Ysgol Gynradd Gymraeg Tregeles

Neath Abbey

Knox & Wells
Design Statement

April 2026

Austin·Smith:Lord

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1.

Introduction

Introduction

This Design Statement has been prepared by Austin-Smith:Lord on behalf of Neath Port Talbot County Borough Council to support a full planning application for the design and build of a new school block at YGG Tregeles.

Project Team

- Civil and Structual Engineer - Cambria
- MEP Engineer - Consilium
- Sustainability - RedSix
- Acoustics - Hunter Acoustics
- Fire Engineer - Helios
- Principal Designer - GreenBuild
- Planning Consultants - Asbri

Executive Summary

This planning application supports the planned construction of a single storey new building. The new accommodation is proposed to allow for modern teaching spaces suitable for the growth of the Welsh medium primary school to complement the retained stone building and it's facilities on the site in place of a poor condition and undersized 1940's building which is to be demolished.

This statement demonstrates the developed and final proposed designs and how it addresses the planning policy, environmental and educational requirements.



Site photograph from Southern gate looking towards the Victorian School block to be retained

2.

The Brief

2.1 Site & Location



2.1 Site & Location

Ysgol Gynradd Gymraeg Tregeles is located in Skewen, to the northeast of Neath. The site occupies an established educational plot within a predominently residential context.

The site is Bounded by St Johns Terrace to the South and West, with residences opposite.

To the north is an embankment of mature trees forming a railway line.

Directly to the east is the cemetary associated with St Johns Church.



Austin·Smith:Lord

2.2 Brief Requirements

Neath Port Talbot County Borough Council proposes the design and construction of a new single-storey primary school block within the grounds of YGG Tregeles, Skewen.

The development will provide modern, inclusive educational accommodation designed to meet BREEAM “Excellent”, Secure by Design, and Net Zero Carbon in Operation standards.

The existing school and childcare facilities will remain fully operational throughout the construction period. To ensure continuity of childcare provision, an outdoor classroom unit will be installed within the front yard of the site and made fully operational prior to the September 2026 academic term.

The proposals include the demolition of the existing rear school block and an associated outbuilding. The new school building will be constructed partly on the footprint of the demolished rear block and partly within the adjacent field, enabling efficient site use while seeking to retain existing green space wherever practicable.

Associated external works will include a designated parking area, a retained and enhanced green playing field, and external play areas directly accessible from the new classrooms.

The field and rear areas of the site are known to experience surface water retention, associated with runoff from the adjacent railway embankment. The proposed development will incorporate appropriate drainage and water management measures to address this issue as part of the overall scheme.

Design Standards:

- 2025 Area Guidelines for Schools in Wales - Building Guidance
- BREEAM Excellent
- Secure By Design
- NZC NPTCBC standards - embodied target of 600kgCO2/ m² / annum (GIA)
- EPC rating A+
- Target energy use 65 kWh/m2/annum (GIA)
- Sprinklers required to new school block

Project Brief:

- Existing school to remain operational

Phase 1:

- Demolish rear block and some associated walls / structures

Phase 2:

- Outdoor classroom for years 3 & 4 (approx.15 pupils) to be provided for September 26 - front yard location
- Temporary Staffroom building for September 26 in site compound

Phase 3: New school block required to provide;

- 5 no. classrooms
- Separate WC facilities for boys and girls, Accessible WC for staff, Hygiene Room
- 2no. Intervention / Group rooms
- Storage room / plant space
- Cleaners cupboard
- Assembly hall for pupils
- Staff room
- Headteachers office
- New parking area with secure access
- Green (soft) playing field to have drainage improvements
- Hard surface play adjacent to classrooms with canopies over

2.2 Schedule of Accommodation

YGG Tregeles New Block Schedule of Accommodation

	Room / Space	Pupil Occupancy	Area (m^2)	Number	Total Area (m^2)	Comments
Teaching	Classroom	30	60	5	300	All Junior rooms with 1no. Infants room
Specialist practical	Specialist Practical Learning	0	0	0	0	agreed as removed by client team
Halls	Hall	120	100	1	100	Small Hall only based on assembly - already 77m^2 in old school block
	Library	0	0	0	0	agreed as removed by client team
Learning Resource	Small group room (SENco)	4	12	0	0	to be relocated intot the existing oversized classrooms in the old block
	Small group room	2	9	2	18	small intervention room
	Head's office		12	1	12	relocated from old school block
Staff admin	Staff room		32	1	32	for the whole school to use
	General office, sick bay etc		0	0	0	in old school block
	Class storage (infant or junior)		1.5	0	0	in each classroom with teaching wall
Storage	Specialist stores		8	0	0	not required as in old block
	PE Store (adjacent to hall)		12	1	12	Sports requirements to be set
	Cloakrooms	3	0		0	3m^2 per class allowance to be in the corridor or lockers
Non-teaching storage	dining/chair store				0	not required as in old block
	Staging/appliance store				0	in hall area
	Caretakers store				0	not required as in old block
	Cleaner's store	2	1		2	
					0	
	Total Net Area		***476***			
			0			
Toilets	Other pupil Toilets	7.5	3		22.5	Junior WCs accessed off the corridor into gender - infants from the classroom
	Accessible toilet / staff WC	4	1		4	Visitor and staff use
	Hygiene Room	12	1		12	Visitor and staff use
Plant	Server Room	9	1		9	recommended by Consilium
	Plant Room	20	1		20	Combined room recommended by Consilium
Circulation	Circulation				104.72	22% of net area if single storey
	Partitions				19.04	4% of net area
	Total GIFA		***667.26***			

Updated during meeting with Z Skinner and W Hopkins 14/01/2026
Education team to review and agree differences from WG Space standards

3.

Site & Context Analysis

3.1 Existing Site and Character

The original school building was constructed in 1868 and remains largely as constructed. It is a characterful example of late-19th-century school architecture, constructed in local coursed stone masonry with contrasting dressed stone detailing. The building is strongly vernacular in appearance, reflecting traditional Welsh techniques and materials.

The principal form comprises a simple gabled range with a steeply pitched slate roof, punctuated by a prominent square stone tower element. The tower is a defining architectural feature, rising above the main roofline and capped with a pyramidal slate roof. Each elevation of the tower includes distinctive circular oculus windows, set within stone surrounds.

Walls are constructed of stone blocks, laid in regular courses, with ashlar quoins to corners and openings. Window openings are vertically proportioned and set within simple stone surrounds, with larger openings arranged rhythmically along the principal elevations, reflecting the original classroom layout.

Roof details include projecting eaves, finished with painted timber fascias, and rainwater goods that follow the building's historic profile.

Despite functional adaptations over time, the original 1868 structure remains clearly identifiable.

1. Main frontage visibile from St Johns Terrace and facing the playground.

2. Visitor and Staff vehicular access approach; a single lane bounded by houses and the stone boundary wall.

3. Separate Childcare unit exterior.

4. Staff/ Visitor vehicular access gate.









3.1 Existing Site and Character

The building constructed circa 1940 forms a later, mid-20th-century addition to the YGG Tregeles school complex and is architecturally and materially distinct from the original 1868 stone school building.

It is a single-storey, linear structure aligned broadly east–west, with projecting gabled ends that create an enclosed yard space between the building and the older school accommodation.

The building is finished externally in grey pebble-dash render with a slate roof and displays a strongly functional and repetitive design typical of the period.

Elevations are characterised by a regular rhythm of large, multi-pane windows set between rendered piers, with a low painted brick plinth at ground level. Simple glazed entrance doors are located at the eastern and western ends, accessed via modest steps or ramps.

Internally, the building comprises former classrooms, circulation space, stores and sanitary accommodation, arranged off a central corridor. The interior fabric is utilitarian, with painted plaster finishes and later adaptations reflecting changing functional requirements rather than architectural intent.

The building is of limited architectural and heritage significance, contributing primarily to the understanding of the site's phased development rather than to its historic or townscape value. As part of the proposed redevelopment of the school, the circa-1940 building is to be demolished, allowing for the delivery of new, fit-for-purpose educational accommodation that better meets contemporary standards and operational needs.

1-3. 40's Block southern elevation.
4. Yard/carpark.
5. View from 40's block to original building along field boundary wall; reception accessed in orginail building from door shown.
6. View from field.













3.1 Existing Site and Character

The field is located to the east of the existing YGG Tregeles school buildings and forms part of the established site. It comprises a level to gently sloping grassed area with limited permanent built structures, aside from small items associated with outdoor use and planting.

The western edge of the field is defined by the school buildings, including the original 19th-century stone school building and later 20th-century additions, associated hardstanding areas,and a low stone wall.

The northern boundary of the field is formed by a railway embankment, behind a weldmesh secure fence, which rises above the site and is densely vegetated with mature trees and scrub.

To the east of the field is the cemetary of St Johns Church, behind a secure fence.

