency Training Centre

This is essentially an enlarged version of the Option 3 proposals, offering additional realistic and immersive training props, which would include:

- Industrial Training Rig – this would also feature the ability to use firefighting foam.
- Quayside and Ship
- Rural Training Area – to include a farmhouse, LPG Tank Fire, muddy field, farmyard, stables and barn.
- Trench collapse
- Urban Zone – which will include terraced houses, detached house, derelict property, fast food restaurant and an urban flooding scenario, where it will be possible to flood part of the urban area.
- Transport Scenario – featuring rail track, tunnel mouth, level crossing, rail carriage and railway station.
- Fire Fighting Foam – The site will support the use of Training or Fire Fighting Foam.

The additional roads, yards and general hardstanding will allow multiple training exercises to be spread out across the site without interfering with each other. They will also allow larger multi appliance training exercises and larger multi agency exercises. This enlarged site will also offer the additional benefit of being able to host a multi service response to a major incident, such as those involving large numbers of casualties on transport networks.

Like Option 3, the development will also feature a large car parking area, equipped with EV car charging facilities, a large area of PV panels which will ensure that the site is zero carbon and the Training Hub and BA School will achieve a BREEAM Rating of Excellent.

The Training Hub, BA School and Appliance Garage will be equipped with OH1 sprinklers. The site will also benefit from an internal fire hydrant system, ensuring sufficient training water is available at all times at the required pressure.

Key residual risks from the implementation of Option 4:

There are no residual risks from the implementation of Option 4, this option stands out for its comprehensive training capabilities, multi-agency focus, realism, sustainability, and versatility. It offers the best opportunity to prepare personnel for a wide range of emergency scenarios and improve collaboration among agencies.

2.5 Qualitative Analysis Summary

The qualitative analysis summarised below, compares each of the four options described above, over twenty quality criteria, with a score in the range of 0 – 5. This gives a total qualitative score for each option out of 100, which is then used to compare each option in the cost value analysis later in the report.

Quality Criteria	Option 1:	Option 2:	Option 3:	Option 4:
Total Scores:	**15**	**27**	**93**	**100**
Provision of LPG facilities	0	0	5	5
Provision for Working from Height Training	1	1	4	5
Usage of training foam on site	0	0	2	5
Provision of Facilities for Multi Agency Training	1	1	4	5
Provision of accessible CFBT Training	0	0	5	5
Provision of Conference Facilities	0	0	5	5
Provision of adequate welfare and fitness facilities	1	1	5	5
Zero Carbon Credentials	0	1	5	5
Provision for Pumps and Ladders Training	1	1	5	5
Provision for RTC Training	1	1	4	5
Provision of Hazmat and Casualty Care Training	1	1	4	5
Projection of Appropriate Authority Image and Standards	0	1	5	5
Provision of carbonaceous facilities	1	2	5	5
EDI Compliance	1	2	5	5
Environmental Contamination Compliance	0	2	5	5
Provision of BA Training Facilities	2	2	5	5

Provision of Incident Command Training	2	2	5	5
Equipment Storage	1	2	5	5
Adequate management of carbonaceous smoke	0	3	5	5
Provision of cold smoke facilities	2	4	5	5
Total Scores:	**15**	**27**	**93**	**100**

The criteria for the scores used is as follows:

Score	Criteria
0	Facilities not provided
1	Poor quality of facilities provided
2	Average, functional facilities provided
3	Good quality facilities provided
4	Very Good quality facilities provided
5	Excellent, state of the art, facilities provided

3.0 Options Appraisal – Quantitative Analysis

Introduction:

The capital costs for Option 1 are based on undertaking remedial repairs to the existing fire / smoke houses at each of the sites to bring the up to an acceptable standard of repair and ensure statutory compliance. It should be noted that this does not bring them to current day training or environmental standards but merely repairs or replaces (on a like for like basis) the original elements.

The cost / m2 have been adjusted to reflect the age of the existing properties and applied to the floor areas which have been provided by NWFRS.

Lifecycle costs for Option 1 include for both the existing training facilities together with the CFBT containers at Airbus and the temporary buildings at Dolgellau.

The capital costs for Option 2 are based on undertaking refurbishment works at the existing sites together with the provision of new training facilities as described in Section 2.2. This also includes the upgrading and provision of suitable ablutions facilities at each site. The costs have been calculated on the basis of a cost/m2, based on standard floor area allowances and existing building floor areas, as applicable.

Lifecycle costs for Option 2 include for both the refurbished training facilities together with the new build facilities and FBT containers at Airbus.

The capital costs for Options 3 and 4 are based on the drawings which are included as Appendices within this business case. The costs have been developed from benchmark data for projects of a similar nature uplifted to the present day.

For each option, percentage allowances have been made for main contractor preliminaries, overheads and profit, risk, design fees and inflation.

Risk Allowances:

Given the different nature of each scheme and anticipated procurement route, risk allowances have been assessed individually for each option.

For Options 1 and 2, the chosen procurement route is likely to be a traditional approach and therefore the majority project risk will remain with NWFRS.

For Options 3 and 4, the chosen procurement route is likely to be a design and build, partnering approach and therefore the project risks will be shared between both NWFRS and the appointed contractor. As a result, an allowance for contractor risk has been included within the capital cost which is based on 3% of the total works cost. A client risk allowance has also been included at the rate of 5% of the works cost including all fees.

It should be noted that these are typical risk allowances for fully developed schemes and do not allow for client design development between RIBA Stages 1 to 4.

Inflation:

For Options 1 and 2 costs have been presented at current day prices, however those for Options 3 and 4 include inflation allowances to the mid-point of construction.

An inflation allowance of 11.2% has been made. This forecast is based on the BCIS All-In TPI Forecast (as published in September 2024) from Q3 2024 (Index 394) to Q3 2027 (Projected Index 438).

3.1 Option 1: Maintain Existing Facilities on a Care and Maintenance Basis including continued compliance with statutory requirements

The detailed budget calculation for this option is set out in Appendix A – Option 1, along with a cash flow forecast, by financial year, for the capital element of the works. In this case, as it is a care and maintenance only option, there is only a small initial capital expenditure to address backlog maintenance.

The total costs for this option are therefore only life cycle costs. In this option to ensure a like for like comparison with the remaining options the life cycle is calculated over a twenty-seven-year period. (The other options are a two-year capital build followed by a 25-year operational period).

The total whole life costs are therefore £10.250m.

3.2 Option 2: Invest in existing facilities and develop as far as the sites will allow.

The detailed budget calculation for this option is set out in Appendix A – Option 2, along with a cash flow forecast, by financial year, for the capital element of the works.

The total costs for this option are an initial capital expenditure of £17.977m with a life cycle cost of £3.504m. over the following twenty-five-year operational period.

The total whole life costs are therefore £21.481m.

3.3 Option 3: Develop a new Training Centre to meet Core Training Needs

The detailed budget calculation for this option is set out in Appendix A – Option 3, along with a cash flow forecast, by financial year, for the capital element of the works.

In addition, this option requires the purchase of a new site. The land purchase costs are not considered in this appraisal as the site has recently been purchased by the Authority.

The total costs for this option are an initial capital expenditure of £37.417m with a life cycle cost of £3.820m over the following twenty-five-year operational period.

The whole life time costs are therefore £ 41.237m.

This option also has an additional benefit insofar that it will allow a reallocation of office accommodation, thus allowing the termination of the lease on Unit 8B, saving the Authority £100.3 k per annum in revenue costs (based on current expenditure). This revenue saving would equate to a total of £2.51m over 25 years.

3.4 Option 4: Develop a new multi hazard, multi-agency Training Centre

The detailed budget calculation for this option is set out in Appendix A – Option 4, along with a cash flow forecast, by financial year, for the capital element of the works.

In addition, this option requires the purchase of a new site. The land purchase costs are not considered in this appraisal as the site has recently been purchased by the Authority.

The total costs for this option are an initial capital expenditure of £46.719m with a life cycle cost of £4.033m over the following twenty-five-year operational period.

The whole life time costs are therefore £50.752m.

This option also has an additional benefit insofar that it will allow a reallocation of office accommodation, thus allowing the termination of the lease on Unit 8B, saving the Authority £62.4 k per annum in rental. This revenue saving would equate to a total of £1.56m over 25 years.

3.5 Quantitative Analysis Summary

The summary table below details the total life cycle costs of each Option over a typical twenty-five-year period.

Option	Capital Cost	Life Cycle (25 years)	**Whole Life Cost**
Option 1: Care & Maintenance	£ 5,530,000	£ 4,720,000	**£ 10,250,000**
Option 2: Invest in Existing	£ 17,977,000	£ 3,504,000	**£ 21,481,000**
Option 3: Core Training	£ 37,417,000	£ 3,820,000	**£ 41,237,000**
Option 4: Whole Site	£ 46,719,000	£ 4,033,000	**£ 50,752,000**

4.0 Cost Value Reconciliation and Recommendation

4.1 This section details in the table below, a cost / value reconciliation of each option and concludes which offers the best "Value for Money".

The methodology is simply to divide the whole life cost by the qualitative score which gives a "cost per quality point". The lowest cost per point providing the best "Value for Money" for the investment made.

It should be noted this is not a calculation of affordability.

Option	Whole Life Cost	Qualitative Score	Cost / Value Score
Option 1: Care & Maintenance	£10.250m	15	0.68
Option 2: Invest in Existing	£ 21.481m	27	0.79
Option 3: Core Training	£ 41.237m	93	0.44
Option 4: Whole Site	£ 50.752m	100	0.51

4.2 Analysis and Risk Consideration

The lowest cost / value score of 0.44 is achieved by Option 3, which confirms that this option gives NWFRS the most qualitative value per pound spent and therefore represents the best "value for money".

The highest cost / value scores are achieved by Options 1 and 2, which confirm these options as giving NWFRS the least qualitative value per pound spent and therefore providing the least "value for money".

As stated earlier in Sections 2 and 3, these options, both of which utilise the existing premises contain significant barriers to delivery requiring additional land purchase, where land is unavailable and challenging planning approvals which are unlikely to be successful. As such there is a very high risk that neither option is deliverable and consequently NWFRS would be left with substantially sub-standard and legally non-compliant training facilities beyond 2030.

Options 1 and 2 also still contain shortfalls in the training facilities that they offer, in comparison to Option 3, which may also lead to a growing firefighter skills gap as new training techniques are introduced and new risks emerge.

Option 4 provides the second-best value for money, however, this comes at considerable extra capital cost than option 3, accordingly this is not recommended for further development.

It is therefore recommended that Option 3 be proceeded with, and the following Section 5 of this business case focuses on the delivery of this option only.

5.0 Analysis of Selected Option

5.1 Site Appraisal

The consultancy team of IKG Consulting Limited, Owen Devonport and Perfect Circle (a consortium of consultants of whom BGH (Architects), Harley Haddow (Building Services & Low Carbon and Gleeds (Quantity Surveying)) have, alongside officers from NWFRS, undertaken a due diligence on the land purchased and its suitability for the implementation of Option 3.

This due diligence has involved undertaking a number of surveys and preparing outline designs for the major building elements. This is both to inform the cost models and to confirm that there are no major barriers to prevent the development for the intended use.

Design Works:

The outputs from the design work are attached to this business case as Appendices B – J.

This design work concludes that, the proposed Option 3 will:

- Fit on the site
- Can be constructed to a standard of Zero Carbon for regulated energy
- Can be adequately drained, serviced and accessed.
- Can be built at reasonable cost given the ground conditions identified

Surveys and Reports:

Topographical and Utility Survey – This survey has identified a high-pressure gas main with a substantial easement along the site boundary with the main road and a second medium pressure gas main to the northern boundary of the site. The impact of these findings on the current design has been minimal and both are incorporated in the Option 3 scheme presented.

The Topographical Survey has also identified the site slope which whilst more than originally expected can be developed. The Option 3 scheme and budget included in this business case makes allowances for the necessary retaining walls and earth movement required as a result of this.

Site Investigation Works – The site investigation has identified largely good ground with minimal contamination. There two small areas of concern on the site in respect of both contamination and soft ground, but these appear at this stage to be isolated. Allowances have been included to address the known issues.

The ground water has also been tested for both contamination and depth, no concerns have been identified in either respect.

It should be noted that prior to a planning approval being granted further, more detailed contamination testing will be required. Also, the work done to date has not included breaking through hard standings and there remains a substantial risk that poor ground and contamination may be located were testing has not taken place. This is a normal risk at this stage in a development and contingency sums have been included in the budget cost to be set against this item if required.

Ecology Survey –The Ecologist has identified, as expected, that the site contains a substantial newt population. This will need to be managed, however the work necessary is now quantified and a budget included in the cost plans. The time constraints have also been incorporated into the programme. The programme currently presumes the newt fencing and trapping will be undertaken in the period February 2025 – June 2025, however this is dependent on weather and temperature. In the event that it is not possible to complete this by September 2025, then this work would be delayed until the following year, as it can only be done in specific seasons.

Arboriculture Survey – This survey did not identify any concerns.

Flood Consequence Assessment – This assessment did not identify any concerns and the site is not located in an area liable to flooding.

Planning

Appendix O includes a Sequential Test Report and a Marketing Report on the viability of this development from a planning perspective.

The project has been discussed with officers from the planning authority. The planning authority have provided caveated comments that whilst the approval of the development is subject to many detailed aspects which have not yet been developed or submitted, the

principle of using the land for this use would be supported, subject to the formal acceptance of the draft sequential test and marketing reports provided.

A consultation with the HSE has also revealed the existence of two potential “no build” zones on the site. One is the high-pressure gas main described above which we are not proposing to develop. The second zone appears to be radius around a point on the site which would appear to be the historical location of the glassworks blast furnace. The HSE have advised that they will remove their “no build” guidance when they are notified by the planning authority that the hazard no longer exists. The planning authority have indicated they will do this on receipt of a formal planning application.

In summary, whilst the investigations have identified some issues which require management, the process for doing this is identified, programmed and budgeted in the cost models. As such there are believed to be no major barriers preventing the site from being developed for its intended use by NWFRS.

5.2 Project Programme & Gateway Reviews

A detailed programme for the procurement of the selected option 3 is included at Appendix R.

The proposed programme, of necessity, makes a number of assumptions around the project start date, namely that approval to purchase the land and commence the project is given by the end of October 2024, and that the land purchase is completed by the end of September 2024.

The first stages in the development process would be to undertake three key tasks:

- Newt Mitigation Works on site.
- Commence the Planning Application process and submit a planning application.
- Appoint the design team and commence design development to RIBA Stage 3.

These are all lengthy activities and we would anticipate completion by October 2025 for the newt mitigation and planning approval, with completion of the RIBA Stage 3 design occurring in December 2025, after which Gateway Review 1 would be undertaken to confirm the

continued viability of the project and the readiness to proceed to the next stage of detailed design and development and agreement of the contract price

The programme also proposes the procurement and appointment of a design and build contractor partner by June 2025 to assist in the design process. This would initially only be for the pre-construction phase which would complete in November 2026 with the completion of detailed design and calculation of a contract sum.

A second Gateway Review to approve the final designs, the signing of the building contract and the commencement of construction. It is envisaged that this will occur in December 2026, with work commencing on site in February 2027, for an estimated construction period of 18 months.

The anticipated project completion would therefore be July 2028.

5.3 Budget and Cash Flow

Appendix A sets out the capital budget requirement for the selected Option 3 as £37.417m including all design fees and contingencies. This excludes the lifecycle costs in section 4 which would be funded from the revenue budget.

Based on the programme at Appendix R, this would result in the following anticipated cash flow.

Financial Year	Nett Cash Flow
2024 / 25	£ 0.440m
2025 / 26	£ 1.270m
2026 / 27	£ 1.270m
2027 /28	£ 23.957m
2028 / 29	£ 10.480m
Total:	**£ 37.417m**

5.4 Low Carbon Credentials

Harley Haddow have undertaken dynamic thermal modelling for the two occupied buildings on the site (the Admin & Training Hub, and the BA School) to assess at this early stage the likely operational carbon footprint for the buildings. They have also calculated the potential carbon associated with the wider site when it comes to the general lighting of it, and an analysis of expected use of the EV car chargers.

From this modelling and calculations, they have been able to predict the total energy use intensity and associated carbon footprint per year for the whole site (excluding any carbon associated with actual training exercises which are specifically excluded in the 'Welsh Public Sector Net Zero Carbon Reporting Guide' [Welsh Government]).

The analysis, whilst still very early stage, indicates that the total carbon emissions from site per year is around 60tCO_{2e}.

With a view to offsetting all of the carbon emissions, the proposals include circa 2,900sqm of photo voltaic (PV - solar panels generating electricity) arrays, and around 6,500sqm of growth areas for trees – which naturally absorb carbon as they grow. These combined are capable of offsetting 60-70tCO_{2e} per year, ultimately demonstrating that at this stage, **the site is shown to be zero carbon in operation**.

5.5 Procurement Process

The programme is currently predicated that the procurement of the selected option 3 will take place using appropriate and compliant framework agreements in line with NWFRS procurement procedures.

The suggested procurement methodology below is selected in order to ensure that the appointed consultants and contractor are suitably experienced in fire training centres and are of a suitable size to undertake a project of this magnitude, whilst maximising the opportunities for local businesses to support and benefit from this significant investment.

The initial proposal would be to procure the necessary design consultants and Contractor as follows:

Design Consultants

It is proposed these would be procured via the SCAPE framework and the appointment of Perfect Circle as the primary design consultant. This framework is selected as it has considerable flexibility within it, to allow NWFRS to take a leading role in selecting the appointment of the design sub consultants ensuring that were possible local suppliers are appointed. This Framework also meets the necessary statutory criteria for a project of this value and has been subject to market testing when undertaking the selection of the Framework supplier.

Perfect Circle provides clients with a diverse, integrated, and local team of specialist suppliers, achieving value for money, efficiency and local economic impact. It has delivered more than 3,000 projects via their public sector frameworks since 2016, supporting clients over with £720m of service delivery, adding £110m of social value and community benefit.

Design and Build Contractor

It is proposed the design and build contractor would be procured via the compliant Pagabo framework, which currently has suppliers of the necessary size and experience appointed. Using this framework allows a mini competition selection process to take place between each of the framework suppliers, testing a number of elements, such as:

- Selected commercial elements
- Quality processes
- Experience
- Inclusion of local suppliers
- Social Value offering

Pagabo are a Pioneer member of Social Value UK and have delivered social & economic value across the UK. £54 Million of this within Wales. This includes areas such as:

- Apprentices

- Job creation
- Workforce productivity
- Benefits to local economies
- Work placements

This Framework also meets the necessary statutory criteria for a project of this value and has been subject to market testing when undertaking the selection of the Framework suppliers.

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North Wales Fire Training Centre

Capital and Lifecycle Costs
Business Case Options 1- 4
August 2024

LVCM0357

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Option 4 Capital and Lifecycle Costs

Indicative Cashflow Forecast

Drawing List

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Option 1 Capital and Lifecycle Costs

North Wales Fire Training Centre

North Wales Fire and Rescue Service
Works to existing training facilities
Cost Estimate - Option 1
August 2024

	Quant	Unit	Rate	Total	
Dolgellau (1992 Build)					
Major Refurbish existing fire house	321.49	m2	2,055	660,533	
incl ful re-wiring, re-roof, temperature monitoring, smoke system, internal doors, int walls, ext windows and doors.					
Replace temporary portacabin buildings	1.00	item	164,368	164,368.00	
External works/drainage	1.00	item	102,730.00	102,730.00	
Installation of smoker cleaner and ductwork	1.00	item	770,475.00	770,475.00	
Sub total				**1,698,106.35**	
Rhyl (1988 Build)				-	
Refurbish existing cold smoke house	210.4	m2	2,054.6	432,288	
Refurbish masonry drill tower	147.40	m2	1,027.30	151,424.02	
				-	
Sub total				**583,711.86**	
Wrexham (2016 Build)					
Light refurbishment existing fire house	315	m2	1,027	323,505	
Sub total				**323,505.00**	
Deeside (2016 Build)					
Light refurbishment existing fire house	301	m2	1,027	309,217	
Sub total				**309,217.30**	
SUBTOTAL				**2,914,541**	
Main Contractor Preliminaries	25.0%			728,635	
Main Contractor's Risk Allowance				-	
Main Contractor's Overheads and Profit	10.0%			364,318	
SUB TOTAL (WORKS COST ESTIMATE)				**4,007,493**	
Allowance for client fees	20%			801,499	
Client Risk Allowance	15.0%			721,349	
TOTAL ESTIMATED PROJECT COST - CURRENT DAY (excluding VAT)				**5,530,341**	
Inflation to mid-point construction	excluded				
TOTAL ESTIMATED PROJECT COST 3Q 24 (excluding VAT)				**5,530,341**	

Notes
Indicative costs only for refurbishment of existing properties

Gleeds general clarifications:
Gleeds' construction cost forecasts are based on the latest information from the supply chain and are current at the date of issue. However, they are subject to change due to evolving market conditions and disruptors, necessitating regular reviews to incorporate market feedback.

While the volatility in materials pricing has cooled, prices remain elevated compared to pre-pandemic levels. Labour pressures persist, with the effects of the long-term skills shortage mounting.

Although forecasts suggest lower construction output in 2024, there is growing optimism in industry data indicating an increase in new orders. Additionally, the expectation of interest rate cuts is bolstering confidence. There is also a strong pipeline of work related to infrastructure and energy investment, particularly concerning the transition to net zero.

Caution remains within the supply chain, especially given the elevated levels of construction insolvencies, which affect risk appetite and capacity in certain areas. This has the potential to result in regional price uplifts due to the limited availability of subcontractors with the resulting associated economic supply and demand impact.

As geopolitical tensions continue, uncertainty persists. Any escalation in unrest could significantly disrupt supply chains and reignite inflation. Therefore, Gleeds recommends regularly reviewing and updating information based on the latest conditions.

NORTH WALES TRAINING CENTRE
BCIS LIFE CYCLE COST ANALYSIS
OPTION 1

FIRE STATIONS
BASED ON 1810m2 (AREA OF REFURBISHMENT)

	RENEW					RENEW	RENEW	MAINTAIN		MAINTAIN	
	FABRIC	SERVICES	DÉCOR	WREXHAM	DEESIDE	DOLGELLAU PORTACABINS	CONTAINERS	FABRIC	SERVICES	CONTAINERS	**TOTALCOST £**
1	10,792	4,388	0				0	5,811	8,150	0	29,140
2	10,792	7,313	0				0	5,811	13,582	0	37,499
3	10,792	4,388	897				0	5,811	8,150	0	30,037
4	10,792	7,411	0				0	5,811	13,763	41,092	78,869
5	10,792	17,260	0				0	5,811	32,054	0	65,917
6	10,792	7,313	20,424				0	5,811	13,582	0	57,922
7	10,792	4,388	0				0	5,811	8,150	0	29,140
8	10,792	7,411	0				164,368	5,811	13,763	0	202,145
9	10,792	4,388	897				0	5,811	8,150	0	30,037
10	71,327	20,185	0				0	38,407	37,486	0	167,406
11	10,792	4,388	0				0	5,811	8,150	0	29,140
12	10,792	7,313	20,456			164,368	0	5,811	13,582	41,092	263,414
13	10,792	4,388	0				0	5,811	8,150	0	29,140
14	10,792	7,313	0				0	5,811	13,582	0	37,499
15	20,792	39,590	897	1,195,425	1,142,295		0	5,811	73,525	0	2,478,335
16	10,792	7,411	0				164,368	5,811	13,763	0	202,145
17	10,792	4,388	0				0	5,811	8,150	0	29,140
18	10,792	7,313	20,456				0	5,811	13,582	0	57,954
19	10,792	4,388	0				0	5,811	8,150	0	29,140
20	71,327	23,696	0				0	38,407	44,006	41,092	218,528
21	10,792	4,388	897				0	5,811	8,150	0	30,037
22	10,792	7,313	0				0	5,811	13,582	0	37,499
23	10,792	4,388	0				0	5,811	8,150	0	29,140
24	10,792	7,411	20,424			164,368	164,368	5,811	13,763	0	386,937
25	10,792	17,260	0				0	5,811	32,054	0	65,917
26	10,792	7,313	0				0	5,811	13,582	0	37,499
27	10,792	4,388	897				0	5,811	8,150	0	30,037
Total	**422,450**	**247,091**	**86,243**	**1,195,425**	**1,142,295**	**328,736**	**493,104**	**222,099**	**458,895**	**123,276**	**4,719,614**

NOTES
Airbus Containers - assumed repairs at Yr 4, 12 and 20
Airbus Containers - assumed replaced at Yr 8, 16 and 24.
Portacabins (Dolgellau) assumed replaced at year 12 and 24.
Assumed Major Refurbishment of Deeside and Wrexham fire houses required at Year 15
Based on Year 1 start of 2025, no allowance for inflation beyond this date
Lifecycle analysis based on 27 years
Excludes cleaning costs, facilities management and energy costs
Life Cycle Costs based on figures provided by BCIS for similar property with uplift included due to age/condition.

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Option 2 Capital and Lifecycle costs

North Wales Fire Training Centre

North Wales Fire and Rescue Service
Works to existing training facilities
Cost Estimate - Option 2
August 2024

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	Quant	Unit	Rate	Total	
Dolgellau					
Major Refurbishment existing fire house	321.49	m2	2,054.60	660,533.35	
Installation of smoker cleaner and ductwork	1.00	item	770,475.00	770,475.00	
Allowance for external works / drainage	1.00	item	102,730.00	102,730.00	
New Ablutions building + fireground store	330.00	m2	3,595.55	1,186,531.50	
Major Refurbishment and re-modelling of existing station	404.50	m2	2,054.60	831,085.70	
Additional floor added to existing fire station	404.50	m2	3,595.55	1,454,399.98	
Provision of temporary fire station (off site)	1.00	item	770,475.00	770,475.00	
Rhyl					
Major refurbishment cold smoke house	210.40	m2	2,054.60	432,287.84	
Allowance for external works to yard	1.00	item	102,730.00	102,730.00	
New shower block/Ablutions/BA store	240.00	m2	3,595.55	862,932.00	
Refurb existing training space in the fire station (Classrooms)	120.00	m2	1,540.95	184,914.00	
Refurbish masonry drill tower	147.40	m2	1,027.30	151,424.02	
Wrexham					
Medium level refurbishment of the fire house	314.90	m2	1,540.95	485,245.16	
Ablutions facilities + classroom	290.00	m2	3,595.55	1,042,709.50	
Small storage facility	100.00	m2	2,054.60	205,460.00	
Deeside					
Light refurbishment of existing fire house	300.50	m2	1,027.30	308,703.65	
New ablutions facilities	240.00	m2	3,595.55	862,932.00	
Airbus					
New ablutions facilities	240	m2	3,595.55	862,932.00	
SUBTOTAL				**11,278,501**	
Main Contractor Preliminaries	20.0%			2,255,700	
Main Contractor's Risk Allowance	included				
Main Contractor's Overheads and Profit	5%			676,710	
SUB TOTAL (WORKS COST ESTIMATE)				**14,210,911**	
Allowance for fees	15%			2,131,637	
Risk Allowance	10.0%			1,634,255	
TOTAL ESTIMATED PROJECT COST - CURRENT DAY (excluding VAT)				**17,976,802**	
Inflation to mid-point construction	excluded				
TOTAL ESTIMATED PROJECT COST TO 3Q 24 (excluding VAT)				**17,976,802**	

Notes
Indicative costs only for refurbishment of existing properties together with provision of new accommodation as indicated above in line with the business case

Gleeds general clarifications:
Gleeds' construction cost forecasts are based on the latest information from the supply chain and are current at the date of issue. However, they are subject to change due to evolving market conditions and disruptors, necessitating regular reviews to incorporate market feedback.

While the volatility in materials pricing has cooled, prices remain elevated compared to pre-pandemic levels. Labour pressures persist, with the effects of the long-term skills shortage mounting.

Although forecasts suggest lower construction output in 2024, there is growing optimism in industry data indicating an increase in new orders. Additionally, the expectation of interest rate cuts is bolstering confidence. There is also a strong pipeline of work related to infrastructure and energy investment, particularly concerning the transition to net zero.

Caution remains within the supply chain, especially given the elevated levels of construction insolvencies, which affect risk appetite and capacity in certain areas. This has the potential to result in regional price uplifts due to the limited availability of subcontractors with the resulting associated economic supply and demand impact.

As geopolitical tensions continue, uncertainty persists. Any escalation in unrest could significantly disrupt supply chains and reignite inflation. Therefore, Gleeds recommends regularly reviewing and updating information based on the latest conditions.

NORTH WALES TRAINING CENTRE
BCIS LIFE CYCLE COST ANALYSIS
OPTION 2

FIRE STATIONS
BASED ON 3663m2 (AREA OF REFURBISHMENT)

	RENEW			RENEW	MAINTAIN		MAINTAIN	
	FABRIC	SERVICES	DÉCOR	CONTAINERS	FABRIC	SERVICES	CONTAINERS	**TOTALCOST £**
1	21,840	8,880	0	0	11,760	16,492	0	**58,972**
2	21,840	14,800	0	0	11,760	27,486	0	**75,887**
3	21,840	8,880	1,814	0	11,760	16,492	0	**60,786**
4	21,840	14,998	0	0	11,760	27,853	41,092	**117,543**
5	21,840	34,929	0	0	11,760	64,869	0	**133,398**
6	21,840	14,800	41,332	0	11,760	27,486	0	**117,219**
7	21,840	8,880	0	0	11,760	16,492	0	**58,972**
8	21,840	14,998	0	164,368	11,760	27,853	0	**240,819**
9	21,840	8,880	1,814	0	11,760	16,492	0	**60,786**
10	144,349	40,850	0	0	77,727	75,864	0	**338,789**
11	21,840	8,880	0	0	11,760	16,492	0	**58,972**
12	21,840	14,800	41,397	0	11,760	27,486	41,092	**158,376**
13	21,840	8,880	0	0	11,760	16,492	0	**58,972**
14	21,840	14,800	0	0	11,760	27,486	0	**75,887**
15	21,840	80,121	1,814	0	11,760	148,796	0	**264,331**
16	21,840	14,998	0	164,368	11,760	27,853	0	**240,819**
17	21,840	8,880	0	0	11,760	16,492	0	**58,972**
18	21,840	14,800	41,397	0	11,760	27,486	0	**117,284**
19	21,840	8,880	0	0	11,760	16,492	0	**58,972**
20	144,349	47,954	0	0	77,727	89,058	41,092	**400,180**
21	21,840	8,880	1,814	0	11,760	16,492	0	**60,786**
22	21,840	14,800	0	0	11,760	27,486	0	**75,887**
23	21,840	8,880	0	0	11,760	16,492	0	**58,972**
24	21,840	14,998	41,332	164,368	11,760	27,853	0	**282,151**
25	21,840	34,929	0	0	11,760	64,869	0	**133,398**
26	21,840	14,800	0	0	11,760	27,486	0	**75,887**
27	21,840	8,880	1,814	0	11,760	16,492	0	**60,786**
Total	834,708	500,056	174,530	493,104	449,441	928,688	123,276	**3,503,803**

NOTES
Airbus Containers - assumed repairs at Yr 4, 12 and 20
Airbus Containers - assumed replaced at Yr 8, 16 and 24.
Based on Year 1 start of 2025, no allowance for inflation beyond this date
Lifecycle analysis based on 27 years
Excludes cleaning costs, facilities management and energy costs
Life Cycle Costs based on figures provided by BCIS for Fire Stations

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Option 3 Capital and Lifeycle Costs

North Wales Fire Training Centre

North Wales Fire and Rescue Service
New Training Centre Site
Cost Estimate - Option 3B
August 2024

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	Quant	Unit	Rate	Total	
Site Clearance generally (excluding GCN area)	29,509.00	m2			
Break up existing concrete slabs/kerbs etc; grubbing up shallow foundations	3,405.00	m2			
Demolish existing concrete retaining walls, assume 200 thick	200.00	m2			Incl below as client enabling works
Allowance for grubbing up existing underground drainage	2,000.00	m			
Allowance for breaking out existing manholes	100.00	nr			
Allowance for breaking up existing tarmac roads/paths/kerbs	6,479.00	m2			
Reduced level excavation, to formation level; ave say 450mm across the site	13,279.05	m3	3.60	47,745	
Disposal to on site spoil heaps	13,279.05	m3	6.16	81,849	
Back fill to make up levels	13,279.05	m3	5.14	68,208	Assume all re-used from site material
Dispose off site surplus excavated material		m3	30.82	-	Assumed all material on site re-used.
Buildings					
Admin Hub and HQ	1,819.00	m2	3,976.92	7,234,026	as previous uplifted to current day
BA Classrooms incl Gym.	960.00	m2	3,724.87	3,575,875	see separate cost plan
RTC Building incl Energy Centre + Fireground store	433.00	m2	3,223.08	1,395,594	
Appliance garage	344.00	m2	2,300.00	791,200	see separate cost plan, area increased WC/CL added + storage
Firehouse	680.00	m2	2,230.39	1,516,666	see separate cost plan, unchanged costs uplifted for inflation only
BA training building	133.00	m2	1,851.52	246,253	see separate cost plan
Forced entry / MoE rig	1.00	item	5,136.50	5,137	
House + shop/flat	234.00	m2	2,415.85	565,309	see separate cost plan, updated 21.8.24
Allowance for furniture (Contractor supply and install)	1.00	item	205,460.00	205,460	
Scenarios					
Highway Scenario - allowance for crash barriers	1.00	item	21,162.38	21,162	
BA Crawl Pipe	1.00	item	15,871.79	15,872	
LPG tank farm	1.00	item	61,638.00	61,638	tanks and valves only excl hardstanding/fence
Rural ditch	1.00	item	5,290.60	5,291	
FBT containers	1.00	item	164,368.00	164,368	
Canopy over FBT Containers	1.00	item	231,142.50	231,143	
Training towers (2nr)	1.00	item	211,623.80	211,624	
Foundation bases to towers	1.00	item	15,409.50	15,410	
Deep water pit	1.00	item	15,871.79	15,872	
Smoke cleaner (excl electric supply)	1.00	item	513,650.00	513,650	
Specialist installation to create LPG scenario terraced house	1.00	item	130,087.00	130,087	
Industrial Structure incl LPG Scenario	1.00	item	529,059.50	529,060	
Other props					
Dressing shelter	1.00	item	15,871.79	15,872	
M&E installations					
Site wide distribution;					
hydrant mains pipework	804.00	m	185.17	148,877	
sprinkler pipework	217.00	m	185.17	40,182	
HV/LV cable	786.00	m	100.52	79,010	
LPG gas distribution pipework	1.00	item	10,273.00	10,273	
domestic water pipework (mains fed)	345.00	m	58.20	20,078	
Service trenches	2,153.00	m	58.20	125,297	
Roof PV's to Buildings incl fixing system	830.00	m2	256.83	213,165	
Battery Storage	1.00	item	105,811.90	105,812	
External lighting around the site	1.00	item	162,518.86	162,519	Adjusted pro rata
Electric vehicle charging - allowance for 8nr vehicle spaces	8.00	nr	5,290.60	42,325	8nr double chargers
Sprinkler tank and base	1.00	item	105,811.90	105,812	
Emergency generator	1.00	item			excluded
Water storage tank 100,000 L (Hydrant) incl pump house	1.00	item	142,846.07	142,846	
Substation enclosure	1.00	item	20,000.00	20,000	
Battery storage enclosure	1.00	item	30,000.00	30,000	
Above ground fuel tank	1.00	item	15,000.00	15,000	
External works					
Concrete hardstandings	5,546.00	m2	66.77	370,331	
Concrete Retaining walls					
600 high x 300 wide	16.20	m2	770.48	12,482	
1150 high x 300 wide	69.00	m2	770.48	53,163	
450mm high retaining wall to front Admin Hub, assume brick	22.50	m2	513.65	11,557	
Allowance for steps and ramps to front entrance Admin Hub	1.00	item	25,682.50	25,683	
2.4m high earth retaining system	96.00	m2	565.02	54,241	
Retaining wall to water storage area	22.00	m2	770.48	16,950	
Soft landscaped areas	4,455.00	m2	16.18	72,082	
Allowance for mix of plants/shrubs	1.00	item	30,819.00	30,819	
Hedgerow to car park	1.00	item	30,000.00	30,000	for Bio Diversity Net Gain
Tree planting zone	incl above				
Wildflower planting area	3,925.00	m2	16.18	63,506	
Trees	56.00	nr	264.53	14,814	note: saplings only
Pedestrian walkways	2,456.00	m2	51.37	126,152	
Tarmac (Highway Scenario and Access Road around site)	4,862.00	m2	94.51	459,515	
Car Park (Tarmac/Permeable Paving)	3,104.00	m2	105.81	328,440	
Allowance for kerbs	1,849.00	m	41.09	75,979	
Allowance for footpath edging	737.00	m	20.55	15,142	
Road markings	1.00	item	10,581.19	10,581	
Timber fencing to houses	32.00	m	79.36	2,539	
Shelter to Well being areas		m2	264.53	-	not shown on drawing
External plant areas fencing/gates	140.00	m	100.52	14,073	incl LPG area, retained as previous Opt 3
External site furniture; benches, bins etc	1.00	item	20,546.00	20,546	
External Signage	1.00	item	51,365.00	51,365	
Secure perimeter fencing	531.00	m	169.30	89,898	

North Wales Fire and Rescue Service
New Training Centre Site
Cost Estimate - Option 3B
August 2024

Vehicle / pedestrian gates	1.00	item	20,802.83	20,803	
Timber post/rail fence to front entrance/car park	377.00	m	51.37	19,365	
Great Crested Newt area	13,843.00	m2			left fallow
Surface Water Drainage (hard landscaped areas)	15,968.00	m2	49.73	794,114	
Attenuation; Tank 1 1.8m deep x 17m wide x 53m long, Tank 2 1.2m deep x 15m x 30m	2,161.80	m3	323.60	699,557	retained as previous cost plan
Foul Water Drainage	4,603.00	m2	42.32	194,821	
Allow for connection into existing drain	1.00	item	26,452.98	26,453	
Incoming services; power, data, water					
Incoming power	1.00	item	154,095.00	154,095	Based on quotation received from SPEN.
Incoming water	1.00	item	51,365.00	51,365	Initial advice from Welsh Water
Incoming data/telecoms	1.00	item	51,365.00	51,365	
Allowance for modification to bellmouth junction	1.00	item	20,000.00	20,000	
SUBTOTAL				**22,907,363**	
Main Contractor Preliminaries	12.5%			2,863,420	
Main Contractor's Risk Allowance	3%			773,123	
Main Contractor's Overheads and Profit	5%			1,327,195	
SUB TOTAL (WORKS COST ESTIMATE)				**27,871,102**	
Main Contractor Fees.					
Main Contractor Pre Construction fee (RIBA STAGE 3/4) SAY 0.75%	0.75%			209,033	
Main Contractor Design fees RIBA 4-6	5.25%			1,463,233	
Client costs					
Design Fees - allowance					
QS RIBA 1-6	1.00%			278,711	
PM RIBA 1-6	0.5%			139,356	
Architect to RIBA 3	1.0%			278,711	
M&E to RIBA 4	0.75%			209,033	
Structural / Civil Engineer to RIBA 3	0.5%			139,356	
M&E Technical Advice RIBA 5/6	1.00	item	102,730.00	102,730	
Building Clerk of Works RIBA 5/6	1.00	item	102,730.00	102,730	18 MONTHS ON SITE
CDM Principal Designer RIBA 1-6	1.00	item	51,365.00	51,365	
Building Regulations Principal Designer	1.00	item	51,365.00	51,365	
BREEAM Advisor and Reports RIBA 1-6	1.00	item	77,047.50	77,048	
Planning fees	1.00	item	32,359.95	32,360	
Building Regulation fees	1.00	item	35,955.50	35,956	
Site Surveys	1.00	item	61,638.00	61,638	including Ground Investigation
GCN Mitigation	1.00	item	154,095.00	154,095	survey costs, newt fencing
Client enabling works / site clearance					
Site Clearance generally to whole site (excluding GCN area)	41,053.00	m2	5.29	217,195	
Break up existing concrete slabs/kerbs etc; grubbing up shallow foundations	7,067.00	m2	14.38	101,639	Assume 150mm thick, crush on site for re-use
Demolish existing concrete retaining walls, assume 200 thick	200.00	m2	102.73	20,546	
Allowance for grubbing up existing underground drainage	2,600.00	m	51.37	133,549	
Allowance for breaking out existing manholes	130.00	nr	513.65	66,775	
Allowance for breaking up existing tarmac roads/paths/kerbs	8,650.00	m2	15.93	137,824	Assume 100mm thick
Main contractor attendances	10%			67,753	
Client small props allowance	1.00	item	51,365.00	51,365	
Land costs incl SDLT	Excluded				
Client legal fees	Excluded				
Financing costs	Excluded				
Client Risk Allowance	5.0%			1,602,723	
TOTAL ESTIMATED PROJECT COST - CURRENT DAY (excluding VAT)				**33,657,189**	1.1955672
Inflation to mid-point construction (3Q 2027)	11.2%			3,759,508	BCIS 394 (3Q 24) to 438 (3Q 27)
TOTAL ESTIMATED PROJECT COST TO 4Q 26 (excluding VAT)				**37,416,697**	

North Wales Fire and Rescue Service
New Training Centre Site
Cost Estimate - Option 3B
August 2024

Risks - currently excluded from Works cost estimate

Costs for dealing with poor ground conditions e.g poor bearing capacity, soft spots, obstructions and the like
Surplus material from excavations are assumed to be inert
Removal and disposal of contaminated materials off site incl asbestos
Removal of redundant undergound buried services
Diversion of services e.g underground or overhead cables, gas/water mains
Dewatering measures during construction
Suitability of fill for re-use on site
Availability of services locally such as incoming power, water and telecoms.
Dealing with Ecological issues - over and above current allowances
Delays to programme
Abnormal or onerous planning conditions
Inflation - over and above current allowances
Contractor availability to undertake project of this scale and nature
Off site highway works / Section 278
Phasing of the works

Gleeds general clarifications:

Gleeds' construction cost forecasts are based on the latest information from the supply chain and are current at the date of issue. However, they are subject to change due to evolving market conditions and disruptors, necessitating regular reviews to incorporate market feedback.

While the volatility in materials pricing has cooled, prices remain elevated compared to pre-pandemic levels. Labour pressures persist, with the effects of the long-term skills shortage mounting.

Although forecasts suggest lower construction output in 2024, there is growing optimism in industry data indicating an increase in new orders. Additionally, the expectation of interest rate cuts is bolstering confidence. There is also a strong pipeline of work related to infrastructure and energy investment, particularly concerning the transition to net zero.

Caution remains within the supply chain, especially given the elevated levels of construction insolvencies, which affect risk appetite and capacity in certain areas. This has the potential to result in regional price uplifts due to the limited availability of subcontractors with the resulting associated economic supply and demand impact.

