



Stallan-Brand

Jedburgh Intergenerational Community Campus
Practice Information Article

Response to Site Context, Brief, Challenges & Added Value Created

Brief description of Jedburgh project

Stallan-Brand are excited to share a public sector project that demonstrates our practice experience and expertise in addressing a community, education, and cultural brief. Following we detail an exemplar project for a new intergenerational learning place in the town of Jedburgh in the Scottish Borders.

The two primary design goals for Jedburgh are to provide an environment which delivers the totality of experiences necessary to equip young people with the skills and understanding to meet the challenges of the 21st century; and secondly, to provide an asset which provides opportunities to enhance the health & well-being of the entire community.

We make a bold claim, our Jedburgh Academy is the most accessible and sustainable campus school in Scotland, a public sector exemplar with directly comparable aims in scope to the opportunities and challenges faced by many communities across the country.

The project imaginatively combines an array of local services and facilities that significantly contribute to an improved quality of life for local people in surprising ways. It is our practices belief that our urban schools across the U.K. are one of the most underutilised resources within the life of most neighbourhoods.

Jedburgh promotes an alternative vision for this building type in addition to addressing climate emergency and the need for more joyful sustainable lifestyles.

Project name and type:

Jedburgh Intergenerational Community Campus, (Community, Education, Civic & Cultural)

Client: Scottish Borders Council

Client Lead: Lesley Munro (Service Director)

Lead Consultant: Stallan-Brand

Design Team: Davie + McCulloch, TGP Landscape Architects, Goodson Associates, BAM Construction, New Acoustics, Space Solutions, Atelier Ten, Turner & Townsend

Contract Value: £36.732 million

Stallan-Brand Lead: Alan Garland (Associate Director), Paul Stallan (Design Director), Ian Harper (Technical Director)

Timescale: 2017 - 2020

An Outstanding Context Specific Response

The town of Jedburgh has a sublime natural setting that is animated by the Jed Water course as it weaves through the Borders landscape. The town, which lies on an important historic route into Scotland approximately 10 miles from the border with England, has an attractive historic character with important architectural landmarks. Key to our design approach was respecting the towns urban form and character and spatially contributing to its unique porosity and joy.

Introducing a major scaled building into Jedburgh's sublime town and landscape was the opportunity and challenge we faced. The building which was required to accommodate 1000 pupils, and significant community uses, could have been a large unsympathetic 'box' and negatively impacted on Jedburgh's unique urban character.

With an overall area of 10,400 m² to be accommodated we undertook significant environmental modelling and visual impact assessments to support our design. Using both virtual and physical modelling techniques we progressed our design three dimensionally, taking full advantage of our chosen site topography and its unique features.



Jedburgh's human scaled architecture responds to a stunning urban & landscape setting.

Outstanding Site Response

Jedburgh nestles into a river valley where the landscape and topography has fashioned a linear urban form along a traditional high street. Lanes, wynds and vennels spring from the high street to create a fishbone pattern, a path network that we directly connected with. Bus & cycle routes were also a priority helping encourage pupils and parents to avoid car movements, yet mindful of the rural demographic. Some pupils come to school on their horse, meaning stable provision is made available thanks to an equestrian centre we incorporated into the design.

The Jedburgh Campus is within the town centre yet takes advantage of open landscape to the north for sports and amenity. Despite proximity to the High Street a key challenge was a dramatic level change of forty metres across the site, one that ultimately allowed for spectacular views across Jedburgh's rooftops. The design also takes full advantage of its topography by organising activities on interlinking levels, stepping the buildings section to follow the contours and make for a dramatic internal and external spatial experience.

Addressing the Key Challenges in this Individual Brief

Our client, Scottish Borders Council, was interested in combining regeneration initiative with education priority. The arithmetic is clear 1+1 =3. To explain the Council is committed to promoting exemplary education environments that support dynamic learner progression from the early years through to a learner's entry into employment, further or higher education.

Improved education offers within a community can be a critical change agent in a local economy's prospects. Borders Council believe that the continuum of 3-18 years education when supported by modern environments and places that are simply more attractive, safe, sustainable, and accessible can drive more cohesive community and individual opportunity for betterment, factors we addressed on Jedburgh. Investment in education can add a 'generation' ingredient into a regeneration impetus to add depth and resilience to our small towns. Improving our school buildings, strengthening the learner experience and outcomes galvanises our communities to fundamentally reinforce the Council's progressive placemaking agenda and our common well-being.