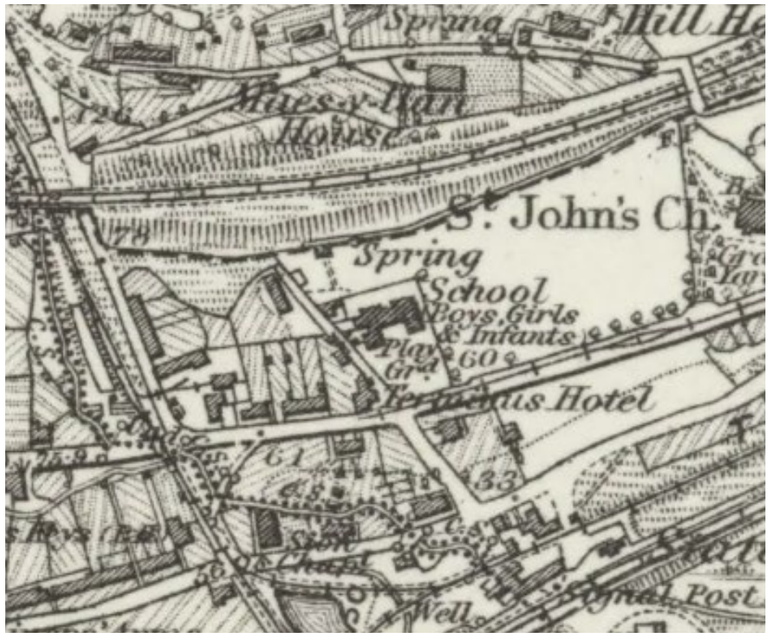
1. View towards the north from the feild capturing boundary conditions.

2. view from southern corner of the field towards the school buildings.



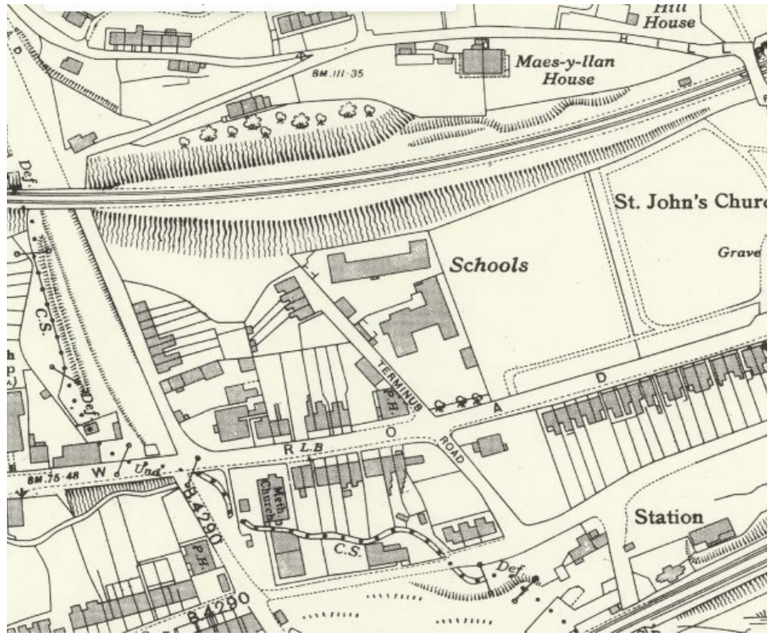


3.2 Historical Development



1876 OS Map

Original School building constructed 1868.



1940 OS Map

First appearance of second school building on the OS Map.



2026 Google Map

3.3 Constraints and Opportunities

Opportunities

- Redevelopment of a site in established educational use
- Removal of outdated mid-20th-century buildings to improve functionality
- Capacity to locate new development partly on previously developed land
- Availability of adjacent open land allowing flexibility in layout and phasing
- Opportunity to retain and enhance green space within the wider site
- Existing boundary treatments and vegetation provide visual containment
- Potential to resolve existing drainage issues as part of the development
- Strong physical and functional relationship with retained school buildings
- Bus stop located immediately outside the site, providing access to public transport

Constraints

- Requirement for the school to remain operational throughout construction.
- Single-lane vehicular access with dead end, serving staff, visitors, and directly adjacent residential properties
- Limited capacity for vehicle passing and manoeuvring within the access route
- Railway embankment to the north influencing drainage, levels, and acoustics
- Known surface water runoff and water retention in the field and rear areas
- Presence of historic school buildings requiring a sensitive design response
- Fixed stone boundary walls limiting access points and extent of development
- Active travel opportunities are limited due to local topography and surrounding infrastructure
- Need to maintain safe pedestrian and vehicular segregation within a constrained site
- Requirement to retain adequate external play and open space for school use



3.4 Planning Policy Context

Introduction
The planning policy framework for the determination of this application is provided by the content and scope of National Planning Policy, which is contained within the twelfth edition of Planning Policy Wales (PPW) and its associated Technical Advice Notes (TANs), together with the Local Planning Policy and its supplementary planning guidance.

The planning policy context for this application is provided in detail in the Planning Statement that accompanies this application. For a full review of pertinent policies please refer to the Planning Statement.

Planning Policy Wales
National planning policy is contained within the twelfth edition of Planning Policy Wales (PPW), published by the Welsh Government in February 2024. PPW is supported by 18 topic-based Technical Advice Notes (TANs), which are also relevant. PPW is the Welsh Government's principal planning policy document, setting out the context for sustainable land use planning policy, within which Development Plans are prepared and development.

Section 3.17 of PPW relates to design and access statements (DAS) discussing that a DAS should communicate what development is proposed, demonstrate the design process that has been undertaken and explains how the objectives of good design and placemaking have been considered from the outset of the development process.

Well-being of Future Generations Act (2015)
The Well-being of Future Generations (Wales) Act came into force in 2015 and seeks to improve the social, economic, environmental and cultural well-being of Wales. The Act puts in place seven well-being goals in order to make sure that everyone works towards the same vision. The well-being goals are set out in the Planning Statement.

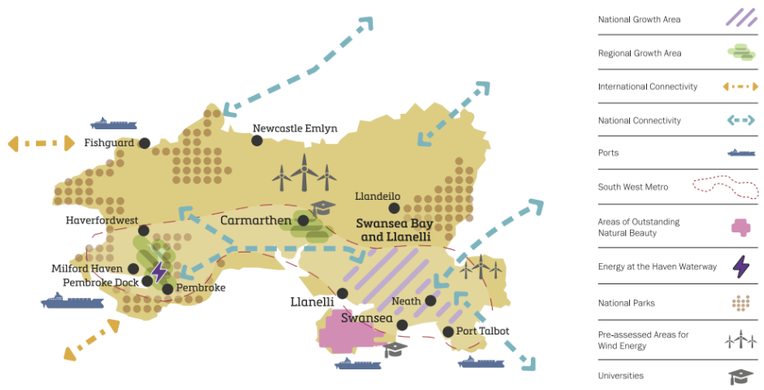






Future Wales: The National Plan 2040
Future Wales – the National Plan 2040 is our national development framework, setting the direction for development in Wales to 2040. It is a development plan with a strategy for addressing key national priorities through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate resilience, developing strong ecosystems and improving the health and well-being of our communities.

Regional strategic diagram



Technical Advice Notes
The following technical advice notes are considered relevant to the proposal:

- TAN 5 Nature Conservation and Planning
- TAN 11 Noise
- TAN 12 Design
- TAN 15 Development, Flooding and Coastal Erosion
- TAN 16 Sport, Recreation and Open Space
- TAN 18 Transport

3.4 Planning Policy Context

Design and Access Statements in Wales (April 2017)
This guidance document sets out the requirements for a DAS, the benefits of preparing a DAS and some of the pitfalls that should be avoided when preparing the document. Section 5 of this document provides guidance on what to include in a DAS and how to communicate the proposals.

NPTCBC Local Development Plan (2011-2026)
Section 38(6) of the Planning and Compulsory Purchase Act 2004 requires that planning application decision should be made in accordance with the authority's adopted development plan, unless material considerations indicate otherwise. In this instance, the statutory development plan for this application site is provided in the Neath Port Talbot County Borough Council's Local Development Plan, adopted in January 2016. A review of the LDP Proposals Map shows that the site lies within the settlement boundary, where development is considered acceptable in principle, subject to compliance with all other material planning considerations. From the map, the site is not subject to any specific constraints or designations.