As geopolitical tensions continue, uncertainty persists. Any escalation in unrest could significantly disrupt supply chains and reignite inflation. Therefore, Gleeds recommends regularly reviewing and updating information based on the latest conditions.

NORTH WALES TRAINING CENTRE
BCIS LIFE CYCLE COST ANALYSIS
OPTION 3

FIRE SERVICE ADMIN/CONTROL BUILDINGS EXCLUDING HQ
BASED ON 1819m2

	RENEW			MAINTAIN		
	FABRIC	SERVICES	DÉCOR	FABRIC	SERVICES	**TOTAL ADMIN HUB COST £**
1	8,901	9,697	0	4,793	18,008	**41,399**
2	9,325	11,025	0	5,021	20,475	**45,846**
3	8,901	10,095	0	4,793	18,748	**42,537**
4	9,325	11,025	0	5,021	20,475	**45,846**
5	11,444	10,494	0	6,162	19,488	**47,588**
6	9,325	11,423	20,807	5,021	21,215	**67,791**
7	8,901	9,697	0	4,793	18,008	**41,399**
8	9,325	11,025	0	5,021	20,475	**45,846**
9	8,901	10,095	0	4,793	18,748	**42,537**
10	127,366	12,220	3,804	68,582	22,695	**234,667**
11	8,901	9,697	0	4,793	18,008	**41,399**
12	9,325	11,423	40,317	5,021	21,215	**87,301**
13	8,901	9,697	0	4,793	18,008	**41,399**
14	9,325	11,025	0	5,021	20,475	**45,846**
15	11,444	10,892	0	6,162	20,228	**48,726**
16	9,325	11,025	0	5,021	20,475	**45,846**
17	8,901	9,697	0	4,793	18,008	**41,399**
18	9,325	11,423	20,807	5,021	21,215	**67,791**
19	8,901	9,697	0	4,793	18,008	**41,399**
20	127,366	64,290	3,804	68,582	119,396	**383,438**
21	8,901	9,697	0	4,793	18,008	**41,399**
22	9,325	11,025	0	5,021	20,475	**45,846**
23	8,901	10,095	0	4,793	18,748	**42,537**
24	9,325	11,025	40,317	5,021	20,475	**86,163**
25	11,444	10,494	0	6,162	19,488	**47,588**
Total	**471,324**	**317,998**	**129,856**	**253,790**	**590,565**	**1,763,533**
£/m2/yr						**38.78**

NOTES

Cost for Building Props is for maintenance and basic fabric renewal only. Assumes a weighting of 80% for renewal/20% maintenance
Based on Year 1 start of 4Q 28, no allowance for inflation beyond this date
Lifecycle analysis based on 25 years
Excludes cleaning costs, facilities management and energy costs
Life Cycle Costs based on figures provided by BCIS

NORTH WALES TRAINING CENTRE
BCIS LIFE CYCLE COST ANALYSIS
OPTION 3

BA SCHOOL AND APPLIANCE GARAGE (BASED ON FIRE STATION LIFE CYCLE MODEL)
BASED ON 1737m2

	RENEW			MAINTAIN		
	FABRIC	SERVICES	DÉCOR	FABRIC	SERVICES	**TOTAL COST OTHER BUILDINGS £**
1	11,225	7,950	0	6,044	4,281	**29,500**
2	11,225	13,251	0	6,044	7,135	**37,655**
3	11,225	7,950	897	6,044	4,281	**30,397**
4	11,225	13,427	0	6,044	7,230	**37,926**
5	11,225	31,271	0	6,044	16,838	**65,378**
6	11,225	13,251	20,446	6,044	7,135	**58,101**
7	11,225	7,950	0	6,044	4,281	**29,500**
8	11,225	13,427	0	6,044	7,230	**37,926**
9	11,225	7,950	897	6,044	4,281	**30,397**
10	74,189	36,572	0	39,948	19,692	**170,401**
11	11,225	7,950	0	6,044	4,281	**29,500**
12	11,225	13,251	20,478	6,044	7,135	**58,133**
13	11,225	7,950	0	6,044	4,281	**29,500**
14	11,225	13,251	0	6,044	7,135	**37,655**
15	11,225	71,730	897	6,044	38,624	**128,520**
16	11,225	13,427	0	6,044	7,230	**37,926**
17	11,225	7,950	0	6,044	4,281	**29,500**
18	11,225	13,251	20,478	6,044	7,135	**58,133**
19	11,225	7,950	0	6,044	4,281	**29,500**
20	74,189	42,932	0	39,948	23,117	**180,186**
21	11,225	7,950	897	6,044	4,281	**30,397**
22	11,225	13,251	0	6,044	7,135	**37,655**
23	11,225	7,950	0	6,044	4,281	**29,500**
24	11,225	13,427	20,446	6,044	7,230	**58,372**
25	11,225	31,271	0	6,044	16,838	**65,378**
Total	**406,553**	**426,490**	**85,436**	**218,908**	**229,649**	**1,367,036**
£/m2/yr						**31.48**

NORTH WALES TRAINING CENTRE
BCIS LIFE CYCLE COST ANALYSIS
OPTION 3

BUILDING PROPS E.G FIRE HOUSE, TERRACED HOUSES
BASED ON 1047M2

	MAINTAIN		RENEWAL	
	FABRIC	SERVICES	BASIC FABRIC RENEWAL	**TOTAL COST BUILDING PROPS £**
1	2,082	1,475	2,568	**6,125**
2	2,082	2,458	2,568	**7,108**
3	2,082	1,475	2,568	**6,125**
4	2,082	2,490	2,568	**7,140**
5	2,082	5,800	2,568	**10,450**
6	2,082	2,458	2,568	**7,108**
7	2,082	1,475	2,568	**6,125**
8	2,082	2,490	2,568	**7,140**
9	2,082	1,475	2,568	**6,125**
10	13,760	6,783	2,568	**23,111**
11	2,082	1,475	2,568	**6,125**
12	2,082	2,458	2,568	**7,108**
13	2,082	1,475	2,568	**6,125**
14	2,082	2,458	2,568	**7,108**
15	2,082	13,303	2,568	**17,953**
16	2,082	2,490	2,568	**7,140**
17	2,082	1,475	2,568	**6,125**
18	2,082	2,458	2,568	**7,108**
19	2,082	1,475	2,568	**6,125**
20	13,760	7,962	2,568	**24,290**
21	2,082	1,475	2,568	**6,125**
22	2,082	2,458	2,568	**7,108**
23	2,082	1,475	2,568	**6,125**
24	2,082	2,490	2,568	**7,140**
25	2,082	5,800	2,568	**10,450**
Total	**75,406**	**79,106**	**64,206**	**218,718**
£/m2/yr				**8.36**

NORTH WALES TRAINING CENTRE
BCIS LIFE CYCLE COST ANALYSIS
OPTION 3

EXTERNAL WORKS

LANDSCAPE MAINTAIN	WHITE LINING REPAIRS	SERVICE PETRO CHEM RIG/LPG	SERVICE SMOKE CLEANER	PUMP MAINTENANCE	CLEANING COSTS (EXCLUDED)	WASTE REMOVAL (EXCLUDED)	**TOTAL COST EXTERNALS £**	**GRAND TOTAL**
14,382			2,055	2,055			**18,491**	**95,516**
14,382			2,055	2,055			**18,491**	**109,101**
14,382	1,079		2,055	2,055			**19,570**	**98,629**
14,382			2,055	2,055			**18,491**	**109,404**
14,382			2,055	2,055			**18,491**	**141,908**
14,382	1,079		2,055	2,055			**19,570**	**152,570**
14,382			2,055	2,055			**18,491**	**95,516**
14,382			2,055	2,055			**18,491**	**109,404**
14,382	1,079		2,055	2,055			**19,570**	**98,629**
14,382			2,055	2,055			**18,491**	**446,671**
14,382			2,055	2,055			**18,491**	**95,516**
14,382	1,079		2,055	2,055			**19,570**	**172,112**
14,382			2,055	2,055			**18,491**	**95,516**
14,382			2,055	2,055			**18,491**	**109,101**
14,382	1,079		2,055	2,055			**19,570**	**214,769**
14,382			2,055	2,055			**18,491**	**109,404**
14,382			2,055	2,055			**18,491**	**95,516**
14,382	1,079		2,055	2,055			**19,570**	**152,602**
14,382			2,055	2,055			**18,491**	**95,516**
14,382			2,055	2,055			**18,491**	**606,406**
14,382	1,079		2,055	2,055			**19,570**	**97,491**
14,382			2,055	2,055			**18,491**	**109,101**
14,382			2,055	2,055			**18,491**	**96,654**
14,382	1,079		2,055	2,055			**19,570**	**171,245**
14,382			2,055	2,055			**18,491**	**141,908**
								0
359,555	**8,629**	**0**	**51,365**	**51,365**			**470,914**	**3,820,202**

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Option 4 Capital and Lifecycle costs

North Wales Fire Training Centre

North Wales Fire and Rescue Service
New Training Centre Site
Cost Estimate - Option 4
August 2024

gleeds

	Quant	Unit	Rate	Total	
Site Clearance generally (excluding GCN area)	29,509.00	m2			
Break up existing concrete slabs; disposal off site	3,405.00	m2			
Demolish existing concrete retaining walls, assume 200 thick	200.00	m2			Incl below as client enabling works
Allowance for grubbing up existing underground drainage	2,000.00	m			
Allowance for breaking out existing manholes	100.00	nr			
Allowance for breaking up existing tarmac roads/paths	6,479.00	m2			
Reduced level excavation, ave 450mm deep to formation level; disposal off site	18,473.85	m3	3.60	66,424	
Disposal to on site spoil heaps	18,473.85	m3	6.16	113,869	
Back fill to make up levels	18,473.85	m3	5.14	94,891	Assume all re-used from site material
Additional RL excavation to rear of site ; disposal off site	17,893.20	m3	43.15	772,031	
Backfill to make up levels (obtained off site); ave 700 thick	8,080.80	m3	46.23	373,563	
Buildings					
Admin Hub incl HQ	1,819.00	m2	3,976.92	7,234,026	see separate cost plan
BA School incl fireground stores, energy centre, RTC classroom	1,157.00	m2	3,223.08	3,729,106	see separate cost plan
Appliance garage	271.00	m2	2,119.38	574,352	see separate cost plan
Firehouse	680.00	m2	2,230.39	1,516,666	see separate cost plan
BA training building & forced entry rig	133.00	m2	1,851.52	246,253	see separate cost plan
Forced entry / MoE rig to the above	1.00	item	5,136.50	5,137	
Terraced houses	349.00	m2	2,417.20	843,601	see separate cost plan
1nr Detached house	182.00	m2	2,035.03	370,375	see separate cost plan
2nr Semi detached houses	242.00	m2	1,945.80	470,883	see separate cost plan
Fast food property/Industrial commercial building	199.00	m2	2,425.02	482,580	see separate cost plan
Farmhouse	62.00	m2	2,463.11	152,713	see separate cost plan
Farm shed	176.00	m2	1,666.15	293,242	see separate cost plan
Allowance for furniture (Contractor supply and install)	1.00	item	205,460.00	205,460	
Scenarios					
Aircraft	1.00	item			concrete base measured elsewhere, prop supplied by client
Ship	1.00	item	529,059.50	529,060	
Water feature 1m deep concrete box (filled with water)	1.00	item	31,743.57	31,744	
Raised Quayside (1500mm above water level) + steps at each end + steps down into water	1.00	item	37,034.17	37,034	
Industrial Structure incl LPG Scenario	1.00	item	529,059.50	529,060	
Industrial Rail	1.00	item	105,811.90	105,812	
Highway Scenario - allowance for crash barriers	1.00	item	21,162.38	21,162	
BA Crawl Pipe	1.00	item	15,871.79	15,872	
LPG tank farm	1.00	item	83,099.38	83,099	
Tunnel Mouth/Bridge	1.00	item	49,202.53	49,203	
Rail Platform	1.00	item	22,220.50	22,220	Carriage client supply
Railway track	55.00	m	1,058.12	58,197	
Level crossing	1.00	item	52,905.95	52,906	
Trench collapse	1.00	item	31,743.57	31,744	
Muddy field + agricultural machinery + fencing / gate	1.00	item	15,871.79	15,872	
Rural ditch	1.00	item	5,290.60	5,291	
Hedge	1.00	item	2,645.30	2,645	
Cattle grid	1.00	item	26,452.98	26,453	
Farm yard + silo + diesel fuel tank + fencing and gate	1.00	item	21,162.38	21,162	
FBT containers	1.00	item	190,461.42	190,461	
Canopy over FBT Containers	1.00	item	231,142.50	231,143	
Urban street (bunded for flood scenario)	1.00	item	158,717.85	158,718	
Training towers (2nr)	1.00	item	211,623.80	211,624	
Foundation bases to towers	1.00	item	15,409.50	15,410	
Deep water pit	1.00	item	15,871.79	15,872	
Smoke cleaner (excl electric supply)	1.00	item	476,153.55	476,154	
Specialist installation to create LPG Scenarios: terraced house [LPG flashover, LPG fire Bed 2 1st floor, LPG fire roof level]	1.00	item	130,087.00	130,087	
Specialist installation to create LPG Scenarios: farm house kitchen, detached house kitchen, semi detached house kitchen, fast food kitchen	1.00	item	102,730.00	102,730	
Other props					
Dressing shelter	1.00	item	15,871.79	15,872	
Bus shelter	1.00	item	10,581.19	10,581	
M&E installations					
Site wide distribution;					
hydrant mains	983.00	m	185.17	182,023	
sprinklers	218.00	m	185.17	40,367	
LV	1,101.00	m	100.52	110,674	
LPG gas distribution pipework	1.00	item	25,682.50	25,683	
domestic water (mains fed)	599.00	m	58.20	34,860	
Service trenches	2,902.00	m	58.20	168,886	
PV's to Solar Farm	332.00	m2	256.83	85,266	
PV "car ports"	2,036.00	m2	513.65	1,045,791	
Roof PV's to Buildings incl fixing system	830.00	m2	256.83	213,165	
Battery Storage	1.00	item	105,811.90	105,812	
External lighting around the site	1.00	item	232,786.18	232,786	
Electric vehicle charging - allowance for 8nr vehicle spaces	8.00	nr	5,290.60	42,325	
Sprinkler tank and base	1.00	item	105,811.90	105,812	
Emergency generator	1.00	item			excluded
Water storage tank 200,000 L (flood) incl pump house	1.00	item	232,786.18	232,786	
Water storage tank 100,000 L (Hydrant) incl pump house	1.00	item	142,846.07	142,846	

North Wales Fire and Rescue Service
New Training Centre Site
Cost Estimate - Option 4
August 2024

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External works					
Concrete hardstandings 200m slab	8,318.00	m2	66.77	555,430	700mm Sub-base included elsewhere
450mm high retaining wall to front Admin Hub, assume brick	22.50	m2	513.65	11,557	
Allowance for steps and ramps to front entrance Admin Hub	1.00	item	25,682.50	25,683	
2.4m high earth retaining system	96.00	m2	565.02	54,241	
Retaining wall to water storage area	22.00	m2	770.48	16,950	
Soft landscaped areas;	1,304.00	m2	16.18	21,099	
Allowance for mix of plants/shrubs	1.00	item	40,064.70	40,065	
Tree planting zone	8,557.00	m2	16.18	138,452	
Wildflower planting	3,504.00	m2	16.18	56,695	
Trees [sapling only allowed for]	375.00	trees	264.53	99,199	
Pedestrian walkways tarmac incl sub-base	2,745.00	m2	51.37	140,997	
Paving to back/front of housing	559.00	m2	66.77	37,327	
Farm yard allowance for paving	240.00	m2	66.77	16,026	
Muddy field	211.00	m2	15.41	3,251	
Tarmac (Highway Scenario and Access Road around site) incl 200mm MOT1 sub-base	7,611.00	m2	94.51	719,328	
Car Park (Tarmac/Permeable Paving)	3,265.00	m2	105.81	345,476	
Allowance for kerbs	2,421.00	m	41.09	99,484	
Allowance for footpath edging	1,797.00	m	20.55	36,921	
Road markings	1.00	item	10,581.19	10,581	
Timber fencing to houses	124.00	m	79.36	9,841	
Shelter to Well being areas		m2	264.53	-	not shown on plans
External plant areas fencing/gates	335.00	m	100.52	33,675	
External site furniture; benches, bins etc	1.00	item	26,709.80	26,710	
External Signage	1.00	item	66,774.50	66,775	
Secure perimeter fencing	910.00	m	169.30	154,062	
Vehicle / pedestrian gates	incl				
Great Crested Newt area	13,843.00	m2			left fallow
Surface Water Drainage (hard landscaped areas)	22,498.00	m2	49.73	1,118,861	
Attenuation; Tank 1 1.8m deep x 20m wide x 46m long, Tank 2 1.2m deep x 20m x 30m	2,376.00	m3	323.60	768,872	
Foul Water Drainage	5,270.00	m2	42.32	223,051	
Allow for connection into existing drain	1.00	item	26,452.98	26,453	
Incoming services; power, data, water					
Incoming power	1.00	item	154,095.00	154,095	Based on quotation received from SPEN.
Incoming water	1.00	item	51,365.00	51,365	Initial advice from Welsh Water
Incoming data/telecoms	1.00	item	51,365.00	51,365	
Drainage to Petro Chem rig (foam tank)	1.00	item	158,717.85	158,718	
Hedgerow to car park for Bio Diversity Net Gain	1.00	item	30,000.00	30,000	Added in 29.8.24
Allowance for modification to bellmouth junction	1.00	item	20,000.00	20,000	
SUBTOTAL				**28,834,042**	
Main Contractor Preliminaries	12.5%			3,604,255	96 WEEKS CONSTRUCTION PERIOD
Main Contractor's Design Contingency	3%			973,149	
Main Contractor's Overheads and Profit	5%			1,670,572	
SUB TOTAL (WORKS COST ESTIMATE)				**35,082,019**	
Main Contractor Fees.					
Main Contractor Pre Construction fee (RIBA STAGE 3/4) SAY 0.75%	0.75%			263,115	
Main Contractor Design fees RIBA 4-6	5.25%			1,841,806	
Client costs					
Design Fees - allowance					
QS RIBA 1-6	1.0%			350,820	
PM RIBA 1-6	0.5%			175,410	
Architect to RIBA 3	1.0%			350,820	
M&E to RIBA 4	0.75%			263,115	
Structural Engineer to RIBA 3	0.5%			175,410	
M&E Technical Advice RIBA 5/6	1.00	item	123,276.00	123,276	
Building Clerk of Works RIBA 5/6	1.00	item	123,276.00	123,276	
CDM Principal Designer RIBA 1-6	1.00	item	51,365.00	51,365	
Building Regulations Principal Designer	1.00	item	51,365.00	51,365	
BREEAM Advisor RIBA 1-6	1.00	item	77,047.50	77,048	
Planning fees	1.00	item	46,228.50	46,229	
Building Regulation fees	1.00	item	35,955.50	35,956	
Site Surveys	1.00	item	61,638.00	61,638	including Ground Investigation
GCN Mitigation	1.00	item	154,095.00	154,095	survey costs, newt fencing
Client enabling works / site clearance					
Site Clearance generally to whole site (excluding GCN area)	41,053.00	m2	5.29	217,195	
Break up existing concrete slabs/kerbs etc; grubbing up shallow foundations	7,067.00	m2	14.38	101,639	Assume 150mm thick, crush on site for re-use
Demolish existing concrete retaining walls, assume 200 thick	200.00	m2	102.73	20,546	
Allowance for grubbing up existing underground drainage	2,600.00	m	51.37	133,549	
Allowance for breaking out existing manholes	130.00	nr	513.65	66,775	
Allowance for breaking up existing tarmac roads/paths/kerbs	8,650.00	m2	15.93	137,824	Assume 100mm thick
Main Contractor attendances	10%			67,753	
Client small props allowance	1.00	item	51,365.00	51,365	
Land costs incl SDLT	Excluded				
Client legal fees	Excluded				

North Wales Fire and Rescue Service
New Training Centre Site
Cost Estimate - Option 4
August 2024

Financing costs	Excluded				
Client Contingency	5%			2,001,170	
TOTAL ESTIMATED PROJECT COST - CURRENT DAY (excluding VAT)				**42,024,578**	
Inflation to mid-point construction (3Q 2027)	11.2%			4,694,145	BCIS 394 (3Q 24) to 438 (3Q 27)
TOTAL ESTIMATED PROJECT COST TO 4Q 26 (excluding VAT)				**46,718,723**	

Risks - currently excluded from Works cost estimate

Costs for dealing with poor ground conditions e.g poor bearing capacity, soft spots, obstructions and the like
Surplus material from excavations are assumed to be inert
Removal and disposal of contaminated materials off site incl asbestos
Removal of redundant undergound buried services
Diversion of services e.g underground or overhead cables, gas/water mains
Dewatering measures during construction
Suitability of fill for re-use on site
Availability of services locally such as incoming power, water and telecoms.
Dealing with Ecological issues - over and above current allowances
Delays to programme
Abnormal or onerous planning conditions
Inflation - over and above current allowances
Contractor availability to undertake project of this scale and nature
Off site highway works / Section 278
Phasing of the works

Gleeds general clarifications:

Gleeds' construction cost forecasts are based on the latest information from the supply chain and are current at the date of issue. However, they are subject to change due to evolving market conditions and disruptors, necessitating regular reviews to incorporate market feedback.

While the volatility in materials pricing has cooled, prices remain elevated compared to pre-pandemic levels. Labour pressures persist, with the effects of the long-term skills shortage mounting.

Although forecasts suggest lower construction output in 2024, there is growing optimism in industry data indicating an increase in new orders. Additionally, the expectation of interest rate cuts is bolstering confidence. There is also a strong pipeline of work related to infrastructure and energy investment, particularly concerning the transition to net zero.

Caution remains within the supply chain, especially given the elevated levels of construction insolvencies, which affect risk appetite and capacity in certain areas. This has the potential to result in regional price uplifts due to the limited availability of subcontractors with the resulting associated economic supply and demand impact.

As geopolitical tensions continue, uncertainty persists. Any escalation in unrest could significantly disrupt supply chains and reignite inflation. Therefore, Gleeds recommends regularly reviewing and updating information based on the latest conditions.

NORTH WALES TRAINING CENTRE
BCIS LIFE CYCLE COST ANALYSIS
OPTION 4

FIRE SERVICE ADMIN/CONTROL BUILDINGS
BASED ON 1819m2

	RENEW			MAINTAIN		
	FABRIC	SERVICES	DÉCOR	FABRIC	SERVICES	**TOTAL ADMIN HUB COST £**
1	8,901	9,697	0	4,793	18,008	**41,399**
2	9,325	11,025	0	5,021	20,475	**45,846**
3	8,901	10,095	0	4,793	18,748	**42,537**
4	9,325	11,025	0	5,021	20,475	**45,846**
5	11,444	10,494	0	6,162	19,488	**47,588**
6	9,325	11,423	20,807	5,021	21,215	**67,791**
7	8,901	9,697	0	4,793	18,008	**41,399**
8	9,325	11,025	0	5,021	20,475	**45,846**
9	8,901	10,095	0	4,793	18,748	**42,537**
10	127,366	12,220	3,804	68,582	22,695	**234,667**
11	8,901	9,697	0	4,793	18,008	**41,399**
12	9,325	11,423	40,317	5,021	21,215	**87,301**
13	8,901	9,697	0	4,793	18,008	**41,399**
14	9,325	11,025	0	5,021	20,475	**45,846**
15	11,444	10,892	0	6,162	20,228	**48,726**
16	9,325	11,025	0	5,021	20,475	**45,846**
17	8,901	9,697	0	4,793	18,008	**41,399**
18	9,325	11,423	20,807	5,021	21,215	**67,791**
19	8,901	9,697	0	4,793	18,008	**41,399**
20	127,366	64,290	3,804	68,582	119,396	**383,438**
21	8,901	9,697	0	4,793	18,008	**41,399**
22	9,325	11,025	0	5,021	20,475	**45,846**
23	8,901	10,095	0	4,793	18,748	**42,537**
24	9,325	11,025	40,317	5,021	20,475	**86,163**
25	11,444	10,494	0	6,162	19,488	**47,588**
Total	**471,324**	**317,998**	**129,856**	**253,790**	**590,565**	**1,763,533**
£/m2/yr						**38.78**

NOTES

Cost for Building Props is for maintenance and basic fabric renewal only. Assumes a weighting of 80% for renewal/20% maintenance
Based on Year 1 start of 4Q 28, no allowance for inflation beyond this date
Lifecycle analysis based on 25 years
Excludes cleaning costs, facilities management and energy costs
Life Cycle Costs based on figures provided by BCIS

NORTH WALES TRAINING CENTRE
BCIS LIFE CYCLE COST ANALYSIS
OPTION 4

BA SCHOOL AND APPLIANCE GARAGE (BASED ON FIRE STATION LIFE CYCLE MODEL)
BASED ON 1428m2

	RENEW			MAINTAIN		
	FABRIC	SERVICES	DÉCOR	FABRIC	SERVICES	**TOTAL COST OTHER BUILDINGS £**
1	9,228	3,519	0	4,969	6,536	**24,252**
2	9,228	5,866	0	4,969	10,893	**30,956**
3	9,228	3,519	738	4,969	6,536	**24,990**
4	9,228	5,944	0	4,969	11,039	**31,180**
5	9,228	13,843	0	4,969	25,708	**53,748**
6	9,228	5,866	16,809	4,969	10,893	**47,765**
7	9,228	3,519	0	4,969	6,536	**24,252**
8	9,228	5,944	0	4,969	11,039	**31,180**
9	9,228	3,519	738	4,969	6,536	**24,990**
10	60,991	16,189	0	32,842	30,066	**140,088**
11	9,228	3,519	0	4,969	6,536	**24,252**
12	9,228	5,866	16,835	4,969	10,893	**47,791**
13	9,228	3,519	0	4,969	6,536	**24,252**
14	9,228	5,866	0	4,969	10,893	**30,956**
15	9,228	31,753	738	4,969	58,969	**105,657**
16	9,228	5,944	0	4,969	11,039	**31,180**
17	9,228	3,519	0	4,969	6,536	**24,252**
18	9,228	5,866	16,835	4,969	10,893	**47,791**
19	9,228	3,519	0	4,969	6,536	**24,252**
20	60,991	19,005	0	32,842	35,295	**148,133**
21	9,228	3,519	738	4,969	6,536	**24,990**
22	9,228	5,866	0	4,969	10,893	**30,956**
23	9,228	3,519	0	4,969	6,536	**24,252**
24	9,228	5,944	16,809	4,969	11,039	**47,989**
25	9,228	13,843	0	4,969	25,708	**53,748**
Total	**334,226**	**188,795**	**70,240**	**179,971**	**350,620**	**1,123,852**
£/m2/yr						**31.48**

NORTH WALES TRAINING CENTRE
BCIS LIFE CYCLE COST ANALYSIS
OPTION 4

BUILDING PROPS E.G FIRE HOUSE, TERRACED HOUSES
BASED ON 2023m2

	MAINTAIN		RENEWAL	
	FABRIC	SERVICES	BASIC FABRIC RENEWAL	**TOTAL COST BUILDING PROPS £**
1	4,022	2,849	5,137	**12,008**
2	4,022	4,748	5,137	**13,907**
3	4,022	2,849	5,137	**12,008**
4	4,022	4,812	5,137	**13,971**
5	4,022	11,206	5,137	**20,365**
6	4,022	4,748	5,137	**13,907**
7	4,022	2,849	5,137	**12,008**
8	4,022	4,812	5,137	**13,971**
9	4,022	2,849	5,137	**12,008**
10	26,586	13,106	5,137	**44,829**
11	4,022	2,849	5,137	**12,008**
12	4,022	4,748	5,137	**13,907**
13	4,022	2,849	5,137	**12,008**
14	4,022	4,748	5,137	**13,907**
15	4,022	25,705	5,137	**34,864**
16	4,022	4,812	5,137	**13,971**
17	4,022	2,849	5,137	**12,008**
18	4,022	4,748	5,137	**13,907**
19	4,022	2,849	5,137	**12,008**
20	26,586	15,385	5,137	**47,108**
21	4,022	2,849	5,137	**12,008**
22	4,022	4,748	5,137	**13,907**
23	4,022	2,849	5,137	**12,008**
24	4,022	4,812	5,137	**13,971**
25	4,022	11,206	5,137	**20,365**
Total	**145,678**	**152,834**	**128,413**	**426,925**
£/m2/yr				**8.44**

NORTH WALES TRAINING CENTRE
BCIS LIFE CYCLE COST ANALYSIS
OPTION 4

EXTERNAL WORKS

LANDSCAPE MAINTAIN	WHITE LINING REPAIRS	SERVICE PETRO CHEM RIG/LPG	SERVICE SMOKE CLEANER	PUMP MAINTENANCE	CLEANING COSTS (EXCLUDED)	WASTE REMOVAL (EXCLUDED)	**TOTAL COST EXTERNALS £**	**GRAND TOTAL**
20,546		3,596	2,055	2,055			**28,251**	**105,909**
20,546		3,596	2,055	2,055			**28,251**	**118,959**
20,546	1,541	3,596	2,055	2,055			**29,792**	**109,326**
20,546		3,596	2,055	2,055			**28,251**	**119,247**
20,546		3,596	2,055	2,055			**28,251**	**149,951**
20,546	1,541	3,596	2,055	2,055			**29,792**	**159,254**
20,546		3,596	2,055	2,055			**28,251**	**105,909**
20,546		3,596	2,055	2,055			**28,251**	**119,247**
20,546	1,541	3,596	2,055	2,055			**29,792**	**109,326**
20,546		3,596	2,055	2,055			**28,251**	**447,834**
20,546		3,596	2,055	2,055			**28,251**	**105,909**
20,546	1,541	3,596	2,055	2,055			**29,792**	**178,790**
20,546		3,596	2,055	2,055			**28,251**	**105,909**
20,546		3,596	2,055	2,055			**28,251**	**118,959**
20,546	1,541	3,596	2,055	2,055			**29,792**	**219,038**
20,546		3,596	2,055	2,055			**28,251**	**119,247**
20,546		3,596	2,055	2,055			**28,251**	**105,909**
20,546	1,541	3,596	2,055	2,055			**29,792**	**159,280**
20,546		3,596	2,055	2,055			**28,251**	**105,909**
20,546		3,596	2,055	2,055			**28,251**	**606,929**
20,546	1,541	3,596	2,055	2,055			**29,792**	**108,188**
20,546		3,596	2,055	2,055			**28,251**	**118,959**
20,546		3,596	2,055	2,055			**28,251**	**107,047**
20,546	1,541	3,596	2,055	2,055			**29,792**	**177,914**
20,546		3,596	2,055	2,055			**28,251**	**149,951**
513,650	**12,328**	**89,889**	**51,365**	**51,365**			**718,596**	**4,032,906**

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Indicative Cashflow Forecast

North Wales Fire Training Centre

North Wales Fire and Rescue Service
New Training Centre Site
Indicative Cashflow Forecast (Capital costs)
August 2024

	FINANCIAL YEAR					
OPTION	24/25	25/26	26/27	27/28	28/29	
1	£ 2.08					
2	£ 10.79	£ 7.19				
3	£ 0.96	£ 0.99	£ 1.03	£ 23.94	£ 10.48	
4	£ 1.21	£ 1.25	£ 1.29	£ 24.62	£ 18.33	

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Drawing List

North Wales Fire Training Centre

North Wales Fire and Rescue Service
New Training Centre Site
Drawing List (Option 3 and 4)
August 2024

Drawing ref	Revision	Name
2267.03.00.206	P2	Pr Site Plan Opt 3B
2267.03.01 302	P1	Pr Floor Plans TAH Opt 3B
2267.03.01.402	P1	Pr Elevations TAH Opt 3B
2267.03.02.302	P1	Pr Floor Plan BA Opt 3B
2267.03.02.402	P1	Pr Elevations BA Opt 3B
2267.03.03.302	P1	Pr App Garage Opt 3B
2267.03.14.301	P1	Pr Floor Plan RTC Opt 3B
2267.03.14.401	P1	Pr Elevations RTC Opt 3B
2267.03.00.204	P3	Pr Site Plan Opt 4
2267.03.03.301	P1	Appliance Garage
2267.03.04.301	P1	Fire House
2267.03.04.302	P1	Fire House
2267.03.04.303	P1	Fire House
2267.03.04.401	P1	Fire House
2267.03.04.402	P1	Fire House
2267.03.04.501	P1	Fire House
2267.03.04.502	P1	Fire House
2267.03.05.301	P1	FBT Canopy
2267.03.07.301	P1	BA Training Bldg
2267.03.08.301	P1	Terraced Houses
2267.03.08.302	P1	Terraced Houses
2267.03.08.303	P1	Terraced Houses
2267.03.08.401	P1	Terraced Houses
2267.03.08.402	P1	Terraced Houses
2267.03.08.501	P1	Terraced Houses
2267.03.09.301	P1	Detached House
2267.03.10.302	P1	Semi-Detached House
2267.03.11.301	P1	Ind Comm and Food
2267.03.12.301	P1	Agricultural Bldg
2267.03.13.301	P1	Farm House
2267.03.00.202	P1	Ex Site Plan
2270.03.00 SK03	P1	Level Strategy Opt 3
2270.03.00 SK04	P1	Level Strategy Opt 4
2270.03.00 SK01	P1	Proposed Drainage Strategy Opt 3
2270.03.00 SK02	P1	Proposed Drainage Strategy Opt 4
BGH Outline Civil and Structural Strategy	Rev -	
Harley Haddow MEP Services Overview -	Rev 2	

GCN MITIGATION AREA

AREA RETAINED FOR FUTURE EXPANSION

LANDOWNER - EXISTING ACCESS ROAD

LANDOWNER - NEW ACCESS ROAD

GCN MITIGATION AREA

HIGH & INTERMEDIATE PRESSURE GAS MAINS HAZARD / NO BUILD ZONE

WILDFLOWER LANDSCAPING ZONE

SOFT LANDSCAPING / TREE PLANTING ZONE

AREA RETAINED FOR FUTURE EXPANSION

SAFE WALKING ROUTE

DEVELOPED SITE AREA = APPROX. 2.677 Ha

RESIDUAL SITE AREA = APPROX. 1.041 Ha

SITE AREA BOUNDED BY SOLID RED LINE = APPROX. 3.718 Ha

N

0 10 20 30 40 50m

1:500

OPTION 3B

status

PRELIMINARY

Hazard Identification

ref	hazard	date

ref	revision	by	date
P3	UPDATED IN LINE WITH COMMENTS RECEIVED AT MEETING 29.08.24	ST	02.09.24
P2	BA TRAINING BUILDING & FORCED ENTRY RIG, BA CRAWL PIPE, ROADSIDE DITCH SHOWN	ST	23.08.24
P1	FIRST ISSUE	ST	18.08.24

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Bradshaw Gass & Hope LLP

client: GLEEDS

project: NORTH WALES FIRE & RESCUE SERVICE
NEW TRAINING CENTRE

drawing: PROPOSED SITE PLAN

drawn by	ST	date	AUG 24
checked by		date	
scale	1:500		A0
dwg no	2270.03.00.206	rev	P3

OPTION 4

GCN MITIGATION AREA

HIGH & INTERMEDIATE PRESSURE GAS MAINS HAZARD / NO BUILD ZONE

WILDFLOWER LANDSCAPING ZONE 3,206 SQ.M

TREE PLANTING ZONE 6,383 SQ.M

PV - TRAINING & ADMIN. HUB 480 SQ.M

PV - BA SCHOOL ETC. 350 SQ.M

PV - SOLAR FARM 332 SQ.M

PV - CAR PARK 1,935 SQ.M

BASED ON AN INDIVIDUAL SOLAR PANEL OF 1M X 2M NOMINAL SIZE

DEVELOPMENT AREA 3.956 Ha

GCN MITIGATION AREA 1.305 Ha

0 10 20 30 40 50m

1:500

status: PRELIMINARY

Hazard Identification

ref	hazard	date

N

ref	revision	by	date
P3	UPDATED IN LINE WITH COMMENTS RECEIVED AT PTM 21.08.23	ST	23.08.23
P2	UPDATED IN LINE WITH COMMENTS RECEIVED AT PTM 08.08.23	ST	10.08.23
P1	FIRST ISSUE	ST	07.08.23

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client: GLEEDS

project: NORTH WALES FIRE & RESCUE SERVICE
NEW TRAINING CENTRE

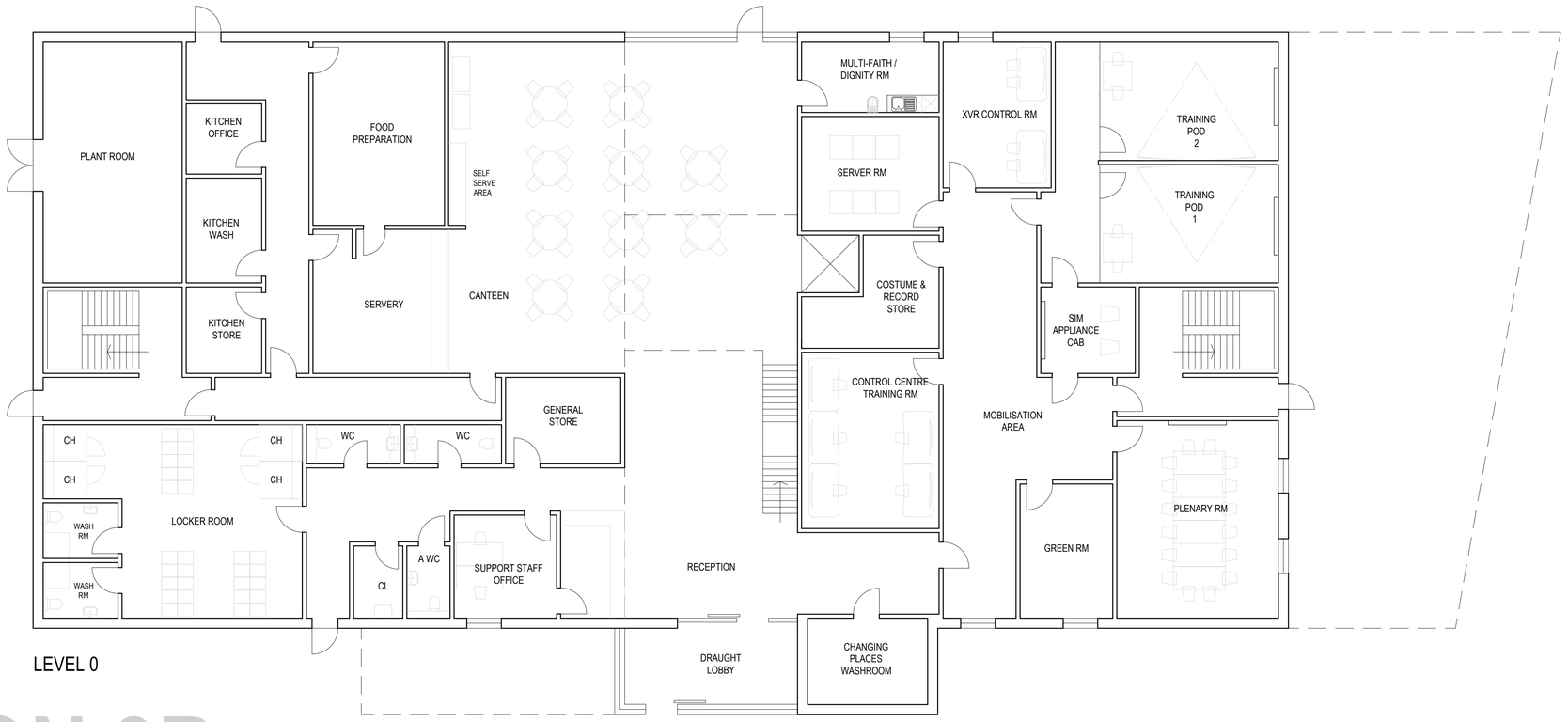
drawing: PROPOSED SITE PLAN

OPTION 4

drawn by	ST	date	AUG 23
checked by		date	
scale	1:500		A0

dwg no: 2270.01.00.204 rev: P3

LEVEL 1



LEVEL 0

OPTION 3B

0 2 4 6 8 10m

1:100

status

PRELIMINARY

Hazard Identification

ref	hazard	date

P1	FIRST ISSUE	ST	18.08.24
ref	revision	by	date

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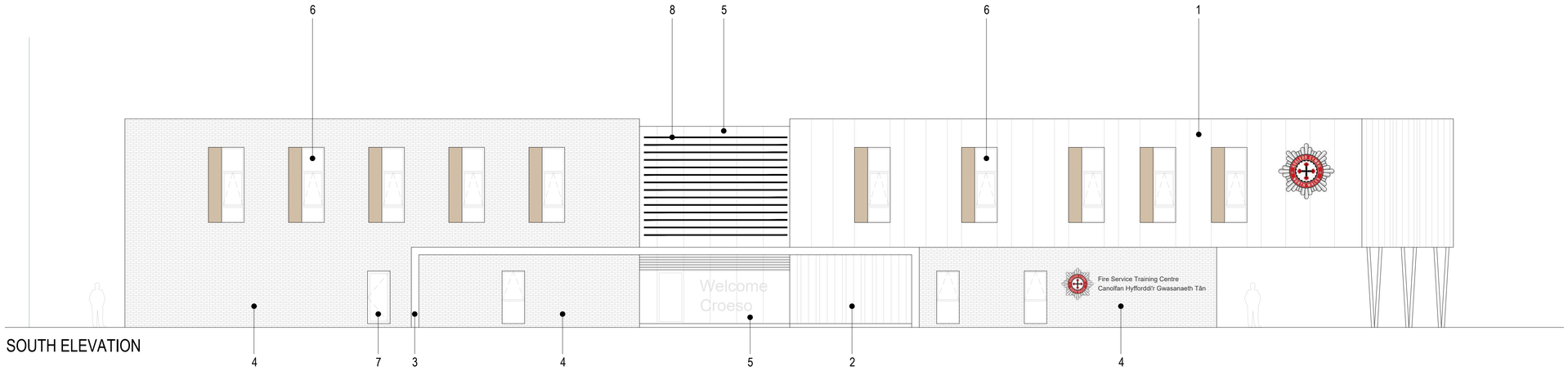
client
GLEEDS