Exceed Expectations

Jedburgh is Scotland's first fully designed studio school referencing more Scandinavian education models that place an emphasis on student centred learning, citizenship and wellbeing. The spatial plan mirrors the curriculum requirements for greater inter-curricula learning. Importantly the building is so spatially dynamic that if learning trends return to a departmental model then by simply re-choreographing the space without structural alteration, this can be achieved.

Our team understand some authorities have different teaching models, however we have learned on Jedburgh that education buildings need to have greater flexibility to respond to curriculum change whether these are driven by pedagogy, technological advance or culture.

Notably our Jedburgh School has immediately proven itself to be flexible, by its non-reliance on classrooms, by being able to respond imaginatively to the very real demands of the current global pandemic.

Incorporates Strong Sustainability Elements

On completion Jedburgh was the most efficient completed school campus building exceeding 10,000sqm built in Scotland. Jedburgh has an EPC predicted energy use of 43kWh/m²/pa. The actual energy use is still to be established given that the school only opened fully in March of this year. Jedburgh benefited from an 'Energy Enhancement Strategy' funded by Scottish Government to test case the project as model for future projects to learn from.

Stallan-Brand is well placed to advise on the delivery of new publicly procured projects to meet progressive energy targets. The practice has been directly engaged with the industry over the past ten years to gain an in depth understanding of the background research, drivers, and the criteria for measuring energy outcomes for new school buildings.

An energy efficiency target of 67/ kWh/sqm/p.a for core use, is helping 'force' transformative and new approaches to school design throughout the industry, one that we are ahead off. Note, evidence from across the Scottish education estate suggests a 'Good' in use energy consumption in Scotland is currently around 115/kWh/sqm/p.a., which we aimed to half.

How We Approached Meeting the Client Brief

The key objectives that the Jedburgh project responded to was the opportunity for the local nursery, primary and secondary school provision to be delivered simultaneously on one site and to provide significant regeneration benefits in Jedburgh; not only to deliver education, but to address broader priorities such as health and well-being, employment, lifelong learning, culture, tourism and high quality collaboration space for local businesses with high quality digital connectivity.

The Jedburgh project enjoyed a 98% approval from our active consultation process with the community where over 500 people participated, and where progress was regularly provided to local people. We would cite the project design, delivery, and outcome as exemplar of context specific development from its inception to completion, where winning local peoples support for its function was as critical as its architectural expression.

Our Design Process & Design Methodology

On Jedburgh our Quality Plan helped us in our pivotal role in taking complete responsibility for the coordination & completeness of all design processes from inception through to production information stages. Our Quality Plan echoed best practice informed by the 'ISO 9000/1 Standards' series that provides guidance on maximizing our capability to respond to client requirements in a way that satisfies all stakeholders, and to supply services that meet regulatory requirements.

Our Quality Plan was unique to this project and determined key headings that as leader of the design team we took responsibility for through progressive RIBA Workstages. Five key headings and areas that we led on where: assigning & managing resource, monitoring & reporting progress, applying relevant design & contract management, coordinating work packages and lastly, legislation & compliance.

Our process reviewed at each workstage the Council's 'cost metric' and 'area metric'. As an architectural practice we took ownership of these numbers not satisfied that this was simply the cost consultants job. Through innovative design we balanced budgets to deliver what we referred to as 'additionality' helping address very specific features the Jedburgh community had raised through our extensive public consultation.

Features like being able to use assembly hall as a theatre or cinema, facilitating a cook school, and providing creative art, information and innovation plaza's for community use. We would also confirm that Stallan-Brand exploited the full capability of our Building Information Modelling (BIM) platform in the design and delivery of the project to ensure total coordination, checking and staged approvals where achieved.

Social Priorities

The project priorities call for early interventions in a young person's life to provide support for parents, carers, and communities, a community partnership approach with local schools that engages young people in active pursuits and skills that will see them into employment. The environment we designed at Jedburgh seeks to facilitate this dynamic ethos.