The following LDP policies are considered relevant in the context of the proposed development:

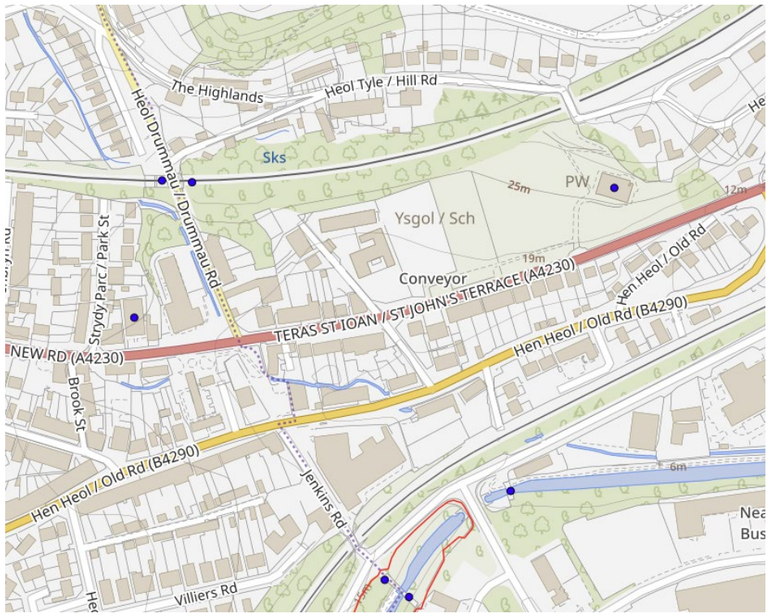
Policy reference	Relating to
SP1	Climate Change
SP2	Health
SP3	Sustainable Communities
SC1	Settlement Limits
I1	Infrastructure Requirements
OS2	Protection of Existing Open Space
SP16	Environmental Protection
EN8	Pollution and Land Stability
SP18	Renewable and Low Carbon Energy
TR2	Design and Access of New Development
BE1	Design

Supplementary Planning Guidance
The following supplementary planning guidance is considered relevant to the proposal:

- SPG: Planning Obligations
- SPG: Pollution
- SPG: Renewable and Low Carbon Energy
- SPG: Design



3.4 Planning Policy Context



Cadw Records Map
Listed Buildings in the local area but no listing or conservation area designations to proposed site.



NRW Flood Risk Map
Medium flood risk to north of site from surface water and small watercourses. Refer to Cambria Flood Consequence Assessment for full detail.



NRW Map
Woodland/Ancient Woodland north of the railway but no designations on-site.

4.

Design Development

4.1 Precedent - Form and Materiality









4.1 Precedent - Form and Materiality









4.1 Precedent - Form and Materiality













4.2 Layout, Form, and Massing Options

Layout Sketches

Initial preferred sketch option explored during Stage 1 &2 looked to balance the brown and greenfield sites and increase connection to the Southern green field for the classrooms.

The hall located to the rear of the site was felt to be too hidden away for invited community events / parents assemblies etc.

It was not desirable to have a classroom adjacent to the carpark for safeguarding reasons.



4.2 Layout, Form, and Massing Options

Layout Sketches

Alternative sketch option explored that aimed to increase individual external areas for the classrooms and hall.

The hall located to the rear of the site was felt to be too hidden away for invited community events / parents assemblies etc.

It was not desirable to have a classroom adjacent to the carpark for safeguarding reasons.

There was no real entrance space for arrivals to and from the hall and this was nearly completely built on the greenfield.



4.2 Layout, Form, and Massing Options

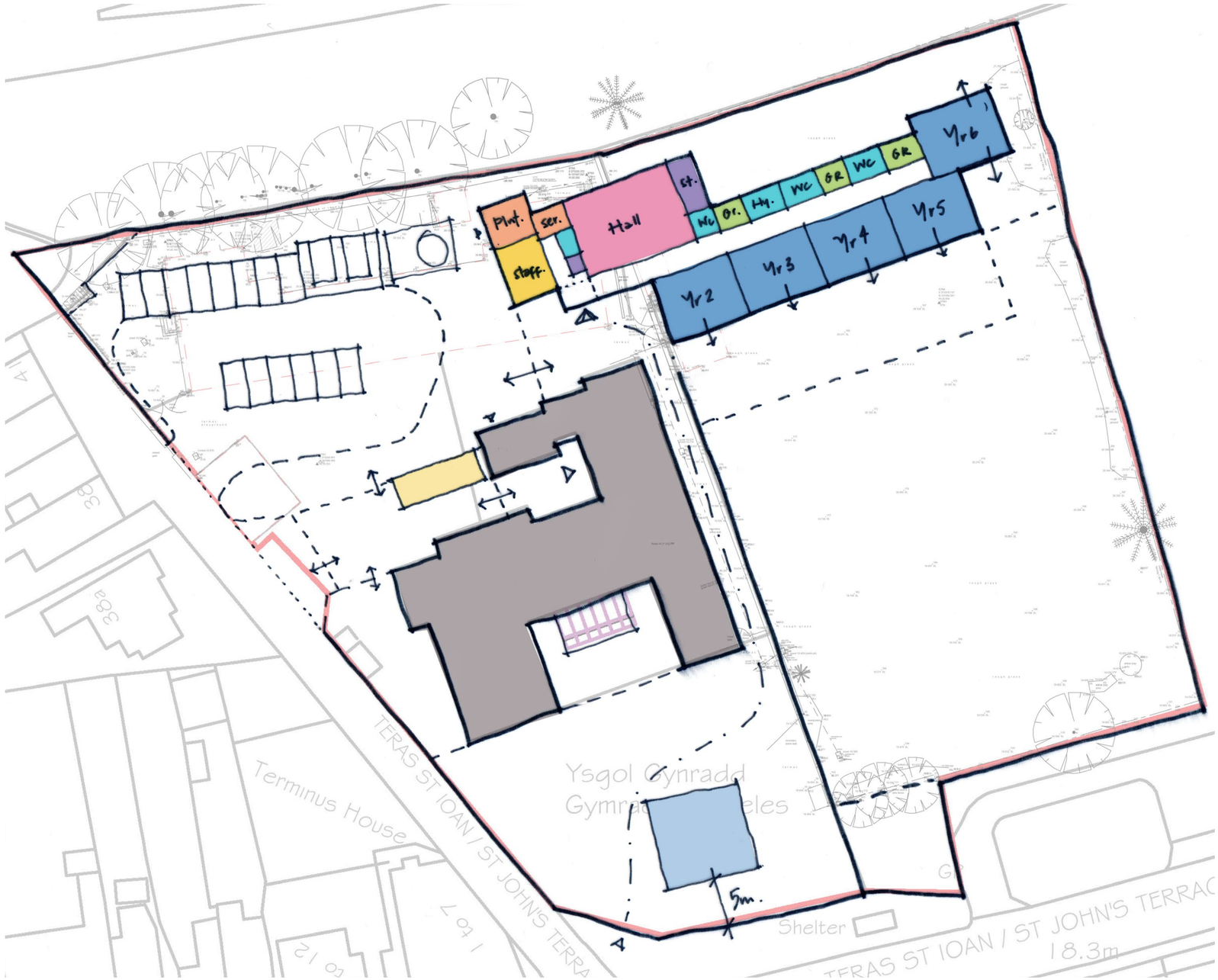
Layout Sketches

Alternative sketch option explored that aimed to better balance the area built on the green field.

The hall is brought forward to enable secure access for visitor / parent events and use by the retained main school block.

Staff areas located for passive supervision of the carpark and entrance areas was well received.

The footprint encroached into root protection areas next to the cemetery and the ground levels in this area would lead to a significant retaining structure being required to keep the proposed building all on one level..



4.2 Layout, Form, and Massing Options

Layout Sketches

Alternative sketch option explored a creative arrangement where all classrooms had East and South facing facades with large areas directly outside each classroom.

The hall is more central so not as secure for visitor / parent events and use by the retained main school block.

Staff areas located for passive supervision of the carpark and entrance areas was well received.

The footprint is located completely on the greenfield and takes up a much larger footprint overall than all the other spaces. Also creates deep plan spaces which would require extensive rooflights to be well lit..

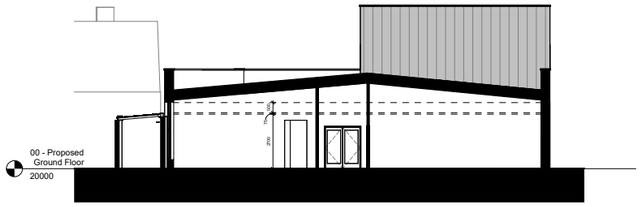


4.2 Layout, Form, and Massing Options

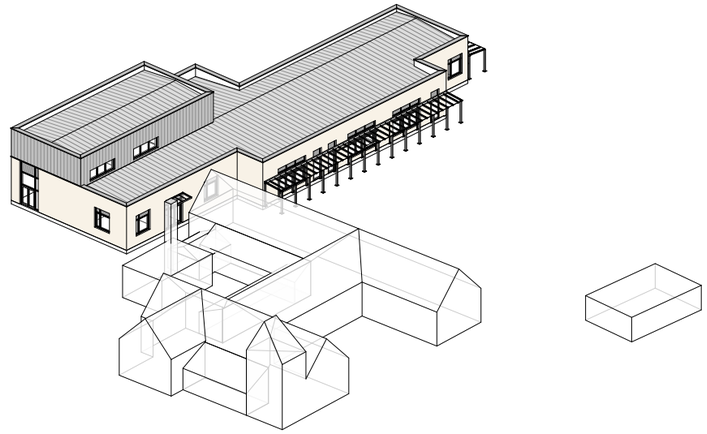
Flat Roof Hall

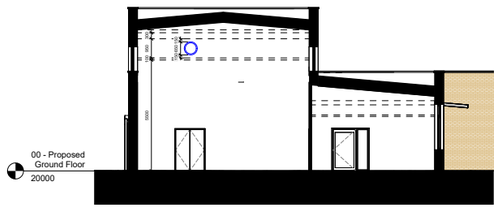
A number of developed form arrangements were explored with the design team during stage 2.