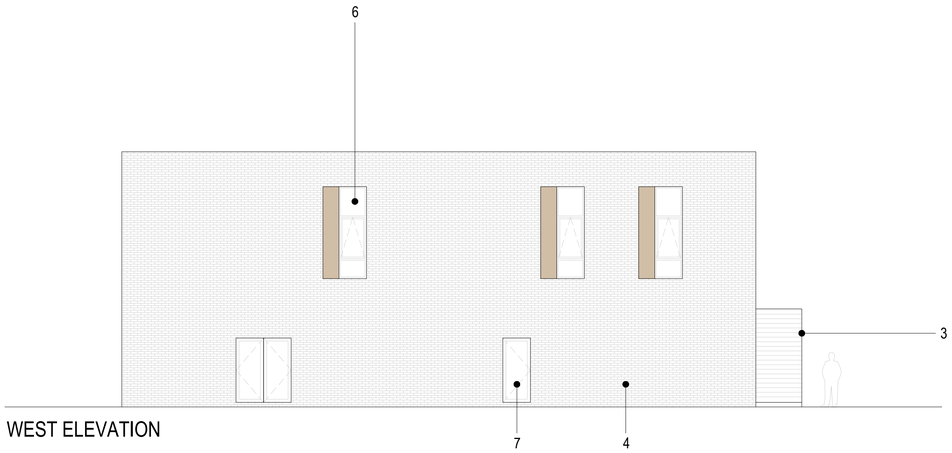
project
NORTH WALES
FIRE & RESCUE SERVICE
NEW TRAINING CENTRE

drawing
TRAINING & ADMIN. HUB
PROPOSED FLOOR PLAN

drawn by	ST	date	AUG 24
checked by		date	
scale	1:50		A1
dwg no	2267.03.01.302	rev	P1



SOUTH ELEVATION



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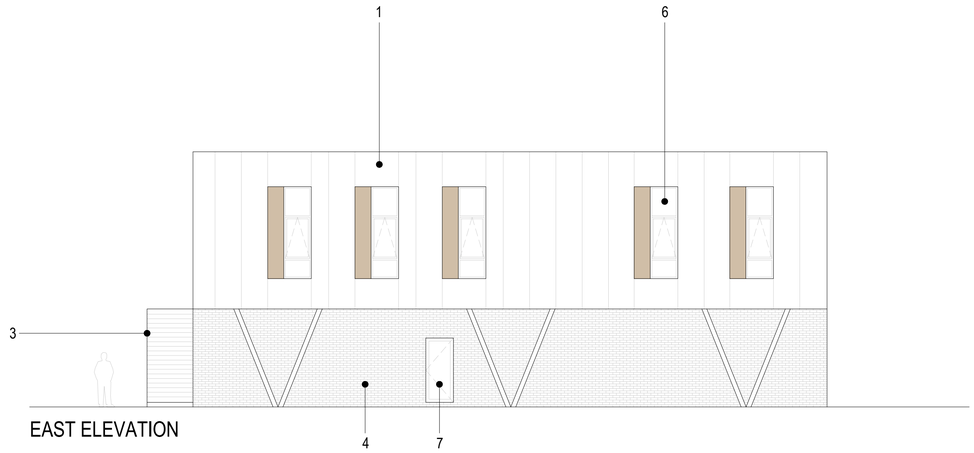

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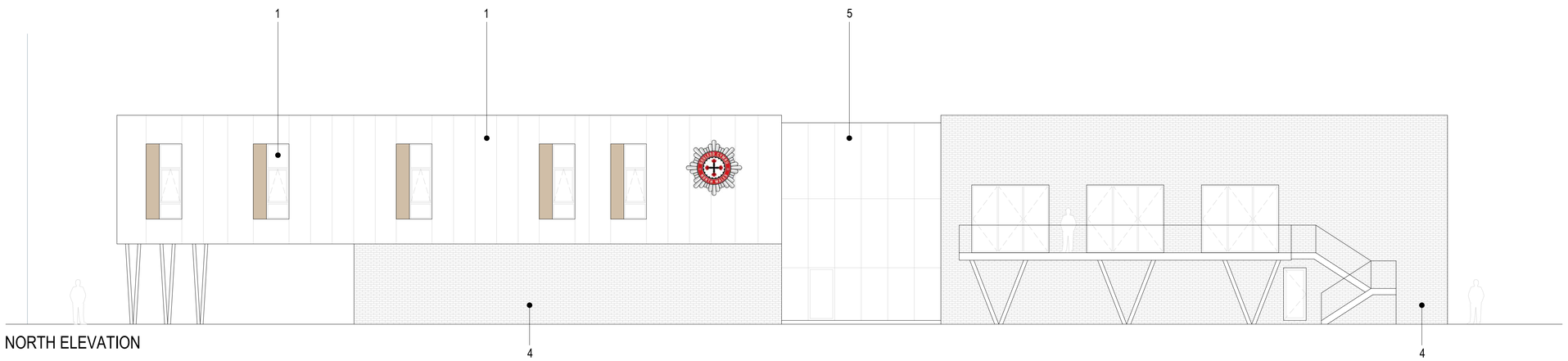

NORTH ELEVATION

OPTION 3B

1	COLOUR COATED PROFILED METAL WALL CLADDING	5	COLOUR COATED ALUMINIUM FRAMED CURTAIN WALLING
2	TRESPA FLAT PANEL CLADDING	6	COLOUR COATED ALUMINIUM FRAMED WINDOWS
3	COLOUR COATED 'WOOD-LOOK' METAL WALL CLADDING	7	COLOUR COATED ALUMINIUM FRAMED DOORS
4	BRICKWORK	8	BRISE SOLEIL

0 2 4 6 8 10m
1:100

status
PRELIMINARY

Hazard Identification

ref	hazard	date

ref	revision	by	date
P1	FIRST ISSUE	ST	18.08.24

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project
NORTH WALES
FIRE & RESCUE SERVICE
NEW TRAINING CENTRE

drawing
TRAINING & ADMIN. HUB
PROPOSED ELEVATIONS

drawn by	ST	date	AUG 23
checked by		date	
scale	1:100		A1
dwg no	2267.03.01.402	rev	P1

North Wales Fire & Rescue Service
Gwasanaeth Tân ac Achub Gogledd Cymru

New Training Centre
Canolfan Hyfforddi

Precedent Images - Administration & Training Hub Building
Adeilad Canolbwynt Gweinyddu a Hyfforddiant

Gwasanaeth Tân ac Achub
Fire and Rescue Service

Natural cladding materials and oversailing upper floor with interesting structural support

Textured slate or slate-look wall cladding

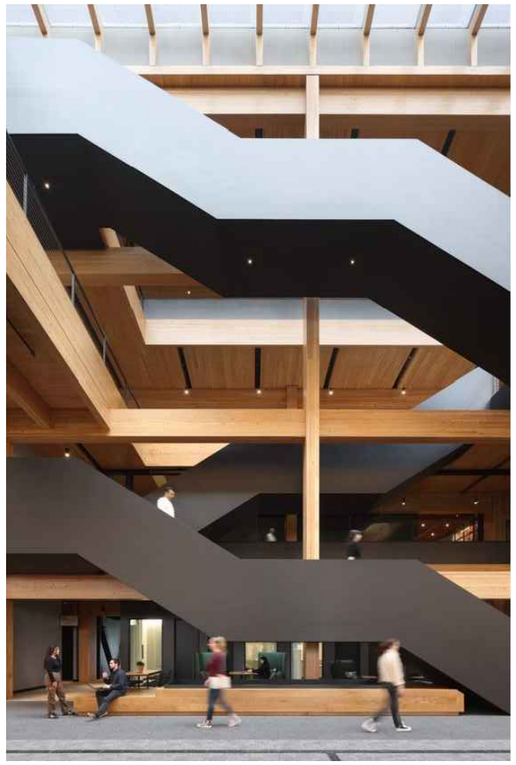
Textured slate or slate look wall cladding

Oversailing upper floor with interesting structural support

Building Fabric

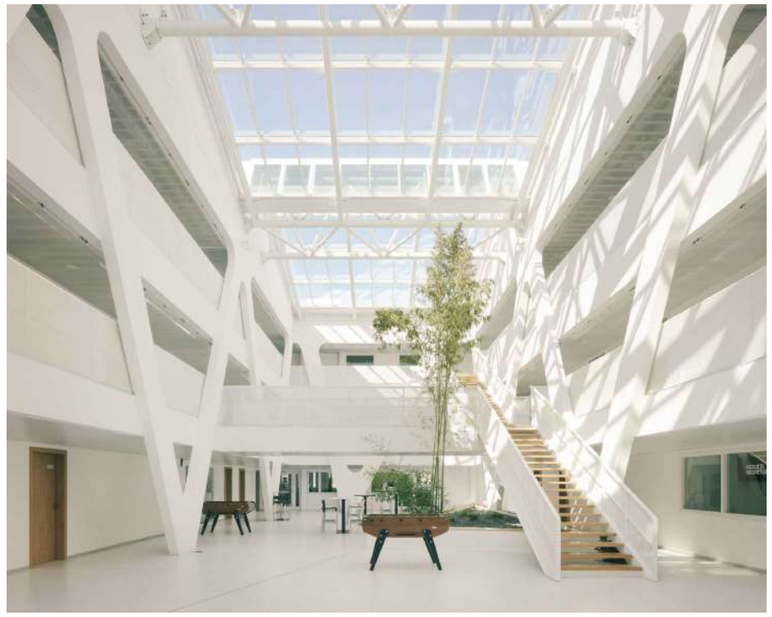
Gwasanaeth Tân ac Achub
Fire and Rescue Service

Simple materials palette creating clean lines and bold statement

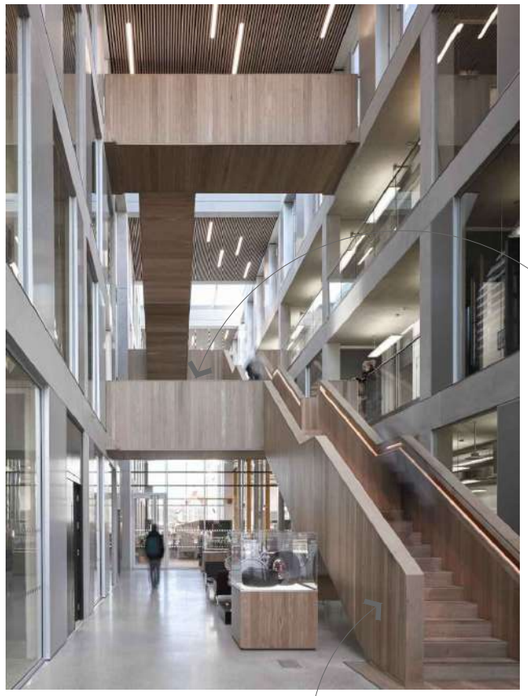


Feature staircase within centralised atrium. Natural materials

Bright / open atrium with light from above and interesting structural form



Bright / open welcome space with large windows. Subtle use of natural materials



Link bridge

Feature staircase within centralised atrium. Natural materials

Welcome Space & Circulation

Gwasanaeth Tân ac Achub
Fire and Rescue Service

Open ceilings / exposed building services

Use of natural materials

Interesting use of materials creating privacy screening to private offices

Meeting Pods

Interesting acoustic room dividers

Thoughtful implementation of internal planting to sub-divide space and create a calming work environment

Office / Meeting

Gwasanaeth Tân ac Achub
Fire and Rescue Service

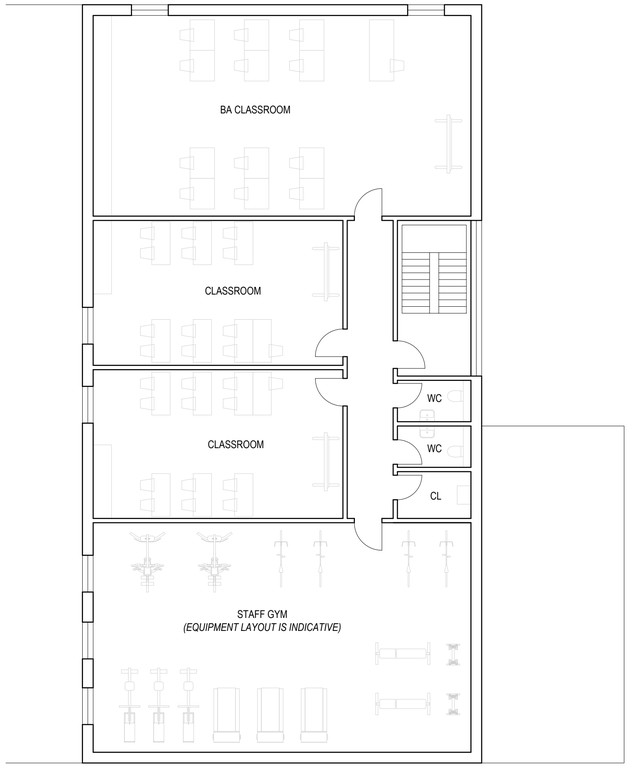
Compact / modern self-service area with bright furniture and dynamic features

Bright / open space with large windows

Minimalist / modern self-service area utilising natural materials

Refreshments & Light Dining

LEVEL 0



LEVEL 1

OPTION 3B

0 2 4 6 8 10m
1:100

status
PRELIMINARY

Hazard Identification

ref	hazard	date

P1	FIRST ISSUE	ST	18.08.24
ref	revision	by	date

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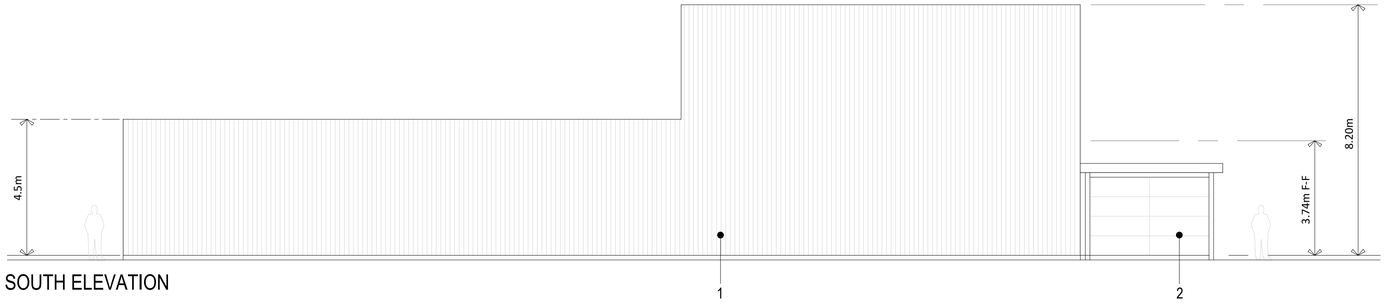
project
NORTH WALES
FIRE & RESCUE SERVICE
NEW TRAINING CENTRE

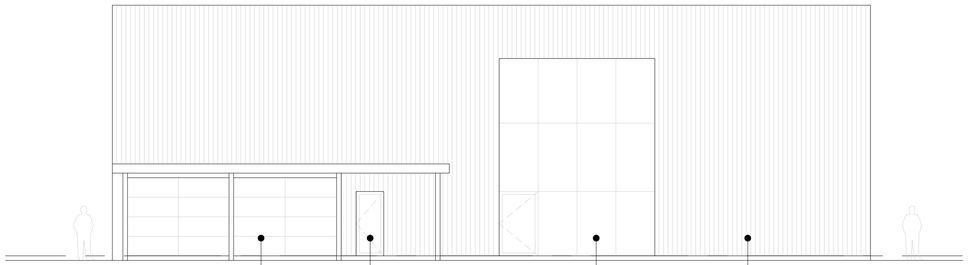
drawing
BA TRAINING HUB
PROPOSED FLOOR PLAN

drawn by	ST	date	AUG 24
checked by		date	
scale	1:50		A1
dwg no	2267.03.02.302	rev	P1

1 COLOUR COATED PROFILED METAL WALL CLADDING
2 TRESPA FLAT PANEL CLADDING
3 COLOUR COATED 'WOOD-LOOK' METAL WALL CLADDING
4 BRICKWORK
5 COLOUR COATED ALUMINIUM FRAMED CURTAIN WALLING
6 COLOUR COATED ALUMINIUM FRAMED WINDOWS
7 COLOUR COATED ALUMINIUM FRAMED DOORS
8 BRISE SOLEIL
9 COLOUR COATED INSULATED SECTIONAL DOOR



SOUTH ELEVATION



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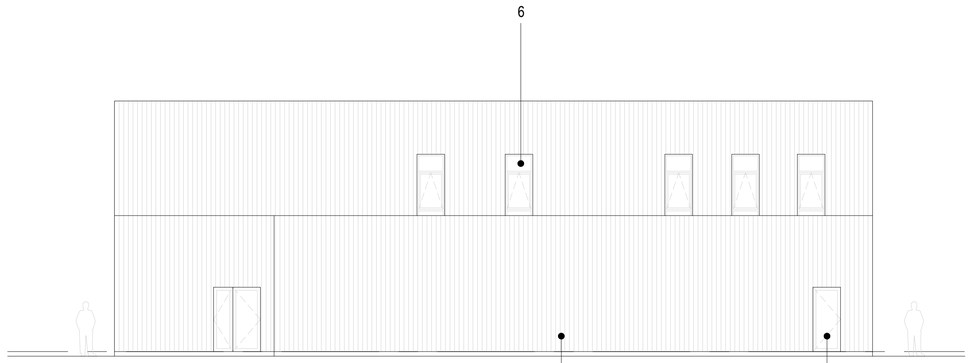
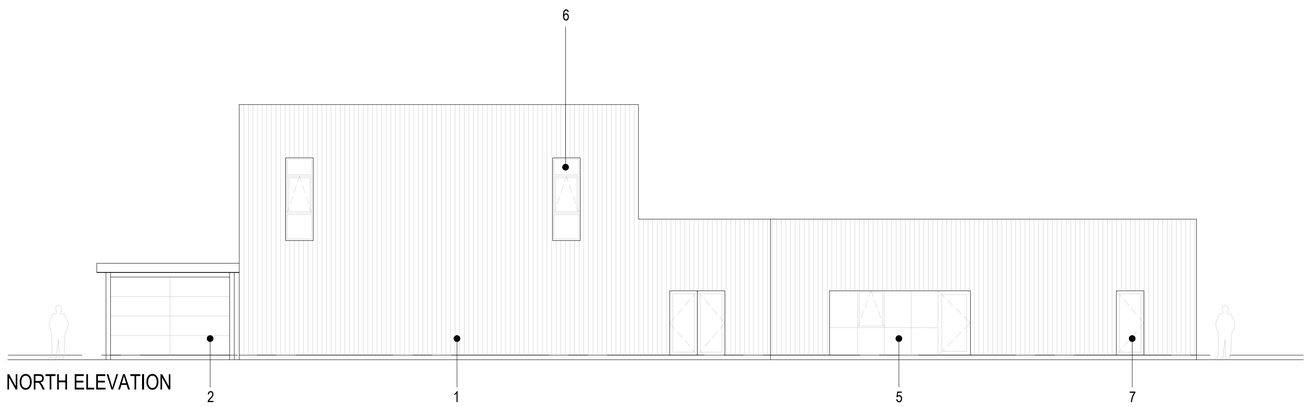


WEST ELEVATION



NORTH ELEVATION

OPTION 3B

0 2 4 6 8 10m
1:100

status
PRELIMINARY

Hazard Identification

ref	hazard	date

ref	revision	by	date
P1	FIRST ISSUE	ST	18.08.24

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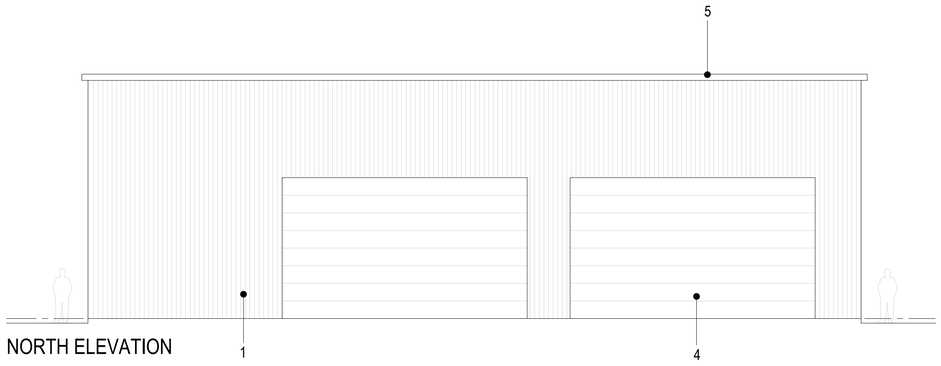
project
NORTH WALES
FIRE & RESCUE SERVICE
NEW TRAINING CENTRE

drawing
BA TRAINING HUB
PROPOSED ELEVATIONS

drawn by	ST	date	AUG 24
checked by		date	
scale	1:100		A1
dwg no	2267.03.02.401	rev	P1



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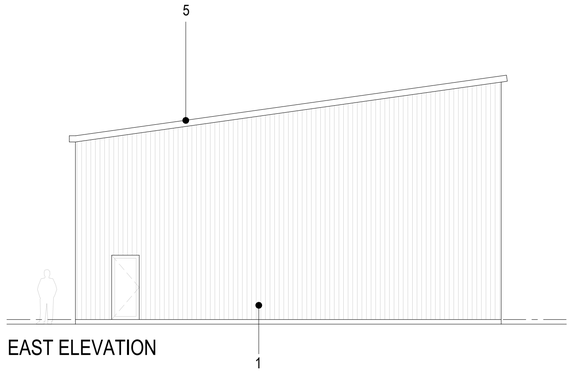

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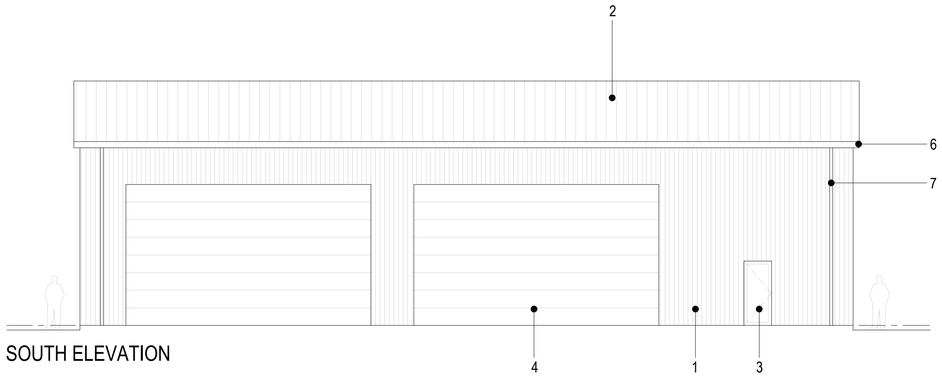

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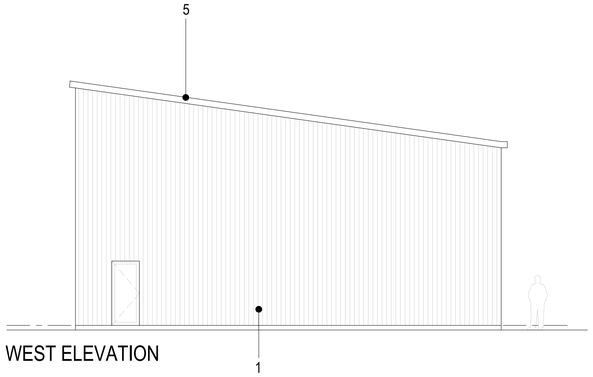
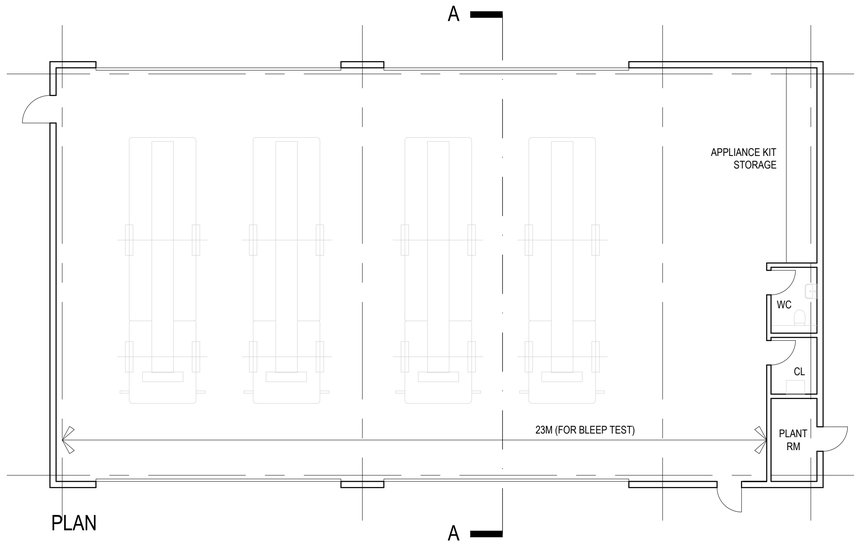
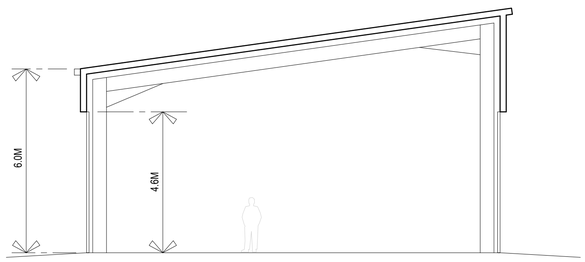


WEST ELEVATION



PLAN



SECTION A-A

1	COLOUR COATED PROFILED METAL WALL CLADDING
2	COLOUR COATED PROFILED METAL ROOF CLADDING
3	COLOUR COATED ALUMINIUM DOOR
4	COLOUR COATED INSULATED SECTIONAL DOOR
5	COLOUR COATED METAL FLASHING
6	COLOUR COATED METAL GUTTER
7	COLOUR COATED METAL RWP'S

0 2 4 6 8 10m

1:100

OPTION 3B

status

PRELIMINARY

Hazard Identification

ref	hazard	date

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P1	FIRST ISSUE	ST	18.08.24

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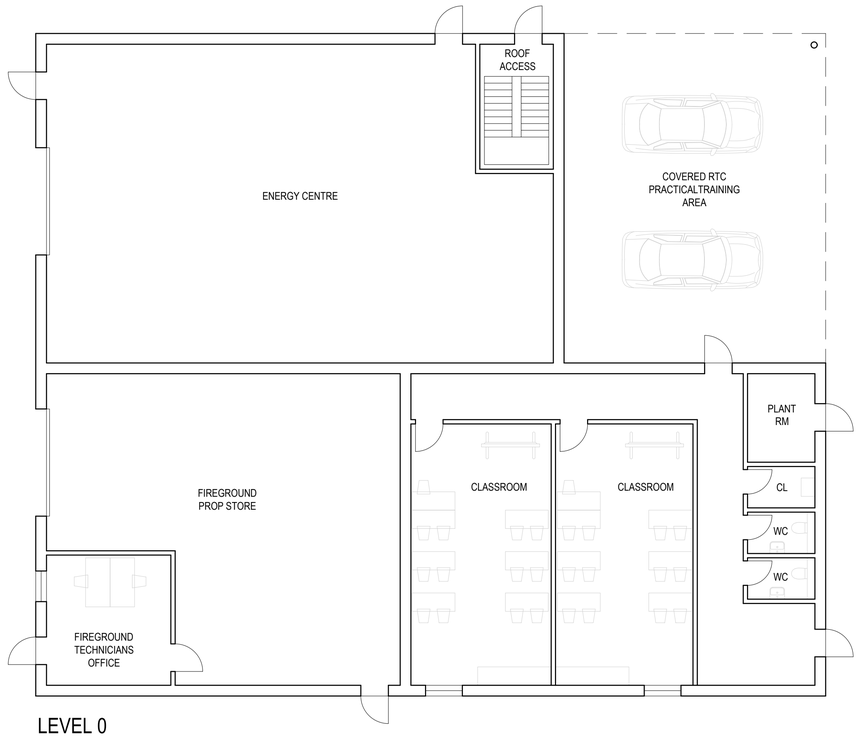
NEW TRAINING CENTRE

drawing
APPLIANCE GARAGE

drawn by	ST	date	AUG 24
checked by		date	
scale	1:100		A1
dwg no	2267.03.03.302	rev	P1



LEVEL 0

OPTION 3B

0 2 4 6 8 10m

1:100

status

PRELIMINARY

Hazard Identification

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P1	FIRST ISSUE	ST	18.08.24
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project

NORTH WALES
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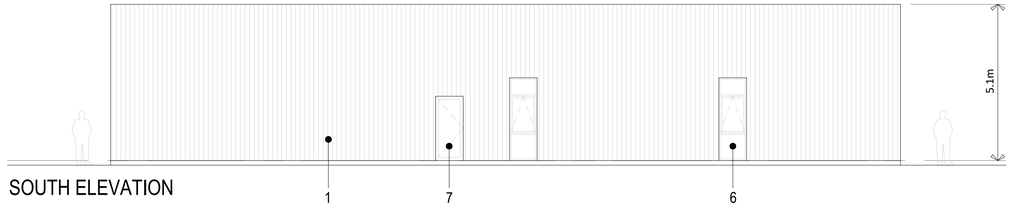
NEW TRAINING CENTRE

drawing

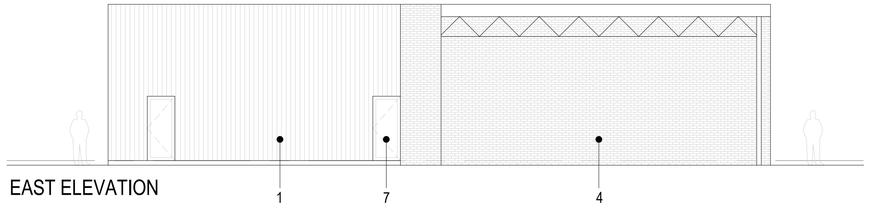
RTC / STORES / ENERGY CENTRE
PROPOSED FLOOR PLAN

drawn by	ST	date	AUG 24
checked by		date	
scale	1:50		A1
dwg no	2267.03.14.301	rev	P1

1 COLOUR COATED PROFILED METAL WALL CLADDING
2 TRESPA FLAT PANEL CLADDING
3 COLOUR COATED 'WOOD-LOOK' METAL WALL CLADDING
4 BRICKWORK
5 COLOUR COATED ALUMINIUM FRAMED CURTAIN WALLING
6 COLOUR COATED ALUMINIUM FRAMED WINDOWS
7 COLOUR COATED ALUMINIUM FRAMED DOORS
8 BRISE SOLEIL
9 COLOUR COATED INSULATED SECTIONAL DOOR



SOUTH ELEVATION



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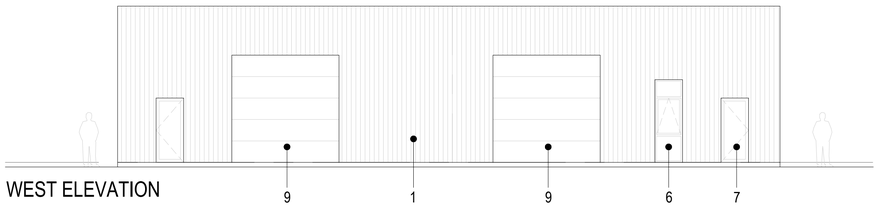

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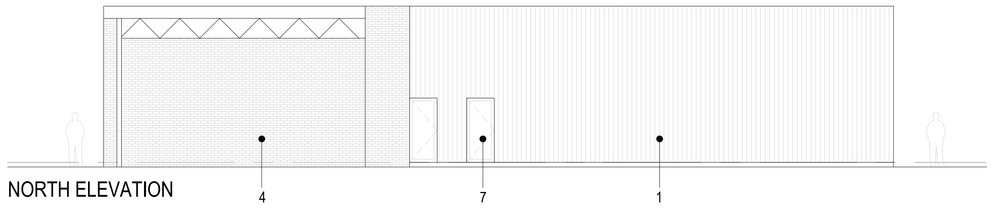

NORTH ELEVATION

OPTION 3B

0 2 4 6 8 10m
1:100

status
PRELIMINARY

Hazard Identification

ref	hazard	date

ref	revision	by	date
P1	FIRST ISSUE	ST	18.08.24

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drawing
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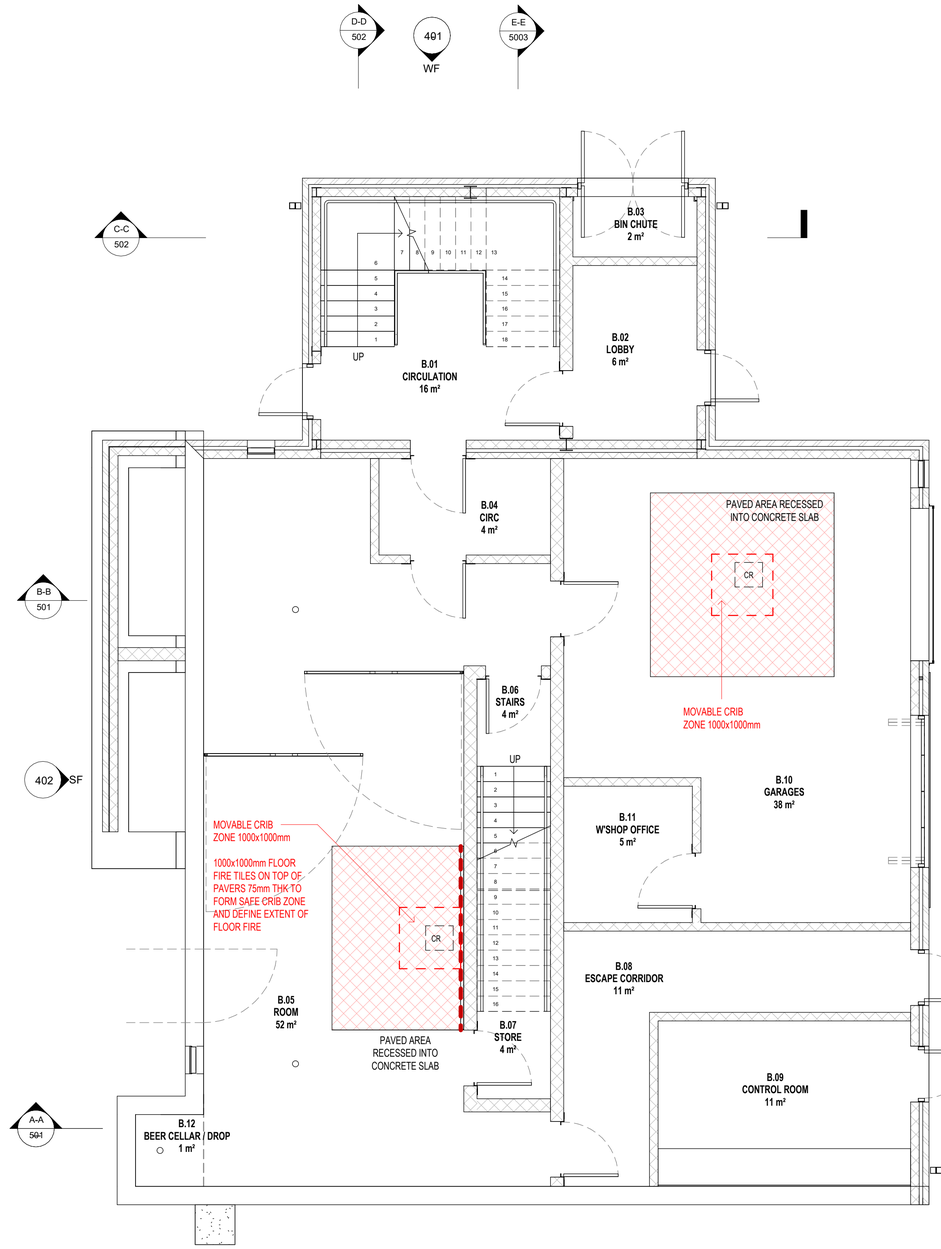
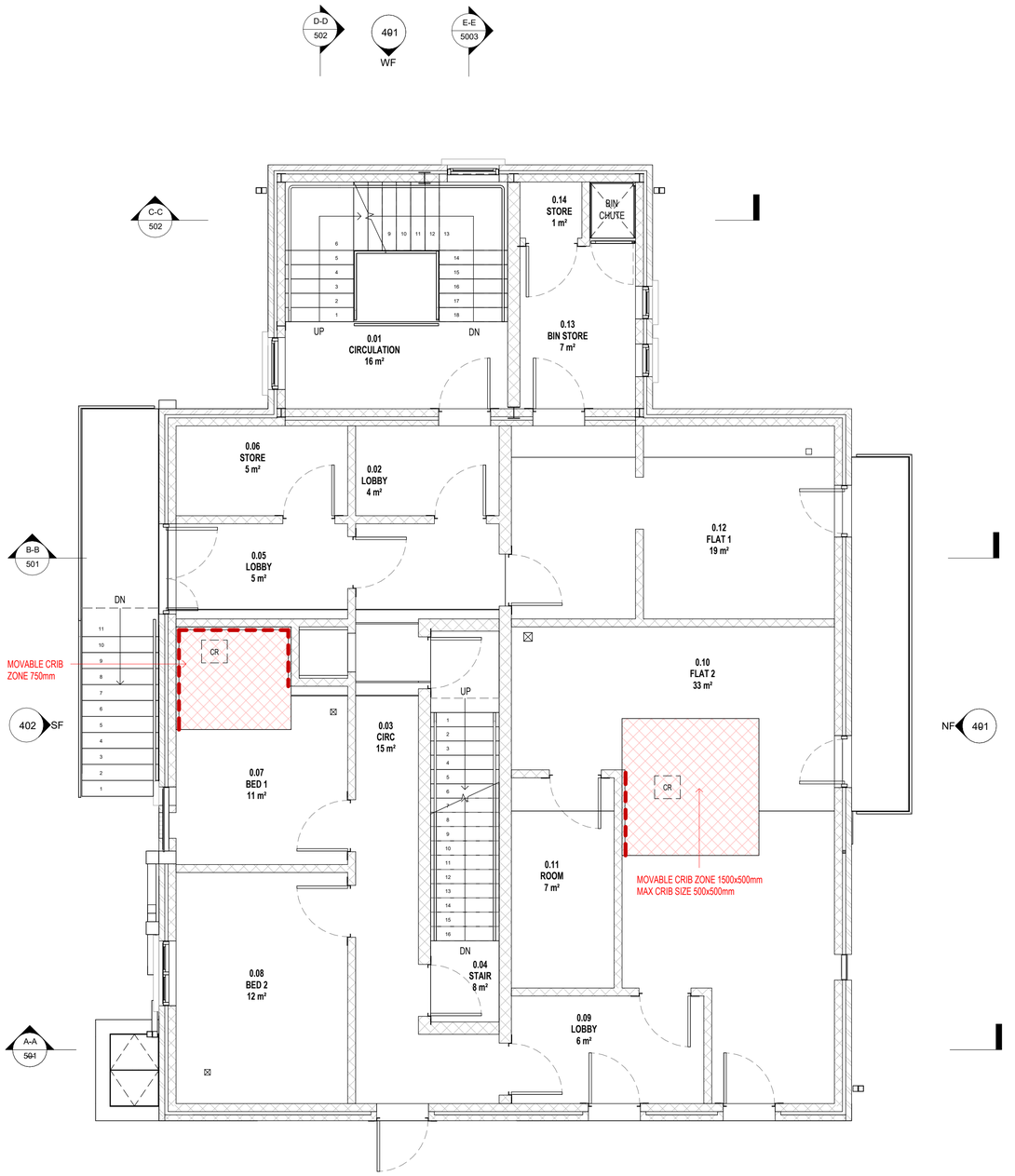
PROPOSED ELEVATIONS

drawn by	ST	date	AUG 24
checked by		date	
scale	1:100		A1
dwg no	2267.03.14.401	rev	P1