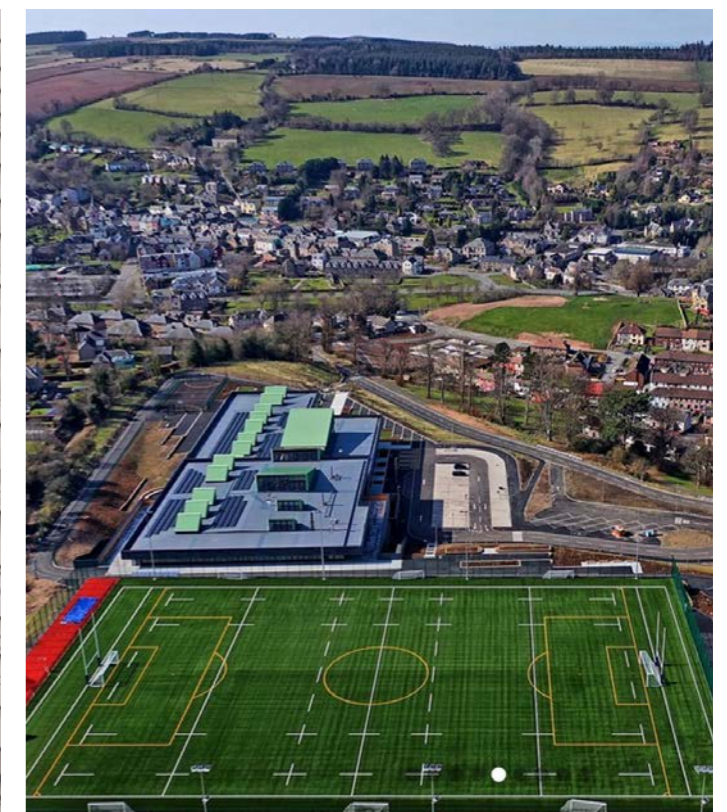
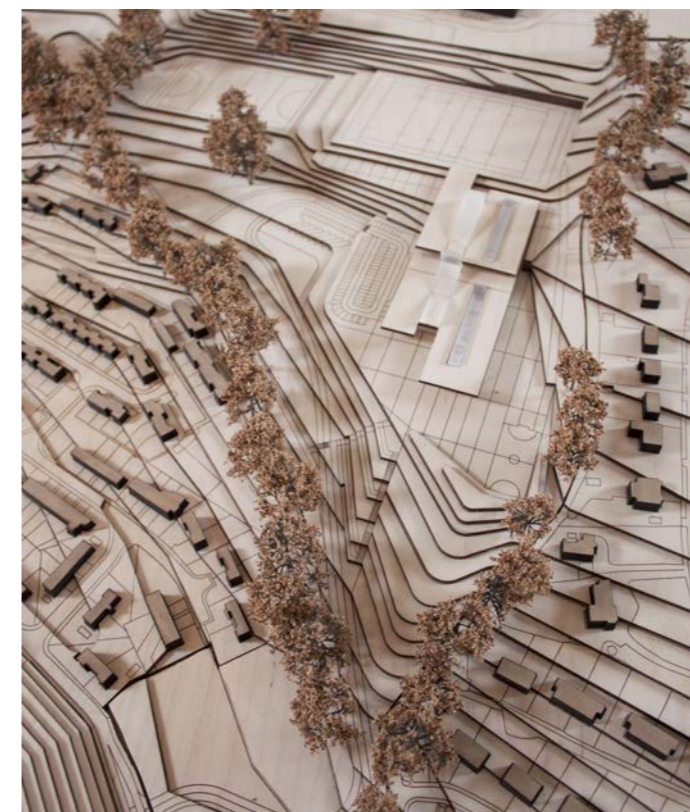
Spatially Jedburgh is arranged around a major common space that extends the life of the towns characterful High Street into the heart of the building. Critically the design is a step change for the education estate in Scotland, this is not a school that is open to the public after hours, it's a civic building that is always open to the public that includes a school.

The building now complete is creatively curated to strike a balance between educational and community needs, recognising that the overlap of these is part of the magic.

Taking Context Seriously & Demonstrating how Challenges were Overcome to Inform the Design

Through consultation it became evident that there was demand for changes to the education in Jedburgh, regarding the accessibility, flexibility & usefulness of the school buildings. With the council we surveyed the quality-of-life indicators and statistical data. There was a 'missing section' of young working aged people in the population with Jedburgh set to lose a fifth of its working age population by 2037.

We identified a need to provide vocational education and training within the area to plug the skills gap and provide the training needs for a young workforce, a brief that our team responded directly to through a blend of new space types and partnering relationships with third sector agencies including further & higher education providers.



Our Jedburgh Intergenerational Community Campus is a project that responds uniquely to the social context of the town in a generous and inclusive basis in its form, space and functionality.

Innovation, Ambition and Approach to Quality Output

Meeting the Ambition of the Client Brief

Stallan-Brand have delivered a model school that is set to challenge, if not become, the new sector exemplar for this building type. We have provided a civic architecture for Jedburgh that breaks the traditional school model, one that combines early years, primary school, secondary school vocational learning in response to the five learning stages within the Scottish Governments Curriculum for Excellence guidance. A key focus in the development of the learning environments was to make internal and external learning better suited to the curriculum and more flexible, moving away from the institutional 'chalk and talk' and 'departmental' models. In short we meet and exceeded Borders Council's ambitious brief.

