Construction Quality Improvement Collaborative

Winchburgh Schools Project - Quality Case Study

January 2023

Introduction

West Lothian Council (WLC or the Authority) is committed to a learning estate that is among the best in Scotland and has an established track record of innovative practice. The Authority has a dedicated, committed team who want each child and young person to reach their highest potential by targeting their individual needs in school buildings and learning environments conducive for teaching in the 21st century.

The Winchburgh Schools Project quality case study details how the Authority's aspirations, vision, and objectives, in terms of the quality required to ensure education buildings support the provision of the best possible learning spaces was achieved – and what lessons can be taken forward and developed from its approach.

Pivotal to the success of the Winchburgh Schools Project was a quality culture of collaboration between experienced, competent and capable parties, developed over a series of projects which immediately preceded the Winchburgh work and refined over the four facilities that comprise the Winchburgh Schools Project (Project).

Winchburgh Schools Project Scope

The Project sits as part of West Lothian's Learning Estate Strategy, an impressive four building campus and the largest single investment in education provision in West Lothian, comprising the following:

- Sinclair Academy - a 660 place denominational secondary school,
- Winchburgh Academy - a 660 place non-denominational secondary school,
- Holy Family Primary School - a 231 place denominational primary school, and
- Winchburgh Sport & Wellbeing hub – a sports centre with swimming pool, gymnasia, fitness studio and weights area.

Key Vision and Objectives

The Authority's vision for the Project was driven by the desire to create the best quality proposal, providing a stimulating and dynamic learning environment that represented best value through efficient design. Consistent with West Lothian Council's corporate asset management mission statement:

"managing assets efficiently and effectively to support the achievement of corporate priorities and to ensure that resources deployed in their management have maximum benefit",

the Project successfully achieves the following key vision and objectives:

Vision:

- well-designed, well-built, and well-managed schools that.
    - support local and national priorities.
    - inspire children, young people, and communities to meet their aspirations.
    - respond to evolving needs; and
    - are sustainable for future generations.

Service Objectives:

- to enable better services through the school environment that focus on.
    - delivery of the curriculum for excellence and effective and inclusive learning for all.
    - the child at the centre: meeting the needs of individual children; and
    - the school at the heart of the community: meeting the needs of communities.

Quality – a pro-active approach

Quality management is not just a construction stage requirement but an 'end to end' collaborative process, beginning at the briefing and concept design stages, and continuing through into the aftercare and Post Occupancy Evaluation stages.

The successful delivery of the Authority's quality vision was achieved through a collective and collaborative effort by all parties working on the Project. The seeds of this success were sown at the outset of the Project through the following:

- a strong Project Board making clear and timeous decisions when required.
- an experienced, competent, trusted team (built from successful delivery of previous projects) selected to deliver the Project.
- a clear understanding of people's roles and responsibilities within the Project.
- a detailed brief and ACRs – collaboratively developed through a Design Sprint. The Design Sprint not only assisted the brief but helped develop/strengthen the project relationships; and
- Collaborative, not confrontational approach.

Quality was given as a much prominence as health & safety, cost, and programme. Quality was embedded (and not simply an "add on") into the development and delivery processes and reinforced at various checkpoints. Further information on how this was achieved through the design and construction phase of the Project is provided below:

Quality through Design

At the heart of achieving quality through the design was the following core quality processes:

- Hub South East / Authority Quality Assurance processes
- The "move to the left" strategy; and
- Implementation of design quality tools

Hub South East / Authority Quality Assurance processes

The Hub South East development process facilitates a robust approach, not only to project delivery, but quality project delivery. Key aspects of this quality assurance through the design process are as follows:

- Regular communication through monthly project and risk meetings, fortnightly design team meetings/workshops and dedicated quality meetings.
- A fformal monthly project report prepared by the Contractor and each design team member on progress on project and key issues identified.
- Hub South East end of stage reviews (Stage 1, Mini Gateway Review and Stage 2) of progress against agreed project outcomes. The Project team presenting the end of Stage Report submissions demonstrating the quality proposals, feasibility options, cost plans, Value for Money, commercial risks and opportunities and whole life costs for approval by the Authority;

- The independent review of the Contractor's submissions by both the Hub South East Cost advisor and Authority technical adviser in relation to the following elements; programme, budget cost, Value for Money, FM/whole life cost information, compliance with the ACR's, compliance with SFT funding metrics and compliance with the Scottish Government letter of grant offer.