LEVEL -1

1 : 50



LEVEL 0

1 : 50

0 1 2 3

SCALE 1 : 50

status

PRELIMINARY

Hazard Identification

ref	hazard	date

ref	revision	by	date
P1	FIRST DRAWING ISSUE	LC	07.08.2023

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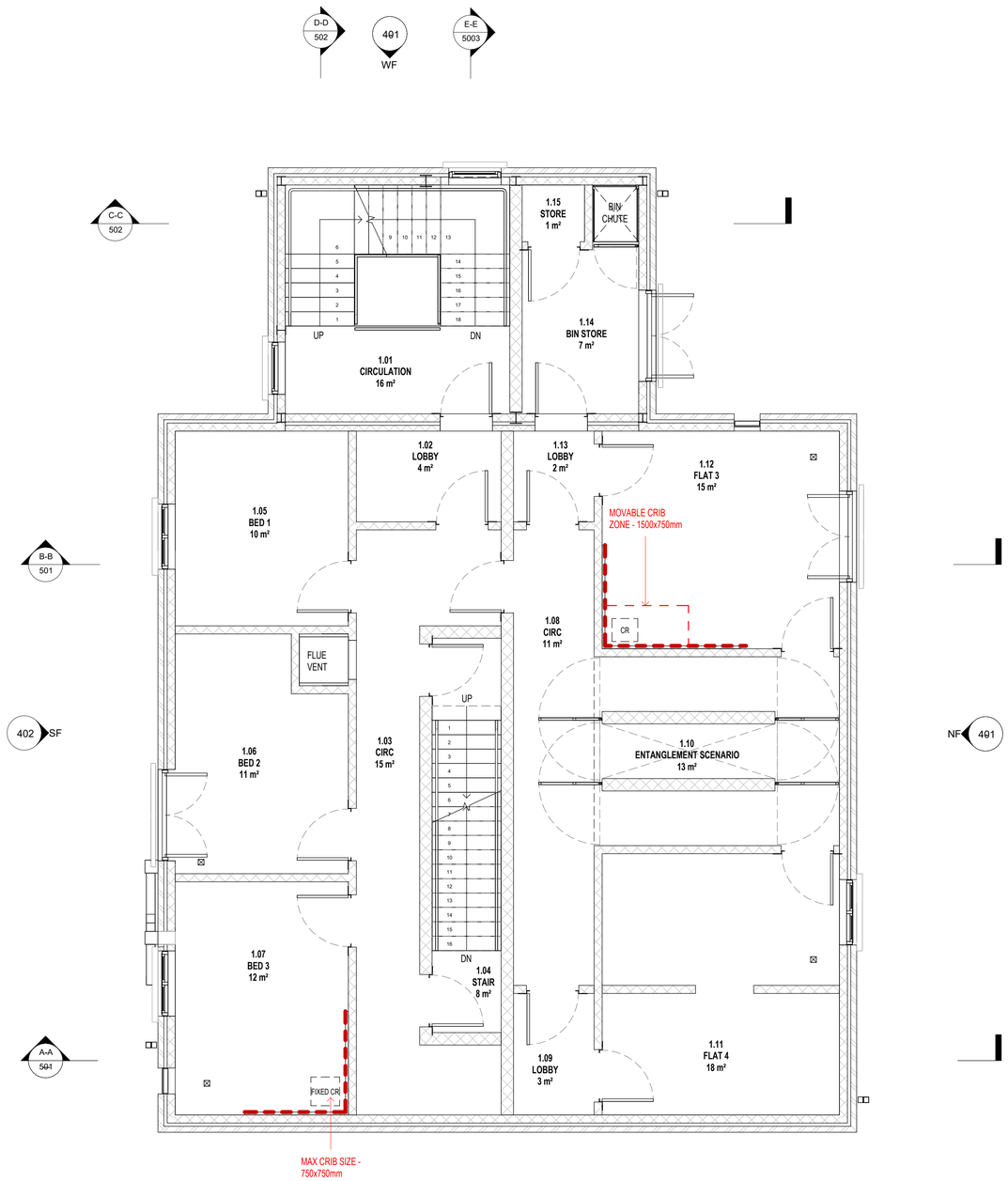
ISG CONSTRUCTION LTD

project
NORTH WALES TRAINING CENTRE

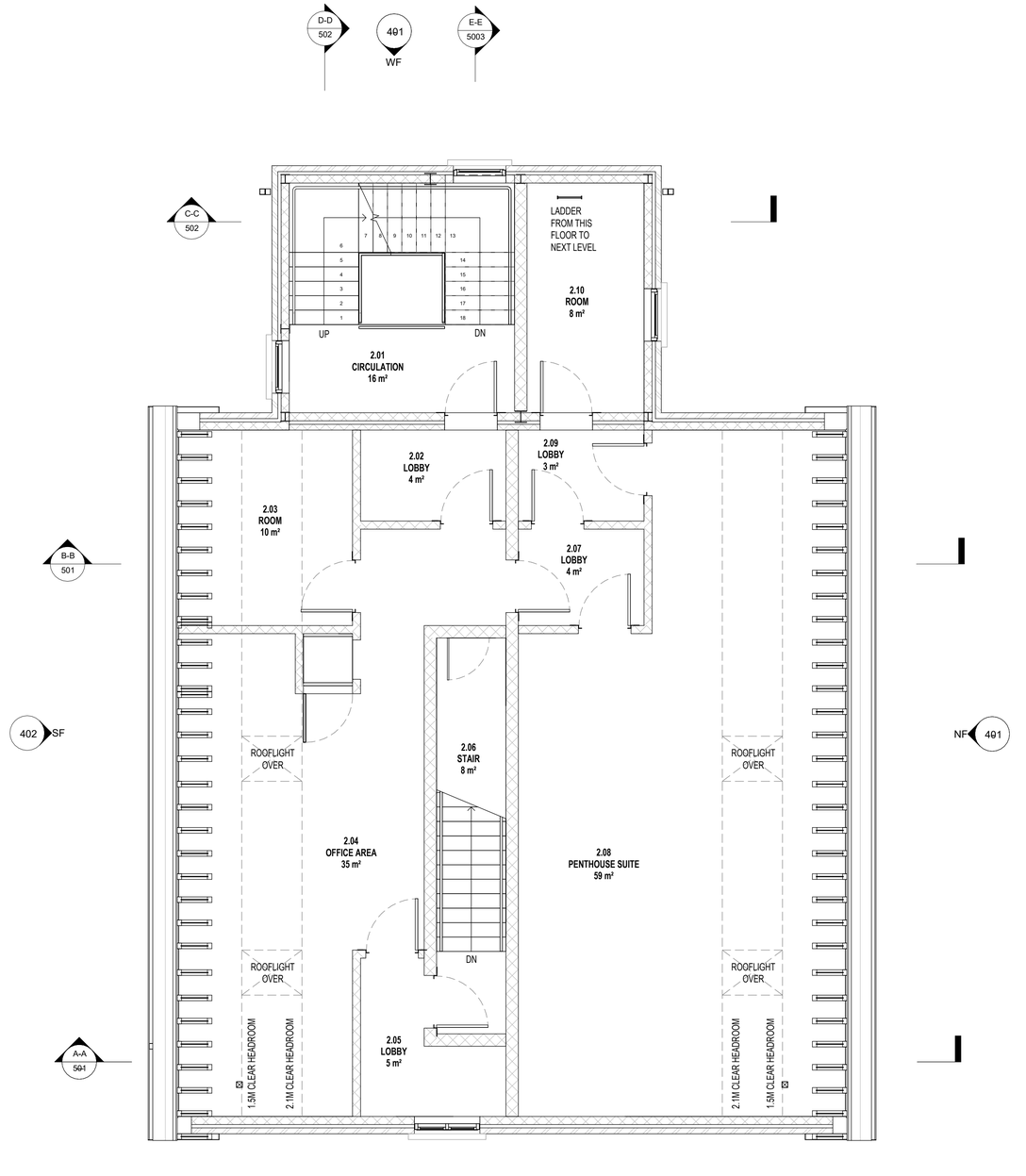
drawing
FIRE HOUSE
PLAN - LEVEL -1 & 0

drawn by	LC	date	AUG 2023
checked by	ST	date	AUG 2023
scale	1 : 50		A1
dwg no	2267.03.04.301	rev	P1



LEVEL 1

1 : 50



LEVEL 2

1 : 50

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SCALE 1 : 50

status

PRELIMINARY

Hazard Identification

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ref	revision	by	date
P1	FIRST DRAWING ISSUE	LC	07.08.2023

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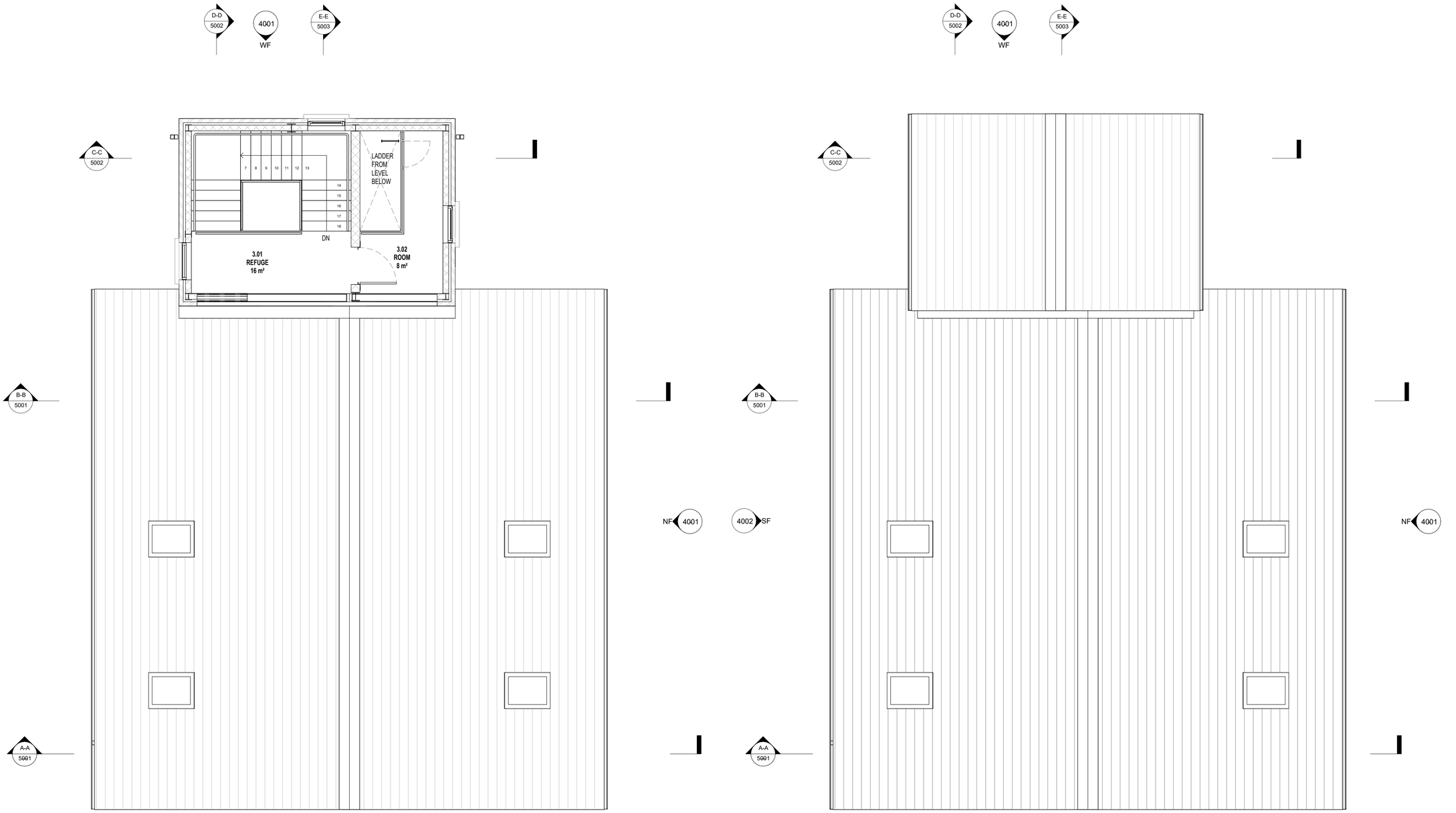
client
ISG CONSTRUCTION LTD

project
NORTH WALES TRAINING CENTRE

drawing
FIRE HOUSE
PLAN - LEVEL 1 & 2

drawn by	LC	date	AUG 2023
checked by	ST	date	AUG 2023
scale	1 : 50		A1
dwg no	2267.03.04.302	rev	P1



LEVEL 3

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ROOF

1 : 50

EF
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SCALE 1 : 50

status

PRELIMINARY

Hazard Identification

ref	hazard	date

ref	revision	by	date
P1	FIRST DRAWING ISSUE	LC	07.08.2023

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Quantity Surveyors

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Bradshaw Gass & Hope LLP

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project
NORTH WALES TRAINING CENTRE

drawing
FIRE HOUSE
PLAN - LEVEL 3 & ROOF

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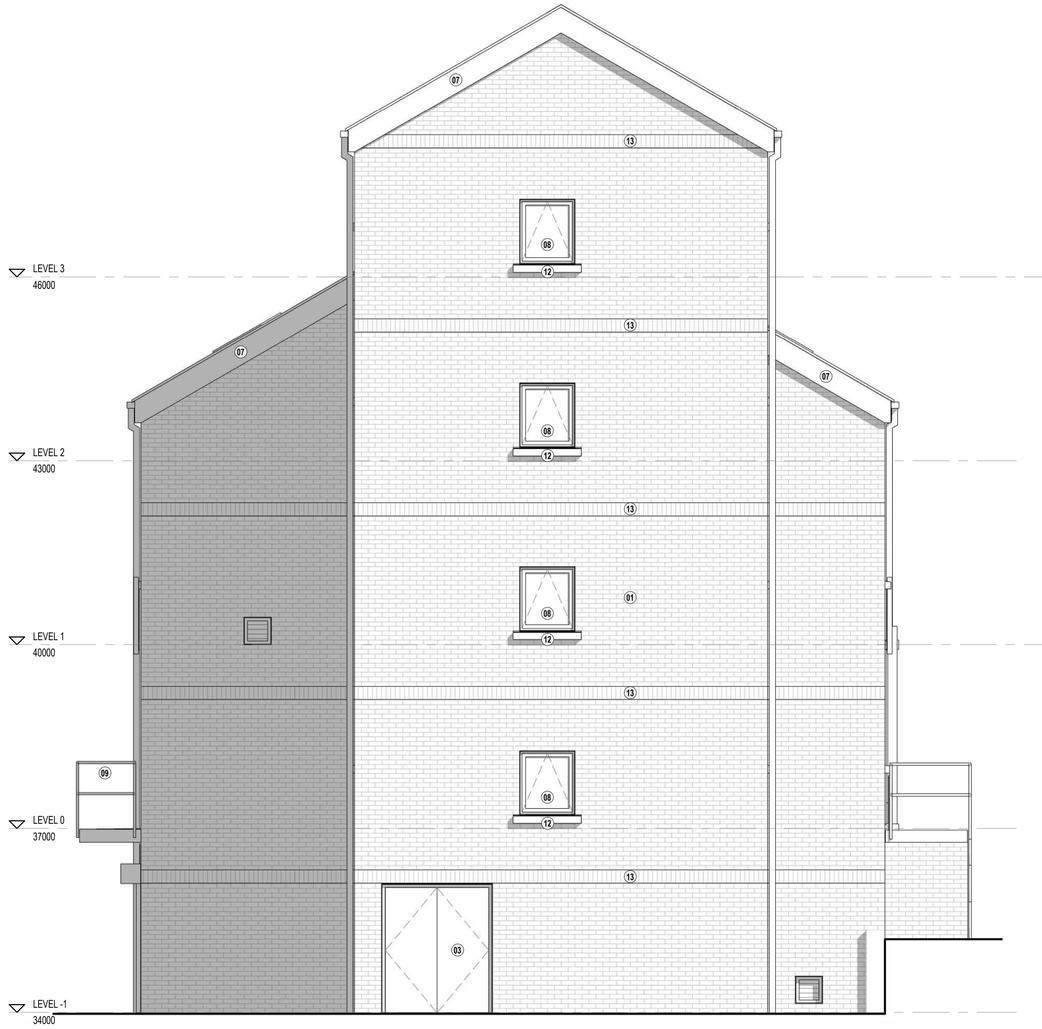
ELEVATION MATERIAL LEGEND

REF	DESCRIPTION	PRODUCT REF / COLOUR
01	BRICK OUTER LEAF / CAVITY / BLOCKWORK	TBC
02	COATED STEEL TILES ON ENGINEERED TIMBER RAFTERS	TBC
03	STEEL DOORSET	TBC
04	VELUX ROOF LIGHTS	TBC
05	METAL ROLLER SHUTTER DOOR	TBC
06	METAL BI-FOLD 4 PANEL DOORS	TBC
07	STEEL RWP / FASCIA / GUTTER	TBC
08	STEEL FRAMED WINDOW GLAZED WITH CLEAR GLASS	TBC
09	1100mm HIGH STEEL HANDRAILING TO BALCONY	TBC
10	STEEL JULIET BALCONY	TBC
11	STEEL FRAMED WINDOW GLAZED WITH PAINTED STEEL SHEET (BLACK)	TBC
12	CONCRETE CILL WITH SACRIFICIAL TIMBER	TBC
13	SOLDIER COURSE BRICKWORK BANDING	TBC
14	COMPOSITE FLAT PANEL WALL CLADDING	TBC

NORTH FACING ELEVATION

1 : 50



WEST FACING ELEVATION

1 : 50

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SCALE 1 : 50

status

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drawing
FIRE HOUSE
ELEVATIONS - SHEET 1

drawn by	LC	date	AUG 2023
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ELEVATION MATERIAL LEGEND

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03	STEEL DOORSET	TBC
04	VELUX ROOF LIGHTS	TBC
05	METAL ROLLER SHUTTER DOOR	TBC
06	METAL BI-FOLD 4 PANEL DOORS	TBC
07	STEEL RWP / FASCIA / GUTTER	TBC
08	STEEL FRAMED WINDOW GLAZED WITH CLEAR GLASS	TBC
09	1100mm HIGH STEEL HANDRAILING TO BALCONY	TBC
10	STEEL JULIET BALCONY	TBC
11	STEEL FRAMED WINDOW GLAZED WITH PAINTED STEEL SHEET (BLACK)	TBC
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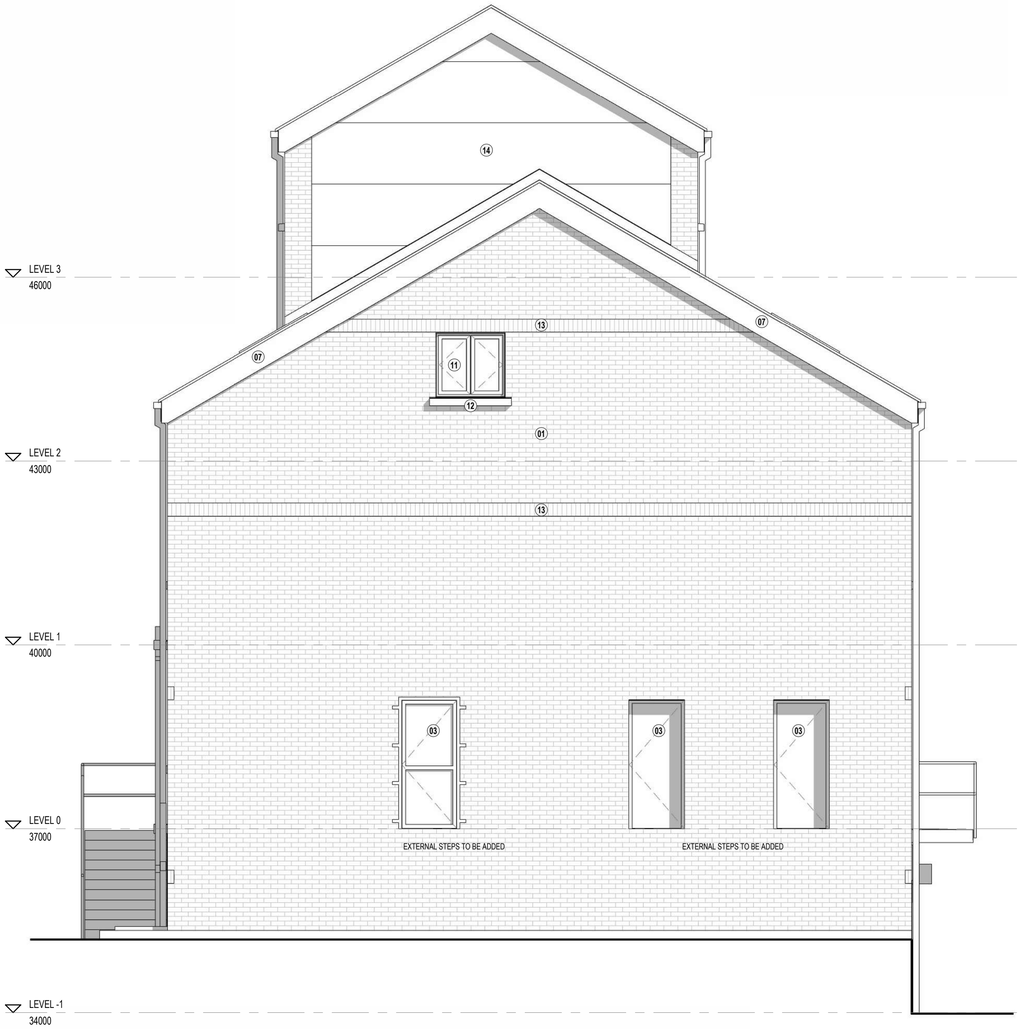
14	COMPOSITE FLAT PANEL WALL CLADDING	TBC



EAST FACING ELEVATION

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SOUTH FACING ELEVATION

1 : 50

0 1 2 3

SCALE 1 : 50

status

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drawing
FIRE HOUSE
ELEVATIONS - SHEET 2

drawn by	LC	date	AUG 2023
checked by	ST	date	AUG 2023
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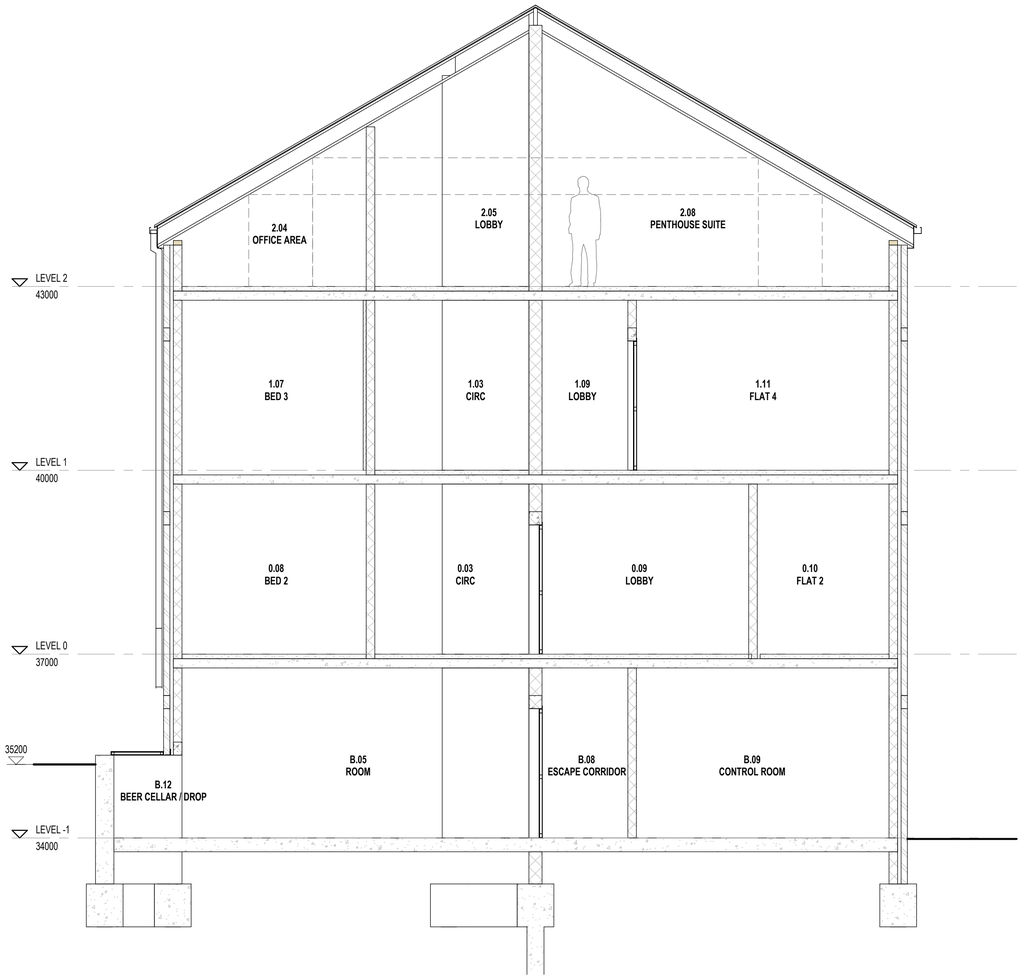
dwg no **2267.03.04.402** rev **P1**



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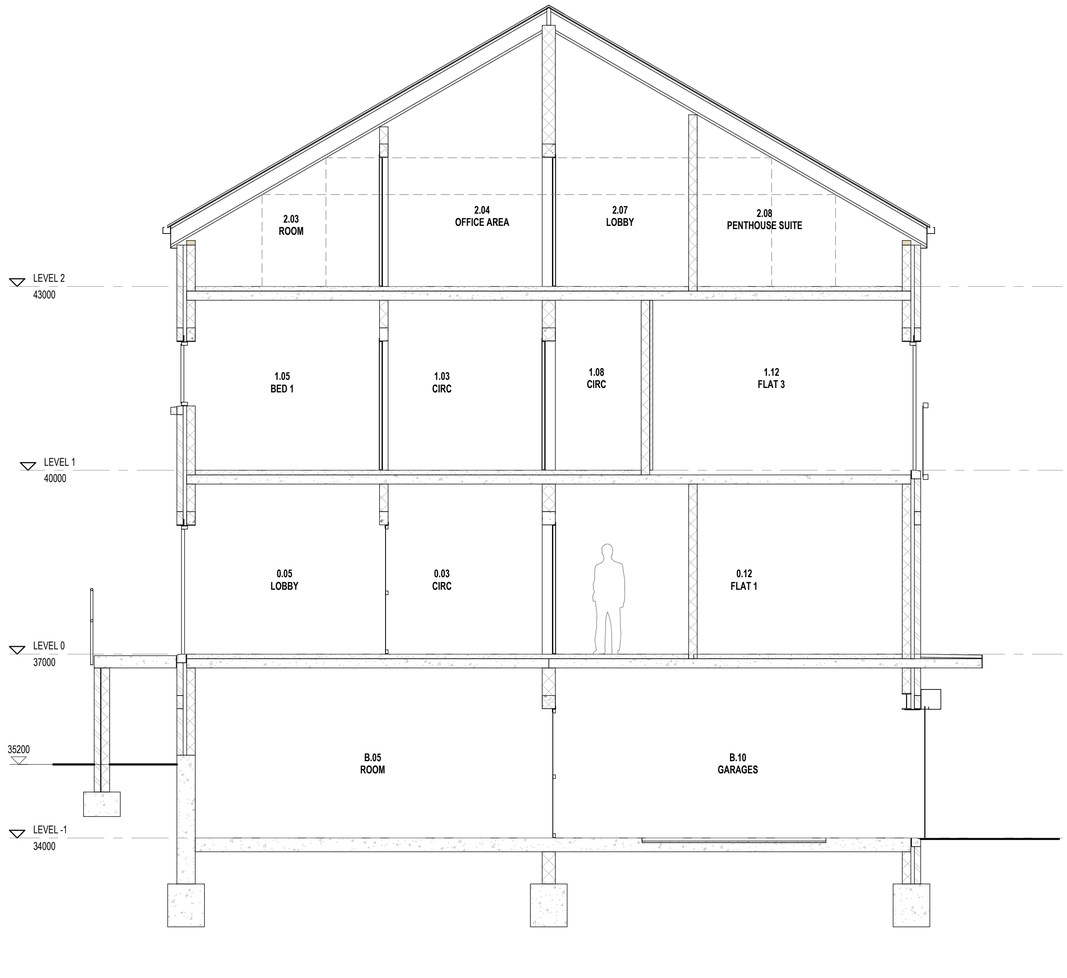

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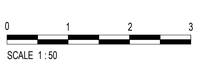

SCALE 1 : 50

status

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drawing
FIRE HOUSE
PROPOSED GA SECTIONS - SHEET 1

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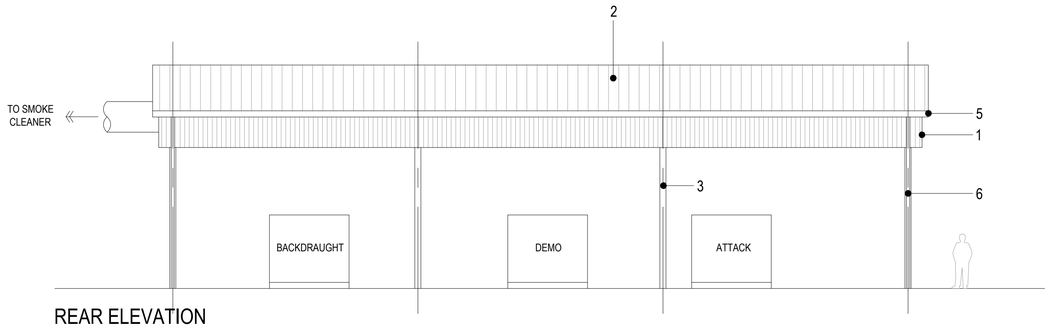

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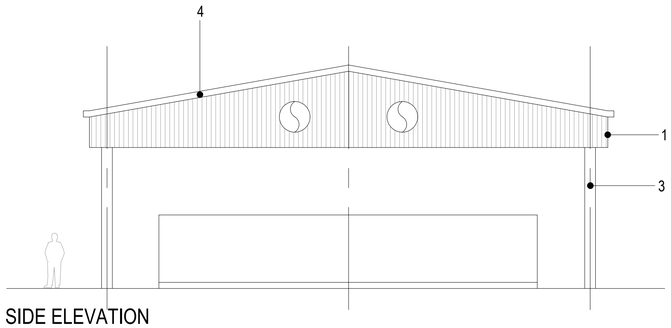

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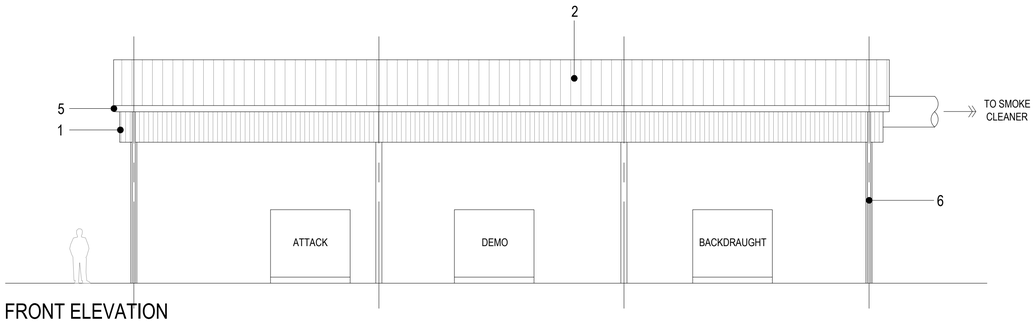

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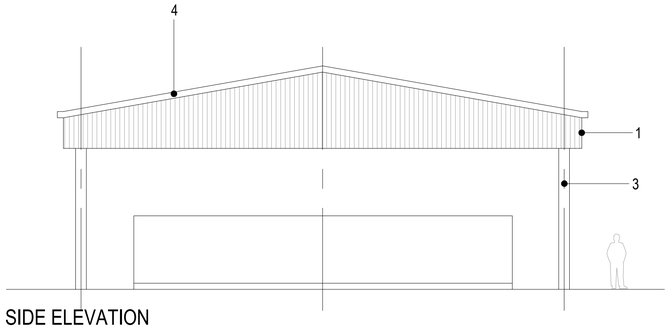

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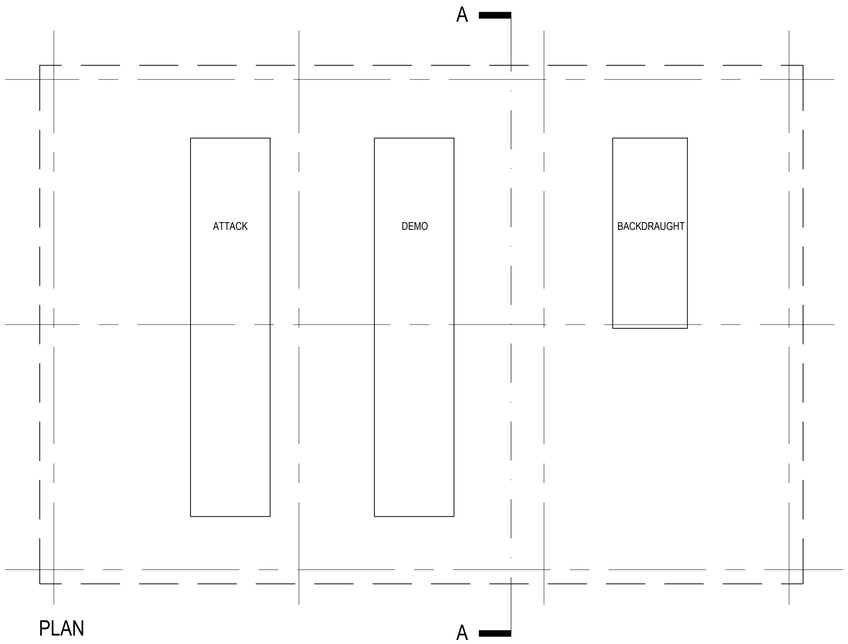
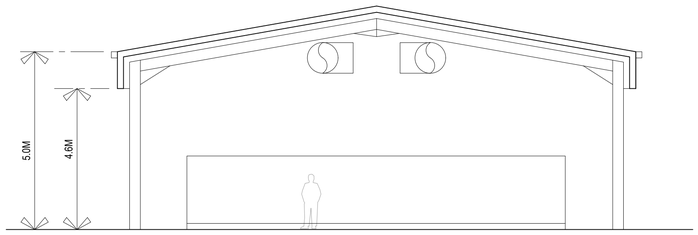


PLAN



SECTION A-A

1 COLOUR COATED PROFILED METAL WALL CLADDING
2 COLOUR COATED PROFILED METAL ROOF CLADDING
3 STRUCTURAL STEEL FRAMING
4 COLOUR COATED METAL FLASHING
5 COLOUR COATED METAL GUTTER
6 COLOUR COATED METAL RWP'S

0 2 4 6 8 10m
1:100

status
PRELIMINARY

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GLEEDS

project
NORTH WALES
FIRE & RESCUE SERVICE
NEW TRAINING CENTRE

drawing
FBT SMOKE CONTAINMENT
CANOPY

drawn by	ST	date	AUG 23
checked by		date	
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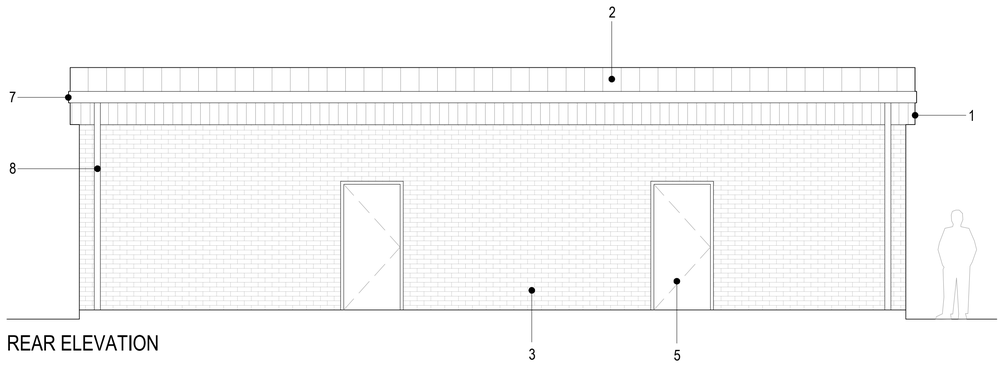
dwg no	2267.03.05.301	rev	P1



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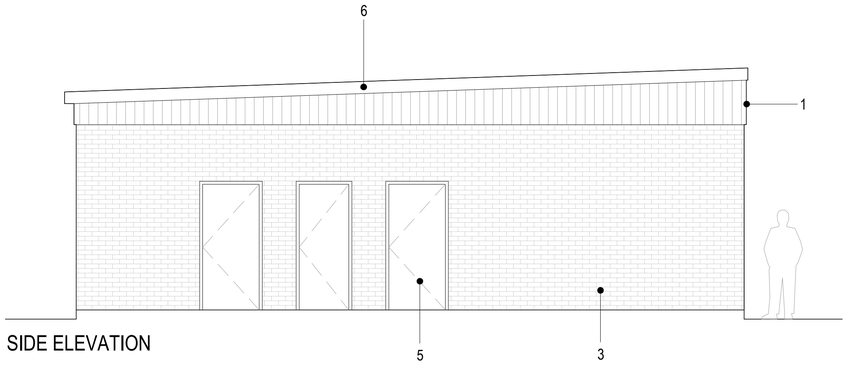

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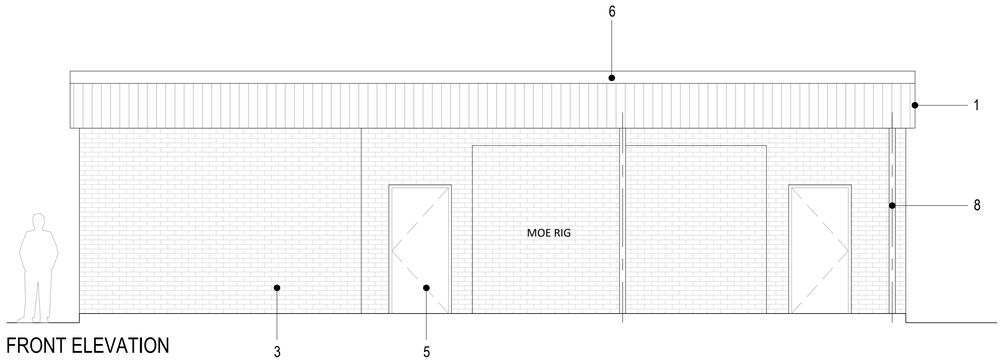

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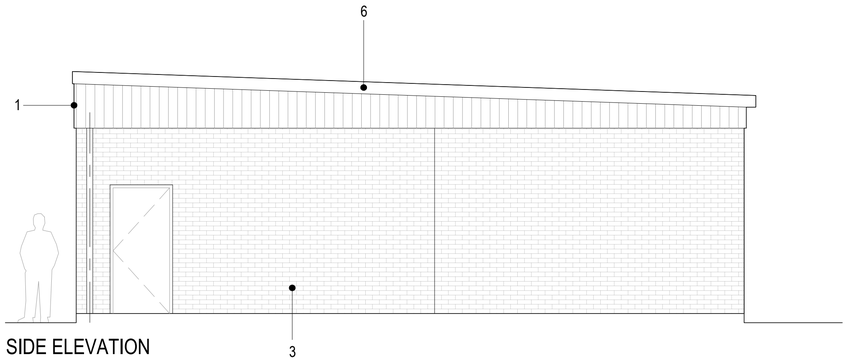
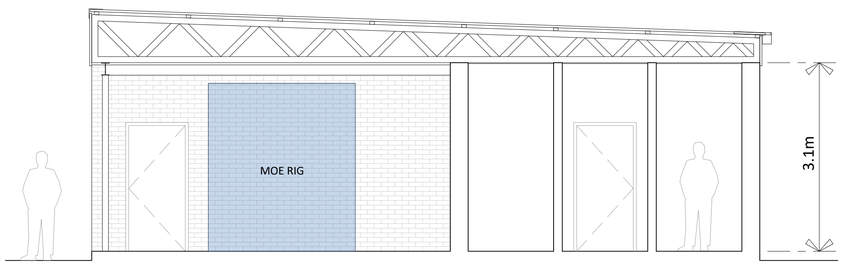


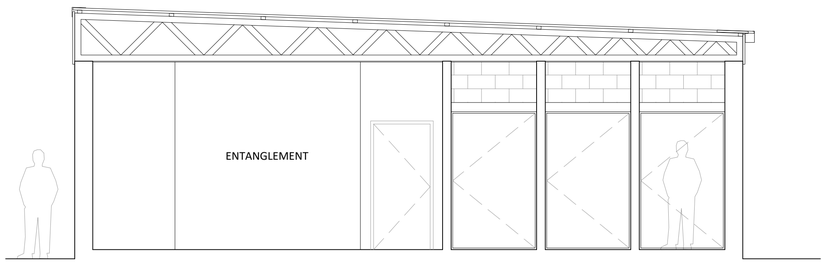
SIDE ELEVATION

1 COLOUR COATED PROFILED METAL WALL CLADDING
2 COLOUR COATED PROFILED METAL ROOF CLADDING
3 BRICKWORK
4 STRUCTURAL STEELWORK
5 COLOUR COATED STEEL DOORS
6 COLOUR COATED METAL FLASHING
7 COLOUR COATED METAL GUTTER
8 COLOUR COATED METAL RWP'S

PLAN



SECTION A-A



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status
PRELIMINARY

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Bradshaw Gass & Hope LLP

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GLEEDS

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NORTH WALES
FIRE & RESCUE SERVICE
NEW TRAINING CENTRE

drawing
BA TRAINING BUILDING

drawn by	ST	date	AUG 23
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St Asaph Business Park
Happy Chappy Toys
Temporarily closed
GreenThumb Lawn Treatment Service
Carlton Ct
Ffordd William Morgan
ClwydAlyn
OES - Office Equipment Systems
New Vision Business Park
St. Asaph Substation
Cwttir Ln
BHC Technology Limited
Bowen Ct
Sage and Company
Sandwich Bar
Sandwich
Bowen Court
St Asaph Business Park
John Owens Solicitors
CGI St Asaph Office
Cadmhas
Pure Residential & Commercial
Get Carter UK 365 Ltd, Gas Plumbing and...
Ask Emma Digital Accountants
StudioScript
Southcroft
Glascoed Rd
B5381
Quanta Dialysis Technologies
Qioptiq Ltd
Ffordd Richard Davies
Phoenix Optical Technologies
Layers
Google

2270.01
North Wales Fire and Rescue Service

New Training Centre – St Asaph
Civil and Structural Engineering Strategy

Rev A - September 2023

Bradshaw Gass & Hope LLP, 21 Silverwell Street, Bolton, BL1 1PR t:01204 525321 e: email@bghbolton.co.uk

Report Details:

Prepared By:	B Howarth		
Checked By:	BGH		
Revisions:	Initial Issue	-	August 2023
	Revision A	-	September 2023

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1.0 Introduction

1.1 Introduction

Gleeds Ltd have appointed Bradshaw Gass and Hope LLP to provide structural engineering services to North Wales Fire and Rescue Service.
Bradshaw Gass and Hope LLP will require approval of the assumptions set out in this report before commencing the next stage of design.

Various options for the training centre have been proposed, this document focuses on Options 3 & 4 only.
Option 3 covers approx. 70% of the site with an area set aside for future expansion and development at a later stage.
Option 4 cover the full development and training props.

1.2 Project Overview

This Civil & Structural Engineering Strategy report summarises the civil and structural brief and proposals for the project. The project involves the design and construction of a Fire and rescue training Centre in North Wales.

The centre will have a number of training buildings and training props across the site. In addition to car parking and ancillary buildings.

1.3 Site Description

1.3.1 GENERAL DESCRIPTION:
The site is adjacent to and is accessed by the B5381 Glascoed Road Whalley Road. The site is a former glass works.
To the north lies a local Electrical distribution station, to the east fields and a plumbers merchants.
Fields and a Factory to the south and New Vision Business Park to the East.
The site slopes downhill in a northern direction.

1.3.2 NEAREST ADDRESS:
St. Asaph, St Asaph, Denbighshire,
Wales, LL17 0LQ, United Kingdom

1.3.3 OS MAPS:
OS Grid Ref: SJ 02011 74059
Indicates site altitude as 32m.
Centre of the Site is approx. 1.55km from the River Elwy
Centre of the Site is approx. 7.8km to the nearest Coastline

1.3.4 ARCHIVE MAPS:
The 1885-1900 Map shows the site undeveloped fields.
The 1888-1913 Map shows the site undeveloped fields.
The 1937-1961 Map shows the site undeveloped fields.
The 1955-1961 Map shows a building located in the south of the site

1.3.5 COAL AUTHORITY MAP INFORMATION

The site is not within a coal mining reporting area.

1.3.6 FLOOD ZONE MAP INFORMATION

The stream and ditch which diagonally crosses the site represents a high flood risk local to that area.

1.3.7 GROUND CONDITIONS

The ground conditions do vary across the site, however the typical ground conditions are:

- **Made Ground** comprising light brown, fine to coarse SAND and angular to subangular, fine to coarse GRAVEL of limestone to a depth of between 0.30m and 1.00m bgl (30.28m and 27.87m AOD), underlain by:
- **[North Western Corner Only] Glacial Till** comprising firm, bluish grey, slightly gravelly, slightly sandy, silty CLAY to a depth of between 1.50m to 2.40m bgl (30.23m and 26.47m AOD), underlain by:
- **Glacial Till** comprising stiff, brown, mottled grey, slightly gravelly, slightly sandy CLAY to a depth of at least 5.45m bgl (23.42m AOD) at termination. The base of this stratum was not proven in any exploratory holes.

A Phase 2 ground investigation survey is available which gives greater understanding of the existing ground conditions.

Some historically infilled ponds are noted within the Phase 2, also perched ground water has been found at circa 1.0m depth at many test locations.

Some asbestos and TPH contamination was noted within the Phase 2 laboratory test, please refer to the Phase 2 for further information.

It should be noted the ground investigation found undocumented services at some trial pit positions, in addition to buried concrete slabs. This may represent a risk during excavation, earthworks and foundation construction.

1.3.8 NOTABLE FEATURES

- The north west of the site is a Great Crested Newt protection zone and cannot be developed or affected in any way.
- A High Pressure gas main runs to the south of the site and a large easement zone is required, within which no works can be carried out.
- A Low pressure gas main runs to the North of the site, which is also subject to an easement zone.
- High pressure insulated pipe work was noted at several locations
- Various service chambers have been noted on site.
- A number of raised concrete platforms, walls and retaining wall have been noted on site.