Our design deconstructed the outdated 'departmental silo's' to provide studio environments for each of the learner stages, i.e., where the students reside, and the teachers come to them. This studio school approach creates an environment for thematic and cross curricular learning activity. We evidenced that learners take greater ownership and responsibility for their studio to create a more nurturing, playful, and dynamic places. No more trudging around corridors for pupils and an end to teachers having their own classrooms and off-limit staffrooms and disconnected staff bases.

Design Exceeding Expectation

Beyond the important needs of the young persons learning experience, the aim at Jed was to strengthen the location as a learning town where children and people of all ages can grow and learn together, where education is embedded within the character and quality of the place. Together with our local authority client we positioned the education offer as a valuable resource for the community to be fully accessible throughout the week, weekend, and evenings to exceed the community's expectations.

Critically, the project bolsters Jedburgh's ability to support and sustain community life by providing space where everyone can simultaneously learn, can attain and be included. A space where our most vulnerable children and citizens are supported at every stage of their life, where their talents, abilities and skills are harnessed and where wellbeing is prioritised.

Delivering Quality Outcomes through Our Involvement

Together with our client Scottish Borders Council our team has invested significant time developing a unique and ambitious vision for the delivery of education, regeneration, and enterprise. This centres around the changes the whole contemporary learning experience, changing demographics, a focus on employment opportunities and an interest in inspired placemaking.

Whilst a stunning place to visit, the Scottish Borders region has low average incomes and one of the highest levels of child poverty in Scotland. Much of this can be attributed to the quality of transport links and accessibility of facilities such as internet for many households. Jedburgh suffers from these challenges.

There are limited opportunities to change transport links, however, there are substantial opportunities to improve the ability for the community to work together and optimise their potential. This is at the core of our design intent, a place to provide exemplar community, workplace & education facilities.

Innovative Design Anticipating Future Use & Needs

Our practice has delivered the most publicly accessible and community orientated School in Scotland by virtue of innovative spatial design, whilst fully ensuring pupils security, safety & wellbeing. The Jedburgh project aims to strengthen the location as a learning town; where the ritual of intergenerational education is embedded in the character and quality of the place and where community togetherness is reinforced. Our Intergenerational Hub promotes social cohesion and learning across ages by providing extensive access to flexible shared facilities.

Spatially the design is arranged around a major common space that extends the life of Jedburgh's characterful High Street into the heart of the building to provide a robust environment that can support an array of local programmes. Critically the Jedburgh design is a step change for the education estate in Scotland, this is not a school it's a civic building that is open at all times to the public that includes a school, an environment curated to strike a balance between educational & community needs, recognising that the overlap of these is part of the magic that will reinforce positive culture and citizenship.

Including Community Input & Diverse Stakeholders

Through consultation with the community and diverse stakeholders it became evident that there was demand within the community for changes to the education provision in Jedburgh, particularly regarding the accessibility, flexibility & usefulness of the school buildings and the breadth of the curriculum and opportunity supported. From initial local inputs we also surveyed in a more forensic basis, the 'quality-of-life indicators' and statistical data for the location, to find a 'missing section' of young working aged people in the population.

Our findings noted that the Jedburgh area was set to lose a fifth of its working age population by 2037. We identified a need to provide vocational education and training within the area to plug the skills gap and provide the training needs for a young workforce, a brief that our team responded directly to through a blend of new space types and partnering relationships with third sector agencies including further & higher education stakeholders who we had consulted.

There were other factors that as designers we considered, including concerning indicators relating to quality of life in Jedburgh where the life expectancy figure was confirmed as low, as was the breast-feeding figure. Additionally the percentage of pupils in low-income families in the catchment was above the 17% Scottish average. We recognised that the major capital investment being made through the school estate could if imaginatively designed, help address many of these societal features.

Design Exceeds Base Brief & Comparable Projects

The typical brief for our project would be for a 'school'. Our brief was for a new 'intergenerational hub' to enable local people to build strong community-based relationships and receive excellent support. The concept addresses a shift from single agency to multi-agency approaches to inclusion and early intervention, in learning, health, employment & much more. For parents in Jedburgh there is a one open door into their child's learning pathway and all forms of public sector support. There are fewer transitions and the school is designed to help focus on supporting children as a family group. Our design has been critical in facilitating this service delivery by providing spatially inclusive environments.