Move to the Left Strategy

This strategy involves bringing key elements of the design forward and completing them as much as possible. Key areas of this approach included:

- Early engagement and commitment of key specialists:
    - Mechanical & Electrical contractor, Fixed Furniture and Equipment/Interior designer, Pool, Kitchen, and Audio-Visual specialists.
- Early internal design reviews focused on buildability and quality of information.
- Early engagement with Building Control to agree the warrant strategy - a total of thirty-eight (38) warrants. These were the infrastructure warrants and four (4) x nine (9) building warrants (envelope in bite sized chunks. If one part of the envelope was late it didn't delay the other warrants).
- Early identification of Contractor Design Portions (CDP) (which were kept to a minimum) and getting specialist input early i.e. envelope specialists.
    - This allowed the Contractor to create a design, procurement and construction programme. This programme was linked to the agreed warrant strategy enabling manageable procurement of specialist designs for Structural Engineers Registration (SER) as a complete CDP design is required ahead of the warrant being granted.
    - Sign off on the CDP was undertaken by the relevant member of the design team and lead designer/architect to ensure that these elements fully met the design requirements and did not adversely impact other parts of the design.
- Regular design team and client team meetings. The Contractor's ten (10) minute, two (2) week lookahead call noted key topics that needed to be discussed throughout the week and was noted as a key success by the design team.
- Agreeing the co-ordinated room layouts with WLC early; and
- Minimising Reviewable Design Data (RDD) elements and closing them out early.

Contractor Design Quality Tools

- Agreeing the Design Responsibilities Matrix (DRM) and scope of service early, so roles and responsibilities were clearly understood.
- The Contractor's design management tool used daily to manage the design process.
    - Action tracker capturing all the key design actions on the project - approximately 1500 actions were recorded in total
    - Key design documents all in the one place i.e. Design Team Meeting (DTM) minutes, RDD tracker, design changes.
- The use of Building Information Modelling (BIM):
    - The design team had high quality models from an early stage. This allowed the Contractor to coordinate and resolve issues before they became a problem.
    - Utilisation of Dalux between all the key members of the team, including the Authority and Building Control. Education teams found this invaluable in assessing

Room Layouts and FF&E and it was used in the access and maintenance discussions to ensure the design proposals complied with the Authority's Employers Design Requirements (with a particular focus on roof access and maintenance). This provided Building Control a far better understanding of the facilities than traditional drawings and allowed elements such as dampers and firewalls to be abstracted to improve the Building Control Officer's ability to understand issues.

  - Key specialist subcontractors had models coordinated with the design teams i.e. Steel, Structural Framing System (SFS), pool, FF+E, Craft, Design and Technology (CDT), etc.
- Viewpoint and Design Review Process.
  - All information uploaded to Viewpoint and all comments tracked.
  - Outstanding comments on information tracked through the action tracker so they could be managed and resolved.

Quality through Construction

At the heart of achieving quality through the Construction phase was the following core quality processes.

Pre-Package Site Start Reviews

- *Procurement quality reviews* were undertaken with large work packages (M&E, Brickwork, SFS and internal joiner work packages) prior to appointing the relevant subcontractor. This involved Inviting tendering subcontractors to site, carrying out interviews on their quality systems and scoring to establish leading candidate prior to subcontractor appointment.
- *Internal Contractor drawing reviews* for each work package involving, site design managers, site managers and the commercial team to ensure both design team and CDP design information was aligned with contract requirements and to ensure detailing was correct prior to construction works on site.
- *Inspection and Test Plans (ITPs)* specific to the Project were issued by all subcontractors prior to site start for the site management team to review and approve.

During Construction

- *Construction (and Design) Quality Plan* – the Contractor maintained these quality plans as part of the contractual documentation that it entered with Hub South East (and Hub South East with the Authority) providing a robust framework upon which quality process and procedures would be based. The information contained within these were regularly subjected to both internal and external audit.
- *Dedicated Monthly Quality Meetings* – these were chaired by Hub South East and took place with the wider site team (including the Authority, Hub South East, Scottish Futures Trust, Contractor, Clerk of Works and Design Team (as applicable)) to provide updates of what events relating to quality were happening on site. These were separate from the monthly site progress meeting to ensure the required focus on quality. The monthly site observation reports raised by the design team from a quality perspective were discussed as were the Clerk of Works observation trackers. Forthcoming works on site were highlighted and quality matters in relation to these works were proactively discussed. Lessons learned from this Project and others were invited and discussed to deliver continual improvement as the

works progressed. This dedicated quality forum was a key part of the quality assurance process for the Authority and Hub South East. During Covid restrictions, the Contractor was able to use drone footage to illustrate progress on site.