2. Training and Administration Hub

2.1 Substructure Proposals

The Phase 2 ground investigation indicates that the Glacial Till clay is suitable to carry loads from a single storey building as such it is taken that shallow reinforced concrete pad footings will be suitable to the steel column locations.

Dynamic Sample DS02 was carried out within the demise of the proposed training hub and this indicates suitable glacial till at to provide a founding strata at approx. 1.2m below existing ground level.

Note due to the presence of established trees and medium volume change potential of the soil heave precautions and local foundation deepening may be required to the western elevation.

Due to the varying depth of perched water on the site, it may be necessary to consider dewatering during excavations.

The dynamic sample local to this area indicates made ground (sands and gravels) to a depth of 0.65m. This made ground will need to be stripped and re-graded and compacted to provide suitable support to a reinforced concrete ground bearing slab.

Note: much of the made ground noted on site appears to be demolition material, from the former glassworks. If re-graded and suitable compacted this should be suitable for used as hard core sub base for slabs and roadways.

2.2 Superstructure Proposals

A steel frame is considered the most appropriate solution. The frame will be braced in each orthogonal direction and bracing locations will need to be agreed with Bradshaw Gass and Hope Architectural. It is likely that braced bays can be located in walls.

The roof will have sufficient plan bracing to transfer lateral loads to braced bays.

The architectural layouts permit the adoption of a regular grid system with conventional beam/column framing arrangement.

Alternatively, should bracing not be possible a moment frame could be adopted though steelwork costs would likely increase as a result. Steel should be assumed to be S355 grade hot-rolled steel designed in accordance with BS 5950.

Steel execution class should be assumed to be EXC2 to BS EN 1090.

It should be assumed that all internal steelwork will require corrosion protection to suit a C2 Low Risk environment.

It is possible that external columns and steelwork in cavities (in particular external columns) will need to be treated to suit a C3 Medium Risk environment. This will be determined during detailed design.

Fire protection requirements will be confirmed by others during detailed design – our working assumption is that 60 minutes will be required. At this stage we have assumed that fire protection will be provided to the steel frame with intumescent paint. It is assumed that fire protection will be required to all steel which supports accessible areas of the roof.

Internal blockwork partitions are to be non-loadbearing. These walls are to be built off the ground floor structure. These walls will require pre-cast concrete lintels to door openings, contraction joints at regular centres. Larger panels may require additional wind posts or framing to provide restraint. These walls may require additional restraint at the head and at external wall interfaces. Additional secondary steel framing to provide restraint if required will determined during the detailed design stage. Tying details to external walls if required will also be determined during the detailed design stage.

3. B.A. School

3.1 Substructure Proposals

The Phase 2 ground investigation indicates that the Glacial Till clay is suitable to carry loads from a single storey building as such it is taken that shallow reinforced concrete pad footings will be suitable to the steel column locations.

Trial pit TP08 was carried out within the demise of the proposed B.A. School and this indicates suitable glacial till at to provide a founding strata at approx. 1.2m below existing ground level.

Note due to the presence of established trees and medium volume change potential of the soil heave precautions and local foundation deepening may be required to the western elevation.

The Trial pit local to this area indicates made ground (sands, gravels and brick) to a depth of 0.6m. This made ground will need to be stripped and re-graded and compacted to provide suitable support to a reinforced concrete ground bearing slab.

Note: much of the made ground noted on site appears to be demolition material, from the former glassworks. If re-graded and suitable compacted this should be suitable for used as hard core sub base for slabs and roadways.

3.2 Superstructure Proposals

A steel frame is considered the most appropriate solution. The frame will be braced in each orthogonal direction and bracing locations will need to be agreed with Bradshaw Gass and Hope Architectural. It is likely that braced bays can be located in walls.

The roof will have sufficient plan bracing to transfer lateral loads to braced bays.

The architectural layouts permit the adoption of a regular grid system with conventional beam/column framing arrangement.

Alternatively, should bracing not be possible a moment frame could be adopted though steelwork costs would likely increase as a result. Steel should be assumed to be S355 grade hot-rolled steel designed in accordance with BS 5950.

Steel execution class should be assumed to be EXC2 to BS EN 1090.

It should be assumed that all internal steelwork will require corrosion protection to suit a C2 Low Risk environment.

It is possible that external columns and steelwork in cavities (in particular external columns) will need to be treated to suit a C3 Medium Risk environment. This will be determined during detailed design.

Fire protection requirements will be confirmed by others during detailed design – our working assumption is that 60 minutes will be required. At this stage we have assumed that fire protection will be provided to the steel frame with intumescent paint. It is assumed that fire protection will be required to all steel which supports accessible areas of the roof.

It is assumed that any cladding will be an SFS system & any additional support members carry loads back to the main hot rolled steel column positions and there are no additional cladding support members as part of the hot-rolled steel frame. The cladding system will be designed by a specialist cladding contractor.

Internal blockwork partitions are to be non-loadbearing. These walls are to be built off the ground floor structure. These walls will require pre-cast concrete lintels to door openings, contraction joints at regular centres. Larger panels may require additional wind posts or framing to provide restraint. These walls may require additional restraint at the head and at external wall interfaces. Additional secondary steel framing to provide restraint if required will determined during the detailed design stage. Tying details to external walls if required will also be determined during the detailed design stage.

4. Appliance Garage

4.1 Substructure Proposals

The Phase 2 ground investigation indicates that the Glacial Till clay is suitable to carry loads from a single storey building as such it is taken that shallow reinforced concrete pad footings will be suitable to the steel portal frame locations.

Trial pit TP05 is the closest position to the proposed appliance garage and this indicates suitable glacial till at to provide a founding strata at approx. 1.2m below existing ground level.

The Trial pit local to this area indicates made ground (Reinforced concrete, gravels and limestone) to a depth of 0.7m. This made ground will need to be stripped and re-graded compacted and/or replaced with engineered fill to provide suitable support to a reinforced concrete ground bearing slab.

Note: much of the made ground noted on site appears to be demolition material, from the former glassworks. If re-graded and suitable compacted this should be suitable for used as hard core sub base for slabs and roadways.

3.2 Superstructure Proposals

A steel portal frame is considered the most appropriate solution. The frame will be braced in the long direction with bracing within/adjacent to external walls.

The roof will have sufficient plan bracing to transfer lateral loads to braced bays and portal frames.

Steel should be assumed to be S355 grade hot-rolled steel designed in accordance with BS 5950.

Steel execution class should be assumed to be EXC2 to BS EN 1090.

Fire protection requirements will be confirmed by others during detailed design – our working assumption is that 60 minutes will be required. At this stage we have assumed that fire protection will be provided to the steel frame with intumescent paint. It is assumed that fire protection will be required to all steel which supports accessible areas of the roof.

It is assumed that any cladding will be an SFS system & any additional support members carry loads back to the main hot rolled steel column positions and there are no additional cladding support members as part of the hot-rolled steel frame. The cladding system will be designed by a specialist cladding contractor.

5. Training Props

5.1 Fire House

The fire house will be subject to high temperatures and as such is required to be a highly robust structure.

It will primarily be constructed in high strength load bearing masonry. To account for potential thermal movement the load bearing masonry will require an increased number of joints than would be typical for a building of its size. All lintels are to be Naylor pre-cast concrete, with any lintels close to burn areas being Naylor Ultra Fire lintels.

The roof is to be engineered timber TJI joists.

The internal floors will be pre-cast concrete units spanning between load baring walls. Typically 150mm concrete units with a 75mm concrete screed to the top surface. Any steel required to form openings will require concrete encasement of the beam line be formed in reinforced concrete.
The support of external balconies will be formed by cantilever beams within the depth of the floor.

The basement retaining walls and slab are to be formed in reinforced concrete.

The foundation solution will be reinforced concrete piled ground beams.

All burn areas are to be protected with refractory concrete fire tiles and insulation to specialist design.

All internal gullies will be required to connect to the foul water system.

5.2 Pair of Semi-Detached houses

The semi-detached houses will follow the same form of construction as the Fire house and as such is required to be a highly robust structure.

It will primarily be constructed in high strength load bearing masonry. To account for potential thermal movement the load bearing masonry will require an increased number of joints than would be typical for a building of its size. All lintels are to be Naylor pre-cast concrete, with any lintels close to burn areas being Naylor Ultra Fire lintels.

The roof is to be engineered timber TJI joists.

The internal floors will be pre-cast concrete units spanning between load baring walls. Typically 150mm concrete units with a 75mm concrete screed to the top surface. Any steel required to form openings will require concrete encasement of the beam line be formed in reinforced concrete.

The ground floor is to be a beam and block solution spanning onto ground beams.

The foundation solution will be reinforced concrete piled ground beams.

All burn areas are to be protected with refractory concrete fire tiles and insulation to specialist design.

All internal gullys will be required to connect to the foul water system.

5.3 B.A. Training Building and Forced Entry Rig

The B.A. training building is to be a single storey masonry building, with a light weight steel roof supported by load bearing walls and an open/canopy area formed with structural steel beams and a column.

Simple strip footings are envisaged for the foundations, with a ground bearing slab on layers of hardcore to a minimum of 0.7m below existing ground level. The ground beaing slab will require a recess to accommodate an unstable floor scenario.

5.4 Containment Enclosure

The containment enclosure area houses Attack and Demo units, which are made from repurposed shipping containers. These sit on a reinforced concrete slab and have a large extract canopy over.

The extract canopy is free standing roof supported by an exposed portal frame structure.

As bracing cannot be permitted additional steel moment frames will be required to provide stability. The roof will have sufficient plan bracing to transfer lateral loads to moment frames and portal frames.

Steel should be assumed to be S355 grade hot-rolled steel designed in accordance with BS 5950.

It should be assumed that all steelwork will require corrosion protection to suit a C3 High Risk environment.

Steel execution class should be assumed to be EXC2 to BS EN 1090.

The foundations to the portal frame should be taken as reinforced concrete pads, founding at a depth of 1.2m below ground level.

The ground bearing slab should be taken as 200mm thick and reinforced with mesh, on hardcore to a depth of 0.7m below ground.

5.5 Highway Scenario

The Highway scenario is to be a length of external Tarmac which resembles an “A” road.

The Suggested build up is:

50mm Stone Mastic asphalt with 20mm chippings
60mm Dense Asphalt Cement
190mm Asphalt Cement
150mm Mot Type 1 Sub base
6F5 Hardcore to 700mm below ground level.

Note: much of the made ground noted on site appears to be demolition material, from the former glassworks. If re-graded and suitable compacted this should be suitable for used as hard core sub base for slabs and roadways.

5.6 The RTC Outdoor

The RTC outdoor area is to be a concrete hardstanding area.

It is suggested that a 200mm thick aerated reinforced concrete slab be used. This will require a hardcore sub base to a minimum of 0.7m below ground to avoid the existing made ground conditions on site.

5.7 Drill Yard

The RTC outdoor area is to be a concrete hardstanding area. Due to the proposed usage for fitness tests etc the yard is to be as flat as possible while still free draining as such a fall of 1 in 100 is to be used. In order to work with this fall ACO channel drains are recommended to the perimeter.

It is suggested that a 200mm thick aerated reinforced concrete slab be used. This will require a hardcore sub base to a minimum of 0.7m below ground to avoid the existing made ground conditions on site.

On previous projects firefighters have preferred darker coloured concrete as it is less reflective in wet conditions. It has been found previously that using a lower C30 grade concrete (than the typical C40 grade typically used in hardstanding design) has given a darker colour. However changes in local sourcing of cement, sands and aggregates can cause variations in colour. In addition the colour of the concrete is not a property which can be specified in a structural concrete mix design without the addition of a pigment. As such it may be necessary to consider adding a pigment to the concrete mix.

Note: much of the made ground noted on site appears to be demolition material, from the former glassworks. If re-graded and suitable compacted this should be suitable for used as hard core sub base for slabs and roadways.

5.8 Training Towers

The training towers are a specialist item, these are typically supplied by Crofton Engineering.

The bases to the training towers require a large concrete anchorage within a block or concrete. Due to the site conditions this will require piling.

5.9 Industrial Structure (Option 3 Expansion/Option 4)

This is to be an unclad galvanised steel frame. This will have various steel stairs, walkways and platforms in addition to training props such as dummy pipework, tanks and LPG burners.

The sub structure is to be a raft slab, with plinths and sumps as required to suit training scenarios. The Raft will be Reinforced concrete and is to sit on hardcore sub base In layers to a competent bearing strata. It may be possible to use site won material (concrete…etc) as the hardcore following suitable re-grading.

5.10 Ship Scenario (Option 3 Expansion/Option 4)

The Ship scenario is to be confirmed, it is understood this will be supported by a raft slab foundation, similar in principle to the Industrial structure noted in section 5.9.

5.11 Farm House and Farm Building (Option 3/option 4)

The Farm House building, is to be a single storey masonry structure supporting a timber joist and steel profiled roof.
The foundation and ground floor slab are to be reinforced concrete raft on compacted hardcore sub-base to a suitable bearing strata.

The agricultural building is to be a steel portal frame, with Masonry external wall to approx. 2.6m with 2.5m of cladding above.

Lateral bracing is to be used within the walls and the roof will have sufficient plan bracing to transfer lateral loads to the lateral bracing and portal frames.

Steel should be assumed to be S355 grade hot-rolled steel designed in accordance with BS 5950.

It should be assumed that all steelwork will require corrosion protection to suit a C3 High Risk environment.

Steel execution class should be assumed to be EXC2 to BS EN 1090.

The foundations to the portal frame should be taken as reinforced concrete pads, founding at a depth of 1.2m below ground level.

The ground bearing slab should be taken as 200mm thick and reinforced with mesh, on hardcore to a depth of 0.7m below ground. It is suggested site won material may be suitable for use as hardcore following suitable re-grading.

6. Drainage Strategy

Please Refer to Appendix A – Drainage Strategy Layout

6.1 Surface Water Drainage Design

The surface water drainage strategy is subject to further detailed. The infiltration tests carried out as part of the Phase 2 report indicate that the site is unsuitable for the use of soakaways.

The drainage design will be subject to a Flood Consequences Assessment identifying current flood risks to the development site. The Suds drainage system will be designed to suit National and local planning policy, regulations and relevant design guidance include:

- National Planning Policy Framework (NPPF) July 2021, Paragraphs 153-158 and 159-169;
- National Planning Practice Guidance (NPPG);
- Principles of Sustainable drainage systems (SuDS) set out by DEFRA (2011);
- CIRIA SuDS Manual C753 (2015);
- CIRIA (2010) Planning for SuDS;
- Non-Statutory Technical Standards for Sustainable Drainage Systems (DEFRA) (March 2015);

The system will be designed to ensure there is no surcharging to the drainage system for a 1 in 30-year storm event and no internal property flooding for a 1 in 100-year storm event + 40% allowance for climate change.

Although part of a stream crosses the site this forms part of the Great Crested Newt protection zone, and as such this cannot be used as a discharge point for the surface water due to the potential change in water level and its subsequent effect on the newt population.

The current proposal is for surface water from the buildings and local hardstanding areas to be collected via a series of attenuation tanks. With surface water connecting to the existing Welsh Water assets locally.

It is the intention to re-use existing drainage connections were possible in order to avoid any works within the associated exclusion zone adjacent to the gas mains on site.

As a SUD's feature and to act as a pollutant control it is proposed that car parking bays will be formed of impermeable surfacing with water collected via a series of perforated pipes within a layer of clean stone.

The drainage system will manage the surface water runoff from impermeable areas of the site through attenuating in the SuDS features with gradual release into the existing surface water network. The flow rate will be restricted using a hydro-brake flow control device or similar.

A SAP application and agreement is required to be in place with Welsh Water prior to any sewer construction on site.

6.2 Foul Water Drainage Design

The foul water drainage network will be designed to achieve a self-cleansing flow of no less than 0.75 m/s up to the connection into the local Welsh Water asset.

The total foul water discharge rate will be calculated in-line with Sewers for Adoption guidance domestic flows calculated in accordance with BS EN 752 and BS EN 12056-2.

The foul water flow rate is to be agreed with Welsh Water and is subject to approval.

From Archive information approximate location of the foul drainage connection from the former glassworks has been identified. It is intended to

7. Roads and Car Park

7.1 Pavement Build Up

In addition to the Highway Scenario given in section 5.5 the following build ups are also suggested:

General Concrete Hardstanding:
200mm Reinforced concrete slab (Air Entrained)
6F5 Hardcore to 700mm below ground level

Access Roadway & Impermeable Parking
40mm Stone Mastic Asphalt
50mm Dense Aspahalt Cement
150mm Asphalt Cement
200mm MOT Type 1
6F5 Hardcore to a minimum depth of 700mm below ground

Permeable Parking
60mm Block Paving
25mm Crushed Aggregate Bedding
300mm Clean Stone
Geotextile/Tanking Layer
6F5 Hardcore to 700mm below ground level

Foot Path
20mm Asphalt Cement
60mm Dense Asphalt Cement
200 MOT Type 1

Note: much of the made ground noted on site appears to be demolition material, from the former glassworks. If re-graded and suitable compacted this should be suitable for used as hard core sub base for slabs and roadways.
The sub-base of existing roadways and slabs may be suitable for re-use following in-situ CBR testing.

7.2 Site Levels and Retaining Walls

As noted previously the site slopes from South to North, with a general fall of circa 4.5m across the 265m (approx.) length.

As a general rule there is a steady change in levels across the site, however there are some notable exceptions:

1. Between the area of the proposed drill yard and B.A. training school there is a sharp change in level of circa 2.0m combined with the general fall across the site.
2. The recently formed vehicle entrance/exit is circa 1.2m higher than much of the surrounding site.
3. Adjacent to the proposed appliance garage position there appears to be the floor slab of a former building which is causing a step in levels locally.
4. Across the proposed fire house position the existing level falls approx. 0.6m.
5. Across the proposed containment enclosure position the existing level falls approx. 1.0m.

Please refer to the mark up plan in appendix B.

The existing levels have been retained were possible.

1 Between the proposed PV solar farm and BA School we will require a 2.4m retaining wall. We are suggesting an earth retaining wall / engineered bank would be best suited for this location, provided the space can be accommodated.

The Tensar Tech Natural Green banking is proposed as a potential system. This does not require and specialist installation knowledge and can be seeded to form a steep grass bank.

2 To deal with the higher vehicle entrance/exit a 450mmhigh retaining wall will be required adjacent to the Training and administration hub, in addition to the re-grading of the area immediately between the vehicle entrance and the Training and Administration Hub.

As the wall position will be within a landscaped area it is suggested this proposed retaining wall be formed in masonry with a reinforced concrete bass and core.

3 The area adjacent to the proposed appliance garage will require further detailed design following the grubbing out of the apparent existing slab.

4 A 0.6m High Reinforced concrete retaining wall will be required between the proposed Fire house and semi-detached houses. It is likely this will require a barrier or handrail.

5 A 1.15m Reinforced concrete retaining wall will be required adjacent to the containment enclosure. Due to proximity to the waste skits we would suggest a vehicle barrier will be required adjacent to the wall.

7. Ancillary buildings

Electrical Sub-Station

It is assumed the substation will be an entirely separate structure, clad to suit the proposed buildings adjacent with a split level base and slab to accommodate trenches as required to suit the local electricity supplier.

The sub-station design will be confirmed during the detailed design stage.

8. Existing Foundations / Building Positions

The site is understood to have been extensively developed as a former Glass works.

Appendix D shows the drainage plan of the former site (Please note this appears to have been reproduced many times with some information obscured) with positions of buildings schown.
Due to the composition and depth of the made ground (gravel, brick & concrete fragments…etc) it is assumed that following demolition of the former glassworks the material has been spread across site.

As such it is highly unlikely that existing foundations will have been removed and grubbed out, in additions some trial pits carried out for the Phase 2 found multiple slabs at depths. This may be indicative of infilled pits or shallow basement areas.

Given the information in the Geotechnical investigation it is likely much of the existing foundations will be founded in the Clay layer, however it is likely that heavy plant and equipment would require a deep foundation solution.

Using the Topographic survey and archive aerial photographs (dated 2006) we have approximately plotted the former building and yard positions (Appendix C). These will be the likely positions of buried foundations on site.

Following a site walk round various concrete walls, loading platforms, slabs and retaining walls are present on site. In addition an insulated steam pipe network appears to be present.

It should also be noted that in at least one of the trial pits carried out for the geotechnical survey undocumented buried services were encountered.

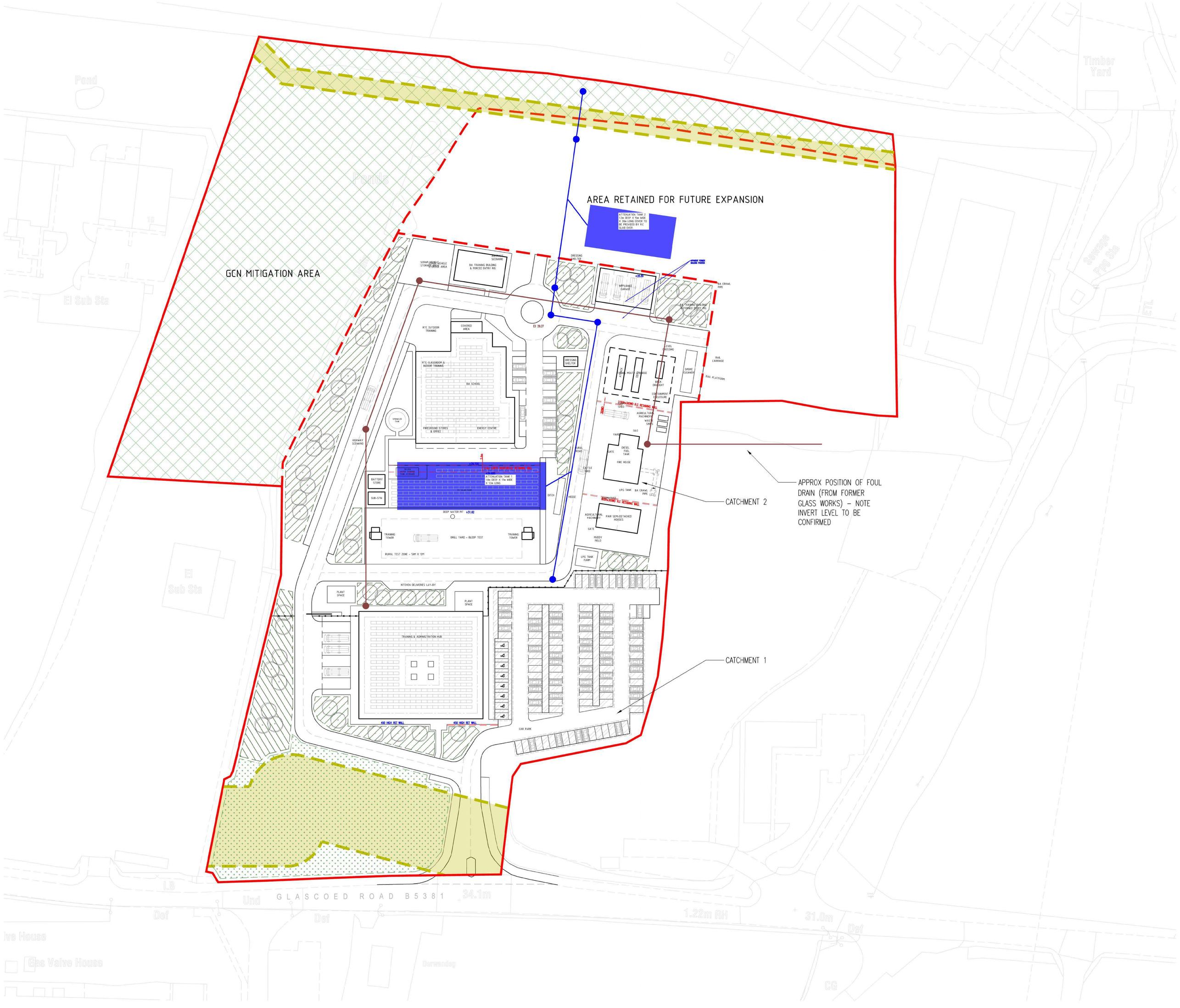
Aerial Photograph of Existing Site (September 2023)

Concrete Walls, Platforms and Retaining Structures

Partially obscured retaining wall & Steel Stanchions.

Additional Photographs are shown in appendix C

Appendix A – Drainage Strategy



OPTION 3

GCN MITIGATION AREA

HIGH & INTERMEDIATE PRESSURE GAS MAINS HAZARD / NO BUILD ZONE

WILDFLOWER LANDSCAPING ZONE 3,206 SQ.M

TREE PLANTING ZONE 3,336 SQ.M

PV - TRAINING & ADMIN. HUB 480 SQ.M

PV - BA SCHOOL ETC. 350 SQ.M

PV - SOLAR FARM 332 SQ.M

PV - CAR PARK 1,935 SQ.M

BASED ON AN INDIVIDUAL SOLAR PANEL OF 1M X 2M NOMINAL SIZE

DEVELOPMENT AREA	2.858 Ha
GCN MITIGATION AREA	1.305 Ha
FUTURE EXPANSION AREA	1.098 Ha

0 10 20 30 40 50m
1:500

status
PRELIMINARY

Hazard Identification

ref	hazard	date

N

ref	revision	by	date
P1	FIRST ISSUE	SJ	13/09/23

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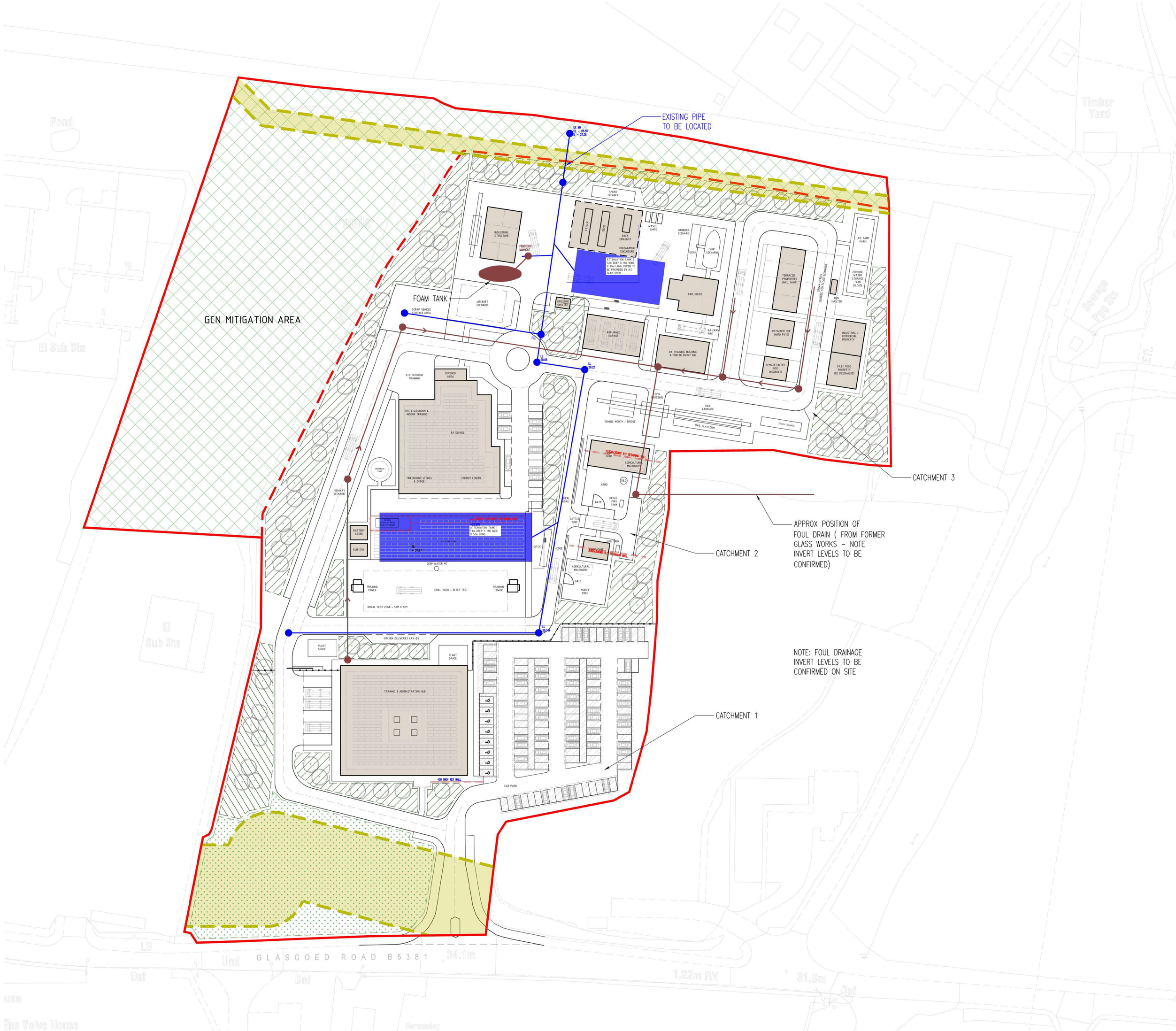
Bradshaw Gass & Hope LLP

client:
GLEEDS

project:
NORTH WALES FIRE & RESCUE SERVICE
NEW TRAINING CENTRE

drawing:
PROPOSED DRAINAGE STRATEGY
OPTION 3

drawn by	SJ	date	AUG 23
checked by	BH	date	SEP 2023
scale	1:500		A0
Bwg no	2270.03.00.SK01	rev	P1



OPTION 4

GCN MITIGATION AREA

HIGH & INTERMEDIATE PRESSURE GAS MAINS HAZARD / NO BUILD ZONE

WILDFLOWER LANDSCAPING ZONE	3,206 SQ.M
TREE PLANTING ZONE	6,383 SQ.M
PV - TRAINING & ADMIN. HUB	480 SQ.M
PV - BA SCHOOL ETC.	350 SQ.M
PV - SOLAR FARM	332 SQ.M
PV - CAR PARK	1,935 SQ.M

BASED ON AN INDIVIDUAL SOLAR PANEL OF 1M X 2M NOMINAL SIZE

DEVELOPMENT AREA	3.956 Ha
GCN MITIGATION AREA	1.305 Ha

0 10 20 30 40 50m
1:500

status
PRELIMINARY

Hazard Identification

ref	hazard	date

N

CATCHMENT 1
AREA = 9735m²
% IMPERMEABLE = 82%
ATTENUATION = 640m³

CATCHMENT 2
AREA = 14434m²
% IMPERMEABLE = 86%
ATTENUATION = 1015m³

CATCHMENT 3
AREA = 11053m²
% IMPERMEABLE = 77%
ATTENUATION = 665m³

ref	revision	by	date
P1	FIRST ISSUE	SJ	13/09/2023

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Bradshaw Gass & Hope LLP

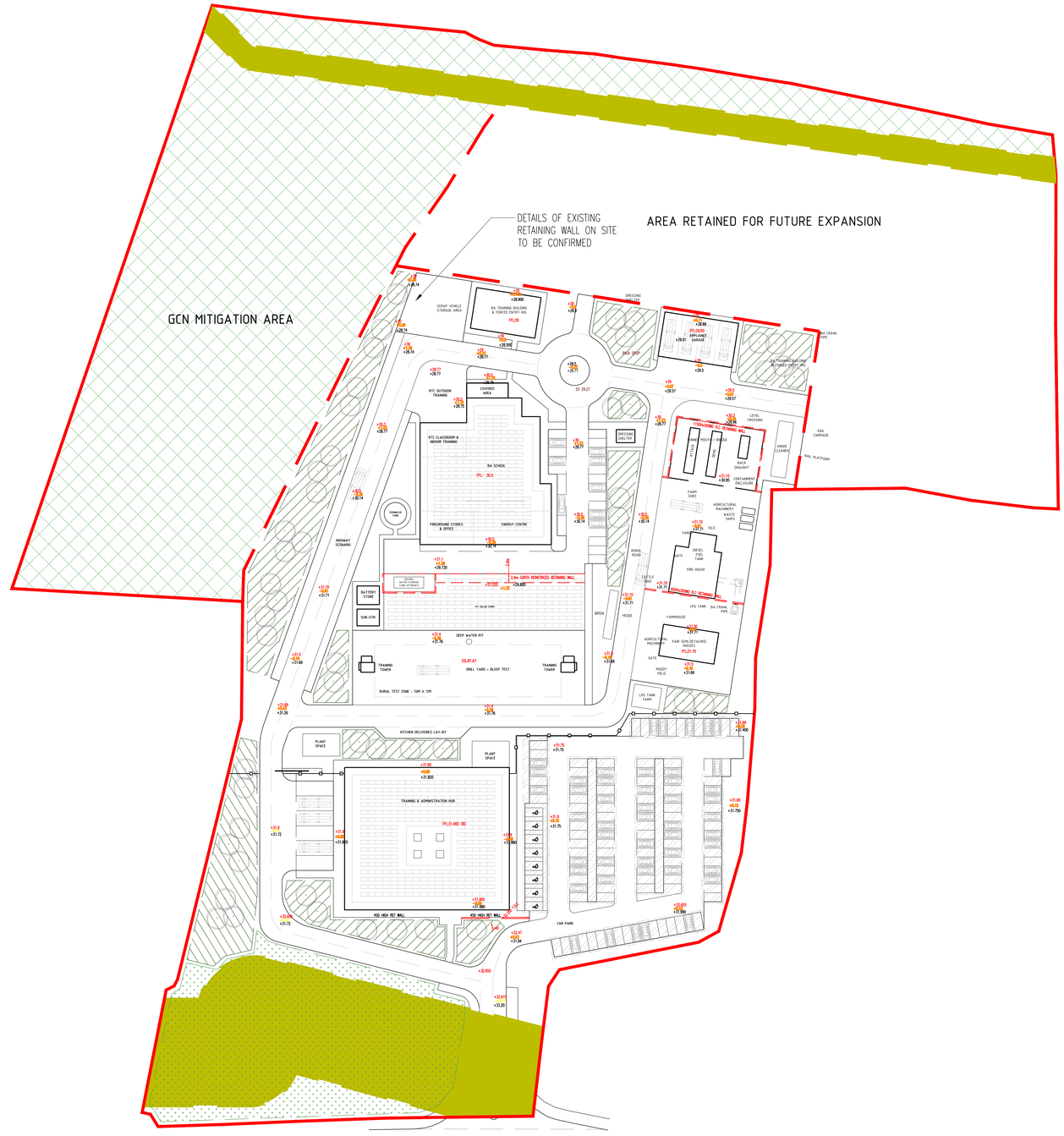
client: GLEEDS

project: NORTH WALES FIRE & RESCUE SERVICE
NEW TRAINING CENTRE

drawing: PROPOSED DRAINAGE STRATEGY OPTION 4

drawn by	SJ	date	AUG 23
checked by	BH	date	SEP 2023
scale	1:500		A0
dwg no	2270.03.00.SK02	rev	P1

Appendix B – Preliminary Levels Assessment



GCN MITIGATION AREA

HIGH & INTERMEDIATE PRESSURE GAS MAINS HAZARD / NO BUILD ZONE

WILDFLOWER LANDSCAPING ZONE 3,206 SQ.M

TREE PLANTING ZONE 3,336 SQ.M

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PV - BA SCHOOL ETC. 350 SQ.M

PV - SOLAR FARM 332 SQ.M

PV - CAR PARK 1,935 SQ.M

BASED ON AN INDIVIDUAL SOLAR PANEL OF 1M X 2M NOMINAL SIZE

DEVELOPMENT AREA 2.858 Ha

GCN MITIGATION AREA 1.305 Ha

FUTURE EXPANSION AREA 1.098 Ha

EXISTING LEVEL

PROPOSED LEVEL

DIFFERENCE IN LEVEL

0 20 40 60 80 100mm

1:1

status
PRELIMINARY

Hazard Identification

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P1	FIRST ISSUE	SJ	13/09/2023

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NORTH WALES FIRE & RESCUE SERVICE
NEW TRAINING CENTRE

drawing
LEVEL STRATEGY
OPTION 3

drawn by	SJ	date	SEPT 2023
checked by	BH	date	SEP 2023
scale	1:500		A0
dwg no	2270.03.00.SK03	rev	P1

GCN MITIGATION AREA

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BASED ON AN INDIVIDUAL SOLAR PANEL OF 1M X 2M NOMINAL SIZE

DEVELOPMENT AREA	3.956 Ha
GCN MITIGATION AREA	1.305 Ha

EXISTING LEVEL

PROPOSED LEVEL

DIFFERENCE IN LEVEL

0 20 40 60 80 100mm

1:1

status

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Hazard Identification

ref	hazard	date

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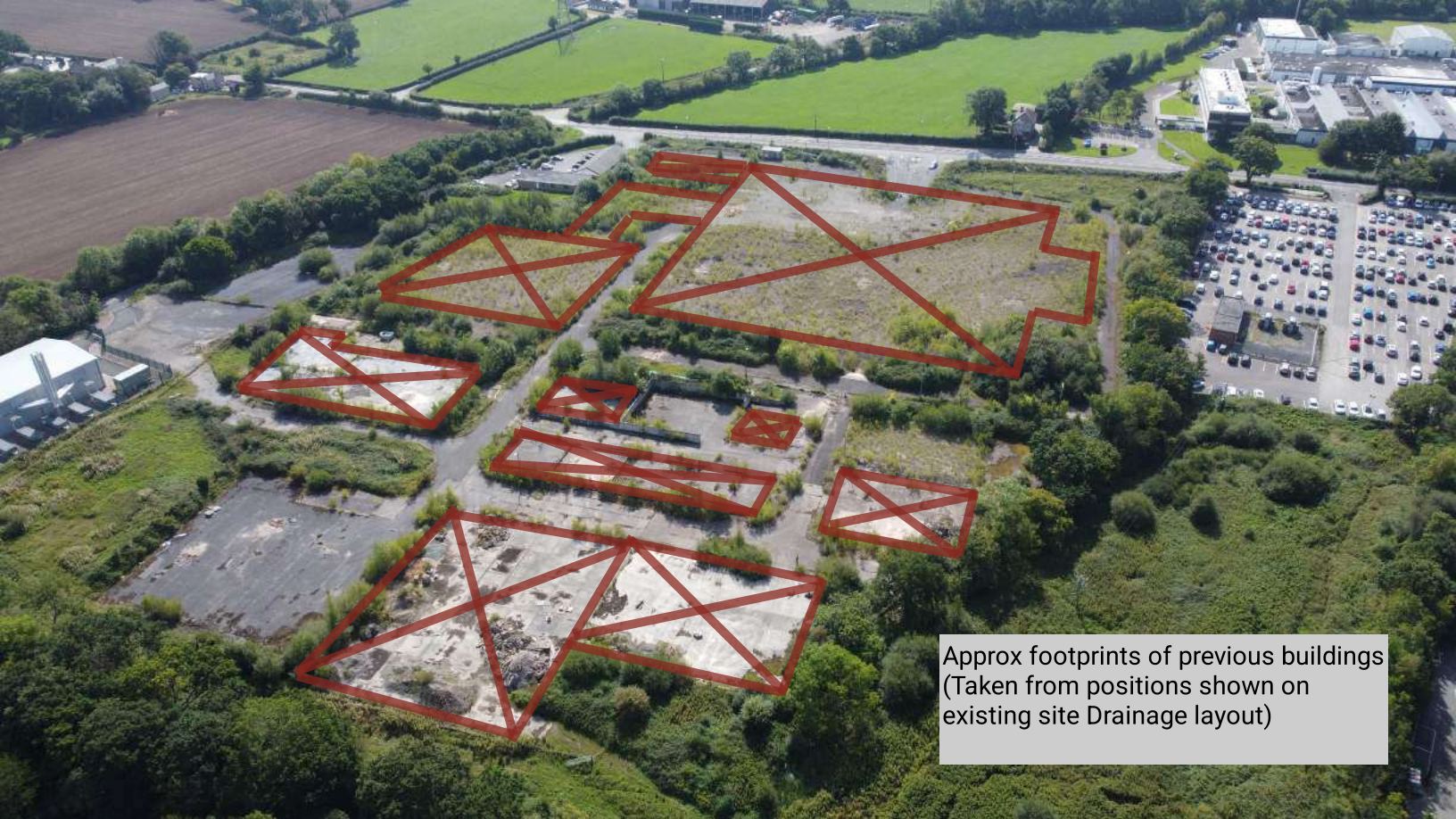
NEW TRAINING CENTRE

drawing
LEVEL STRATEGY
OPTION 4

drawn by	SJ	date	SEP 2023
checked by	BH	date	SEP 2023
scale	1:500		A0

dwg no **2267.03.00.SK04** rev **P1**

Appendix C – Former Site Features


Approx footprints of previous buildings (Taken from positions shown on existing site Drainage layout)

Former Gate House – Note Steam Pipe

Existing Roadway- View from Site Entrance

Gas Easement Zone – View from Site Entrance

Concrete Platform – Suspected Former Loading Bay

Concrete Raodway

Undocumented Chambers

Former Building Positions – Existing Slabs Remain

Former Building Position – Undocumented Retaining Wall

Gas Main Marker

Concrete Roadway and Raised Platform (Note Gas Power Station in Background)

Existing Tarmac Area

Typical Roadway

Former Threshold and Level Changes

Reinforced Concrete Wall

Reinforced Concrete Wall

Existing Walls and Concrete Yard

Ramp/Change in Level from Demolition Debris

Stone Retaining Wall

Suspected steam pipe network

Suspect Steam Pipe Network

View towards former entrance

Appendix D – Existing Drainage Information

DO NOT SCALE

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED

N

DRAINAGE DITCH

SEWAGE PUMP STATION

DRAINS REMOVED

SURFACE WATER DRAINS

FOUL WATER DRAINS

SCALE:- 1=500.	REFERENCE DRAWING Nos.
DRAWN BY SJC 03.08.1989	ACAD No. - CPL 139K. (ORIGINAL SITE PLAN - DEC. 1987)
CHECKED BY	
APPROVED BY	
APPROVED (CLIENT)	

A	B	C
DRAWING UP DATED AFTER DRAIN SURVEY.		

PILKINGTON SPECIAL GLASS LTD.
GLASCOED ROAD
ST.ASAPH
DENBIGHSHIRE, LL17 0LL

DRAWING NO.:- 673-08-M REV:- A

TITLE:-
SITE DRAINS LAYOUT WITHIN PSG. BOUNDARY FENCES.

ACAD No.- 673-08-M PROJECT

HARLEY HADDOW

North Wales Fire & Rescue Service – New Training Centre

MEP Services Overview

September 2023

ENGINEERING POWERED BY THE PAST
BUILDING THE FUTURE

Document Revision Control

Revisions	Date	Reason for Issue	By	Approved
00	25/08/23	For information only	IC/TB	IC
01	04/09/23	Updated following design team meeting	IC	IC
02	15/09/23	Appendices added, including proposed services routing	IC	IC

Contents

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2.0 Incoming Services 5
3.0 Training & Administration Hub (TAH) 6
4.0 BA School (BA) 10
5.0 Training Props / Sitewide Requirements 14

1.0 Introduction

This document has been prepared to provide a high-level overview of the likely servicing proposals for the new Fire Training Centre, in St. Asaph, North Wales.