Jedburgh has space for parental and community activities from early morning into the evening where the whole family can enjoy learning and wellbeing activities. There are spaces for family cooking classes and places where people can dine together. There is a single support approach for families and people where inclusive, safe and attractive space is provided to meet local needs, now and in the future.

A key innovation the design addresses to a greater extent than other comparable projects in the sector, is the cliff edge that many pupils face who are not going onto higher education in Scotland opting for vocational opportunities. Spaces for enterprise whether workshops or co-working space for local business are provided to help transition from school to employment. These same spaces also support adults coming back into education to learn new skills. Accommodation is also provided for Borders College who help incubate a sixth year academy and advise on pathways for young people.

Outstanding Design Quality

The practice was awarded by the Royal Incorporation of Architect Scotland 'Best Education Project of the Year 2019' for our work with the Scottish Borders Council client, adding to a long list of awards that evidence a commitment to design and sustainability. Jedburgh was built on this achievement delivering an exemplar education environment with a particular focus on learner progression, flexible and digitally optimised environments, with clear regeneration and community benefit. We summarise these following;

- A learning space in the town where everyone
- simultaneously learns, develops, and keeps healthy
 - can attain, achieve, participate, and be included
 - where our most vulnerable children are supported
 - where education is for everyone
 - where learning and employment are embedded
 - access partnership working across industry and enterprise to develop a young workforce.
- A healthy living place where
- diet, lifestyle and activity are embedded
 - talents, abilities, and skills of everyone in the community is brought together for the benefit of all
 - provides a one place approach to service delivery
 - improves community health & wellbeing
 - encourages the concept of healthy lifestyles.



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Approach to Delivery and Project Management

Approach to delivery and project management

Managing Project through Dynamic Quality Plan
Stallan-Brand confirm that our application of a dynamic Quality Plan on the Jedburgh project helped us in our role as Lead Consultant, address both risks and opportunities to deliver the project within budget, on time and to the highest quality, referencing the ISO 9000/1:2015 guidance intended to help teams develop their capability to respond to client and regulatory requirements. Our approach ensured we 'attained programme dates', that 'information was coordinated' and that 'we met employer requirements' detailed in the strategic brief.

Advising on Delivery to Ensure Best Value
Prior to the Jedburgh project Stallan-Brand had earned the trust of the Scottish Borders Council client through a six year relationship via a consultant framework appointment. Through this time our team delivered key projects on time and on budget that were also heralded by the community as being critically successful. The Jedburgh project was positioned as the largest and most complex of projects to date. Our professional counsel was sought on how best to procure and structure the design and procurement process to ensure the best quality and value outcome.

Influencing a Design Led Procurement
We decided that Jedburgh was to be procured via Scottish Futures Trust Standard Form 'Design, Build, Finance and Maintain' Project Agreement with an FM operational requirement over 25 years. Uniquely the teams appointment was made in advance of the contractor partner which was untypical of this procurement route where the team tend to work to the contractor much earlier in the process. Borders were adamant that this would not occur as they had bad experiences on their previously procured Kelso High School, which they believed was compromised by the contractor and the procurement process through the marginalising of the architect led design team.

Taking Responsibility for Design Delivery
Our appointment to deliver the Jedburgh Campus was novated to BAM Construction at the end of RIBA Technical Design Stage 4. This was a critical decision made by Borders Council which we influenced. The Council opted to retain the Design team input through Technical Design stage to ensure that they 'got the product that they wanted'. This is not typical for Scottish publicly procured projects and placed a responsibility directly on Stallan-Brand to lead and

ensure a full coordination across the design team. We took responsibility for leading the design team in both the pre and post novation context and importantly through the client handover & occupation stage.

Leading Design Team
As lead design consultant we proactively coordinated the Jedburgh project plan with reference to an evolving governance structure that clarified all team members and stakeholder inputs and their role in the process. With this clarity we provided regular and transparent staged reports on brief development & budget, that included reporting on programming and technical development of the project. A project wide consultant directory & communications protocol was established that confirmed how the team was to manage email, the cloud, ftp sites & drawing platforms like dwg Cad or Revit models.

Delivering within Budget & Time Constraints
Jedburgh's briefing progressed from a standing start only 18 months before Financial Close which was achieved on the 5th October 2018 (by which point construction had already progressed to steel structure stage). The building was completed in March 2020, on programme and on budget despite the challenges presented by the Covid-19 pandemic. Within a circa three year window we delivered a major public project on time and on budget. BAM Construction was the tier 1 Design & Build contractor for the project with BAM FM responsible for lifecycle maintenance.