These included a completely contemporary approach to expressing the new block as two flat roofed boxes which clearly contrast against the retained old school building.

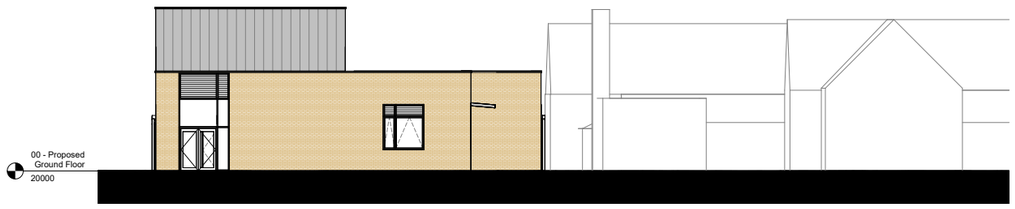


5 Classroom & Corridor Section - Flat Roof Option
1 : 100

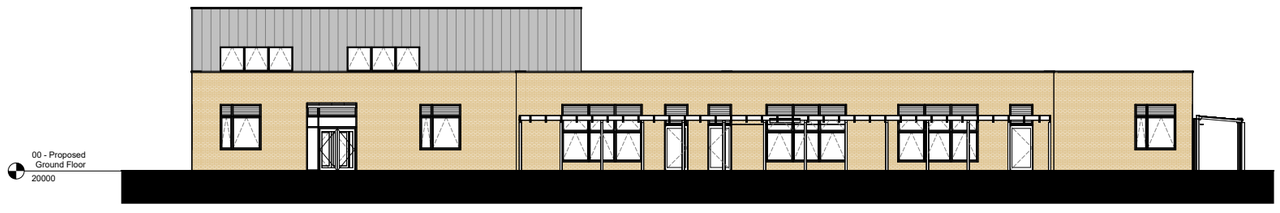




4 Hall Section - Flat Roof Option
1 : 100



3 West Elevation - Flat Roof Option
1 : 100



2 South Elevation - Flat Roof Option
1 : 100

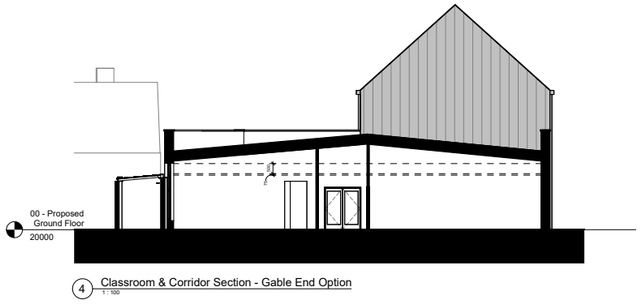
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4.2 Layout, Form, and Massing Options

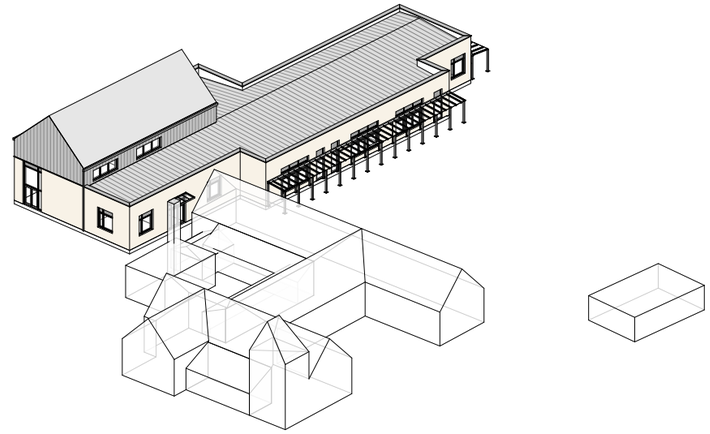
Dual Pitch Hall

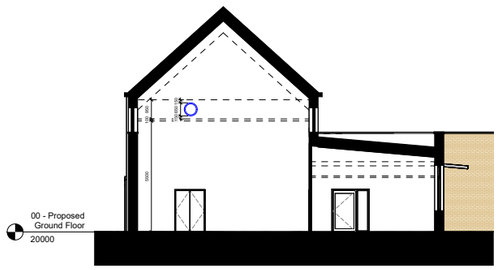
This option looked to express the larger hall element of the new building with a pitched roof. This echoes the numerous large volume spaces with pitched roofs on the retained old block.

The rest of the new building is kept low in height with a shallow pitched roof hidden behind a low parapet to ensure clean, modern detailing can be achieved.

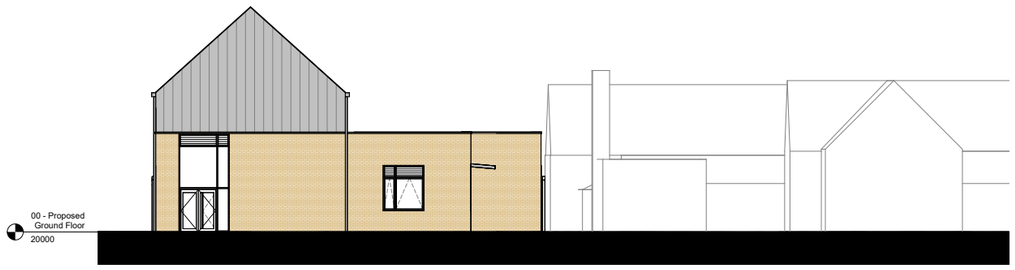


4 Classroom & Corridor Section - Gable End Option
1 : 100

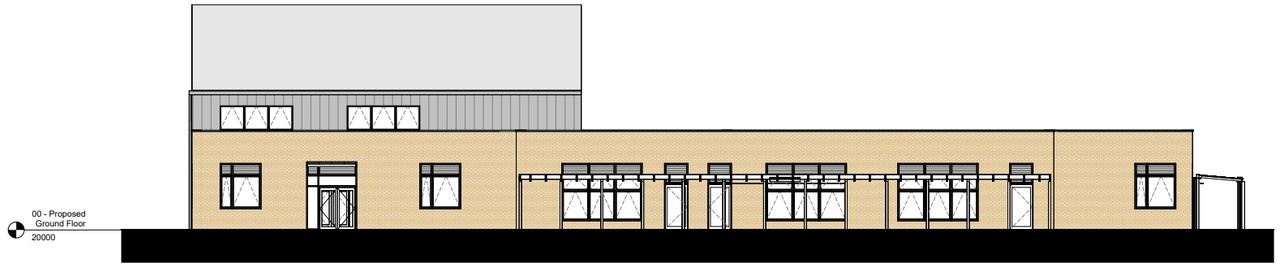




5 Hall Section - Gable End Option
1 : 100



3 West Elevation - Gable End Option
1 : 100



2 South Elevation - Gable End Option
1 : 100

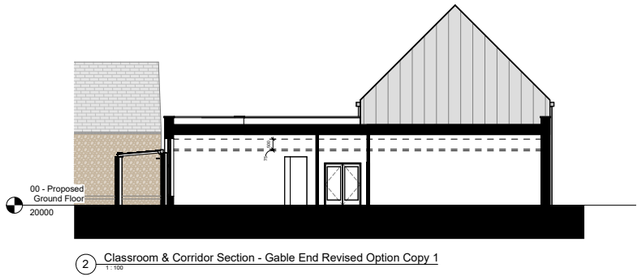
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4.2 Layout, Form, and Massing Options

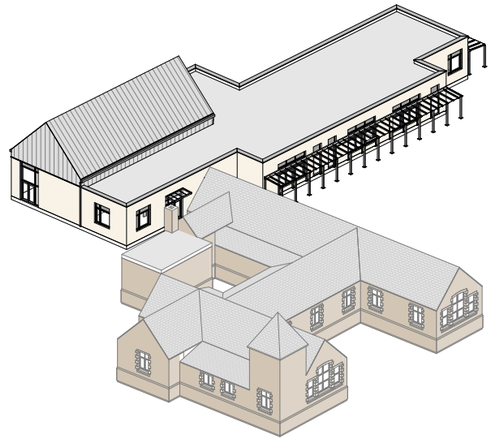
Final development with lowered roof heights

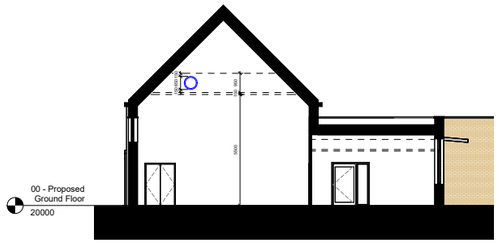
This final option looked to better relate the new block to the retained school building by lowering the proposed heights fo the roofs.

This ensures the new hall roof pitch is lower thean the bell tower of the retained building whilst also providing the large floot roof area required to meet the SUDs and NZCiO targets required by providing a green roof with solar panels that can be efficiently placed facing South.