2.0 Incoming Services

New incoming services will be required for electricity, water and comms. There is no proposal to bring natural gas onto the site.

2.1 Electric

An initial electrical connection quote has been applied for, to provide a budget cost for the new connection – which has suggested a cost of ~£90,000. At this stage, we would suggest that a larger amount than this be used for the cost plan. Only when a formal (and paid for) application is processed will we get confirmation on any limitations on exporting electricity generated by the PV array back into the grid.

HV incoming cables will route to the substation on the site, before electrical services being distributed at LV around the site to the buildings, and to the props where appropriate.

Battery storage is proposed, to store any surplus electricity generated by the PV arrays.

PV arrays are proposed, currently located:

- Roof of the Training & Admin Hub building
- Roof of the BA School building
- Solar farm
- Car park (canopies over the parking spaces)

2.2 Water

Incoming water mains will be provided to give supplies to:

- The occupied buildings (TAH & BA)
- The 100,000l water storage tank for the training hydrant supplies
- The sprinkler tank (provides sprinkler protection to the occupied buildings
- The 200,000l water storage tank for the flood training prop (Option 4 only)

A town hydrant main will run around the building to provide hydrant coverage in the event of genuine (unplanned) fires.

2.3 Comms

A new incoming comms cable will be provided, from the BT network.

3.0 Training & Administration Hub (TAH)

The TAH building is a single storey building which will likely be serviced as follows. It is also worth noting that the building has a BREEAM 'Excellent' requirement, as such there will be extensive energy/consumer meters and controls that need to be included in the early-stage cost plan.

3.1 Mechanical

3.1.1 Primary Plant

Primary heat source – some sort of heat pump technology (both ground source and air source currently being investigated further). Location for the heat pumps in the Energy Centre

3.1.2 Heating/Cooling

Whilst still to be considered further, the heating and cooling for the building is likely to comprise of a combination of heating/cooling from the mechanical ventilation system, 4-pipe fan coil units (maximising the use of the heat pumps), and radiators – suitably sized to take into account the low grade heat generated by the heat pumps.

Subject to heat gains in some of the more specialist training rooms (e.g., Control Centre Training room, Sim Appliance Cab), additional cooling may also need to be provided.

Server Room – a single dedicated DX unit is proposed (no redundancy)

3.1.3 Ventilation

Given the shape/form of the building, and the specialist uses of certain areas, there will need to be significant areas of the building that are mechanically ventilated. This is not a bad thing, as high efficiency heat recovery will be utilised to keep heating/cooling requirements to a minimum. There is a preference to avoid having plant located on the roof, for both visual and maintenance reasons. AHUs are likely to be located in/around the external plant compounds to the north of the building. Routing ductwork through the building will require much more coordination given that it will have to pass over some of the Training Rooms.

Variable air volume systems (VAV) will likely be provided to allow the ventilation rates to increase/decrease to suit occupancy in individual parts of the building.

The kitchen will have its own dedicated ventilation plant, separate from that serving the rest of the building.

Where possible, natural ventilation by means of manually openable windows will be provided – albeit the opportunity for this may be limited.

3.1.4 Domestic Water Services

Domestic cold and hot water services will be piped through the building serving the kitchens, WC block, washroom and multi-faith room. Domestic hot water will likely be generated by high temperature heat pumps. Sizing and recovery times for the hot water generators will be discussed in further detail as the project progresses.

The potential inclusion of rainwater or greywater recycling is still to be discussed.

3.1.5 Above Ground Drainage

There are no known complications to the drainage requirements, over and above any other type of 'standard' office building, as such it is likely that this will be installed in uPVC pipework. Acoustic implications of this will need to be considered in noise sensitive areas.

Drainage from the kitchen ideally will be in either HDPE or Cast Iron. Grease interceptors should be included before the drainage from the kitchen hits the below ground system.

3.1.6 Sprinklers

Sprinklers will be provided to the building – level of classification OH1. Sprinkler tank is provided external to the building.

3.1.7 BMS/Controls

A full building BMS will be provided – which will likely be linked or even combined with the other occupied buildings on site. This is all still to be defined further.

3.2 Electrical

3.2.1 Primary Plant

The building will be served by an incoming low voltage supply terminated in a new 4 pole MCCB Main Switch within a Form 4 Type 2 Panelboard located within the ground floor plant room.

The Panelboard will be c/w outgoing MCCB's and metering.

Distribution boards will be provided to serve distinct areas of the building, all distribution boards will be separately metered (for lighting and power), except where providing power services only.

3.2.2 Electrical Containment & Distribution

All cabling and containment systems will be within ceiling voids where applicable with recessed mounted drops to accessories, except in plant room where drops will be surface mounted.

Dado trunking will be installed with drops from the ceiling void carried out via vertical runs of dado trunking (dado droppers).

Dado trunking will be three compartments and suitable for Cat 6 data cabling.

Dado trunking will be mounted at a height to suit desk/whiteboard fit out.

<u>IT / Comms Room</u>

A fully functional building IT/Comms system will be provided – which will likely be linked with the other occupied buildings on site. This is all still to be defined further.

3.2.3 General Lighting

The intention is for an energy efficient LED lighting scheme that compliments the building style and client purpose. To this end, the majority of lighting will be recessed mounted in the suspended ceiling / designed for suspended fitting where there are no ceilings

Note: Any requirement for turn-out lighting to simulate an operational fire station to be confirmed.

Lighting Control Systems

1. Generally, within corridors, locker rooms, shower rooms, stores and WC's etc., the luminaries will be controlled via passive infra-red movement sensors utilising microwave technology.

2. Within the plant rooms, etc. the luminaries will be manually switched.

3. Elsewhere, such as the training rooms, offices etc. luminaires will be controlled via passive infra-red absence detectors and retractive switches, daylight sensing will be provided to external perimeter rooms where appropriate.

3.2.4 Emergency Lighting

A fully functional emergency lighting installation will be provided.

Emergency test key switches will be installed as part of multi gang switches located adjacent to the distribution boards for testing purposes.

3.2.5 Small Power & Data

Small Power & Data provision will be provided throughout the building to suit Room Data Sheet requirements – This is still to be defined further.

3.2.6 Fire Alarms

A fully functional building fire alarm system will be provided – which will likely be linked with the other occupied buildings on site. This is all still to be defined further along with the category of system required.

Interfacing with Other Systems

The following systems will be interfaced with the fire alarm system:

• Sprinklers
• Access Control Systems
• BMS
• Car Park Gate/Barrier

3.2.7 PV – see 2.1.

3.2.8 Access Control

A fully functional building access control system will be provided – which will likely be linked with the other occupied buildings on site. This is all still to be defined further.

The system will comprise of all proximity access control readers, door controllers, request to exit buttons, emergency break glass units, electro-magnetic locking devices, cards, cabling, power supplies, and all other equipment to form a complete installation.

3.2.9 PA System

A fully functional building Public Address system will be provided – This is all still to be defined further.

Note: Any requirement for turn-out beacons to simulate an operational fire station to be confirmed.

3.2.10 TV Distribution System

There are no requirements for a TV distribution system on the site. There will likely be multiple display screens throughout the site, albeit these will not have a traditional 'aerial' system associated. Any future live TV services would need to be via the internet / Smart TVs.

3.2.11 Lightning Protection

A fully functional building lightning protection system will be provided.

The system will comprise air termination networks, down conductors, earth electrodes and all cross connections and mechanical fixings.

A lightning protection specialist will measure the earth resistance and provide earth electrodes as required.

Connections to earthing electrodes will be housed in concrete inspection housings provided as part of the lightning protection system.

4.0 BA School (BA)

The BA School building is also a single storey building which will likely be serviced as follows. Much like the TAH, the BA School also has a BREEAM 'Excellent' requirement, as such there will be extensive energy/consumer meters and controls that need to be included in the early-stage cost plan.

4.1 Mechanical

4.1.1 Primary Plant

Primary heat source – some sort of heat pump technology (both ground source and air source currently being investigated further). Location for the heat pumps in the Energy Centre

4.1.2 Heating/Cooling

Whilst still to be considered further, the heating and cooling for the building is likely to comprise of a combination of heating/cooling from the mechanical ventilation system, 4-pipe fan coil units (maximizing the use of the heat pumps), and radiators – suitably sized to take into account the low grade heat generated by the heat pumps.

Server Room – dedicated DX unit provided. Query whether n+1 redundancy is required?

4.1.3 Ventilation

Given the uses of the BAS most of it will need to be mechanically ventilated. This is not a bad thing, as high efficiency heat recovery will be utilized to keep heating/cooling requirements to a minimum. There is a preference to avoid having plant located on the roof, for both visual and maintenance reasons. AHUs are likely to be located in/around the external plant compounds – locations of which still to be determined.

Variable air volume systems (VAV) will likely be provided to allow the ventilation rates to increase/decrease to suit occupancy in individual parts of the building.

Where possible, natural ventilation by means of manually openable windows will be provided – albeit the opportunity for this may be limited.

4.1.4 Domestic Water Services

Domestic cold and hot water services will be piped through the building serving the various showers, WCs and WHBs. Domestic hot water will likely be generated by high temperature heat pumps. Sizing and recovery times for the hot water generators will be discussed in further detail as the project progresses.

The potential inclusion of rainwater or greywater recycling is still to be discussed.

4.1.5 Above Ground Drainage

There are no known complications to the drainage requirements, over and above any other type of 'standard' office building, as such it is likely that this will be installed in uPVC pipework. Acoustic implications of this will need to be considered in noise sensitive areas.

4.1.6 Sprinklers

Sprinklers will be provided to the building – level of classification OH1. Sprinkler tank is provided external to the building (same shared sprinkler tank as the TAH Building)

4.1.7 BMS/Controls

A full building BMS will be provided – which will likely be linked or even combined with the other occupied buildings on site. This is all still to be defined further.

4.2 Electrical

4.2.1 Primary Plant

The building will be served by an incoming low voltage supply terminated in a new 4 pole MCCB Main Switch within a Form 4 Type 2 Panelboard located within the ground floor plant room.

The Panelboard will be c/w outgoing MCCB's and metering.

Distribution boards will be provided to serve distinct areas of the building, all distribution boards will be separately metered (for lighting and power), except where providing power services only.

4.2.2 Electrical Containment & Distribution

All cabling and containment systems will be within ceiling voids where applicable with recessed mounted drops to accessories, except in plant room where drops will be surface mounted.

Dado trunking will be installed with drops from the ceiling void carried out via vertical runs of dado trunking (dado droppers).

Dado trunking will be three compartments and suitable for Cat 6 data cabling.

Dado trunking will be mounted at a height to suit desk/whiteboard fit out.

<u>IT / Comms Room</u>

A fully functional building IT/Comms system will be provided – which will likely be linked with the other occupied buildings on site. This is all still to be defined further.

4.2.3 General Lighting

The intention is for an energy efficient LED lighting scheme that compliments the building style and client purpose. To this end, the majority of lighting will be recessed mounted in the suspended ceiling.

Note: Any requirement for turn-out lighting to simulate an operational fire station to be confirmed.

<u>Lighting Control Systems</u>

1. Generally, within corridors, locker rooms, shower rooms, stores and WC's etc., the luminaries will be controlled via passive infra-red movement sensors utilising microwave technology.

2. Within the plant rooms, etc. the luminaries will be manually switched.

3. Elsewhere, such as the gym, training rooms, offices etc. luminaires will be controlled via passive infra-red absence detectors and retractive switches, daylight sensing will be provided to external perimeter rooms where appropriate.

4.2.4 Emergency Lighting

A fully functional emergency lighting installation will be provided.

Emergency test key switches will be installed as part of multi gang switches located adjacent to the distribution boards for testing purposes.

4.2.5 Small Power & Data

Small Power & Data provision will be provided throughout the building to suit Room Data Sheet requirements – This is still to be defined further.

4.2.6 Fire Alarms

A fully functional building fire alarm system will be provided – which will likely be linked with the other occupied buildings on site. This is all still to be defined further along with the category of system required.

Interfacing with Other Systems

The following systems will be interfaced with the fire alarm system:

- Sprinklers
- Access Control Systems
- BMS System
- Car Park Gate/Barrier

4.2.7 PV – see 2.1.

4.2.8 Access Control

A fully functional building access control system will be provided – which will likely be linked with the other occupied buildings on site. This is all still to be defined further.

The system will comprise of all proximity access control readers, door controllers, request to exit buttons, emergency break glass units, electro-magnetic locking devices, cards, cabling, power supplies, and all other equipment to form a complete installation.

4.2.9 PA System

No requirements within the BA Building.

4.2.10 TV Distribution System

There are no requirements for a TV distribution system on the site. There will likely be multiple display screens throughout the site, albeit these will not have a traditional ‘aerial’ system associated. Any future live TV services would need to be via the internet / Smart TVs.

4.2.11 Lightning Protection

A fully functional building lightning protection system will be provided.

The system will comprise air termination networks, down conductors, earth electrodes and all cross connections and mechanical fixings.

A lightning protection specialist will measure the earth resistance and provide earth electrodes as required.

Connections to earthing electrodes will be housed in concrete inspection housings provided as part of the lightning protection system.

5.0 Training Props / Sitewide Requirements

5.1 Training Props

All still to be discussed further.

In general, the props require small power electrical supplies to suit local consumer units which provide lighting to the various rigs/props. Similarly, ICT/network cabling will be required to the majority of props for BMS reporting purposes.

Within the Fire House, a ‘fake’ sprinkler pump set will also be installed.

5.2 Sitewide Services

Street lighting, power outlets, ICT infrastructure, barriers, access control, CCTV, EV charging locations to be provided.

Wi-Fi is also required throughout the site.

6.0 Appendices

6.1 – Proposed Services Routes, Option 3

6.2 – Proposed Services Routes, Option 4

GCN MITIGATION AREA

HIGH & INTERMEDIATE PRESSURE GAS MAINS HAZARD / NO BUILD ZONE

WILDFLOWER LANDSCAPING ZONE 3,206 SQ.M

TREE PLANTING ZONE 3,336 SQ.M

PV - TRAINING & ADMIN. HUB 480 SQ.M

PV - BA SCHOOL ETC. 350 SQ.M

PV - SOLAR FARM 332 SQ.M

PV - CAR PARK 1,935 SQ.M

BASED ON AN INDIVIDUAL SOLAR PANEL OF 1M X 2M NOMINAL SIZE

DEVELOPMENT AREA 2.858 Ha

GCN MITIGATION AREA 1.305 Ha

FUTURE EXPANSION AREA 1.098 Ha

OPTION 3

Proposed site services distribution - Option 3

Harley Haddow

Sep 23

Drawn by: Ian Chalk

0 10 20 30 40 50m
1:500

status
PRELIMINARY

Hazard Identification

ref	hazard	date

N

ref	revision	by	date
P3	UPDATED IN LINE WITH COMMENTS RECEIVED AT PTM 21.08.23	ST	23.08.23
P2	UPDATED IN LINE WITH COMMENTS RECEIVED AT PTM 08.08.23	ST	10.08.23
P1	FIRST ISSUE	ST	07.08.23

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NORTH WALES FIRE & RESCUE SERVICE
NEW TRAINING CENTRE

drawing
PROPOSED SITE PLAN

OPTION 3

drawn by	ST	date	AUG 23
checked by		date	
scale	1:500		A0
dwg no	2270.01.00.203	rev	P3

OPTION 4

GCN MITIGATION AREA

HIGH & INTERMEDIATE PRESSURE GAS MAINS HAZARD / NO BUILD ZONE

WILDFLOWER LANDSCAPING ZONE 3,206 SQ.M

TREE PLANTING ZONE 6,383 SQ.M

PV - TRAINING & ADMIN. HUB 480 SQ.M

PV - BA SCHOOL ETC. 350 SQ.M

PV - SOLAR FARM 332 SQ.M

PV - CAR PARK 1,935 SQ.M

BASED ON AN INDIVIDUAL SOLAR PANEL OF 1M X 2M NOMINAL SIZE

DEVELOPMENT AREA 3.956 Ha

GCN MITIGATION AREA 1.305 Ha

Proposed site services distribution - Option 4

Harley Haddow

Sep 23

Drawn by: Ian Chalk

0 10 20 30 40 50m
1:500

status
PRELIMINARY

Hazard Identification

ref	hazard	date

N

ref	revision	by	date
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drawing
PROPOSED SITE PLAN

OPTION 4

drawn by	ST	date	AUG 23
checked by		date	
scale	1:500		A0
dwg no	2270.01.00.204	rev	P3

HARLEY HADDOW

North Wales Fire & Rescue Service – New Training Centre

Low and Zero Carbon Strategy Report

September 2023

ENGINEERING POWERED BY THE PAST
BUILDING THE FUTURE

Document Revision Control

Revisions	Date	Reason for Issue	By	Approved
00	15/09/2023	For information only	PP / GK	IC

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Executive Summary

To ascertain the operational carbon footprint of the proposed Admin &Training Hub as well as BA school (North Wales Fire and Training Centre), Harley Haddow Ltd was commissioned to undertake an energy assessment of the proposed buildings using dynamic thermal modelling and using the model to ascertain the operational carbon footprint (per annum). Furthermore, ways to offset the generated carbon during building operation were identified through photovoltaic panels or trees or a combination of both.

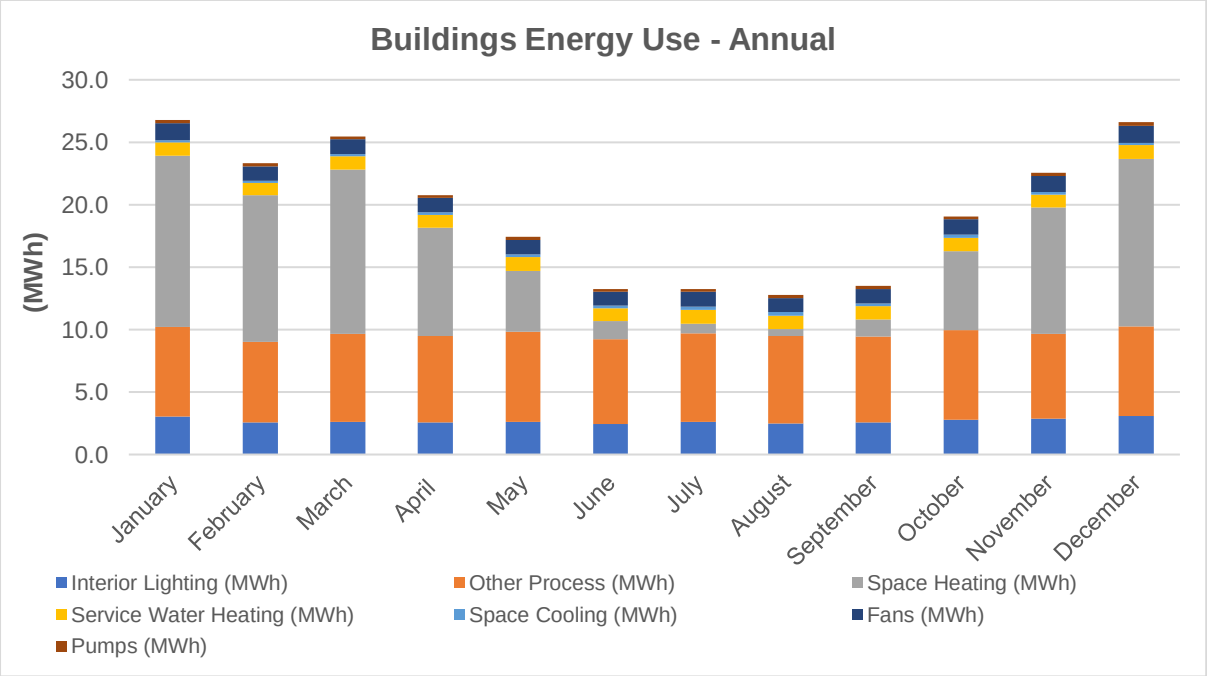


Figure 1: Annual energy use - proposed buildings

Furthermore, the feasibility for an efficient ground source heat pump (GSHP) was also tested in tandem with an expert. The feasibility study, which was based on the geology beneath the site advised that an open loop ground source heating/cooling system would be difficult to develop at any scale due to there being limited water present. Yields from local boreholes are low, due to the geology rather than being poorly drilled. However, closed loop boreholes or horizontal collectors under parking/landscaping may prove beneficial for the purpose. Should the GHSP system be paired with a solar thermal system to recharge the closed loops in warmer conditions, then the borehole array could be further reduced.

The high level modelling exercise suggests that the energy use intensity of the building is expected to be circa 83 kWh/m^2/year, whilst the carbon footprint is expected to be around 32 Tonnes of CO_{2e}/year. Carbon emissions by the site, which includes external lighting and EV charging is expected to generate an additional 28 $tCO_{2e.}$ To offset that amount of carbon emissions (for building + site), roughly 1562 PV panels (covering circa 2885 m^2) or 6000 trees or a combination of two are required. Considering available roof area for PV mounting of 2907m^2, a PV array of the same size can offset the entire energy demand, and ensure the proposed building along with the overall site is net zero carbon in operation.

Please note that results and recommendations are based on the assumptions described in this report. If any of the inputs change then results are likely to change, and recommendations might no longer be appropriate.

1. Introduction

To ascertain the operational carbon footprint of the proposed Admin &Training Hub as well as BA school (North Wales Fire and Training Centre), Harley Haddow Ltd was commissioned to undertake an energy assessment of the proposed buildings using dynamic thermal modelling and using the model to ascertain the operational carbon footprint (per annum). Furthermore, ways to offset the generated carbon during building operation were identified through photovoltaic panels or trees or a combination of both.

2. Modelled Parameters

2.1. Occupancy

The occupancy of the proposed spaces in the admin-training and BA blocks that was used for the dynamic thermal modelling can be seen in the table below. The sensible and latent heat gains per person are based on the values defined in the UK National Calculation Methodology.

Space Name	Occupancy	Sensible Gain	Latent Gain
	(Number)	(W/person)	
L0_PR_BA_Classroom	16	70	70
L0_PR_BA_Workshop	3	48.6	131.4
L0_PR_Locker_Room_Student	10	70	70
L0_PR_Locker_Room_Trainer	10	70	70
L0_PR_RTC_Classroom	25	70	70
L0_PR_RTC_Indoor_Training	4	70	70
L0_PR_Staff_Gym	10	102	198
L0_TAH_Breakout/Circulation	30	70	70
L0_TAH_Changing_Place	2	70	70
L0_TAH_Classroom	14	70	70
L0_TAH_Classroom	14	70	70
L0_TAH_Command/Plenary	8	48.6	131.4
L0_TAH_Control_Centre_Training	2	48.6	131.4
L0_TAH_Green_Room	2	73	50
L0_TAH_Immersive_Trauma	1	48.6	131.4
L0_TAH_IT_Classroom	33	73.2	46.8
L0_TAH_Kitchen	5	63	117

L0_TAH_Meeting	2	73	50
L0_TAH_Meeting	2	73	50
L0_TAH_Multi_Faith	2	73	50
L0_TAH_Office	2	73	50
L0_TAH_Restaurant/Cafe	150	67.1	42.9
L0_TAH_Sim_Appliance_Cab	2	73.2	46.8
L0_TAH_Study	30	85.4	54.6
L0_TAH_Teams_Pod	3	61	39
L0_TAH_Training_Pods	10	48.6	131.4
L0_TAH_Trauma_Classroom	14	70	70
L0_TAH_XVR_Control	5	73	50

Table 1: Occupancy figures in the model

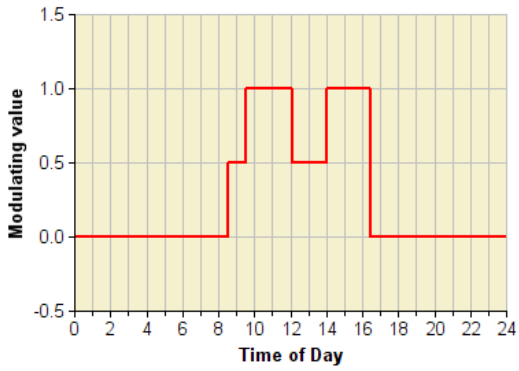
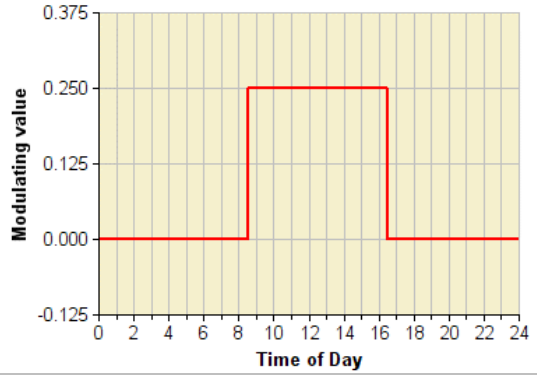
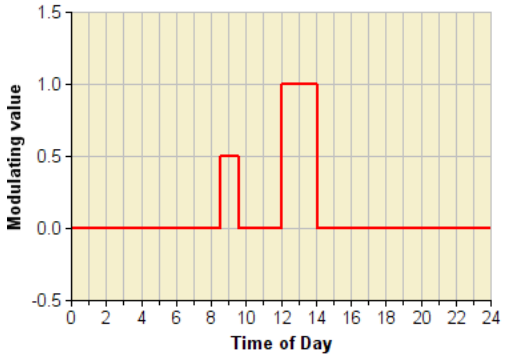
	
Occupancy Profile for all **regularly occupied areas** - Training and Classroom (6 days a week operation)	Occupancy profile for **all offices** – Assuming 25% occupancy across the working hours (0900 to 1700 hours)
	N/A (Blank)
Occupancy profile for the **dining area** (restaurant/café) – 150 students for lunch and 50% of students for breakfast (responds to the occupancy profile for occupied areas)	

Table 2: Profiles used for occupancy

2.2. Equipment gains – both blocks

The equipment gains for the proposed spaces are predominantly referred from the UK National Calculation Methodology and has been modelled as such. The gains can be seen in the table below:

Space Name	Consumption (W/m^2)
Circulation, Lobby, Study	1.83
Training Pods, Command, Workshop, Immersive Trauma, Control Centre	4.36
Washrooms	4.57
Classroom, Indoor Training, Changing and Lockers	4.79
Green Room, Offices, Meeting	11.90
Gymnasium	14.14
Restaurant/Cafeteria	17.17
Kitchen	34.02
IT Classrooms, Simulation Appliance	27.81
Energy Centre, Compressor	54.41

Table 3:Equipment gains modelled - referred from the UK NCM

The equipment gains which are not referred from the UK National Calculation Methodology but were used in the model are as follows:

Space Name	Consumption (W/m^2)
Server Room	150

Table 4: Modelled equipment gains - not based on NCM

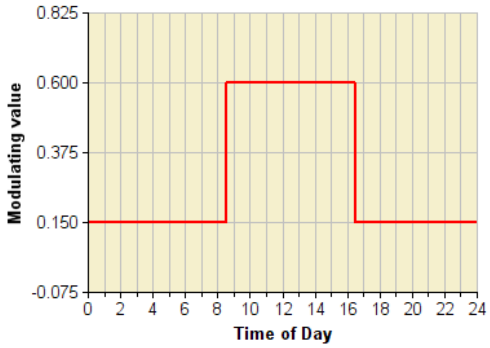
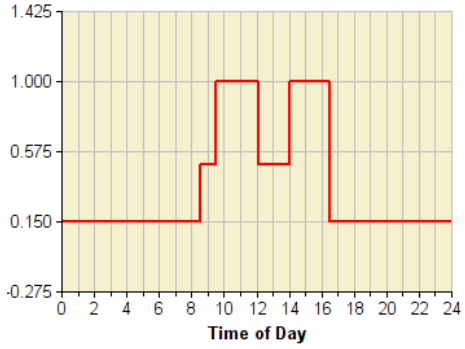
	
Equipment gains profile for all **unoccupied areas** (i.e. spaces which are not normally continuously occupied – such as washrooms, locker rooms, store)	Equipment gains profile for all **occupied areas** (Classrooms, training labs, immersive trauma, gymnasium, appliance lab)

Table 5: Profiles used to control the equipment gains

2.3. Lighting Gains – both blocks

A generic lighting gain value was used in the model to reflect energy efficient luminaires. In addition, daylight dimming was used to further reduce the lighting energy use wherever possible (occupied spaces with access to ample daylight)

Space Name	**Gain**
All Spaces (Both TAH and BA Blocks)	5W/m^2

Table 6: Modelled lighting power density

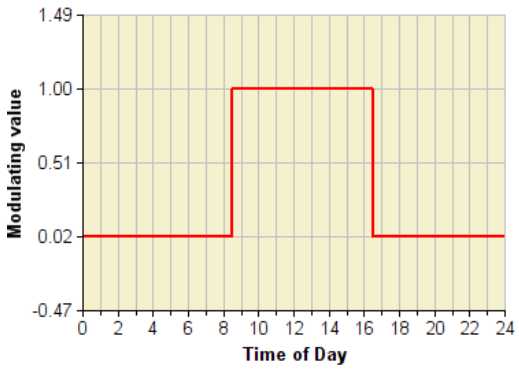
	Lights to dim to 25% of their peak luminous flux if the illuminance on the work-plane is >300 Lux
Lighting profile used in the model – 07:00 to 17:00 hours with 0.1W/m^2 of parasitic power demand.	**Dimming condition** used in the modelling – only applied to spaces with access to daylight.

Table 7: Lighting and dimming profile/parameters

2.4. Fabric properties – all spaces

The following fabric parameters were modelled based on limiting U values as defined in the Part L2, 2021 (with 2023 amendments) of the English and Welsh Building Regulations.

Building Category	Modelled Name	Source	U value (W/m^2.K)
Roof	NW_Roof	Part L2, 2021	0.18
Ground/Exposed Floor	NW_Floor	Part L2, 2021	0.18
External Wall	NW_Wall	Part L2, 2021	0.26
Internal Partition	NW_Partition	NCM Default	1.00
Internal Ceiling/Floor	NW_Ceiling	NCM Default	1.00
External Window	NW_Window	Part L2, 2021	1.60
Door	NW_Door	Part L2, 2021	1.60

Table 8: Fabric properties modelled

2.5. HVAC System – all spaces

The HVAC systems which were assigned to the spaces are detailed in the table below. Heating is modelled to be supplied by Heat Pump(s) (Ground Source or Air Source or a combination of both) through a low temperature hot water loop (LTHW). Mechanical ventilation (MVHR) is proposed in regularly occupied spaces to provide thermal comfort, maintain reasonable CO_2 levels and also recover heat to reduce the overall energy consumption. No cooling is modelled in the blocks apart from the DX unit serving the server room.

Spaces	Heating/Cooling System	Modelled efficiency	Ventilation
Classroom	LTHW fed heater battery – Heat Pump	300%	MVHR
Dining	LTHW fed heater battery – Heat Pump	300%	MVHR
Offices	LTHW fed heater battery – Heat Pump	300%	MVHR
Meeting	LTHW fed heater battery – Heat Pump	300%	MVHR
Labs	LTHW fed heater battery – Heat Pump	300%	MVHR
Workshops	LTHW fed heater battery – Heat Pump	300%	MVHR
Gymnasium	LTHW fed heater battery – Heat Pump	300%	MVHR
Washrooms	Electric Panel Heater – Direct Electric	100%	Extract
Circulation	Electric Panel Heater – Direct Electric	100%	Passive
Stores	Electric Panel Heater – Direct Electric	100%	Passive
Locker Room	Electric Panel Heater – Direct Electric	100%	Extract
Kitchen	Electric Panel Heater – Direct Electric	100%	Extract
Server Room	Direct Exchange Refrigerant (DX)	250% - Heating 500% - Cooling	Passive

Table 9: Modelled heating and cooling system with the heating/cooling source efficiencies

The mechanical ventilation heat recovery system is modelled to have a heat recovery efficiency of 77% along with a summer bypass to utilize free cooling during the spring/fall season. The modelled flowrates for the spaces are referred from the UK National Calculation Methodology. Note: the model is simulated with no operable windows and hence relies solely on the mechanical ventilation units to provide adequate fresh air and maintain thermal comfort. Domestic hot water is assumed to be supplied via direct electric systems throughout the building. Again, the DHW consumption has been referred from the UK National Calculation Methodology.

Spaces	DHW System	Modelled efficiency	Consumption
All	Point of Use Instantaneous heater	100%	NCM

Table 10: Modelled DHW systems

Figure 2: Modelled Geometry

2.6. External Lighting

Energy consumption attributable to external lighting has also been ascertained. The calculations are based on finding the running length of walkway and using the allowable lighting power density table published by United States Green Building Council (USGBC). The aforementioned table stipulates that a maximum of 3.2W of lighting can be installed per running metre length (LZ4 category) of walkway and 0.5W/m^2 of landscaping.

A time and date calculator was used to calculate hours which are categorized as 'Night' and 'Astronomical Twilight' to establish hours per annum during which the lights will be illuminated. Based on the calculations, which were taken on the 15th of every month, a total of 3126 hours of darkness was calculated in the UK. The running length of pathways, parking spaces and vehicular circulation as well as the landscaped areas was calculated from the site plan provided by the Architect. The running length was calculated to be circa 1750 metres for walkways and circa 6500m^2 for landscape-green areas.

2.7. Electrical Vehicle Charging – On site

50% of parking spaces being allocated for EV charging were factored in the overall operational carbon footprint. Roughly 65 parking spaces are expected to have EV charging and a diversity of 25% was applied to bring the overall number of EV chargers being used at a time to 17 parking spaces (to reflect the absence of any ULEZ zones in Wales and only 0.17% of vehicles to be electric in Wales as of 2020). It was assumed that 7kW chargers are installed and the chargers are used for 4 hours a day.

3. Ground Source Heat Pump Feasibility

The feasibility for an efficient ground source heat pump (GSHP) was also tested in tandem with an expert. The feasibility study, which was based on the geology beneath the site advised that an open loop ground source heating/cooling system would be difficult to develop at any scale due to there being limited water present. Yields from local boreholes are expected to be low due to the local geology. However, closed loop boreholes or horizontal collectors under parking/landscaping may prove beneficial for the building. A closed loop GHSP system be paired with a solar thermal system to recharge the ground during warmer conditions, which may then allow the borehole array to be further reduced. The feasibility study was based on a peak demand of 90kW, a value which corroborates with the dynamic thermal model's output.

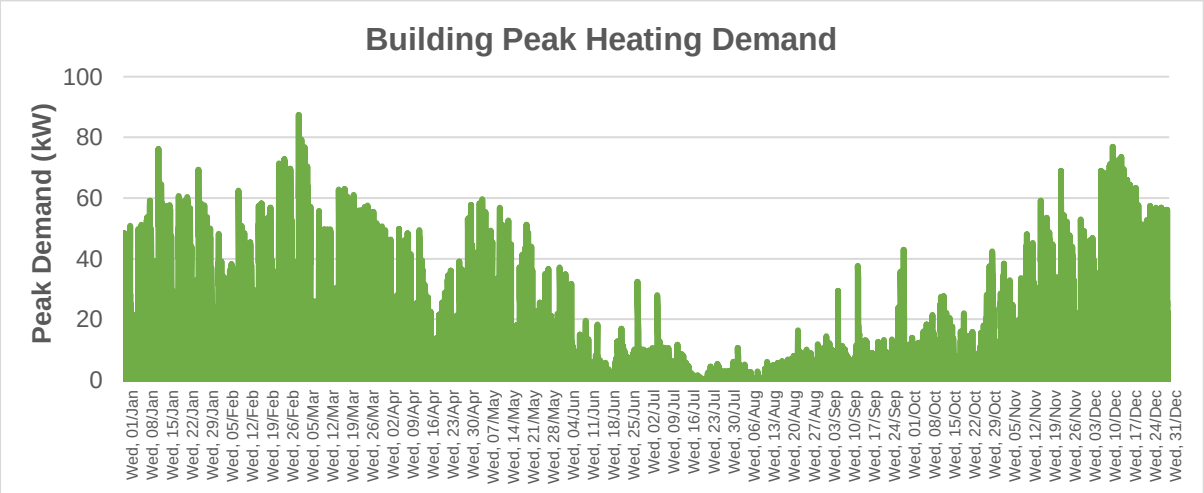
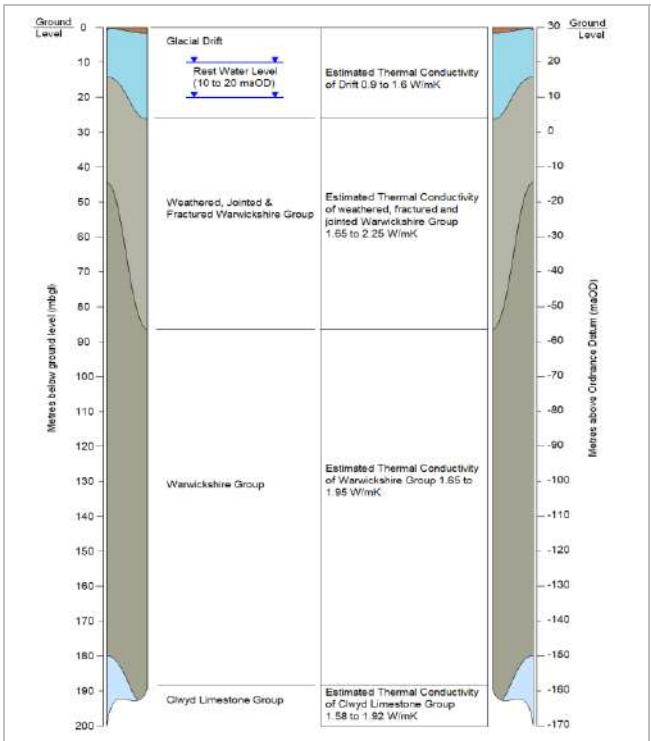
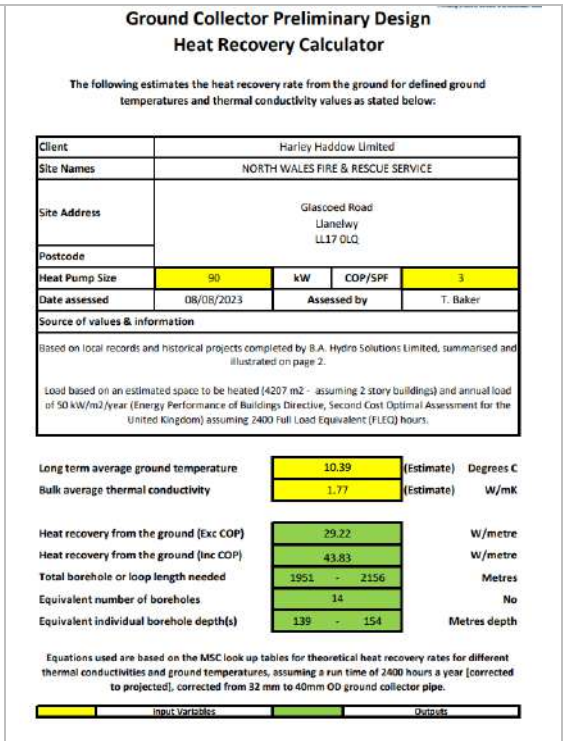


Table 11: Peak demand from the model used for the ground source heat pump study



Thermogeological Summary – Study conducted by BA Hydro Solutions



Ground Collector Preliminary Design
Heat Recovery Calculator

The following estimates the heat recovery rate from the ground for defined ground temperatures and thermal conductivity values as stated below:

Client	Harley Haddow Limited			
Site Names	NORTH WALES FIRE & RESCUE SERVICE			
Site Address	Glascoed Road Llanelwy LL17 0LQ			
Postcode				
Heat Pump Size	90	kW	COP/SPF	3
Date assessed	08/08/2023	Assessed by		T. Baker
Source of values & information				

Based on local records and historical projects completed by B.A. Hydro Solutions Limited, summarised and illustrated on page 2.

Load based on an estimated space to be heated (4207 m2 - assuming 2 story buildings) and annual load of 50 kW/m2/year (Energy Performance of Buildings Directive, Second Cost Optimal Assessment for the United Kingdom) assuming 2400 Full Load Equivalent (FLEQ) hours.

Long term average ground temperature	10.39	(Estimate)	Degrees C
Bulk average thermal conductivity	1.77	(Estimate)	W/mK
Heat recovery from the ground (Exc COP)	29.22		W/metre
Heat recovery from the ground (Inc COP)	43.83		W/metre
Total borehole or loop length needed	1951 - 2156		Metres
Equivalent number of boreholes	14		No
Equivalent individual borehole depth(s)	139 - 154		Metres depth

Equations used are based on the MSC look up tables for theoretical heat recovery rates for different thermal conductivities and ground temperatures, assuming a run time of 2400 hours a year (corrected to projected), corrected from 32 mm to 40mm OD ground collector pipe.