Mitigating Common Risks through Coordination
By far the greatest risk to a projects timescale and budget is poor technical coordination. Establishing a Common Data Environment (CDE) was therefore critical on Jedburgh. We delivered universal coordination supporting each work stage and the approvals process to advance the Strategic Brief. Through our Building Information Modelling (BIM) platform we promoted the use of a single source of information for the project to manage documentation. The application of a CDE facilitated collaboration between team members helping avoid duplication and mistakes. Having team working in parallel on the same BIM model improved timescales and technical resolution including helping specification, measuring quantities for billing & costing.

Approach to Working with Client and Stakeholders

Working with Public Sector Clients

Our team are experienced in working across the public sector. Following we summarise our approach and experience delivering a complex public project with a multi-headed client team from inception through to successful completion.

Strategic Advice

Our practice ensured that Scottish Borders Council had absolute clarity and political support from local members, the Scottish Government and importantly the local community when they presented their preliminary proposals for consolidating two existing primaries and a secondary school on a single site within Jedburgh. Stallan-Brand played an essential role in helping concisely define the authority's business case to ensure that the brief was substantiated strategically, fully resolved and easily understood to assist effective executive decision making.

Brief Development

The practice made a significant contribution to the community and stakeholder consultations to assist the authority with the RIBA Preparation & Briefing workstages that not only determine the projects direction of travel but also the political expectation. Through animations, models, parents' nights, engaging teachers, public events, articles in local paper, exhibition events and engaging with pupils, our positioning of the project helped us save 18 months compared to the typical gestation period for a similar project.

Concept Champion

Our championing of the Concept Design Workstage was instrumental in curating a 'stars aligned moment' where Scottish Futures Trust, The Education Minister, the Council and community fully supported the vision of a co-located facility, one that went beyond being a 3-18 school to become a new civic building serving the needs of whole community. The enthusiasm & expectation around the project contributed measurably to the projects ongoing momentum helping us position the project positively with the Councils Planning team in preparation for a detailed application.

Developing Design

Progress on the Developed Design RIBA Workstage was seamless given the rigour of our briefing and information gathering activities at the project's inception. Our management of parallel workstreams enabled us to improve on program timescales, e.g. we progressed the structural design and site plan

works early in the design development work as we had faith and experience in our overarching architectural plan diagram, allowing internal space planning and adjacencies to progress more quickly.

Technical Definition

The practice purposefully designed the building diagram to support curriculum development and thus spatial flexibility going forward a feature we took advantage of through the Technical Design Workstage, i.e. understanding that the layouts had the potential to change. Waiting to achieve consensus on all departmental plans would have massively impacted on our global programme and our ability to conclude this critical Workstage and preparation of fully coordinated information for the contractor. The design flexibility had advantages in the procurement stage and helps future-proof the investment.

Construction & Handover

Our practice coordinated and managed the information flow through technical design to prioritise the proposed construction sequence. Through regular design and technical meetings, the contractor and consultant team effectively worked as one to fulfil the common objective of delivering the project successfully through the construction Workstage. Essentially early engagement with the contractor prior to resolution of the design ensured we benefited from their supplier chain and expertise.

Collaborative Project Culture

Key to a collaborative 'togetherness' is trust and a genuine willingness to create an inspired outcome. Our experience dictates that effective collaboration is more successful in situations where there is respect and openness. On Jedburgh we ensured our relationship with the council had clear executive agreement on project outcomes, that we provided stable and available resourcing and that we responded to 'values' & preferences in ways of working.

Wellbeing

Stallan-Brand are interested in the teams mental health. We encourage mentoring and a buddy system to allow people to share how they are feeling. Listening & kindness is at the core of our approach which extends to our relations to those we work with in the public sector.

Approach to Sustainability

Design Supporting Zero Carbon

Performance Led Approach

Our team is at the forefront of driving the net zero carbon agenda, spanning the development lifecycle. Our goal is to deliver performance led outcomes, rather than simply designing for compliance. We are a champion of the industry's 'Design for Performance' scheme and have invested heavily in parametric modelling, machine learning and single analysis models allowing us to confidently design buildings that are efficient while maximising health & well-being. Key to our approach is preparing a clear brief that establishes a holistic approach to sustainable energy & carbon emissions to inform the basis of the design and specification of the development, understanding the burden of embodied & operational energy demands.