2 Classroom & Corridor Section - Gable End Revised Option Copy 1
1 : 100

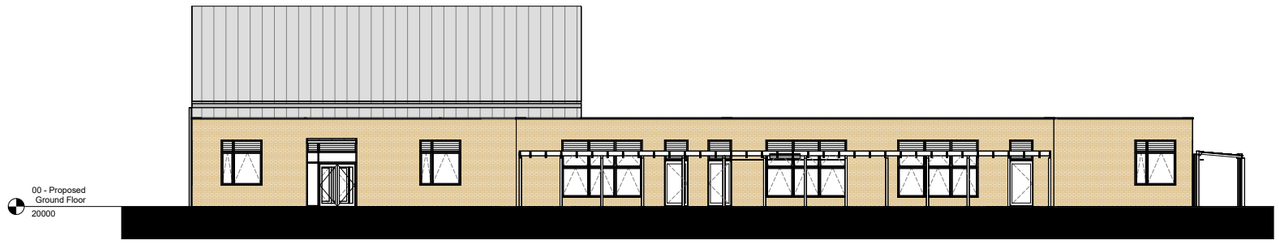




1 Hall Section - Gable End Revised Option
1 : 100



4 West Elevation - Gable End Revised Option
1 : 100



5 South Elevation - Gable End Revised Option
1 : 100

Austin·Smith:Lord

4.3 Landscape - Site Layout Options

A number of alternative site layout options have been explored to achieve a balanced design which improves staff parking facilities, provides clear and secure areas for refuse storage and sensitive location of a new sprinkler compound and associated MEP plant for the servicing of the new building.

Also considered ar ethe improvement of the secure routes into the school for all users and the provision of enhanced greenery, SUDs features such as a raingarden and cycle shelter for sustainable travel.

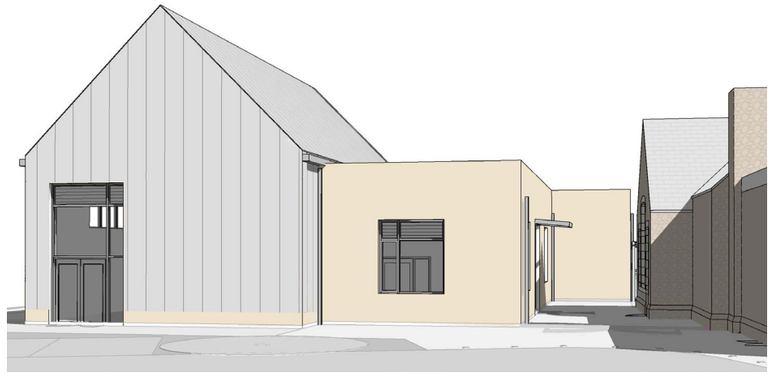


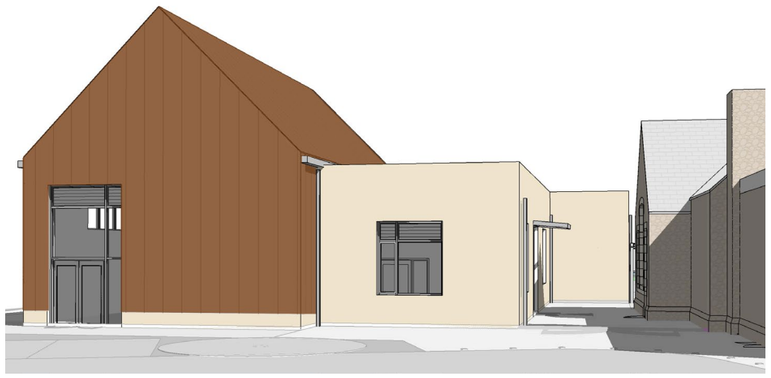


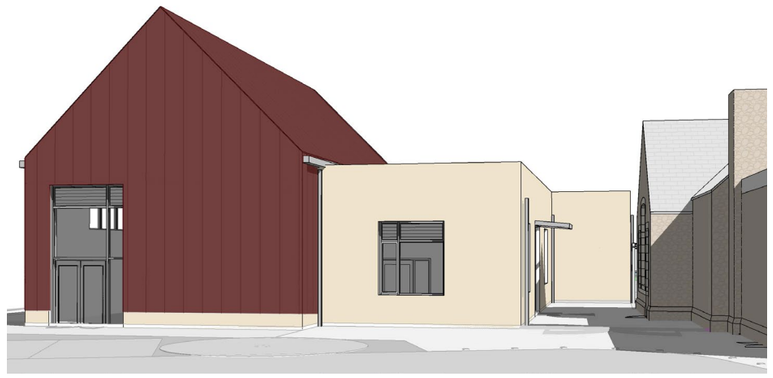
4.4 Elevation Options

Sketch options reviewed for the elevation treatment of the main facades - here looking at the approach from the carpark









Metal cladding colour options



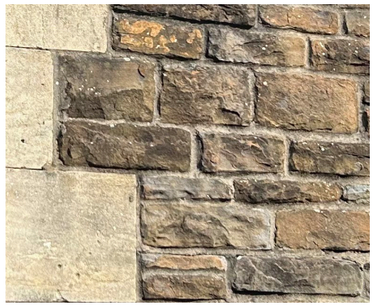




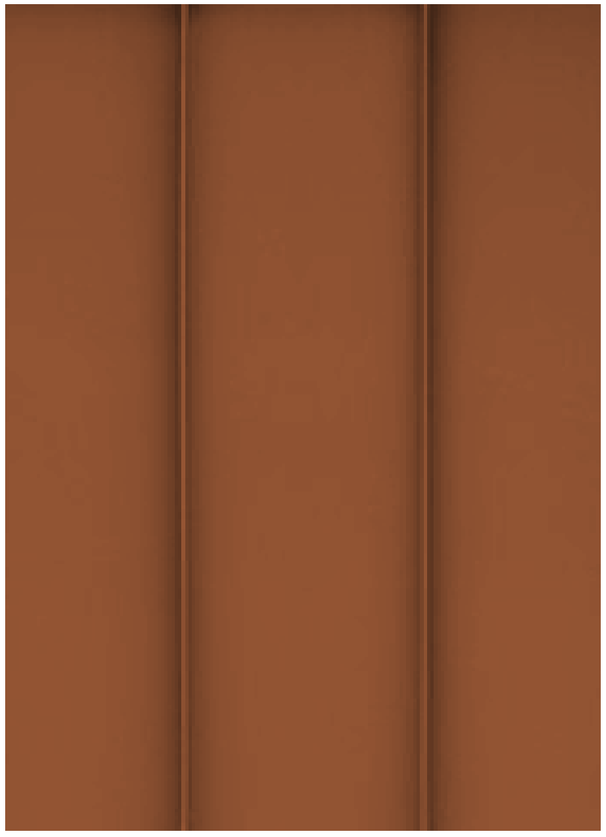


Multi-buff brick is proposed to the new block to echo the stone of the existing retained building shown below.

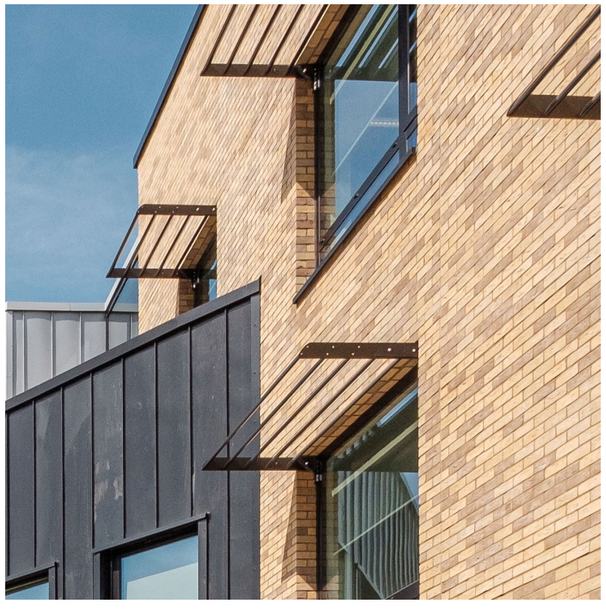




4.5 Materiality













The final proposed materials palette looks to create a contemporary school building which relates to the character of the retained stone building but introduces modern and playful finishes.

Metallic Copper standing seam metal roof and facacde cladding looks to draw on thewarm tones of the retained building in a modern style. Also proposed to enhance the boiler room elevations on the retained school building.

Multi-Biff brick is a durable material which brings a warmth to the facade whilst being robust and tonally complementing the stonework on site.

The metal windows and door frames are proposed to be finished in a modern Anthracite Grey to add a contemporary and timeless finish tocomplement the buff brick.

Other metalwork including rainwater goods and flashings will be in the same dark grey.

The main lower roof element is designed to be a green roof, attenuating stormwater. It will be planted with a native wildflower mix.