Input Variables | Outputs

Preliminary Design Heat Recovery Calculator for a 90kW GHSP – BA Hydro

Figure 3: Screenshot of the GHSP feasibility study

4. Results

4.1. Energy Demand – Buildings

The monthly energy demand for various end uses (lighting, small power, heating, hot water, cooling, fans and pumps) is shown in the table below:

Month	Interior Lighting	Other Process	Space Heating	Water Heating	Space Cooling	Fans	Pumps
	(MWh)						
January	3.0	7.2	13.7	1.1	0.2	1.35	0.3
February	2.6	6.4	11.8	1.0	0.2	1.15	0.2
March	2.6	7.0	13.2	1.1	0.2	1.17	0.2
April	2.6	6.9	8.6	1.1	0.2	1.15	0.2
May	2.6	7.2	4.9	1.1	0.2	1.18	0.2
June	2.4	6.8	1.5	1.0	0.2	1.09	0.2
July	2.6	7.1	0.8	1.1	0.3	1.16	0.2
August	2.5	7.0	0.6	1.1	0.3	1.12	0.2
September	2.6	6.9	1.4	1.1	0.3	1.14	0.2
October	2.8	7.2	6.3	1.1	0.2	1.24	0.2
November	2.8	6.8	10.1	1.0	0.2	1.27	0.3
December	3.1	7.2	13.4	1.1	0.2	1.38	0.3
Summed total	32.2	83.7	86.1	12.8	2.6	14.41	2.88

Table 12: Monthly energy demand

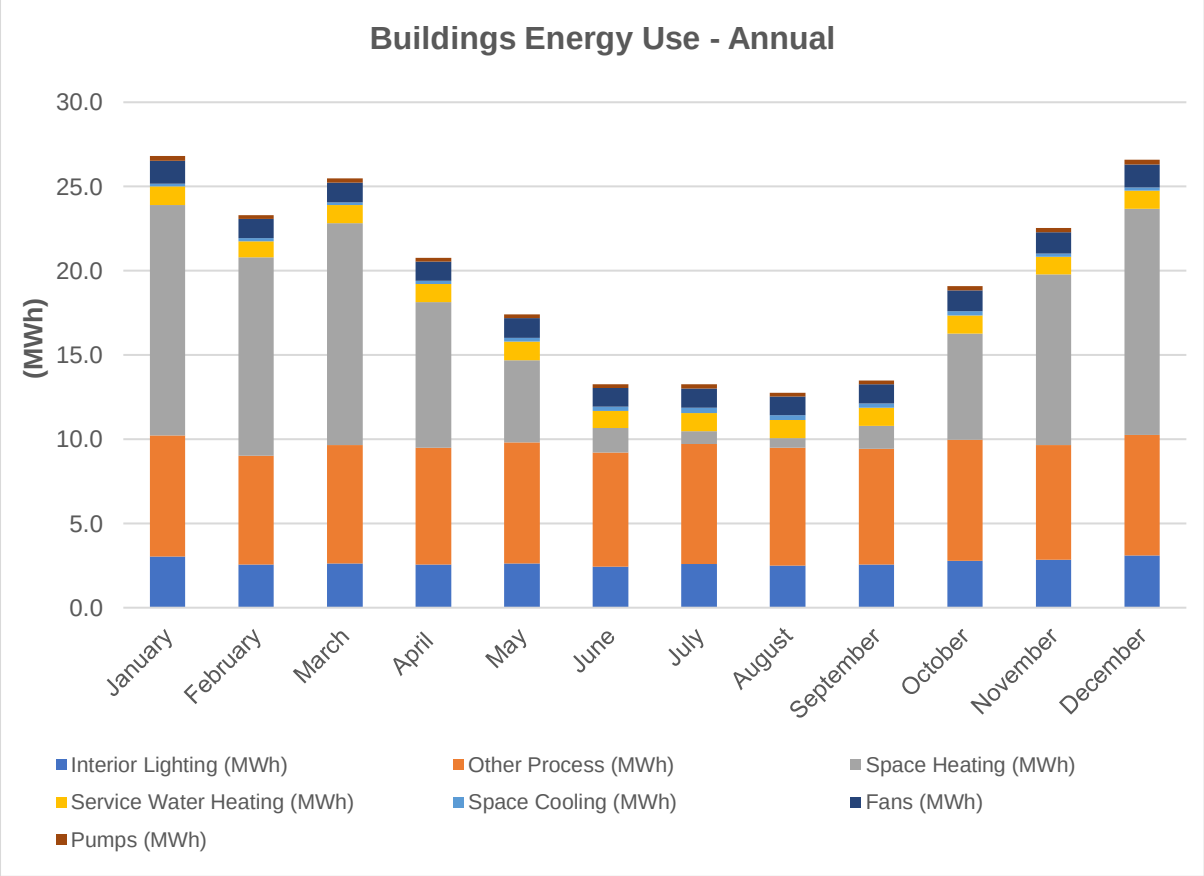


Figure 4: Visual representation of the energy demand.

4.2. Energy Demand – External lighting and EV Charging

Component	Installed Capacity	Hours/Annum	Total consumption
External lighting	Pathways – 5.6kW Green/Landscape – 3.2kW	3126	27506 kWh/Year
EV Charging	17*7kW each – 224kW	1460	173740 kWh/Year

Table 13: Energy consumed by EV chargers and External lighting

4.3. Carbon Footprint – Building

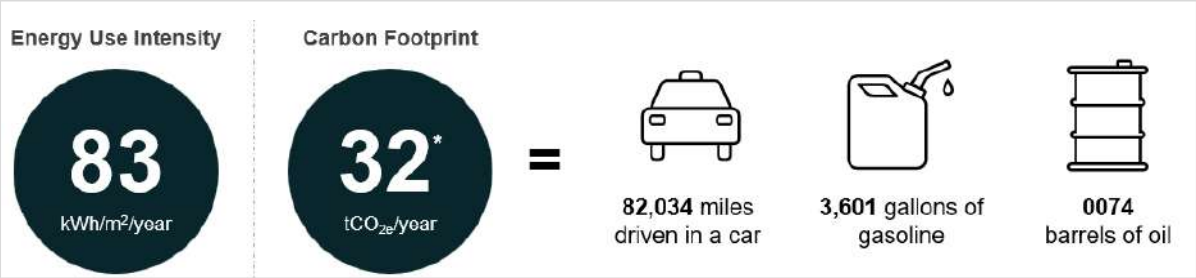


Figure 5: Visual representation of the energy use intensity and the carbon footprint

The operational carbon footprint is based on an emission factor of 0.1388 $KgCO_{2e}$/kWh of electricity consumed. It is essentially a long-range factor accounting for grid decarbonisation out to 2050.

4.4. Carbon Footprint – External lighting and EV Charging

Component	Annual Consumption	Carbon factor	Annual Carbon
External lighting	27506 kWh/Year	0.1388 $KgCO_{2e}$/kWh	3817 $KgCO_{2e}$/Year
EV Charging	173740 kWh/Year	0.1388 $KgCO_{2e}$/kWh	24115 $KgCO_{2e}$/Year

Table 14: Energy consumed by EV chargers and external lighting

4.5. Carbon offset – Building

To offset 32tCO_{2e} of carbon emissions arising from circa 235MWh/year of electricity consumption (83 kWh/m^2/Year) from the building roughly 833 PV panels (covering circa 1500 m^2) or 3200 trees or a combination of two are required. Figure 6 shows the grid displaced electricity on a monthly basis from a PV array of 1500 m^2 mounted horizontally with an efficiency of 21.6% against the simulated monthly energy demand from the model. Of itself this is sufficient to offset the entire energy demand, operational carbon footprint of the buildings (Training and BA blocks) and ensure the proposed buildings are net zero carbon in operation.

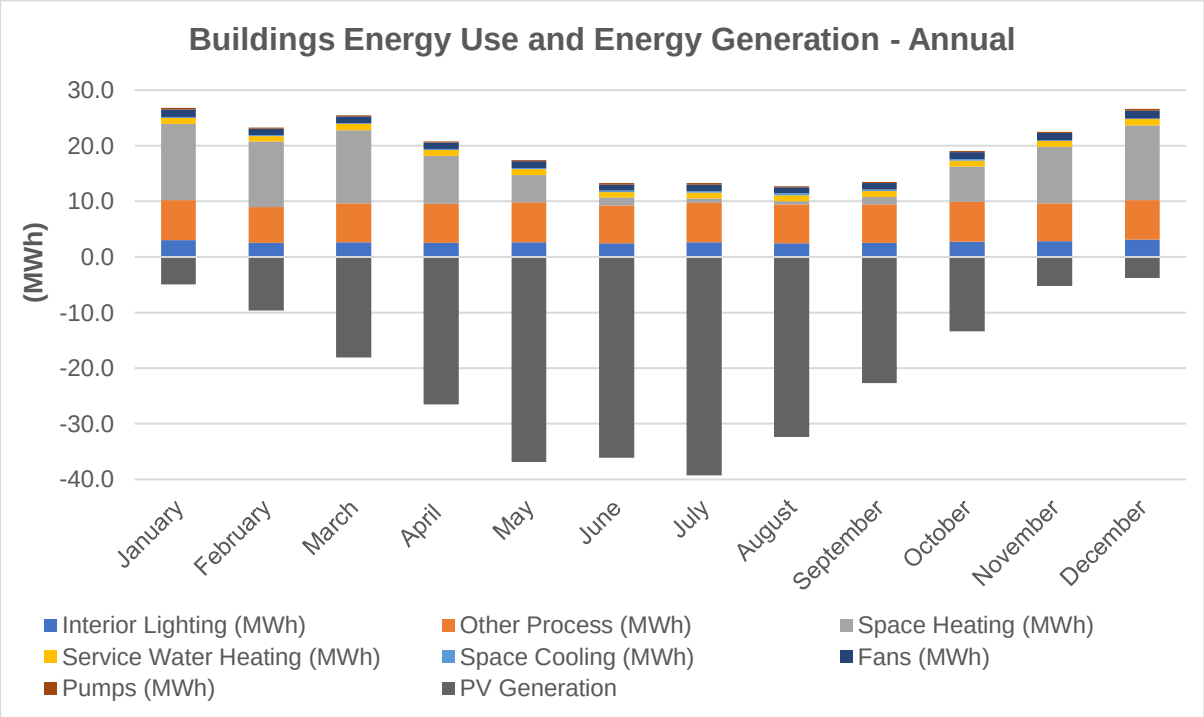


Figure 6: Visual representation of energy consumption and energy generation (from a 1500m^2 PV array) – buildings

4.6. Carbon offset – External lighting and EV Charging

To offset 28 tCO_{2e} of carbon emissions from EV charging and external lights, roughly 729 PV panels (covering circa 1385 m^2) or 2800 trees or a combination of two are required for the external lighting and EV charging. These calculations are based on an installed external lighting capacity of 8.8 kW (based on USGBC's permissible lighting power density for external spaces), being used for 3126 hours annually and 17 X 7kW EV chargers (25% of total EV charging stations proposed) being used for 4 hours a day or 1460 hours annually.

4.7. Carbon offset – Whole site (Buildings + External lighting and EV Charging)

The site plan indicates a potential PV mounting area of circa 2907 m^2 (highlighted in orange in Figure 8), which can in-theory accommodate enough PV panels to offset the operational carbon emissions of the whole site (buildings + external factors such as lighting and EV charging). Additionally, the plans also indicate a potential area of 6505m^2 available for planting trees (marked in red in Figure 9). This is sufficient for approximately 1200 trees offsetting approximately 12tCO_{2e} per annum. Whilst this could contribute to the total it is insufficient of itself to offset the site emissions, hence the installation of solar power should be considered the primary route for carbon offsetting on site.
The carbon balance of the site, considering all the trees, potential PV arrays, buildings and external elements (external lighting and EV charging) is illustrated in Figure 7 below.

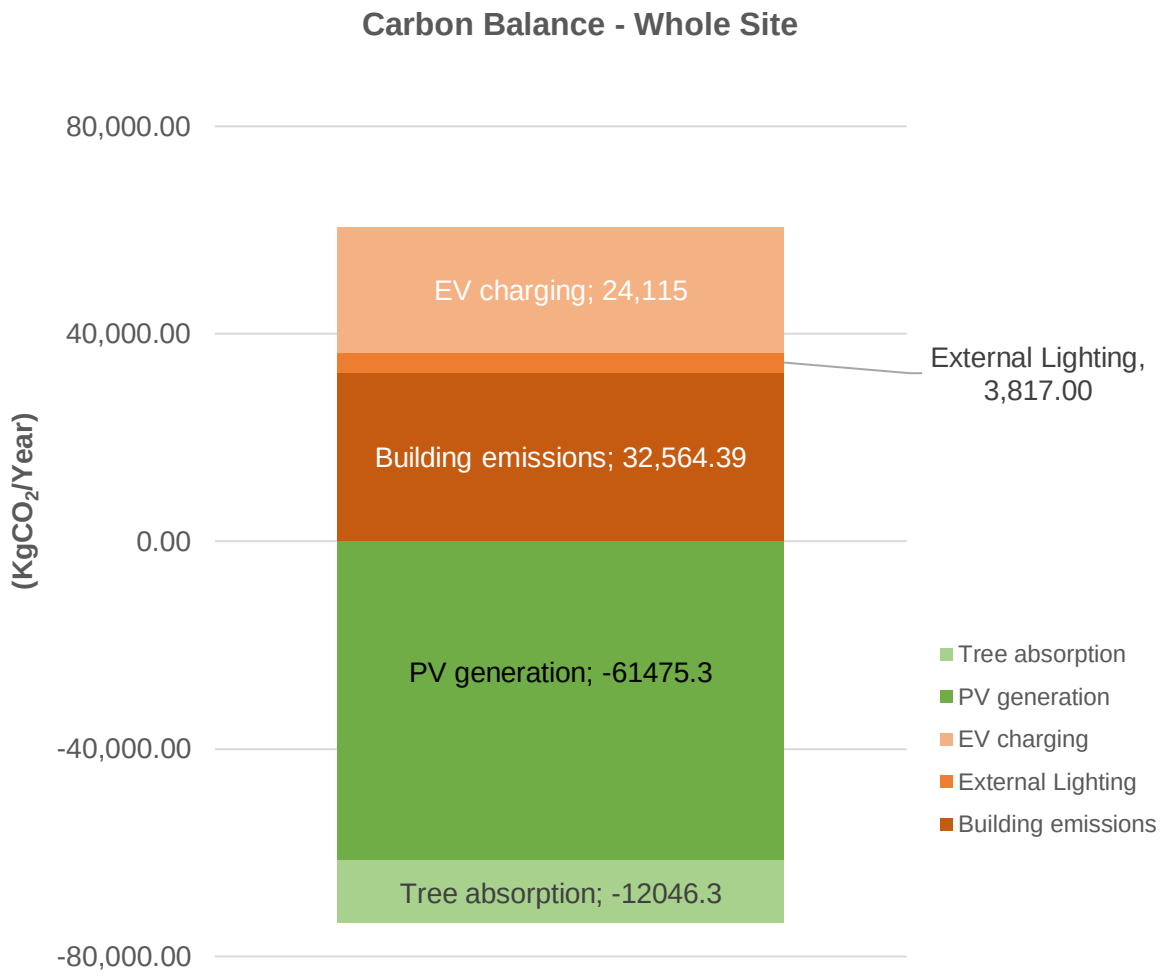


Figure 7: Carbon balance of the whole site (emissions in positive and offset in negative)

Figure 8: PV Array shown on the site plans on top of the BA block, Training Block as well as on external elements

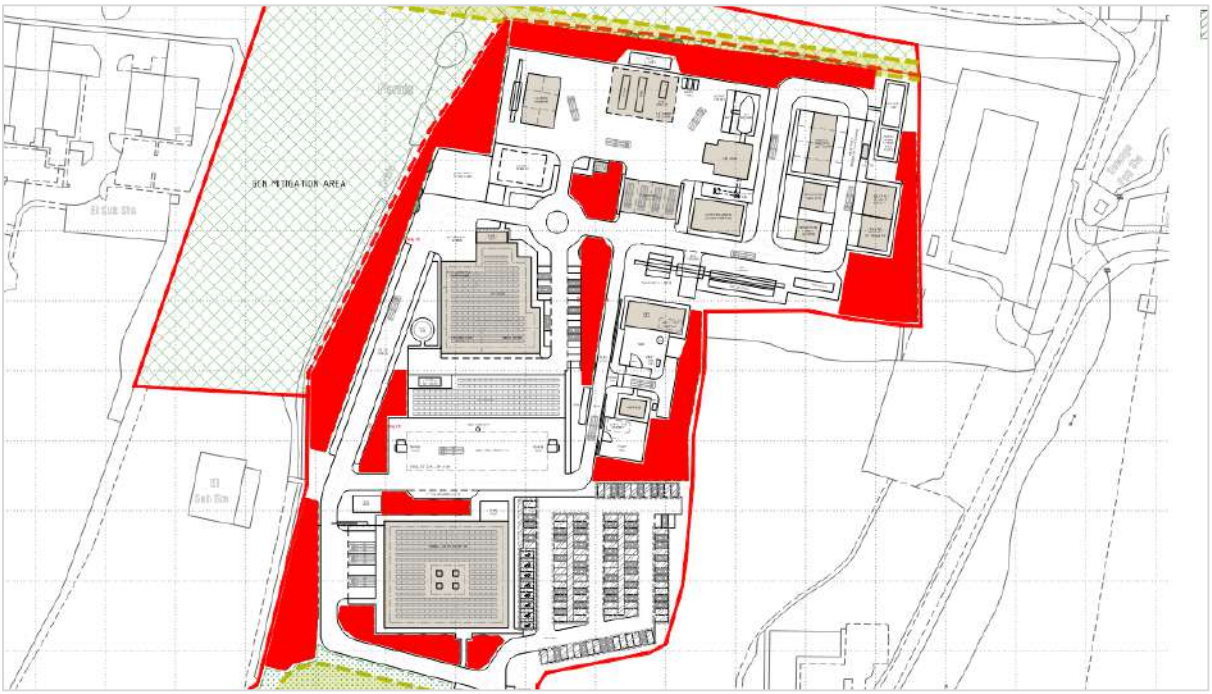


Figure 9: Areas earmarked for tree planting on the site plan – marked in red.

5. Appendix A – References

CIBSE Guide A (2021)	Guide A: Environmental design (2015) | CIBSE
UK NCM	NCM (uk-ncm.org.uk)
Part L2, 2021 with 2023 amendments	Conservation of Fuel and Power, Part L, Volume 2, 2021
USGBC – Lighting table	Allowable lighting power densities, by lighting zone (GIBc17)
EV market share	Welsh Government Electric Vehicle Charging Strategy - Arup

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Our ref: GCR/vn/P5053

19 June 2023

For the attention of Mr Stephen Roberts
Head of Facilities
North Wales Fire and Rescue Service
St Asaph
Denbighshire

Dear Stephen

Sequential Test Report – Suitable Site for Proposed New Fire Training Centre

1.0 Instruction

1.1 We refer to your kind instruction to provide a Sequential Test Report in respect of suitable sites for the development of a Fire and Rescue Service Training Centre, having regard to your requirements as set out in the report prepared by IKG Consulting dated 23 June 2022.

2.0 Background

2.1 We were initially instructed in September 2022 to provide advice on the appropriate level of bid to be offered for the acquisition of the freehold title to the subject property. At the time of completing this original report we undertook market research in order to establish the tone of value that comparable evidence would support. It was noted then that there was a noticeable absence of similar sized sites available throughout the whole of North Wales.

2.2 For the purpose of our instruction the property search on site availability was undertaken on the full geographical area of North Wales, comprising the counties of Gwynedd, Anglesey, Conwy, Denbighshire, Flintshire and Wrexham, making note of any site of over 1 acre (0.40 ha). The search was not restricted to industrial or business/enterprise zones, and included any site that may have been within the settlement envelope. There were no such sites identified within the entire search area. Had there been they would have been assessed against the criteria provided. Our research confirmed that there remains only a very limited stock of suitable and appropriately sized commercial/industrial development sites currently available in the market place which are described herein.

2.3 We append to the rear of this report a summary of our search which shows that the majority of sites available are far smaller in size than that which is required for the Training Centre Development.

3.0 Land Requirements

3.1 We have been provided with a copy of a report prepared by IKG Consulting dated 23 June 2022, which sets out the land requirements for the proposed training centre which are as follows:

- Land size in the region of 10-20 acres which include space for carbon offset arrangement as an organisation aspiring to become carbon neutral (10 acres for operations – remainder landscaping /trees /buffer zone);
- Though most topography will be considered, large flat or gently sloping areas are preferred, features such as steeper slopes, quarries, cliff faces, water features and small rivers will not rule out as they could be incorporated into training scenarios;
- The site will need to be in Flood Plain 1;
- The site should be located on the A55 corridor;
- The site must not be in the Nation Park;
- The site must have the ability to allow of wood and LPG. (There will be some form of grey smoke emissions from the site);
- The site will require substantial water and electricity supplies and means of water disposal. Being close to infrastructure will be advantageous though not fully essential);
- Brownfield sites will be considered, but any site must be free of contaminants or at lease any contaminants declared and the land value adjusted accordingly.

3.2 Additionally we were provided with a copy of an Isochrone Map, produced by North Wales FRS, defining the optimum location of fire stations in regard to travel distance in relation to the area in which the new Fire Training Centre be best located.

4.0 Site Identification

4.1 Having analysed our findings, we further refined our search taking into account the specific requirements set out in the IKG report and listed in paragraph 3.1 of this report, and addressing only those aspects we considered relevant sites of circa 10 acres or more, located within appropriate proximity of the entire A55 corridor and within Flood Zone Area 1.

4.2 This eliminated all but three of the available sites, and for reasons given below are deemed inappropriate for the proposed development as described in the IKG Consulting report of 23 June 2022.

4.3 Freehold Land for Sale in the marketplace

- Holyhead, Anglesey - Unit C9 Parc Cybi

  Located within the established Llangefni Industrial Estate, within Anglesey's Enterprise Zone/Grant Assisted Area at a distance of c. 0.2 miles from Junction 2 off the A55 Expressway.
  10.5 acres of land – asking price £735,000 (£70,000 per acre)

  Although within the A55 corridor, the site is located at the furthest point west of the search area, and in an area having the least number of fire stations located within a 60 minute travelling time (1-20 fire stations). The Parc has land zoned for employment use under B1, B2, B8 use classes.

  There is an existing truck stop for 168 vehicles located at the centre of the park and a new Premier Inn, which is under construction.

  We consider that this land is not suitable for your requirements

- Deeside Industrial Estate, Flintshire - Waste Management/Waste to Energy Development Site, Weighbridge Road

  15.48 acres of brownfield land, located within the Deeside Enterprise Zone. The property comprises the site of a former power station and, currently has planning consent for waste management uses.

  Part of the access road to the site appears to be within in an area identified as being at high risk of flooding by Natural Resources Wales, whilst the rest of the site is not identified as being at risk as it is at a slightly higher level.

  There are also certain access rights reserved in favour of Scottish Power over the site to access their adjacent sub-station.

  The site lies at the westerly most point of the search area, having 20-26 stations within a 60 minute drive.

  We considered that this land is unlikely to be suitable for you requirements.

- KSS Site, Sarn Road, Rhyl

  257 acre, strategic development site, this is being advertised speculatively to test the market. This site has been identified as a key strategic site Denbighshire County Council's current Local Development Plan for mixed use site. See Local Plan extract Policy BSC5 – Key Strategic Site – Bodelwyddan appended to this report.

  The site is completely devoid of any infrastructure and services.

Any development of this site would be a future intent, and for this reason we disregarded this site at this stage.

4.4 Subject Site

Land at Glascoed Road, St Asaph

Comprising a level rough surfaced site extending to the required 10 acres. It has an established vehicular access off Glascoed Road, with access to services.

The site is centrally located along the A55 corridor, within a short distance of Junction 26 of the A55 Expressway, and the most accessible having 32 to 39 fire stations located within a 60 minutes.

The site is entirely within Flood Zone 1.

The site is located on the periphery of the St Asaph Business Park.

4.5 Leasehold Land

4.5.1 Whilst outside our brief we have also included in our search parameters those sites that we are aware to be available in the market place on leasehold/ground lease basis.

4.5.2 It may be that the landlord on a direct approach, might consider disposal on a long ground lease or even a freehold basis, but we have not undertaken any such enquiry with the landowner(s) or their agent(s) to establish whether this could be the case.

4.5.3 We have deemed it appropriate to report on these sites despite that they fall outside the brief.

- Land at Tata Steel, Shotton Works

  100 acres of land available to let within the Deeside Enterprise Zone, for industrial development purposes. The landowner (Tata Steel UK Limited) have full control over how the site can be developed, and it is their aspiration that the site be a "construction campus for Wales and the United Kingdom. It is the stated current intention of the freeholder not to sell any part of the site but to work in partnerships with likeminded businesses delivering a construction centre of excellence in North Wales.

  We consider that your proposed use may not accord with the landowner's aspirations. Accordingly we have dismissed this site.

- Former Ferodo Site, Caernarfon

  40 acre site with buildings. The full extent of the building extends to some 250,000 sq ft approx. which are to be retained.

  It is understood that approximately half of this building will be retained by the owners for some form of leisure scheme development and that they have engaged with the appropriate planning authority involved with the Menai Straits Development Plan. Our searches of the planning portal have not revealed any further information on this aspect.

  The agents are currently offering, on the market, the remaining part of the building extending to some 125,000 sq ft (see particulars appended at rear) and advertised as being available to let, but the agents advise that the vendor's may consider a freehold disposal.

  Having regard to the fact that the factory was utilised for the production of automotive parts and components, principally brake shoe lining pads and clutches (originally asbestos based), it is thought that there may still be issues with some form of contamination affecting part of the site.

  The site is outside of the A55 corridor, approximately 4.5 miles from Junction 9 of the Expressway, with a catchment of 20-26 fire stations within 60 minutes.

  We considered that this land is unlikely to be suitable for you requirements.

5.0 Conclusion

5.1 Having regard to the above it is our opinion that the Land at Glascoed Road, St Asaph is the most suitable site for locating the new Fire Training Centre.

5.2 None of the other sites reported upon within this Report deemed to offer comparable alternatives for locating the proposed new development.

Yours sincerely

Celt Rowlands & Co.

Celt Rowlands & Co

APPENDICES

CRCo 1 – FULL LIST OF SITES CONSIDERED

CRCo 2 – DENBIGHSHIRE LOCAL DEVELOPMENT PLAN EXTRACT

CRCo 1 – FULL LIST OF SITES CONSIDERED

1

Development Site- North Wales Business Park

A547

Abergele, LL22 8LJ

Parcel Size: **1.64 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: -

Sale Price: **£795,000**
Price/AC: **£484,756**
Sale Status: **Active**
Days On Market: **761**

Tenure: **Long Leasehold**

This property is represented by Eddisons - Robert Diggle, 0151 268 5280
This property is for sale individually

2

Development Land

Conway Rd

Llandudno, LL31 9NB

Parcel Size: **7.36 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: -

Sale Price: **£1,500,000**
Price/AC: **£203,804**
Sale Status: **Active**
Days On Market: **217**

Tenure: **Freehold**

This property is represented by St Davids Commercial - Charlotte Flannigan, 01492 534881
This property is for sale individually

3

Llandegai Rd

Bangor, LL57 4HP

Parcel Size: **4.46 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **For Sale**
Price/AC: -
Sale Status: **Active**
Days On Market: **4,170**

Tenure: **Freehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

4

Llandegai Rd

Bangor, LL57 4HP

Parcel Size: **5.66 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **For Sale**
Price/AC: -
Sale Status: **Active**
Days On Market: **4,170**

Tenure: **Freehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

5

Llandegai Rd

Bangor, LL57 4HP

Parcel Size: **5.73 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **For Sale**
Price/AC: -
Sale Status: **Active**
Days On Market: **4,170**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

6

Llandegai Rd

Bangor, LL57 4HP

Parcel Size: **5.58 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Industrial**

Sale Price: **For Sale**
Price/AC: -
Sale Status: **Under Offer**
Days On Market: **4,170**

Tenure: **Freehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

7

Llandegai Rd

Bangor, LL57 4HP

Parcel Size: **5.73 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **For Sale**
Price/AC: -
Sale Status: **Active**
Days On Market: **4,170**

Tenure: **Freehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

8

Llandegai Rd

Bangor, LL57 4HP

Parcel Size: **6.80 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **For Sale**
Price/AC: -
Sale Status: **Active**
Days On Market: **4,170**

Tenure: **Freehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

9

Llandegai Rd

Bangor, LL57 4HP

Parcel Size: **3.24 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **For Sale**
Price/AC: -
Sale Status: **Under Offer**
Days On Market: **4,170**

Tenure: **Freehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

10

Llandegai Rd

Bangor, LL57 4HP

Parcel Size: **7.77 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **For Sale**
Price/AC: -
Sale Status: **Under Offer**
Days On Market: **1,622**

Tenure: **Freehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

11

Llandegai Rd

Bangor, LL57 4HP

Parcel Size: **2.25 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **For Sale**
Price/AC: -
Sale Status: **Active**
Days On Market: **1,622**

Tenure: **Freehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

12

Llandygai Rd

Bangor, LL57 4HP

Parcel Size: **1.40 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Industrial**

Sale Price: **£295,000**
Price/AC: **£210,714**
Sale Status: **Active**
Days On Market: **247**

Tenure: **Freehold**

This property is represented by Legat Owen - Mark Diaper, 01244 408236 Rupert Chadwick Dunbar, 01270 621001
This property is for sale individually

13

C1 Parc Cybi

Holyhead, LL65 2YE

Parcel Size: **4.20 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **£294,000**
Price/AC: **£70,000**
Sale Status: **Active**
Days On Market: **1,590**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

14

C2 Parc Cybi

Holyhead, LL65 2YE

Parcel Size: **3.80 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **£266,000**
Price/AC: **£70,000**
Sale Status: **Active**
Days On Market: **1,590**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

15

C3 Parc Cybi

Holyhead, LL65 2YE

Parcel Size: **2.15 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **£150,500**
Price/AC: **£70,000**
Sale Status: **Active**
Days On Market: **1,590**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

16

C4 Parc Cybi

Holyhead, LL65 2YE

Parcel Size: **2 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Industrial**

Sale Price: **£140,000**
Price/AC: **£70,000**
Sale Status: **Active**
Days On Market: **1,590**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

17

C5 Parc Cybi

Holyhead, LL65 2YE

Parcel Size: **3 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **£210,000**
Price/AC: **£70,000**
Sale Status: **Active**
Days On Market: **1,590**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

18

C7 Parc Cybi

Holyhead, LL65 2YE

Parcel Size: **1.35 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **£94,500**
Price/AC: **£70,000**
Sale Status: **Active**
Days On Market: **1,590**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

19

C8 Parc Cybi

Holyhead, LL65 2YE

Parcel Size: **1.86 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **£130,200**
Price/AC: **£70,000**
Sale Status: **Active**
Days On Market: **1,590**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

20

C9 Parc Cybi

Holyhead, LL65 2YE

Parcel Size: **10.50 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **£735,000**
Price/AC: **£70,000**
Sale Status: **Active**
Days On Market: **1,590**

Tenure: **Freehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

21

KSS

Sarn Rd

Rhyl, LL18 5UN

Parcel Size: **150 AC**
Lot Dimensions: **Irregular**
# of Lots: -
Proposed Use: **Apartment Units**

Sale Price: **For Sale**
Price/AC: -
Sale Status: **Active**
Days On Market: **860**

Tenure: **Freehold**

This property is represented by Legat Owen - Matthew Pochin, 01244 408205
This property is for sale individually

22

St Asaph Business Park

St Asaph, LL17 0JD

Parcel Size: **1.56 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **£156,000**
Price/AC: **£100,000**
Sale Status: **Active**
Days On Market: **1,777**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

23

St Asaph Business Park

St Asaph, LL17 0JD

Parcel Size: **1.01 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **£101,000**
Price/AC: **£100,000**
Sale Status: **Active**
Days On Market: **1,777**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

24

St Asaph Business Park

St Asaph, LL17 0JD

Parcel Size: **2.12 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **£212,000**
Price/AC: **£100,000**
Sale Status: **Active**
Days On Market: **1,777**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

25

St Asaph Business Park

St Asaph, LL17 0JD

Parcel Size: **1.09 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **For Sale**
Price/AC: -
Sale Status: **Active**
Days On Market: **1,778**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

26

St Asaph Business Park

St Asaph, LL17 0JD

Parcel Size: **2.88 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **£288,000**
Price/AC: **£100,000**
Sale Status: **Active**
Days On Market: **1,778**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

27

St Asaph Business Park

St Asaph, LL17 0JD

Parcel Size: **2.66 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **£266,000**
Price/AC: **£100,000**
Sale Status: **Active**
Days On Market: **1,778**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

28

St Asaph Business Park

St Asaph, LL17 0JD

Parcel Size: **2.25 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **£225,000**
Price/AC: **£100,000**
Sale Status: **Active**
Days On Market: **1,778**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

29

Plot C7

St Asaph Business Park

St Asaph, LL17 0JD

Parcel Size: **4.54 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: **Commercial**

Sale Price: **For Sale**
Price/AC: -
Sale Status: **Active**
Days On Market: **1,778**

Tenure: **Long Leasehold**

This property is represented by Welsh Government - Julie McNamara, 0300 061 5593
This property is for sale individually

30

Waste to Energy, Deeside Industrial Site

Weighbridge Rd

Deeside, CH5 2LF

Parcel Size: **15.48 AC**
Lot Dimensions: -
# of Lots: -
Proposed Use: -

Sale Price: **For Sale**
Price/AC: -
Sale Status: **Active**
Days On Market: **1,496**

Tenure: **Freehold**

This property is represented by Avison Young - Chris Lockwood, 020 7911 2884 Paul Marsh, 020 7911 2852
This property is for sale individually

CRCo 2 – DENBIGHSHIRE LOCAL DEVELOPMENT PLAN EXTRACT

sustainability. Around 50 hectares of employment land will be allocated in the Local Development Plan.

Spatial Strategy

The Local Development Plan spatial strategy is to focus development into a small number of large sites in the north of the County, with smaller scale new development being supported in other County settlements. The main justification for this spatial approach is based on the issues and objectives set out in the preceding chapters, which in summary include:

- Benefits of large mixed use developments in integrating land uses (homes, shops, leisure facilities and jobs) to create sustainable communities;
- Benefits of larger mixed use developments in delivering significant infrastructure investment and community facilities;
- The north of the County has the 64% of the County's population, the greatest level of housing need and the strongest housing market;
- The County's main public transport nodes are located to the north – primarily based around the train stations at Rhyl and Prestatyn;
- The A55(T) is located in the north – this road is a trans-European network and is the source of considerable commercial and commuter activity;
- The constraints on development land are more significant in the south of the County.
- The need to protect and enhance the natural and built heritage of the County.

It is important to consider that, whilst this spatial strategy aims to concentrate the majority of the Local Development Plan development requirements into the north of the County, it does not aim to preclude development opportunities in other parts of the County. Smaller scale sites have been allocated in other settlements to meet local needs.

The distribution of growth and new development in the County will be largely determined by the settlement hierarchy and associated spatial strategy. All settlements within the County have been placed into a five tier classification system as set out below. Further detail is set out in Policy BSC 1 - Growth Strategy for Denbighshire. Development boundaries have been defined for Bodelwyddan, the Lower Growth Towns, and villages within the settlement hierarchy; these are shown on the proposals maps. Development boundaries have been drawn to allow for an appropriate level of development for each settlement and to follow clearly identifiable features. Within development boundaries, new development will, in principle, be supported provided that it meets the criteria of other policies in the Local Development Plan and material planning considerations.

Key Strategic Site – Bodelwyddan

Bodelwyddan has been identified as a Key Strategic Site to meet the needs of Denbighshire in line with the LDP strategy. This large mixed use site will deliver new housing, employment opportunities, open space and community facilities,

creating a sustainable, expanded community. The site is identified on the proposals maps.

Lower Growth Towns

The towns of Rhyl, Prestatyn, St Asaph, Denbigh, Ruthin and Corwen have been identified as lower growth towns. These towns function as regional and/or local service centres with wide rural hinterlands. These centres will collectively make an important contribution to the overall housing and employment requirements of the County. Development boundaries have been drawn for each town and the proposals maps show housing, employment and retail allocations as appropriate.

Villages

The settlement tier for villages contains both traditional villages and the towns of Rhuddlan and Llangollen. This tier in the hierarchy refers to the level of growth that it is considered is appropriate for each of these settlements as opposed to any strict definition of what constitutes a 'village'. The amount of growth will vary between villages and growth will be primarily to meet local needs. All villages have defined development boundaries and where appropriate housing and employment allocations are shown on the proposals maps.

Hamlets

A settlement tier for hamlets has been developed in response to local concerns that development opportunities for local people have been overly constrained in very rural areas in previous Plans. Hamlets have been defined as having a community facility such as a school, shop, pub, place of worship etc either within the settlement or being a settlement that supports a neighbouring facility. Housing growth within hamlets will still be limited by a quota for each settlement and tied to local needs, with the aim of helping to sustain local communities and facilities. No development boundaries have been defined for hamlets as these would be overly restrictive given the limited amount of development that would be permitted; instead areas of search are shown on the proposals maps within which appropriate affordable housing proposals will be considered.

Open Countryside

All other areas are classified as open countryside where development opportunities will be strictly controlled in line with national policy. There will be a limited contribution to meeting housing needs through conversions of redundant rural buildings and infill development. Appropriate employment opportunities will also be supported to help sustain local communities.

Phasing

In general, it is expected that housing development will be delivered by the private sector, including housing associations (Registered Social Landlords, or RSLs). The private sector is also expected to make a contribution towards much of the public

This policy will contribute to meeting Objective(s):
1: Population and Community

Policy BSC 5 – Key Strategic Site – Bodelwyddan

Land at Bodelwyddan has been identified as a Key Strategic Site as shown on the proposals map, as part of the Preferred Strategy of the Local Development Plan and in order to meet the acknowledged development needs of the north of the County. The site is intended to be an exemplar site in terms of sustainability and high quality design.

Development will be phased over the plan period and should incorporate all the following key elements:

- **1,715 dwellings including the provision of affordable housing in accordance with Policy BSC4; and**
- **education, training and health provision; and**
- **26 hectares of B1, B2 & B8 serviced employment land and units; and**
- **new highway network between the existing A55 Junction 26 and Sarn Road and other offsite improvements; and**
- **onsite community facilities, open space, retail provision; and**
- **safeguarding and enhancement of any areas / species of nature conservation importance; and**
- **pedestrian and cycle facilities to serve connectivity between homes and jobs, including the surrounding Rights Of Way network; and**
- **new public transport links; and**
- **sustainable building materials, energy efficient and water efficient measures and aspire to be carbon neutral; and**
- **consideration as to the potential impacts on the linguistic, cultural and social character of the area; and**
- **integration of the development into the landscape based on the findings of a robust landscape framework.**

A development brief and detailed masterplan will be required to be produced in consultation key stakeholders and the local community before a decision is be made on a planning application.

National Policy links

Planning Policy Wales :
Chapter 4 – Planning for Sustainability
Chapter 7 – Economic Development
Chapter 9 – Housing
Chapter 12 – Infrastructure and Services

Technical Advice Notes:
TAN 2 – Planning & Affordable Housing
TAN 12 - Design

Justification

The Wales Spatial Plan, North East Wales Area, identifies a hub between the towns on the Denbighshire coast and St. Asaph. The hub provides a focus for future employment, housing and retail and provides continued support and opportunity for growth and regeneration for a wider area.

The site also lies within the North Wales Coast Strategic Regeneration Area. The employment allocation at Bodelwyddan will assist in the regeneration of Rhyl and improved linkages between the two settlements will enhance the sustainability of them both.

The site is in close proximity to the County boundary with Conwy County Borough this lends itself to collaboration work in terms of identifying need for affordable housing, education and employment provision. Whilst a development of this size brings change to the existing residents of Bodelwyddan the Council identifies a number of opportunities in site masterplanning to address the strategic County issues such as housing needs, and building on the economic success of the St Asaph Business Park and local colleges. In environmental terms some real opportunities for enhancement exist. Bringing forward a strategic mixed development is likely to have a host of other benefits such as, greater opportunity to promote sustainable development principles, reduced reliance on the private car and a mixed sustainable community. In addition to the delivery of serviced employment sites development could provide various community benefits such as funding of school places, transport improvements, affordable housing and extra care housing.

Building a sense of place through high quality design is key and masterplanning the infrastructure requirements to reduce water demand and increase renewable energy generation is integral to the design.

A development brief and detailed masterplan will be required to be produced in consultation with key stakeholders and the local community before a decision is made on a planning application.

This policy will contribute to meeting Objective(s):
1: Population and Community
2: Economy and Jobs
6: Transport

12: Infrastructure
13: Mixed Use Development

Policy BSC 6 - Local connections affordable housing in hamlets

Local connections affordable housing will be permitted in the hamlets listed below, provided that all the following criteria are met:

i) **the proposal would provide an affordable dwelling to meet local needs; and,**
ii) **the proposals would help to secure the viability of the local community, and strengthen the community and linguistic character; and,**
iii) **new housing is located within the defined area of search of the hamlet and overall growth levels restricted to that indicated below; and,**
iv) **the proposal is in keeping with traditional building styles and is sympathetic in design, scale and materials to other traditional buildings in the locality; and,**
v) **satisfactory arrangements are made to ensure the dwelling is retained in perpetuity as an affordable dwelling for local need and this is contained in a Section 106 agreement.**

The hamlets included in the policy are listed below and shown on the proposals maps – the figure in the second column denotes the number of dwellings that will be permitted in each settlement over the Plan period.

National Policy links

Planning Policy Wales :
Chapter 4 – Planning for Sustainability
Chapter 9 – Housing.

Technical Advice Notes
TAN 2 – Planning & Affordable Housing
TAN 6 – Planning for Sustainable Rural Communities
TAN 12 – Design

Justification

New dwellings in the hamlets will be restricted to affordable housing only in order to meet local affordable housing need. An applicant must have a strong local connection with the Community Council area in accordance with the Council's Local Connections Policy, as stipulated in the Supplementary Planning Guidance on Affordable Housing.

Applicants will not necessarily need to be registered on any housing waiting list but must:

1. not be able to afford to purchase a suitable property for their needs on the open market, and

Albion House, Albion Street,
Chester CH1 1RQ
Tel: 01244 408200
Website: www.legatowen.co.uk

STRICTLY PRIVATE AND CONFIDENTIAL
Jamie Bradshaw
Owen Davenport Limited

Email: jamie@owendavenport.co.uk

Date: 09 August 2023

Our Ref: MJP/RH

Your Ref:

Email: mattpochin@legatowen.co.uk

Direct Line: 01244 408205

Dear Jamie

RE: TEN ACRE SITE, ST ASAPH BUSINESS PARK, ST ASAPH

I refer to your request to provide a review of the marketing and background to the marketing of the St Asaph Business Park site, upon which you are working to secure planning consent for a new facility for the North Wales Fire and Rescue Services.

Legat Owen

Legat Owen are a commercial property practice based in Chester and Nantwich, providing services in all aspects of commercial property. The Practice geographically focuses upon the Cheshire and North Wales markets, where we are recognised as the principle independent practice. We have an agency team of 14 fee earners with skill sets in all sectors and many years of experience in the North West and Wales.

The subject site falls within the abilities provided by the practice to include industrial, office and development expertise.

The primary personnel involved in the site during the course of its marketing have been Stephen Wade (sadly deceased), Mark Diaper, Ben Lamont and Matthew Pochin.

Historical Involvement

The site was first taken on as an instruction by Legat Owen in November 2009, when it was acquired by Stretton Property Group and Anwyl in a joint venture company.

The intention of the joint venture partnership was to market the opportunity for commercial use with a specific focus on the office and industrial sectors (subject to planning) as effectively an extension to the St Asaph Business Park.

From 2009 through to the acquisition in late 2021 by CAM Ltd the scheme has been fully marketed through the usual tools as an opportunity of the nature outlined.

- Marketing boards – Continually in existence on site and still on site today (August 2023)
- Marketing brochures – See attachment of a selection of generic brochures that have been used, with the initial brochure being dated November 2009
- Aerial photography – Refer to brochures
- Mail shots – Direct to agents, company specific and geographically focused
- Web listings – Legat Owen, Zoopla, Loopnet, EG Propertylink and Nova Loca

We assess the marketing spend on the site from November 2009 to the current date to be somewhere in the region of £12,000 to £15,000 plus VAT.

One area that has not been significantly covered during the marketing process has been media advertising. This is not uncommon as this form of promotion is seen as unduly expensive in relation to the leads it generates. We would not see the choice to not use advertising via that medium as a hinderance to full exposure in generating leads and building the site profile and market awareness.

Occupier Focus

The site was acquired by the joint venture partnership with the specific strategy to create buildings and generate rental or capital.

All interests were considered on a leasehold and freehold basis from owner occupiers, developers and potential land sales.