- *Site Team and Authority Clerk of Works Weekly Meetings* - Weekly recorded meetings took place between the site team and the Authority's Clerk of Works to review issues on site and agree resolutions, review design issues and discuss upcoming works. Each trade work package was allocated to a specifically qualified site manager responsible for the quality management so there was a single point of responsibility for the CoW to go to with any issues.
- *Interactive Quality Workshops/Toolbox* talks were carried out physically on site to ensure all relevant personnel were aware of the requirements, in particular where several trades were involved in one phase of works. Examples from this Project include:
    - Fire damper installation, coordination between M&E, joiner, and fire protection subcontractors
    - Fire door installation, coordination between joiner and flooring subcontractors
    - High level MF Ceilings, coordination between M&E, ceiling installer and fire protection subcontractors.
- *Common single source platform for reporting issues* - the Field View system was used to share all issues between the site and wider teams. The Contractor carried out training for the Authority site team and key subcontractors to ensure the system was used effectively. By having a common platform for communication, lessons were learned between the four buildings and trends could be easily identified and acted upon as part of the continual improvement journey. The Authority Clerk of Works had full editable access to upload any snagging / defects.
- *Third Party Specialist Reviews* – The Contractor employed RSK consultants to visit site on a fortnightly basis to carry out quality checks on the envelope construction. A report was issued for each inspection which assisted the site management team in ensuring the works were carried out to a high standard. Evidence of positive results of this process were the 4no. successful air tests for each building (at the first attempt) and minimal leaks throughout the building process.
- *Live 'Teams' Trackers* - Due to the size/scale of the Project, a Building Control Completion Certificate was required for each of the four buildings. To facilitate this, the Contractor had a single point of contact who would carry out fortnightly reviews with the Building Control Officer on site and upload all information to a live tracker which was made available to the wider site team. This was effective and ensured any issues raised were visible to the site team to enable close out prior to the following visit. All Final Building Control Completion Certificates were obtained prior to handover.
- *Contractor ITPs* - these are fully detailed inspection plans that note what will be inspected, by whom and the frequency of these inspections with a formal sign of by those inspecting. The ITPs identify "hold points" where all relevant personnel are given the opportunity to inspect and record quality, before areas are closed in.
- *Authority Clerk of Works* - Fabric and Mechanical and Electrical quality control was provided as separate specialisms. An onsite presence was in place throughout the Project. These roles advised the Authority on compliance with contract information and construction quality requirements and non-conformances.

- *Authority Technical Advisor* – scope of services, compliance of contractor initial and final submissions to meet project requirements in terms of quality and Value for Money. This role contributed to the process of getting works right by identifying risks and lessons learned from previous projects.

Commissioning and Handover

The principal framework to facilitate the organised handover for the Project was the Final Commissioning Programme (FCP) which was prepared by the Contractor, approximately six months in advance of handover, in collaboration with key stakeholders. Given the phased handover of the site, a FCP was developed for each of the four buildings.

The FCP provided timescales when all the M&E systems would be completed and commissioned and when the Authority's witnessing of the commissioning was required. It set out when the Health & Safety files and Operational and Maintenance manuals would be issued, initially in draft, and then in their final format and provided detail on the Handover procedure and the Handover deliverables (Completion Criteria).

The majority of the FCP concentrates on the sequence and timings of when the various M&E systems would be completed and commissioned, and incorporates when all utilities are scheduled to be live, and when the installed systems will be commissioned and validated in readiness for Handover.

It detailed periods when the demonstration of each building and systems would be undertaken. This was necessary to ensure that sufficient notice could be provided to the appropriate Authority personnel of when their attendance would be required, and for how long. Following these demonstrations, training sessions were also scheduled to ensure that all operational and maintenance personnel were familiar with the installations and how they are managed and adjusted. This ensured a smooth transition from the Contractor to the Authority Facility Management personnel at handover.

To facilitate this process, demonstrations of the various systems were video recorded and those video files formed part of the Health and Safety file so that future personnel, not present at the original demonstration, could gain a working knowledge of the various systems, direct from the installation specialist.

The contract incorporates Completion Criteria (Handover deliverables) and these provide a robust framework and audit trail for all to be comfortable that the buildings are ready and able to be handed over. A key element to the success of the completion criteria is to agree upfront the evidence requirements to allow these to be signed off and regularly monitor progress against these items.

Continual Improvement

The Authority, Hub South East and the Contractor has continued to develop their strong partnership and collaborative approach to working to successfully deliver projects since the West Calder High School project back in July 2018. Whilst there has been continuity in key personnel delivering these Projects (and subsequent ones), complacency has not been allowed to creep in. A rigorous approach to lessons learned on each project has been taken forward and applied to subsequent projects for their betterment. This formal approach to lessons learned takes the following forms:

- Post Project Reviews with the project team following shortly after a project has reached Financial Close i.e. when formal contracts are signed, to learn lessons from project development.
- Post Project Reviews within three months of handover of a project with the project team, to learn lessons through the construction phase.
- Quality lessons learned, discussed through the dedicated monthly quality meetings held
- Wider Hub Advisory Group quarterly meetings with Hub South East and its Contractors, disseminating lessons learned and good practice across all active projects.

The Authority, with support from Hub South East and its Contractor will continual to learn lessons through the Post Occupancy Evaluation (PoE) that will be held based upon the appreciative enquiry model at twelve months, twenty four months and 36 months after project completion.

This pro-active approach to quality has lead to the successful delivery of four high quality buildings which delivers on the Authority's vision for the Project.