Ysgol Gymraeg Tregeles

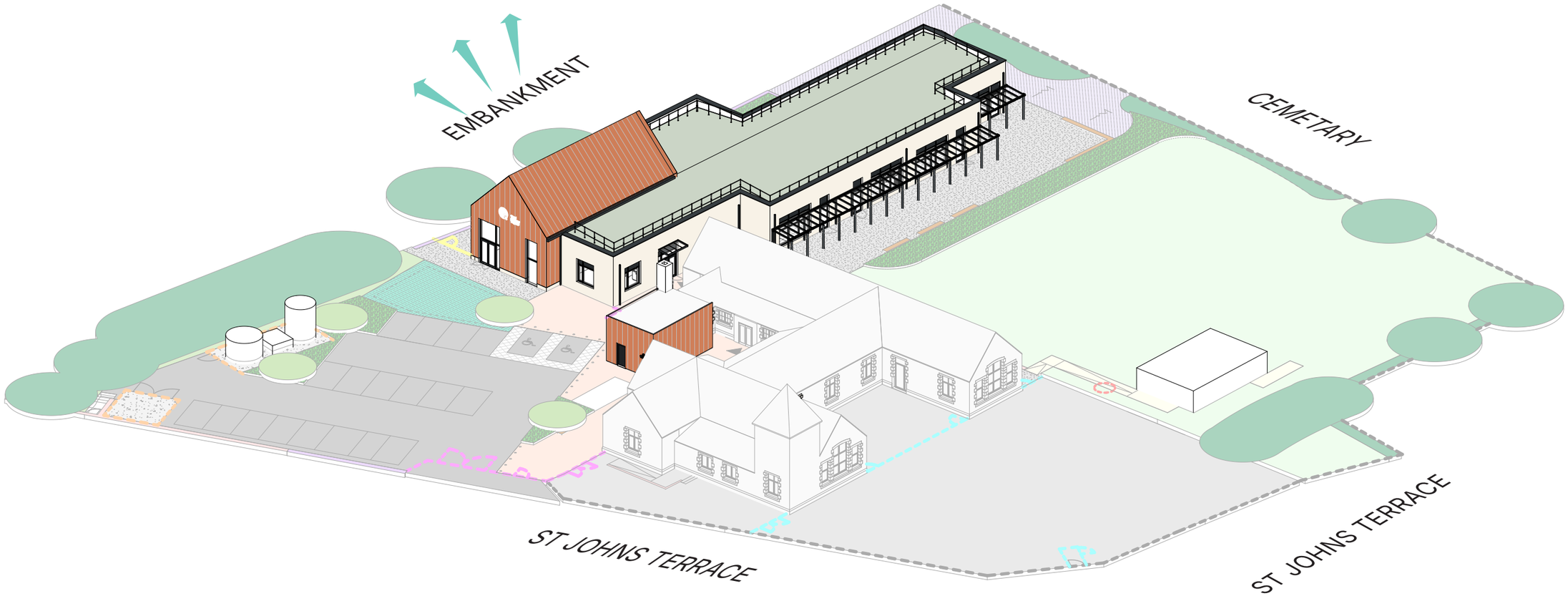
5.

The Proposal

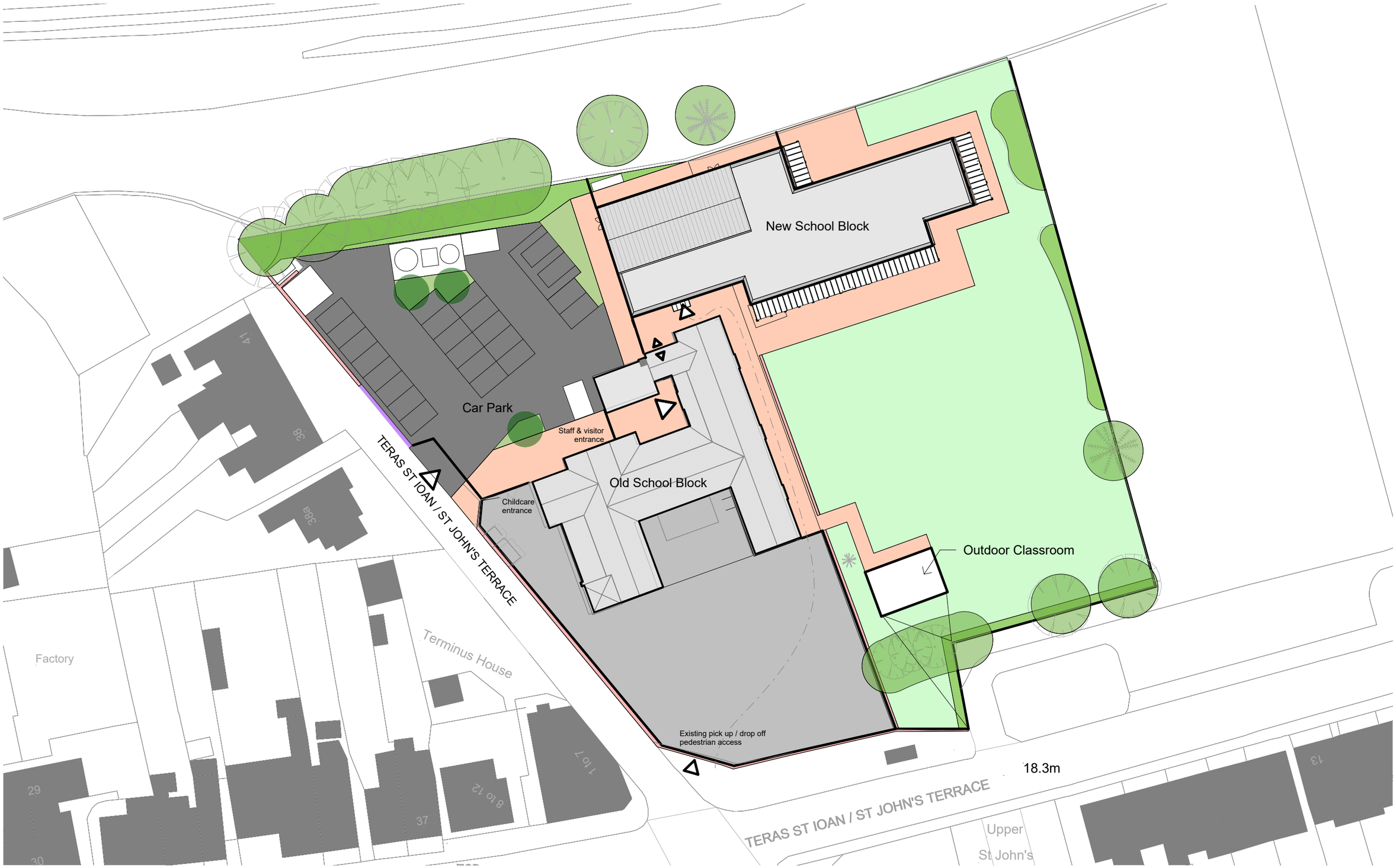
5.1 Scale and Massing

While the new block uses both previously-built-on land and part of the field, the proposal is smaller than the existing block and set back from the boundary so will not significantly impact neighbouring sites.

Additionally the outlook from the new classrooms to the field creates a visual and physical relationship with green space that the school currently misses.