The broad approach to marketing had to be taken in relation to this site due to its secondary location and relatively limited demand and catchment.

Pricing

In a similar manor to the broad approach to marketing, pricing for leasehold and freehold design and builds, land sales were always kept broad to ensure no interested parties or opportunities were dismissed from the process due to pricing.

Therefore, the market approach has always been broad and flexible.

Enquiries

During the marketing process very limited numbers of enquiries materialised.

We found most office or high-tech users focused on the existing and established opportunities offered at Vista Business Park whilst the subject site was perceived to be on the fringe to the established area. As highlighted on the VBP website it is publicised as stating “There is a sizeable amount of developable land for B1 uses”. Interestingly, how much new build space of scale has been committed to on the existing VBP during the course of the marketing of the subject site would be worth establishing, if any.

Some enquiries did arise from energy from waste businesses and data centres but the construction costs and the upgrades to the service infrastructure made these opportunities unviable.

Consideration was given to small scale office and individual schemes but the costs of splitting the site and providing services and infrastructure was too costly and once more provided issues with viability. Whilst existing units and supply are/were available and provided for on the VBP, then the enquiries were never going to be able to compete.

Eventually the joint partnership between Stretton and Anwyl took the decision to dispose of the site to CVAM Ltd in September 2021. This was a strategic decision based upon the lack of opportunity to develop the site. The Partnership decided to extract what funds they could and invest elsewhere.

The new purchaser saw the site as an opportunity to create a new facility for their existing business on part, whilst leaving the balancing plot as a development opportunity. It was at this point that the North Wales Fire and Rescue Service were identified as an occupier looking for a bespoke new opportunity along the A55. Hence the position we are in today with an owner occupier taking part of the site and a very specific and location sensitive occupier taking the balance of the land. This is the best, and with hindsight, the only currently viable mix of use for the land.

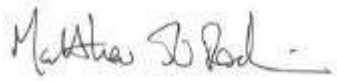
As you will see from our involvement in the site from November 2009 up until the point of disposal in September 2021, and the interest from the North Wales Fire and Rescue Services, a 12 year period has elapsed.

I am sure you will agree that a 12 year holding period for a site of this nature does not make sense for an active developer, such as the partnership between Stretton and Anwyl. All avenues had been explored, break up, speculative development, land sales but the site, based upon the allocation was not financially viable and more cost effective and readily available opportunities already existed on the VBP.

Therefore, we have no qualms, or issues, to fully support a change of direction for use of the site as we feel that if the significant development by the North Wales Fire and Rescue Services is not persued, the site could remain dormant for a further number of years.

We hope this letter is of assistance and if you require any further information, please do not hesitate to contact me.

Yours sincerely



Matt Pochin BSc (Hons) MRICS
Director

Particulars added to our database on 5th November 2009.

Legat Owen
CHARTERED SURVEYORS

GLASCOED ROAD

ST ASAPH BUSINESS PARK

ST ASAPH LL17 OLL

Description

The site, which is clear and level, extends to approximately 18 acres or thereabouts and offers potential (subject to planning) for a range of employment uses including: Offices, Research & Development, Hi-Tech Manufacturing & Warehouse/ Distribution in units from 7,804 sq ft (725 sq m).

The site has 5,000 kVA power capacity.

Indicative site layout

Schedule

Unit 1	15,000 sq m	161,460 sq ft
Unit 2	5,000 sq m	53,820 sq ft
Unit 3A	2,250 sq m	24,219 sq ft
Unit 3B	2,250 sq m	24,219 sq ft
Unit 4A	725 sq m	7,804 sq ft
Unit 4B	725 sq m	7,804 sq ft
Unit 4C	725 sq m	7,804 sq ft
Unit 5A	875 sq m	9,419 sq ft
Unit 5B	775 sq m	8,342 sq ft
Unit 5C	750 sq m	8,073 sq ft

Opportunity

A design team is in place with a proven track record in providing bespoke, fast track, design & build solutions.

Financial Support

The site is situated within a Tier 1 Assisted Area. Qualifying projects may be eligible for financial support via the Welsh Assembly Government.

- Office
- Research & Development
- Hi-Tech Manufacturing
- Warehouse/Distribution

SAT-NAV
LL17 0JD

Location

St Asaph Business Park is widely regarded as the premier business park in North Wales and is already home to a number of major occupiers including *The Welsh Assembly Government, TRB, North Wales Police, RNLI and Conwy & Denbighshire NHS Trust.*

Well served by road communications the park has the benefit of direct access to Junction 26 of the A55 Expressway (Euro Route 22). The A55 provides a link to Wrexham, Chester and the national motorway network (M56 & M53) to the east and direct route to the port of Holyhead in the west offering ferry services to the Republic of Ireland.

VISTA

Terms

Completed buildings are available on both Leasehold and Freehold terms.

Legal Costs

Each party will be responsible for their own legal costs.

VAT

All prices and rentals quoted are exclusive of but may be liable to VAT.

Viewing and Further Information

Please contact the joint agents Lamont and Legat Owen for further information or to arrange a site inspection.

LAMONT
www.lamonts.co.uk
01270 621001

NEIL LAMONT
nlamont@lamonts.co.uk
MATTHEW POCHIN
mpochin@lamonts.co.uk

Legat Owen
CHARTERED SURVEYORS
01244 408200
www.legatowen.co.uk

STEPHEN WADE
scw@legatowen.co.uk
MARK DIAPER
markdiaper@legatowen.co.uk

Particulars were updated on our database on 15th December 2020.

LegatOwen
CHARTERED SURVEYORS

VISTA

GLASCOED ROAD, ST ASAPH BUSINESS PARK,
ST ASAPH LL17 0LL

FOR SALE

Serviced employment land from 1 to 18 acres

ENTER

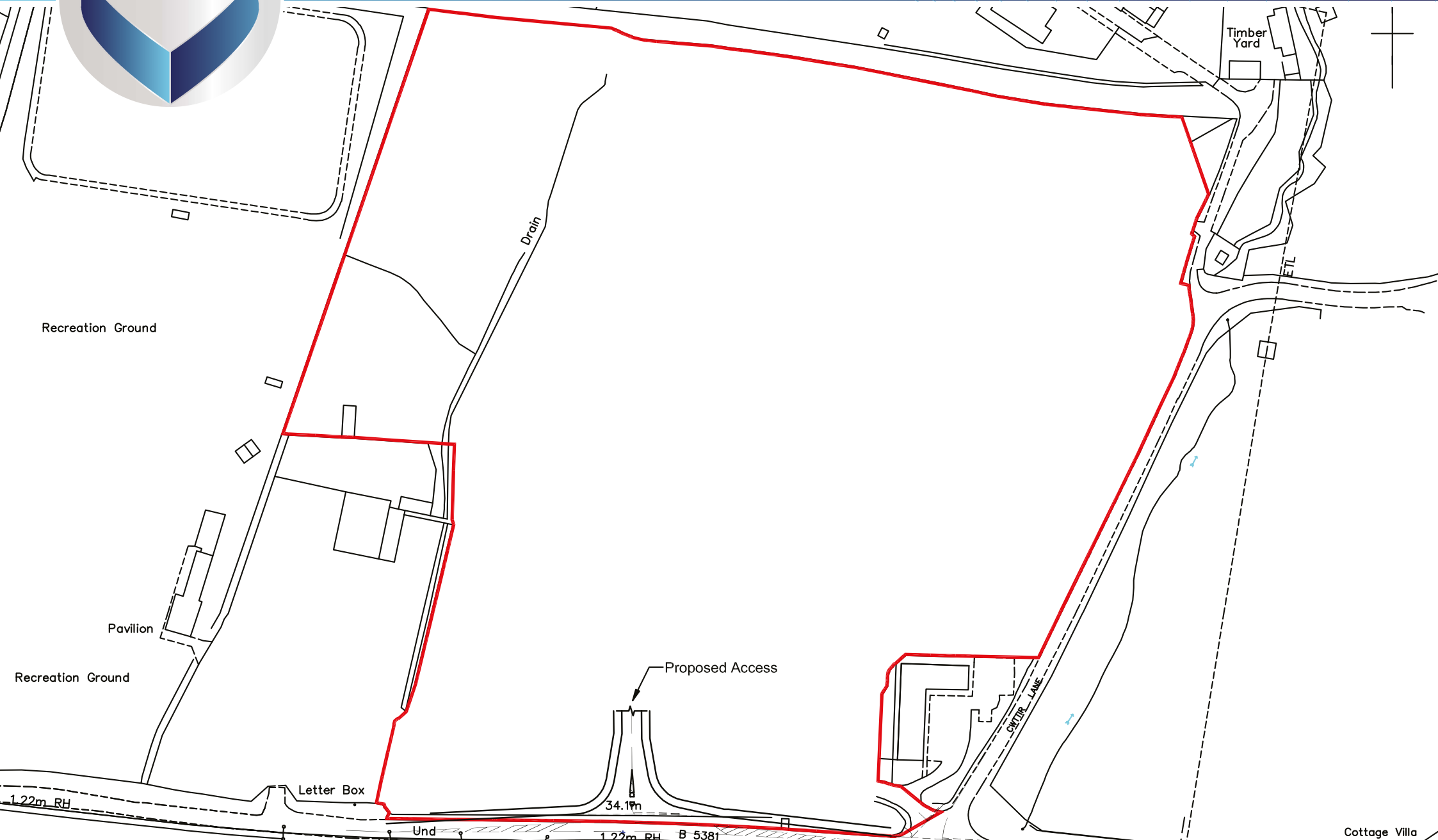

To West Wales
& Holyhead
A55
J26
A55
ST Asaph
Business Park
To Chester M56 & M6
Fford William Morgan
Glascoed Road
To A55 J27

The site, which is clear and level, extends to approximately 18 acres or thereabouts and offers potential (subject to planning) for a range of employment uses including:

- Offices
- Research & Development
- Hi-Tech Manufacturing & Warehouse/Distribution.

The site has 5,000 kVA power capacity. Plots of serviced employment land are available from 1 to 18 acres.

St Asaph Business Park is widely regarded as the premier business park in North Wales and is already home to a number of major occupiers Glydwr University, TRB, North Wales Police, RNLIand Betsi Cadwaladr University. Well served by road communications the park has the benefit of direct access to Junction 26 of the A55 Expressway (Euro Route 22). The A55 provides a link to Wrexham, Chester and the national motorway network (M56 & M53) to the east and direct route in the west offering ferry services to the Republic of Ireland.


Timber Yard
Drain
ETL
Recreation Ground
Pavilion
Recreation Ground
Proposed Access
CHITOR LANE
Letter Box
1.22m RH
34.1m
Und
1.22m RH
B 5381
Cottage Villa

Financial Support

The site is situated within a Tier 1 Assisted Area. Qualifying projects may be eligible for financial support via the Welsh Assembly Government.

Terms

Price Upon Application.

Legal Costs

Each party will be responsible for their own legal costs.

VAT

All prices and rentals quoted are exclusive of but may be liable to VAT.

Viewing and Further Information

Please contact the agent Legat Owen for further information or to arrange a site inspection.

Stephen Wade
stephenwade@legatowen.co.uk

Matt Pochin
mattpochin@legatowen.co.uk

Mark Diaper
markdiaper@legatowen.co.uk

Legat Owen
CHARTERED SURVEYORS
Incorporating LAMONT
01244 408200
www.legatowen.co.uk

Particulars were updated on our database on 16th December 2020.

Stephen Wade was removed from the contacts.

LegatOwen
CHARTERED SURVEYORS

Glascoed Road, St. Asaph

Vision Document

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Glascoed Road, St. Asaph

Site Location Plan

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Glascoed Road, St. Asaph

Site Context Plan

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Gross Internal Areas

Unit	Gross Internal Areas (ft²) Footprint	No of floors	Total GIA
01	13200	1	13,200
02	16200	1	16,200
03	16200	1	16,200
04	16200	1	16,200
05	19500	1	19,500
06	19000	1	19,000
07	96800	1	96,800
Total:: 7	**197100**		**197,100**

Parking Schedule

Description	Total
Parking Bays	246

Glascoed Road, St. Asaph

Site Plan As Proposed- Option A

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Gross Internal Areas

Unit	Gross Internal Areas (ft²) Footprint	No of floors	Total GIA
01	38000	1	38,000
02	8500	1	8,500
03	8500	1	8,500
04	8500	1	8,500
05	8500	1	8,500
06	16300	1	16,300
07	18300	1	18,300
08	96800	1	96,800
Total:: 8	**203400**		**203,400**

Parking Schedule

Description	Total
Parking Bays	264

Glascoed Road, St. Asaph

Site Plan As Proposed- Option B

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Glascoed Road, St. Asaph

Typical Elevation

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Glascoed Road, St. Asaph

Option A - Typical Elevation: Unit 6

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Glascoed Road, St. Asaph

Option A - Office Elevation: Unit 6

Issue No.3

Project Management • Architecture • Building Surveying • Cost Consultancy

C4 Consulting

Glascoed Road, St. Asaph

Option A - Main Entrance: Unit 6

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

STRETTON
PROPERTY GROUP

ANWYL
thoughtful building

C4 Consulting
- Project Management
- Architecture
- Building Surveying
- Cost Consultancy

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Particulars were updated on our database on 1st April 2021.

LO logo changed.

Glascoed Road, St. Asaph

Vision Document

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Glascoed Road, St. Asaph

Site Location Plan

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Glascoed Road, St. Asaph

Site Context Plan

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Gross Internal Areas

Unit	Gross Internal Areas (ft²) Footprint	No of floors	Total GIA
01	13200	1	13,200
02	16200	1	16,200
03	16200	1	16,200
04	16200	1	16,200
05	19500	1	19,500
06	19000	1	19,000
07	96800	1	96,800
Total:: 7	**197100**		**197,100**

Parking Schedule

Description	Total
Parking Bays	246

Glascoed Road, St. Asaph

Site Plan As Proposed- Option A

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Gross Internal Areas

Unit	Gross Internal Areas (ft²) Footprint	No of floors	Total GIA
01	38000	1	38,000
02	8500	1	8,500
03	8500	1	8,500
04	8500	1	8,500
05	8500	1	8,500
06	16300	1	16,300
07	18300	1	18,300
08	96800	1	96,800
Total:: 8	**203400**		**203,400**

Parking Schedule

Description	Total
Parking Bays	264

Glascoed Road, St. Asaph

Site Plan As Proposed- Option B

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Glascoed Road, St. Asaph

Typical Elevation

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Glascoed Road, St. Asaph

Option A - Typical Elevation: Unit 6

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

C4 Consulting

Glascoed Road, St. Asaph

Option A - Office Elevation: Unit 6

Issue No.3

Project Management • Architecture • Building Surveying • Cost Consultancy

C4 Consulting

Glascoed Road, St. Asaph

Option A - Main Entrance: Unit 6

Issue No.3

Project Management ● Architecture ● Building Surveying ● Cost Consultancy

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- Project Management
- Architecture
- Building Surveying
- Cost Consultancy

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Appendix V – List of Surveys Undertaken

The following surveys have been completed to inform this Business Case.

1. Geotechnical Site Investigation Report – Phase 1
2. Geotechnical Site Investigation Report – Phase 2 – including isolated contamination Testing.
3. Ecology Report
4. Flood Consequences Assessment
5. Topographical Survey
6. Desktop Utility Survey
7. Arboricultural Survey
8. H and S Exclusion Zone Report
9. Extensive Information provided by current landowner

HARLEY HADDOW

North Wales Fire & Rescue Service – New Training Centre

BREEAM New Construction V6 Pre-Assessment Report

September 2023

ENGINEERING POWERED BY THE PAST
BUILDING THE FUTURE

Document Revision Control

Revisions	Date	Reason for Issue	By	Approved
00	Sep 2022	For Information		SJP
01	Sep 2023	Updated for 2023 Re-Visit	IC	IC

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1.0 Executive Summary....4
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1.0 Executive Summary

Harley Haddow have undertaken a BREEAM Pre-Assessment for the proposed North Wales Fire Training Centre.

Individual credits considered achievable were selected by the design team in order to achieve a targeted 'Excellent' BREEAM UK New Construction V6 Assessment.

The following credits are mandatory for a 'Excellent' rating and have been included:

BREEAM Issue	BREEAM Rating/ Minimum number of credits
	Excellent
Man 03: Responsible construction practices	1 Credit Responsible construction management
Man 04: Commissioning and handover	1 Credit Commissioning test schedule and responsibilities
Man 04: Commissioning and handover	Criterion 11 Building User Guide
Man 05: Aftercare	1 Credit Commissioning Implementation
Ene 01: Reduction of energy use and carbon emissions	4 Credits Energy Performance
Ene 02: Energy monitoring	1 Credit First Sub-Metering Credit
Wat 1: Water consumption	1 Credit
Wat 02: Water monitoring	Criterion 1
Mat 03: Responsible sourcing of construction products	Criterion 1
Wst 03: Operational Waste	1 Credit

A final target score of **76.71%** was determined which provides an **6.71%** margin on the minimum 70% score required for an Excellent rating.

The results of the Pre-Assessment are included within this report along with details of the credit criteria that the project must achieve.

2.0 Introduction

2.1 General

The proposed North Wales Fire Training Centre development is required to undergo assessment and certification against the BREEAM environmental assessment method.

The minimum requirement for the project is to achieve a ‘’Excellent” rating under the BREEAM V6 New Construction Scheme Version 0.0.

A desktop Pre-Assessment exercise has been carried this report summarises the potential credits which are achievable with the current design strategy.

Analysis of the Pre-Assessment results shows that a BREEAM rating of ‘’Excellent” can be targeted for this project, with an anticipated BREEAM score of **76.71%**.

2.2 BREEAM Categories

The BREEAM New Construction scheme awards credits in 9 separate sections which relate to the construction, design and procurement decisions made on a project:

- Management – project brief and design, life cycle costing, construction practices, commissioning, and aftercare.
- Health and Wellbeing – indoor air quality, thermal comfort, acoustic performance, daylighting, and occupant controls.
- Energy – energy reduction, carbon emissions, heating and lighting control, energy monitoring, low carbon design.
- Transport – transport assessment, travel plan, sustainable transport measures.
- Water – leak detection, water meters, low flush toilets and grey water use.
- Materials – specification of building material and prohibition of hazardous substances.
- Waste – waste management, waste recycling, and functional adaptability.
- Land Use and Ecology – existing and enhanced ecological value of the site.
- Pollution – pollution monitoring, ozone depleting substances and NOx emission rates.

2.3 BREEAM Credits for Innovation

Innovation credits provide additional recognition for a building that innovates in the field of sustainable performance, above the level that is currently recognised in BREEAM. An additional 1% score can be added to a building’s final BREEAM score for each innovation credit achieved, up to a maximum of 10%.

Innovation credits can be achieved by meeting exemplary performance requirements or by making an application to BRE based on a particular building feature, system, or process.

2.4 Explanation of Scoring

Each category is weighted differently to reflect the relative significance that it has on the environmental impact of the building as follows:

BREEAM Section	Weighting %		
	Fully Fitted Out	Shell Only	Shell and Core Only
Management	11%	12%	11%
Health & Wellbeing	14%	7%	8%
Energy	16%	9.5%	14%
Transport	10%	14.5%	11.5%
Water	7%	2%	7%
Materials	15%	22%	17.5%
Waste	6%	8%	7%
Land Use & Ecology	13%	19%	15%
Pollution	8%	6%	9%

Figure 1: Environmental Weightings

For each BREEAM section the number of credits achieved, as determined by the BREEAM Assessor, is converted into a percentage of the total credits available for the section. This percentage is then multiplied by the section weighting, giving the section score. Each section score is then added together to give the overall BREEAM score (as a percentage).

The BREEAM score then determines the BREEAM rating as described in the table below:

BREEAM Rating	Minimum Score Required
Unclassified	<30%
Pass	≥30%
Good	≥45%
Very Good	≥55%
Excellent	≥70%
Outstanding	≥85%

Figure 2: BREEAM rating benchmarks

BREEAM rating benchmarks enable a client and all other stakeholders to compare the performance of a newly constructed building with other BREEAM rated buildings, and the typical sustainability performance of a stock of new non-domestic buildings in the UK. In this respect each BREEAM rating broadly represents performance equivalent to:

1. Outstanding: Less than the top 1% of UK new non-domestic buildings (innovator)
2. Excellent: Top 10% of UK new non-domestic buildings (best practice)
3. Very Good: Top 25% of UK new non-domestic buildings (advanced good practice)
4. Good: Top 50% of UK new non-domestic buildings (intermediate good practice)
5. Pass: Top 75% of UK new non-domestic buildings (standard good practice

2.5 Minimum Performance

To achieve a BREEAM rating, the minimum percentage score must be achieved, as described above, and the minimum standards (i.e., number of credits achieved) applicable to that rating level complied with as outlined in the table below:

BREEAM Issue	BREEAM Rating/ Minimum number of credits				
	Pass	Good	Very Good	Excellent	Outstanding
Man 03: Responsible construction practices	-	-	-	1 responsible construction management	2 responsible construction management
Man 04: Commissioning and handover	-	-	1 Commissioning test schedule and responsibilities	1 commissioning-test schedule and responsibilities	1 Commissioning test schedule and responsibilities
Man 04: Commissioning and handover	-	-	Criterion 11 Building User Guide	Criterion 11 Building User Guide	Criterion 11 Building User Guide
Man 05: Aftercare	-	-	-	1 Commissioning Implementation	1 Commissioning Implementation
Ene 01: Reduction of energy use and carbon emissions	-	-	-	4 Energy performance	6 Energy performance 4 Energy modelling and reporting
Ene 02: Energy monitoring	-	-	1 First Sub Metering	1 First Sub Metering	1 First Sub Metering
Wat 01: Water consumption	-	1	1	1	2
Wat 02: Water monitoring	-	Criteria 1	Criteria 1	Criteria 1	Criteria 1
Mat 03: Responsible sourcing of materials	Criteria 1	Criteria 1	Criteria 1	Criteria 1	Criteria 1
Wst 01: Construction waste management	-	-	-	-	1
Wst 03: Operational waste	-	-	-	1	1

Figure 3: Minimum BREEAM Standards

2.6 BREEAM Certification

The project will be assessed and verified at Design stage at which point an interim design certificate will be issued by BRE. Full certification will only be achieved following the Post Construction assessment.

3.0 Pre-Assessment Results

The information below summarises the potential credits that can be targeted by the team to attain an '**Excellent**' rating.

3.1 Management

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
Man 01	Project Brief and Design	Up to 4 credits are available where the following is achieved: 1. Prior to completion of concept design the project delivery stakeholders have identified and defined their roles, responsibilities, and contribution. 2. Prior to completion of concept design all relevant interested party stakeholders have been consulted and covers the minimum consultation content. *Pre-Requisite for BREEAM AP credits - The project team, including the client, formally agree strategic performance targets early in the design process.* 3. Will a Sustainability Champion (BREEAM AP) be appointed at RIBA stage 1 and performance targets contractually agreed? 4. Will a Sustainability Champion (BREEAM AP) be appointed to monitor and report progress during concept, developed and technical design stages?	4	4
Man 02	Life cycle cost and service life planning	4 credits are available where the following are achieved: 1. Will a feasibility stage elemental Life Cycle Cost (LCC) analysis be commissioned and completed? 2. Will a component level LCC be commissioned and completed? 3. Will full capital cost reporting take place?	4	4
Man 03	Responsible Construction Practices	Up to 6 credits are available where the following is achieved:	6 *(+1 Innovation)*	6 *(+1 Innovation)*

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
		Pre-Requisite – all timber and timber-based products are legally harvested and traded. 1. Will the principal contractor operate a compliant Environmental Management System AND will the principal contractor adopt best practice pollution prevention policies and procedures? *Pre-Requisite for the BREEAM AP - The client and the contractor formally agree performance targets.* 2. Have the client and contractor formally agreed performance targets 3. Will the principal contractor evaluate the risks (on site and off site) and implement actions to minimise through responsible construction management in accordance with BREEAM criteria? 4. Will site energy consumption be metered / monitored? 5. Will site water consumption be metered / monitored? 6. Will the transport of construction materials and waste to / from site be measured / monitored? **NOTE:** Minimum standards apply for Excellent		
Man 04	Commissioning & handover	Up to 4 credits are available where the following is achieved: 1. Will a schedule of commissioning be prepared and included in programme? 2. Will an appropriate team member be nominated to monitor and programme commissioning? 3. Will the building fabric be tested and inspected post construction, with all defects rectified?	4	4

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
		4. Will building user guides and relevant user information be provided? 5. Will a building technical and non-technical training schedule be prepared? **NOTE:** Minimum standards apply for Excellent		
Man 05	Aftercare	Up to 3 credits are available where the following is achieved: 1. Will aftercare support be provided? Will water and energy use be monitored for 12 months? 2. Will seasonal commissioning be undertaken? 3. Will a post occupancy evaluation be carried out? **NOTE:** Minimum standards apply for Excellent	3	3

Note: Strikethrough text indicates this portion of the credit is not targeted.

3.2 Health and Well-being

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
Hea 01	Visual Comfort	Up to 5 credits available where the following is achieved: 1. Will the design provide adequate glare control for building users? 2. Will all relevant building areas be designed to achieve the appropriate daylight factor(s) and uniformity? 3. Will the design provide a compliant view out for building users? 4. Will internal / external lighting be specified in accordance with the relevant CIBSE / British Standards? 5. Will internal lighting have the appropriate zoning and occupant control?	5 *(+2 Innovation)*	5
Hea 02	Indoor Air Quality	Up to 4 credits available where the following is achieved: *Pre-Requisite - Will an air quality plan be produced and building designed to minimise air pollution?* 1. Will the building be designed to minimise the concentration and recirculation of pollutants? ~~2. Will the building be designed to, or have the potential to provide, natural ventilation?~~ 3. Will the relevant products be specified to meet the VOC testing and emission levels required? ~~4. Will formaldehyde and total VOC levels be measured post construction?~~	4 *(+1 Innovation)*	2
Hea 04	Thermal Comfort	Up to 3 credits are available where the following is achieved: 1. Will thermal modelling of the design be carried out? 2. Will thermal modelling demonstrate that the relevant requirements are achieved for a projected climate change environment? 3. Will the modelling inform the development of a thermal zoning and control strategy?	3	3

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
Hea 05	Acoustic Performance	Up to 3 credits are available where the following is achieved: 1. Will a suitably qualified acoustician be appointed to provide appropriate design advice? 2. Will the building meet the relevant acoustic performance standards and testing requirements?	3	2
Hea 06	Safety and Security	One credit is available where the following is achieved: 1. Will a suitably qualified security consultant be appointed, and security considerations accounted for?	1 (+1 Innovation)	1
Hea 07	Safe and healthy surroundings	Up to 2 credits are available where the following is achieved: 1. Where vehicle delivery access and drop-off areas form part of the assessed development the appropriate BREEAM criteria is to be met. 2. Is there an outside space providing building users with an external amenity area?	2	2

Note: Strikethrough text indicates this portion of the credit is not targeted.

3.3 Energy

<table>
<tr><th>Ref.</th><th>Issue Title</th><th>BREEAM Criteria</th><th>No. Credits Available</th><th>No. Credits Proposed</th></tr>
<tr>
<td>Ene 01</td>
<td>Reduction of energy use and carbon emissions</td>
<td>
Up to 13 credits are available where the following is achieved:

1. Calculate an Energy Performance Ratio Reduction of carbon dioxide emissions:
<table>
<tr><th>BREEAM credits</th><th>EPR_{NC}</th><th>Minimum requirements</th></tr>
<tr><td>1</td><td>0.1</td><td rowspan="3">Requires a performance improvement progressively better than the relevant national building regulations compliant standard</td></tr>
<tr><td>2</td><td>0.2</td></tr>
<tr><td>3</td><td>0.3</td></tr>
<tr><td>4</td><td>0.4</td><td rowspan="2">Excellent
Requires 5 credits to be achieved (equivalent to an EPR of at least 0.375).</td></tr>
<tr><td>5</td><td>0.5</td></tr>
<tr><td>6</td><td>0.6</td><td rowspan="4">Outstanding
Requires 6 credits to be achieved (equivalent to an EPRNC of at least 0.6) and 4 credits for Energy Modelling and reporting.</td></tr>
<tr><td>7</td><td>0.7</td></tr>
<tr><td>8</td><td>0.8</td></tr>
<tr><td>9</td><td>0.90 and zero net regulated CO2 emissions</td></tr>
</table>
2. Pre-Requisite - Prior to completion of the Concept Design, relevant members of the design team hold a preliminary design workshop focusing on operational energy performance.
3. Will additional energy modelling during the design and post-construction stage be carried out to
</td>
<td>13
(+5 Innovation)</td>
<td>6
(+4 Innovation)</td>
</tr>
</table>

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
		generate predicted operational energy consumption figures? **NOTE:** Minimum standards apply for Excellent		
Ene 02	Energy Monitoring	Up to 2 credits are available for the inclusion of BMS and or sub-metering: 1. Will a BMS or sub-meters be specified to monitor energy use from major building services systems? 2. Will a BMS or sub-meters be specified to monitor energy use by tenant / high energy load building function areas? **NOTE:** Minimum standards apply for Excellent	2	2
Ene 03	External Lighting	One credit is available where external light fittings and controls will be specified in accordance with BREEAM criteria?	1	1
Ene 04	Low Carbon Design	Up to 3 credits available for Low carbon design. ~~1. Will a passive design analysis be undertaken?~~ ~~2. Can free cooling be achieved for the building?~~ 3. Will a low carbon feasibility study be carried out?	3	1
Ene 06	Energy Efficient Transportation Systems	Up to 2 credits are available for efficient lifts: 1. Will a transportation analysis be carried out to determine the optimum number and size of lifts, escalators or moving walks? 2. Will three energy-efficient features for each lift offering the greatest potential energy savings be part of the system?	2	2
Ene 08	Energy efficient equipment	Up to 2 credits are available for the specification of energy efficient equipment, for the project this will consider:	2	2

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
		▪ Domestic Scale Appliances ▪ Kitchen and Catering Facilities ▪ Process equipment		

Note: Strikethrough text indicates this portion of the credit is not targeted.

3.4 Transport

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
Tra 01	Transport assessment and travel plan	Up to 2 credits where the following is achieved: 1. Has a travel plan based on site specific travel assessment been done? 2. Does the travel plan cover the minimum BREEAM criteria?	2	2
Tra 02	Sustainable transport measures	Up to 10 credits are available where the following is achieved: *Pre-Requisite - Achieve the Tra 01 Transport assessment and travel plan credits.* 1. Have any sustainable transport measures been implemented? 2. What is the building's indicative Accessibility Index?	10	4

Note: Strikethrough text indicates this portion of the credit is not targeted.

3.5 Water

<table>
<tr><th>Ref.</th><th>Issue Title</th><th>BREEAM Criteria</th><th>No. Credits Available</th><th>No. Credits Proposed</th></tr>
<tr><td>Wat 01</td><td>Water Consumption</td><td>Up to 5 credits are available for domestic water-consuming components that reduce the water consumption for the building:

<table><tr><td>% Improvement</td><td>No. of BREEAM credits</td></tr><tr><td>12.5</td><td>1</td></tr><tr><td>25</td><td>2</td></tr><tr><td>40</td><td>3</td></tr><tr><td>50</td><td>4</td></tr><tr><td>55</td><td>5</td></tr><tr><td>65</td><td>Exemplary credit</td></tr></table>
Is a greywater or rainwater system to be specified and installed?

NOTE: Minimum standards apply for Excellent</td><td>5
(+1 Innovation)</td><td>3</td></tr>
<tr><td>Wat 02</td><td>Water Monitoring</td><td>One credit can be awarded where the following is met:

1. Will there be a water meter on the mains water supply to the building(s)?
2. Will metering / monitoring equipment be specified on the water supply to any relevant plant/building areas?
3. Will all specified water meters have a pulsed output?
4. If the site / building has an existing BMS connection, will all pulsed meters be connected to the BMS?

NOTE: Minimum standards apply for Excellent</td><td>1</td><td>1</td></tr>
<tr><td>Wat 03</td><td>Water Leak Detection</td><td>Up to 2 credits are available:

1. Will a mains leak detection system be installed on the building’s mains water supply?
<s>2. Will flow control devices be installed in each sanitary area/facility?</s></td><td>2</td><td>1</td></tr>
</table>

Note: Strikethrough text indicates this portion of the credit is not targeted.

3.6 Materials

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
Mat 01	Environmental impacts from construction products - Building life cycle assessment (LCA)	Up to 7 credits are available where the following is provided: 1. Will a Building Low Carbon Assessment (LCA) of the superstructure design be carried out? *2.* Will a Building Low Carbon Assessment (LCA) of at least 6 significantly different substructure and hard landscaping design options be carried out?	7 *(+3 Innovation)*	4 *(+1 Innovation)*
Mat 02	Environmental impacts from construction products	One credit is available when the Specification of products with a recognised environmental product declaration (EPD) achieve a total EPD points score of at least 20.	1	1
Mat 03	Responsible sourcing of construction products	Up to 4 credits are available where the following is provided: *Pre-requisite - Are all timber and timber-based products used on the project legally harvested and traded?* 1. Will materials be sourced in accordance with a documented sustainable procurement plan? 2. Can applicable building elements demonstrate they have been responsibly resourced? **NOTE:** Minimum standards apply for Excellent	4 *(+1 Innovation)*	2
Mat 05	Designing for Durability and Resilience	One credit is available where the following is provided: 1. Are protection measures incorporated into the building's design and construction to reduce damage to the building's fabric or materials in case of accidental or malicious damage occurring? 2. Have key exposed building elements been designed and specified to limit long and short-	1	1

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
		term degradation due to environmental factors?		
Mat 06	Material efficiency Assessment scope	One credit is available where opportunities have been identified, and measures investigated and implemented, to optimise the use of materials in building design, procurement, construction, maintenance, and end of life.	1	1

Note: Strikethrough text indicates this portion of the credit is not targeted.

3.7 Waste

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
Wst 01	Construction Waste Management	Up to 4 credits are available where the following is provided: 1. Will a compliant RMP be produced? 2. What level of Non-hazardous construction waste will be targeted? 3. What level of Non-hazardous construction waste, demolition waste and excavation waste will be diverted from landfill?	4 *(+1 Innovation)*	4
Wst 02	Use of recycled and sustainably sourced aggregates	One credit is available where the following is provided: 1. What aggregate uses and types will be present? 2. Have the aggregates sourced location and distance travelled been identified?	1 *(+1 Innovation)*	0
Wst 03	Operational Waste	One credit is available for the provision of dedicated storage facilities for operational waste streams. **NOTE:** Minimum standards apply for Excellent	1	1
Wst 05	Adaption to Climate Change	One credit is available where the following is provided: **1.** Will a compliant climate change adaptation strategy appraisal for structural and fabric resilience be produced at concept stage?	1 *(+1 Innovation)*	1
Wst 06	Design for disassembly and adaptability	Up to 2 credits are available where the following is provided: 1. Will a building-specific functional adaptation strategy study be carried out at concept stage which includes recommendations for measures to be incorporated to facilitate future adaptation? ~~2. Will the measures be implemented in the design?~~	2	1

Note: Strikethrough text indicates this portion of the credit is not targeted.

3.8 Land Use and Ecology

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
LE 01	Site Selection	Up to 2 credits are available where the following is achieved: 1. Will at least 75% of the proposed development's footprint be located on previously developed land? ~~2. Is the site deemed to be significantly contaminated?~~	2	1
LE 02	Identifying and understanding the risks and opportunities for the project	Up to 2 credits are available where the following is achieved: *Pre-requisite: The client or Contractor to confirm compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.* 1. Will a suitably qualified ecologist be appointed to report on enhancing and protecting site ecology? 2. Has an appropriate level of survey and evaluation been carried out at the early stages to determine the ecological baseline value of the site? 3. Have specific solutions and measures been identified, appraised, and selected in the early stages to influence key project planning decisions? 4. Has the optimal ecological outcome for the site been selected?	2 *(+1 Innovation)*	2 *(+1 Innovation*
LE 03	Managing negative impacts on ecology	Up to 3 credits are available where the following is met: *Pre-Requisite – LE 02's 'Survey and evaluation and determining ecological outcomes' criteria have been achieved.* 1. Have the roles and responsibilities been clearly defined, allocated and implemented to support successful delivery of project outcomes? 2. Site preparation and construction works have been planned for and implemented at a stage that is	3	2

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
		sufficiently early in the project to optimise benefits and outputs. 3. Will a suitably qualified ecologist be appointed to report on the negative impacts of the project? 4. Have negative impacts from site preparation and construction been identified and managed?		
LE 04	Change and enhancement of ecological value	Up to 4 credits are available where the following is met: *Prerequisite - LE 03 Criterion 6 has been achieved and the client or contractor has confirmed that compliance is monitored against all relevant UK, and EU or International legislation relating to the ecology of the site.* 1. Will a suitably qualified ecologist be appointed to report on enhancing and protecting site ecology? 2. Will the suitably qualified ecologist's general recommendations be implemented? 3. Will the improvement in ecological value increase as targeted as a result of the enhancement actions?	4 *(+1 Innovation)*	2
LE 05	Long term ecology management and maintenance	Up to 2 credits are available where the following is met: *Prerequisite - The client or contractor has confirmed that compliance is being monitored against all relevant UK, EU and International standards relating to the ecology of the site. And where pursued, LE 03 Criterion 8 has been achieved and 1 credit under LE 04 has been awarded.* 1. Will the project team liaise and collaborate with representative stakeholders, taking into consideration data collated on solutions and measures implemented and insure the continued relevance over the project life? 2. Has an ecology and biodiversity section been included in the building user/owner information?	2	1

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
		3. Will a landscape and ecology management plan be produced for the first 5 years after completion? 4. Will the landscape and ecology management plan be updated to support maintenance of the ecological value of the site?		

Note: Strikethrough text indicates this portion of the credit is not targeted.

3.9 Pollution

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
Pol 01	Impact of refrigerants	Up to 3 Credits are available where the following is met: 1. Will refrigerant containing system be installed in the assessed building? *Pre-requisite: All systems (with electric compressors) comply with BSÂ EN 378:2016 (parts 2 and 3) and (where applicable) Institute of Refrigeration Ammonia Refrigeration Systems code of practice.* 2. Will the systems have a Direct Effect Life Cycle CO_2eq. emissions ≤ 100CO_2eq/kW cooling/heating capacity or have a Global warming potential ≤10? Or will the systems using refrigerants have a DELC of ≤ 1000 kgCO_2eq/kW cooling and heating capacity. Will a refrigerant leak detection and containment system be specified/installed?	3	0
Pol 02	Local air quality	Up to 2 credits where all heating and hot water is supplied by non-combustion systems. For example, only powered by electricity.	2	1
Pol 03	Flood and surface water management	Up to 5 credits are available where the surface water run-off of the site is restricted: *Pre-Requisite - An appropriate consultant is appointed to carry out and demonstrate the development's compliance with all criteria.* 1. Will a Flood Risk Assessment be undertaken, and ground level of the building / access meets BREEAM criteria? 2. Will the site meeting meet the BREEAM criteria for peak rate surface water run-off? 3. Will the site meet the criteria for surface water run-off volume,	5	5

Ref.	Issue Title	BREEAM Criteria	No. Credits Available	No. Credits Proposed
		attenuation and/or limiting discharge? 4. Will the site be designed to minimise watercourse pollution in accordance with the BREEAM criteria?		
Pol 04	Reduction of Night-time Light Pollution	One credit is available where the external lighting has been eliminated or if present designed to reduce light pollution.	1	1
Pol 05	Noise Attenuation	Will there be, or are there noise-sensitive areas/buildings within 800m radius of the development? One credit is available where a noise impact assessment is completed and where the site is complaint with all the relevant noise criteria in order to reduce the likelihood of noise from fixed installations on the new development affecting nearby noise-sensitive buildings.	1	1

Note: Strikethrough text indicates this portion of the credit is not targeted.

3.10 Innovation

Up to a maximum of 10 credits are available in aggregate from a combination of the following:

Ref.	Issue Title	No. Credits Available	No. Credits Proposed
Man 03	Responsible construction practices	1	1
Hea 01	Visual comfort	2	0
Hea 02	Indoor air quality	1	0
Hea 06	Security	1	0
Ene 01	Reduction of energy use and carbon emissions	5	4
Wat 01	Water consumption	1	0
Mat 01	Environmental impacts from construction products - Building life cycle assessment (LCA)	3	1
Mat 03	Responsible sourcing of construction products	1	0
Wst 01	Construction waste management	1	0
Wst 02	Use of recycled and sustainably sourced aggregates	1	0
Wst 05	Adaptation to climate change	1	0
Le 02	Ecological risks and opportunities	1	1
Le 04	Ecological change and enhancement	1	0

4.0 Summary

The results of the initial pre-assessment indicate a predicted BREEAM score for the North Wales Fire Training Centre development of **76.71%** a 'Excellent' rating.

The information below summarises the scoring and results of the Pre-Assessment exercise.

BREEAM UK BREEAM UK New Construction Version 6 bre

Pre-assessment : Design (Interim) : North Wales (TBC)

BREEAM Rating

	Credits available	Credits achieved	% Credits achieved	Weighting	Category score
Man	21.0	21.0	100.00%	11.00%	11.00%
Hea	18.0	15.0	83.33%	14.00%	11.66%
Ene	23.0	14.0	60.87%	16.00%	9.73%
Tra	12.0	6.0	50.00%	10.00%	5.00%
Wat	9.0	6.0	66.67%	7.00%	4.66%
Mat	14.0	9.0	64.29%	15.00%	9.64%
Wst	9.0	7.0	77.78%	6.00%	4.66%
LE	13.0	8.0	61.54%	13.00%	8.00%
Pol	12.0	8.0	66.67%	8.00%	5.33%
Inn	10.0	7.0	70.00%	10.00%	7.00%
Total	141.0	101.0	71.63%	-	76.71%
Rating	-	-	-	-	★★★★☆ **Excellent**

Performance by environmental category

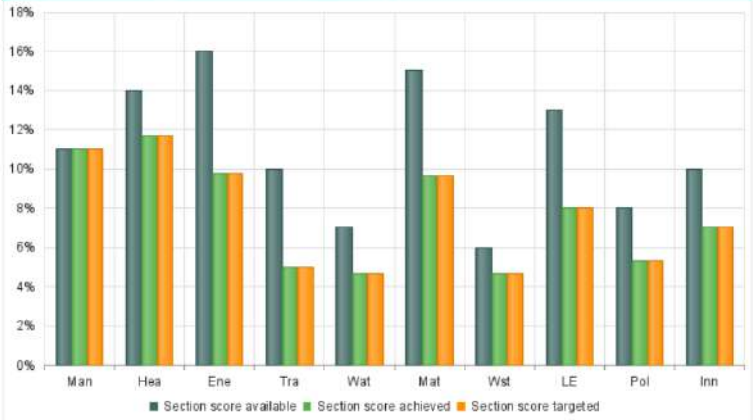

Figure 4: Predicted BREEAM score