Expertise & Awareness

Critically our team recognise the explicit requirements for Net Zero Carbon approach to the procurement of new public buildings. Through early engagement with our client we seek to define carbon neutral strategies. Previously we have referenced 'The UK Green Buildings Council Framework 'as a standard for scoping and for assessing, the 'Net Zero Carbon of Buildings (BSI PAS 2060)' which provides a route to certification of Carbon Neutrality. Additionally we are delivering public buildings through the Passivhaus Accreditation process. Regardless of the route to net zero carbon our team have complete clarity from a design perspective on the measures and methods we need to apply. Importantly we are expert in presenting strategies so that they are easy to understand.

Circular Economy

In support of the circular economy we address three types of environmental resilience informed by the extent of active change we predict to occur, and the degree to which this change is permanent. With reference to the old adage, 'the only thing that we can predict is that it will be unpredictable', means that we are required to consider a buildings adaptability, transformability & convertibility. The life cycle of an unsustainable building follows a pattern of use, re-use, mis-use to its eventual dis-use. Our intention is to arrest this redundancy; to future-proof architecture by providing space that we can inhabit differently to create circular use and help extend the life of the building, its value & environmental impact.

Delivering a Sustainable Built Environment

Key Challenges - Sustainable Design Solutions

Our design concepts are developed following 'lean, clean, green principles', prioritising orientation, form and fabric coupled with passive and ultra efficient systems and equipment to minimise the energy demand. Renewable technologies and fuel sources are identified to meet the residual energy demand and achieving Net Zero Carbon operational performance. Embodied Carbon can be assessed for the design options following the guidance adopted from the recognised standards. This early strategic approach sets our 'direction of travel'.

Meeting Energy Performance Targets

To achieve energy performance targets, our design approach typically focuses on a 'fabric first' strategy seeking to push the envelope to Passivhaus or equivalent standards. As well as optimising energy performance this approach provides wider benefits such as improvements to comfort, air quality and natural light which positively impact on our wellbeing. Utilisation of waste heat sources (e.g. ventilation exhaust, heat recovery heat pumps) and exploitation of demand response opportunities (e.g. demand controlled ventilation, daylight and occupancy linked lighting controls and energy storage) are other aspects we would review in the design.

Form Factor

A process we command is determining efficient form factors. Making the amount of external walls, roof & floor efficient in relation to floor area and extent of glazing is key on a design. This requires careful balancing of requirements especially daylighting. Aspect & orientation are important considerations when designing the glazed elevations, due to potential heat loss and solar gains.

Modern & Alternate Methods of Construction,

We review alternate construction methodologies as the industry standard of the steel & concrete frame is now not an automatic default for public buildings. Presently traditional masonry and timber solutions such CLT or SIPS panels can deliver cost effective sustainable solutions. All constructional approaches would be reviewed especially given how the market has been affected by Brexit and the Covid-19 pandemic.

Approach to Designing Sustainable Project

The practice commitment to climate change was embed into the design process, actioned and approved at each RIBA Work Stage, achieving our aims through consistent design scrutiny as the project evolved. We summarise our approach following.

RIBA WORK STAGE 0

Strategic Definition - Set Aspiration

Stallan-Brand determined sustainability outcomes to be achieved. We identified within the project team a **net zero carbon champion**, together with identifying project team responsibilities to achieve **operational energy use targets** including the calculation of these targets, documenting assumptions, managing risks and **validating in-use performance**. We also considered contractual incentives for achievement of **performance targets**.

RIBA WORK STAGE 1

Brief Preparation – Prepare a Course of Action

Further to reviewing the energy use criteria that our local authority client had embedded within the brief, we set a **clear intent for zero carbon targets** and defined what this included for. We reviewed at this stage any **localised energy constraints** together with the **likely demand response**. All briefing constraints and opportunities associated with energy use were incorporated within our **BIM requirements**. We advised on consultant selection, design specialism and supply chain matters that affected our sustainable design going forward.

RIBA WORK STAGE 2

Concept Design – Review Material & Specification

Having established clear energy targets we presented conceptual strategies to the Authority that achieved this requirement for approval. We evidenced that the design had been developed in accordance with **best practice recommendations**. Specific aspects which we presented include building orientation, building form factor, facade glazing ratio, likely occupancy patterns and operating scenarios and technical systems integration. We will also developed an **operational energy model** aligned to the **Energy Use Intensity Targets** which we used to guide the design through our building option studies. Other features considered at this stage included deciding on the form of heating and hot water systems to be used and the potential for energy storage.