5.2 Proposed Site Plan



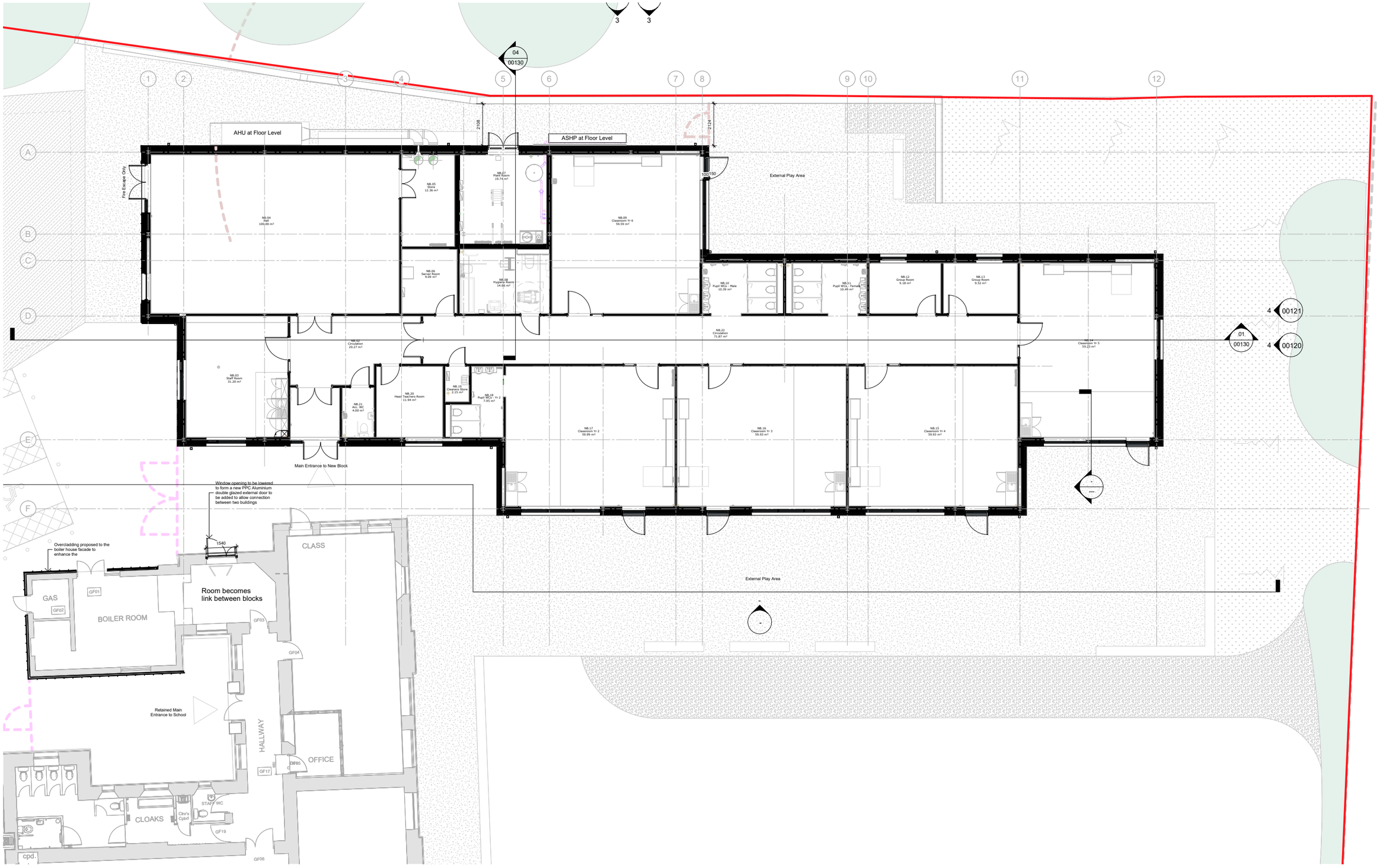
5.3 Proposed Elevations





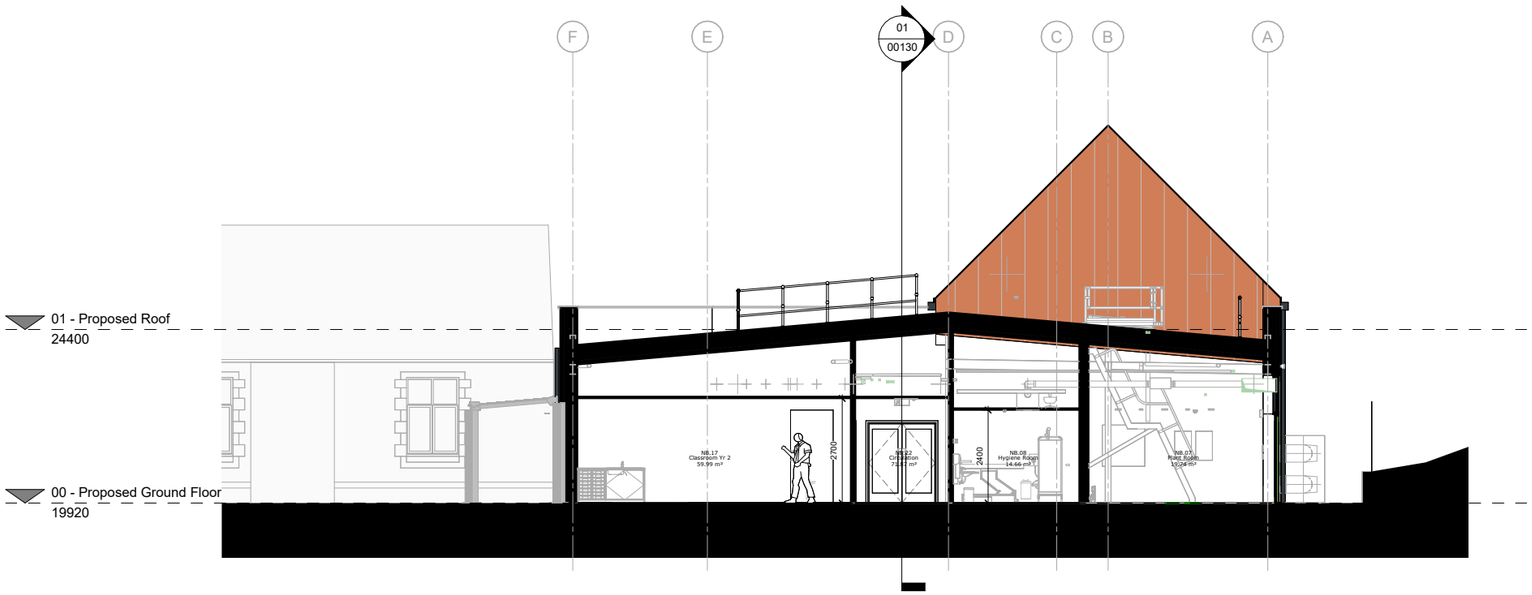


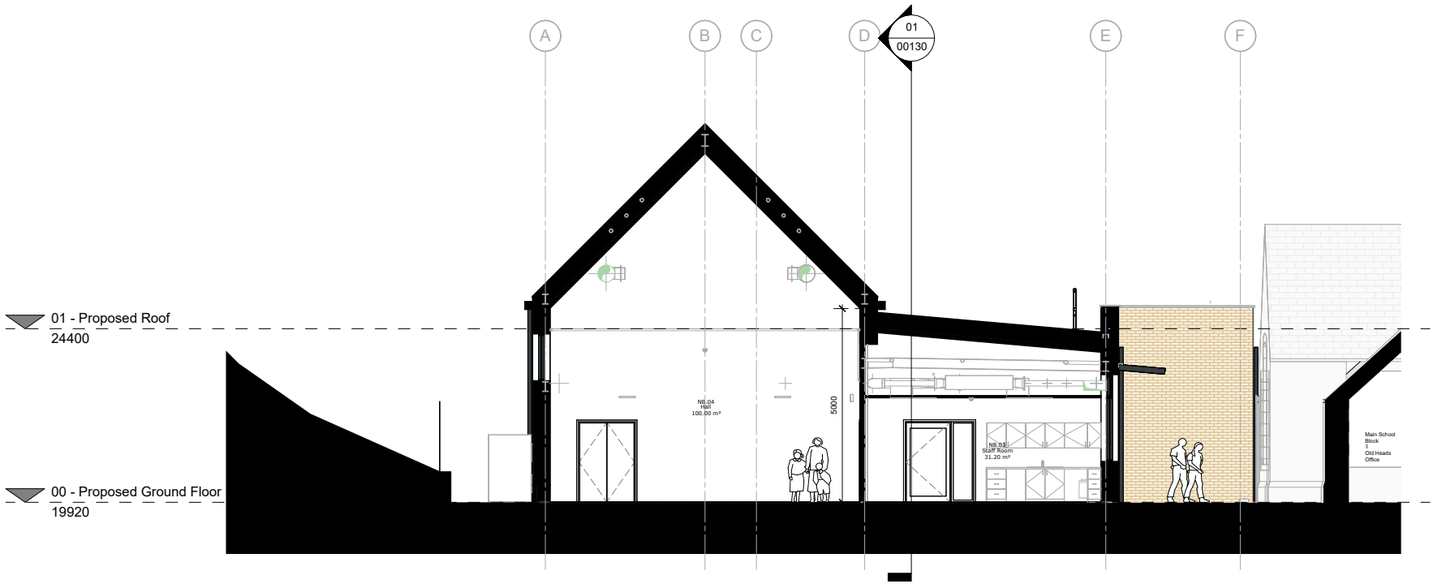
5.4 Proposed New Block Plan



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5.6 Proposed Sections





5.7 Overcladding of Boiler House





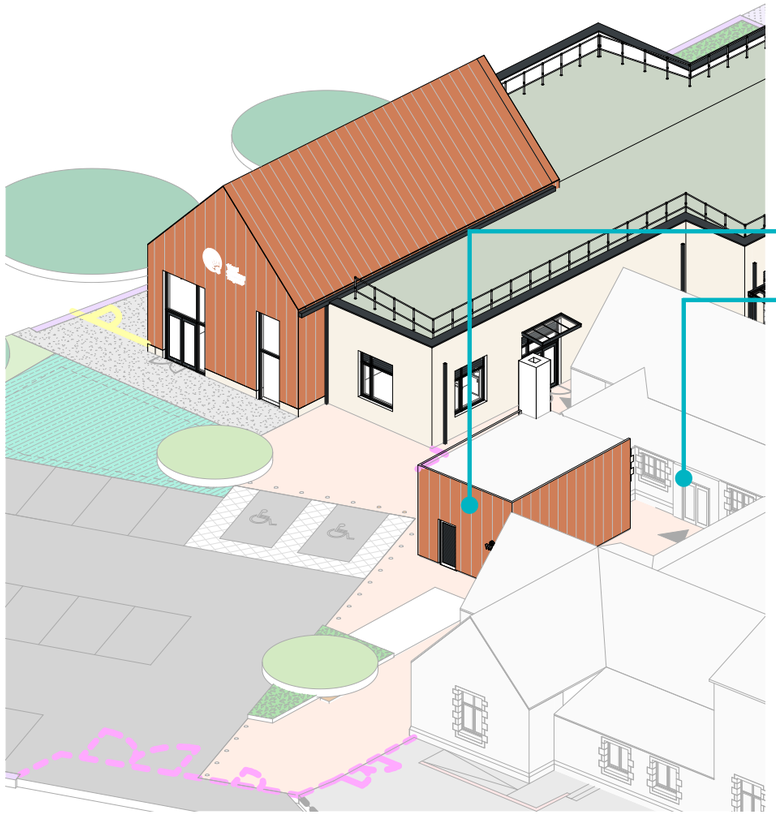
Above; Photographs showing existing boiler house with spray painted elevations

The current main entrance to the school from the visitors entrance and car park is visually dominated by the boiler house for the retained old school building.

This was built much later that the original stone Victorian building and the concrete brickwork facade has been spray painted with a colorful mural on all 3 sides.

It is now proposed to knit this element into the new development by incorporating the metal standing seam cladding used in the new block to the hall through overcladding this boiler house and repainting of the doors to match. This will create a better first impression with the same language and materials palette across the two buildings.

This also provides a clean facade where clear signage can be introduced to direct visitors more clearly to the main entrance which is tucked away past the boiler room in the old building.







5.8 Visualisations



View from Main pedestiran approach showing the overclad boiler house centrally with new block to the left.

5.8 Visualisations



View from car park looking at the Western gable elevation of the new hall.

5.8 Visualisations



View from the green playing area looking to the South facing classrooms with external play areas shelterd by canopies.

5.9 Landscape Design

The final landscape design is captured ina number of drawings supplied with this application.

Please also refer to the Landscape management plan and green infrastructure statement for further details.

The design aims to enhance the existing landscaped areas of the site whilst improving others with the introduction of new trees, plants and safer external areas for play, access and servicing.



5.10 Vehicular Access

Site Boundary

Vehicular Access

Vehicular Access (Bus - Public)

Car Parking (spaces)

Disabled Parking (8 Spaces)

Bus Stop

Cycle Store



5.11 Safety and Security

Proposed Secure Lines

Site Boundary

Public Access

Controlled Access

Secure Access

The proposed development at Ysgol Tregeles has been designed with safety, security and safeguarding as key considerations from the outset. The scheme fully adopts and incorporates all recommendations set out in the South Wales Police Designing Out Crime Officer's report (April 2026) and is intended to achieve compliance with Secured by Design principles.

The design employs a layered security approach, combining controlled access, clear surveillance, robust building fabric and appropriate management systems. Site layout and landscaping promote natural surveillance and avoid concealed areas, while perimeter treatments and boundaries provide clear definition and security.

Access to the new school building will be controlled, with the ability to implement a full site and building lockdown if required. Doors, windows and glazing will meet recognised security standards, and the building envelope will be designed to resist unauthorised access. External lighting and CCTV coverage will be extended to protect entrances, circulation areas, play spaces, parking, cycle and refuse facilities, in full compliance with GDPR requirements.

Ancillary facilities, including bin stores, cycle storage, external furniture and service areas, will be securely designed and appropriately located to reduce opportunities for misuse, theft or arson. Alarm systems and communication measures will provide effective monitoring and incident response capability.



5.12 Access and Movement

5.12.1 Aims of the Development
The scheme will provide an inclusive design in compliance with Building Regulations Approved Document M 2004 edition incorporating 2010 amendments, Wales; the recommendations of BS 8300: 2018 part 1 'Design of an accessible and inclusive built environment and External environment - code of practice', and part 2 'Design of an accessible and inclusive built environment. Buildings - code of practice', along with Approved Document K 1998 edition incorporating 2000 and 2010 amendments) Wales. This is to ensure that the project universally enhances the facilities available to the school's pupils, staff and visitors.

5.12.2 Approaches and External Routes
The existing main entrance points to the site for both vehicular and pedestrian access have been maintained within the proposals for consitency of wayfinding and minimising disruption during the works.

Please refer to the Transport Assessment to review details of the wider Active Travel plan.

5.12.3 Vehicle Parking Provision
The proposal rationalises staff and visitor parking by providing additional area and a clear layout.

18 parking bays and 2accessible bays are proposed which is an improvement on the current provision. There will be no change to the capacity of the school.

5.12.2 Cycle Parking
A cycle store is proposed within the development, providing capacity for 14 bicycles. This will be available for both staff and pupils.

5.12.4 Internal Accessibility
The interior layout of the new block is designed to be fully accessible. The occupiable spaces and classrooms are arranged around a single circulation route over a single storey, easing wayfinding and mitigating accessibility issues.

Classroom layouts will be developed with extensive end user consultation to best suit the needs of the groups they accommodate.

Any fixed furniture proposed will be Equality Act compliant, and finishes will provide the appropriate contrasts between surfaces to aid any visual impairments.

Horizontal circulation is simply a single corridor, avoiding complexity in wayfinding. While secondary natural light to the corridor will be achieved via glazed panels, artifical lighting will be used to provide the appropraite lux levels to circulation. Doors will comply with both Part M and Part K of the building regulations.

6.

Sustainability

6. Sustainability

The proposed development at YGG Tregeles has been designed to deliver a highly sustainable, low-carbon educational building that supports Neath Port Talbot County Borough Council's wider commitments to decarbonisation, climate resilience, and long-term operational efficiency.

Sustainability has been embedded from the outset of the design process through a fabric-first design approach, prioritising reductions in energy demand before the introduction of low-carbon systems and renewable energy generation. The proposals align with the Welsh Government 21st Century Schools Programme Net Zero Carbon ambitions and seek to achieve a **BREEAM "Excellent"** rating and **Net Zero Carbon in Operation** targets.

The building is designed to operate as a fully electric facility, with no fossil fuels used for space heating or hot water. Energy efficiency is prioritised through:

- A compact form to minimise heat loss
- A high-performance building envelope
- Careful orientation and glazing design to optimise daylight while controlling overheating

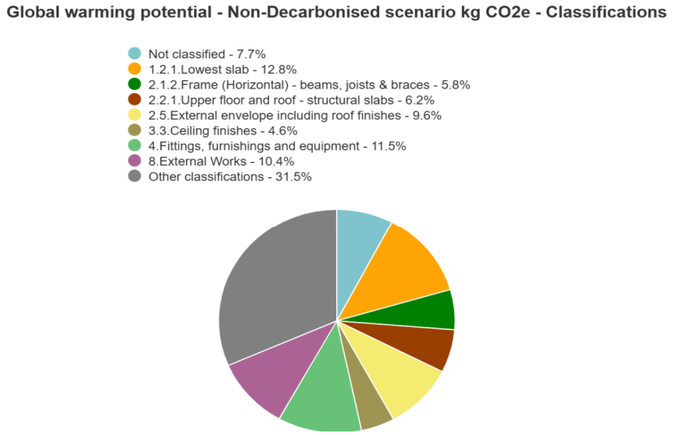
Low-carbon services include air source heat pumps, heat-recovery ventilation, and energy-efficient LED lighting with daylight and occupancy controls.

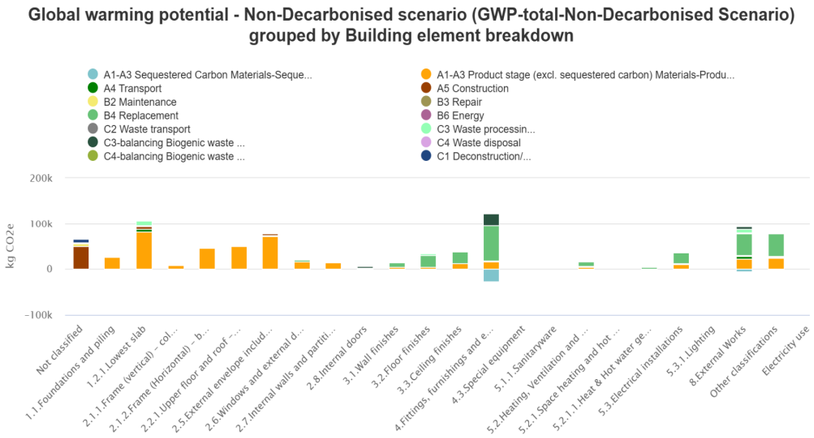
A key feature of the design is the incorporation of a biosolar roof, combining photovoltaic panels with an extensive green roof system. This approach maximises on-site renewable energy generation while also delivering wider environmental benefits, including improved rainwater attenuation, enhanced biodiversity, reduced roof surface temperatures, and improved photovoltaic efficiency. The biosolar roof contributes to both carbon reduction and ecological enhancement objectives.

Whole-life carbon modelling has been undertaken to establish baseline performance for operational and embodied carbon. As the technical design develops, further opportunities to reduce embodied carbon through material selection, recycled content, and structural design will continue to be explored.

Water efficiency will be achieved through low-flow fittings and efficient sanitaryware, reducing potable water demand in line with best practice. Materials will be specified to prioritise durability, longevity and ease of maintenance, supporting reduced whole-life environmental impact.

The design supports a healthy learning environment through good levels of daylight, internal air quality, acoustic performance and thermal comfort. Overheating risk has been assessed and mitigated through passive design measures and ventilation strategy.





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