RIBA WORK STAGE 3

Developed Design - Review Material & Efficiency

We refined a **fully operational energy model** for evaluation of predicted demand, ensuring simulation considered energy use from all items in the building. We tested proposed design changes using this energy model, whilst continuously updating targets, measures & assumptions of likely **occupancy patterns & operating scenarios** in support of long-term adaptability. We ensured construction details supported low energy and **airtightness performance characteristics**, whilst also modelling the risk and mitigation of **overheating**. To assist this assessment, we developed our **demand response strategy** and simulated potential scenarios for consideration by the Authority. A **sub-metering strategy** was defined to record heating & cooling consumption allowing **fabric performance** to be assessed separately. Additionally, we included **targets for whole life carbon** in specifications & tender documentation.

RIBA WORK STAGE 4

Technical Design – Material & Product Declaration

We updated the building energy model with latest design amendments ensuring operational targets were still being achieved by our proposed strategies. We created a **Building Performance Register** at this stage to be read with our model. We confirmed **envelope specification** and complete detail design, ensuring good continuity of insulation & airtightness. With refinement, we iterated the demand response model with more exact data to gain a more **accurate prediction of carbon savings** and monetary gains, whilst also assessing that specified equipment integrated fully to **carry out demand response processes**. We critically included **operational energy targets** in the construction tender package pre-novation, e.g., using a **Design for Performance** type of target & feedback loop. Additionally, we incorporated in contractors' prelims '**guarantees to recalculate energy model**' when items in the register were changed or value engineered, to demonstrate '**as built**' project met agreed operational targets. Created risk register & confirmed responsibility for managing this during construction and commissioning.

We advised on the appointment of an independent clerk of works responsible for quality checks that have a bearing on energy & fabric performance in addition to the responsibilities that both the design team and the contractor had. On site monitoring is increasingly necessary to record construction sequencing and processes especially with regard to airtightness.

RIBA WORK STAGES 5

Construction – Verification of Material & Product

Through the construction stage we continued to **dynamically update the energy model** to account for changes in the design, reject substitutions and omissions if achieving performance targets led to compromise. We **engaged with the supply chain** on the design targets of the project and provided workshops to help upskill contractors on the criticality of quality construction. We ensured our contractor partner understood the commissioning requirements, including metering commissioning & validation of manual vs half hourly readings. We required the contractor to have a **quality monitoring processes** to ensure proper installation of insulation, achieving airtightness and mechanical equipment for the whole of the construction period. We carried out **benchmark inspections** to clarify quality expectations and monitor construction quality, including in-situ thermal performance tests, thermographic and air tightness testing. Ultimately we reviewed the final construction including rectification work, for quality, including in-situ thermal performance tests, thermographic and air tightness testing. We finalised the **as-built energy model** to account for changes in the design or assumptions behind it prior to Handover. Notably, we engaged with the contractor to **reduce waste** throughout the build process.

RIBA WORK STAGE 6

Handover – As Built Carbon Report to North Ayrshire

Submitted finalised as-built energy model. Ensured commissioning & testing was complete & witnessed that the '**as installed**' control strategies, setpoints, commissioned flow rates, metering etc. are in line with the model. Ensured building user client is trained and understands the building systems. Ensured the demand response activities occur correctly as part of the commissioning process and initial setup parameters are recorded. Crucial **performance data** from sensors were reconciled with main meter and BMS readings to **facilitate long term monitoring** of building performance. Finally we undertook **post completion analysis** using as-built information to assess upfront embodied carbon.

RIBA WORK STAGE 7

In Use – In-Use Carbon Report as intended

For the first year of occupation the building and **targets were tuned to actual building usage patterns**, with a dual focus of improving accuracy of targets as well as **improving building operation**. We Identified and tracked key efficiency metrics to help this process. Reviewed hourly energy consumption trends matched **operating hours** and that the metering system were operating correctly and validated against utility meters. We recommend an annual budget for monitoring energy use and tuning controls was provided by qualified client member. Monthly reviews & quarterly a '**deep dive**' analysis was recommended to assess the buildings performance. Best practice promotes that we **line up energy assessments with post occupancy evaluations** to ensure occupant satisfaction with conditions in the building and that we capture critical information that will inform future buildings being procured across the sector.

Additionality

The Stallan-Brand team measured sustainable design effectiveness through applying;

Passivhaus - We designed with reference to Passivhaus Standard and deliver assessments against each RIBA Work Stage and each Gateway approval stage.

BREEAM - We designed with reference to BREEAM standards to achieve BREEAM excellent rating.

Well Standard - We referenced the WELL, the leading tool for advancing health and well-being in building design globally, one that had a significant bearing on the sustainability objectives of the project.

Statutory Approvals & Certification - The team extracted and make distinct those features that were improving sustainability and complying with technical standards at each stage of a project's development.

