Forth Valley College

Agenda

25 August 2016
BOARD OF MANAGEMENT

Room 109
Falkirk Campus 4.30pm (refreshments available from 4.00pm)

AGENDA

1 Declarations of interest

2 Apologies

FOR APPROVAL

3 Minutes of meeting of 21 June 2016
(Elements of paper 3 are withheld from publication on the Forth Valley College website under Section 33 Commercial Interests and the Economy of the Freedom of Information (Scotland) Act 2002.)

4 Matters Arising

a) B/15/040 Outcome Agreement 2016-17
b) B/15/045 Board Self Evaluation Activity (Verbal)

5 Minutes of Committee Meetings

- Finance Committee 16 August 2016
- Falkirk Campus Project Board (to follow) 18 August 2016

6 Honorary Fellowship Nominations Alison Stewart

7 Falkirk Estate Full Business Case Tom Gorman
(Elements of paper 7 are withheld from publication on the Forth Valley College website under Section 33 Commercial Interests and the Economy of the Freedom of Information (Scotland) Act 2002.)

Boardroom, Falkirk Campus (commencing at 4.30pm)

Present: Mr Hugh Hall (Chair)
Mrs Anne Mearns
Dr Ken Thomson (Principal)
Ms Lorraine Simpson (Student Union President)
Ms Beth Hamilton
Mr Ken Richardson
Mrs Caryn Jack
Mrs Lorna Dougall
Mr Alan Buchan
Mrs Fiona Campbell
Mr Steven Tolson
Ms Angela Winchester
Mr Liam McCabe
Mr Colin Alexander

Apologies: Mr Andrew Carver
Mr Ralph Burns

In Attendance: Mr David Allison, Associate Principal and Executive Director Information Systems
Mrs Alison Stewart, Associate Principal and Executive Director of Finance
Mr Andrew Lawson, Associate Principal and Executive Director of HR and Operational Effectiveness
Mr Stephen Jarvie, Corporate Governance and Planning Officer
Fiona Brown

Mr Ian Beach, Education Scotland, gave a presentation on the outcome of the recent Education Scotland visit. He highlighted that there were 19 areas of positive practice identified and that the 2 areas for improvement and 1 main point of action had already been identified by the College and that a strategy was in place to address these.

He highlighted the work of the Student Association and overall learner engagement throughout the College.

a) The Board noted the content of the presentation and expressed their appreciation for the work done by College staff to reach this positive result.

B/15/032 Declarations of Interest

None.

B/15/033 Principal's Report

The Principal presented a report on his activities since the last meeting of the Board of Management.

He highlighted that the College had received the TES award for Best Teaching and Learning Initiative, and provided an overview of the recent visit to the College by John Swinney, Deputy First Minister and Cabinet Secretary for Education and Skills.

He also referred to the recent SCOTS graduations and outlined the positive impact this activity has on young people who are at risk of becoming disengaged with learning.

a) Members noted the content of the report and recorded their congratulations on the TES award win.

B/15/034 Minute of Board of Management Meeting of 24 March 2016

The Minute of the meeting of 24 March 2016 was accepted as an accurate record.

B/15/035 Matters Arising

a) B/15/026 a) Falkirk Campus Project Board – 9 February 2016

This was covered under point B/15/036 a)

b) B/15/010 Key Estates Issues and Strategic Options following completion of updated Full Business Case

This was covered under point B/15/036 a)

c) B/15/029 Board Self Evaluation Activity (Verbal)

This was covered under B/15/045

B/15/036 Minutes and draft minutes of other Committee

a) Falkirk Campus Project Board – 26 May 2016

Ken Richardson, Falkirk Campus Project Board (FCPB) Chair, provided an overview of the recent meeting. He highlighted the timescales in relation to the approval of the Full Business Case, discussed the impact of the Falkirk Council decision not to proceed with the Arts Venue; and outlined the current project risks and mitigation plans.

b) Strategic Development Committee – 31 May 2016

Anne Mearns, Committee Chair, reported that the committee had requested changes be made to the Operational Plan to make individual objectives more specific. She also updated members on the College involvement with the Stirling Care Village, noting that the College was the sole training provider involved with this large project.

c) Audit Committee – 2 June 2016

Lorna Dougall, Committee Chair, reported that the recent meeting had received no high level recommendations from the College auditors.

d) HR (Inc. Nomination) Committee – 7 June 2016

Beth Hamilton, Committee Chair, noted that the meeting had covered a lot of ground and that this was reflected in the minute.

d) Finance Committee – 14 June 2016

Liam McCabe, Committee Chair, confirmed that the substantive business of the Committee had been brought forward to this meeting.

B/15/037 **Budget 2016/17**

The Associate Principal and Executive Director of Finance presented the proposed budget for 2016/17. She outlined changes to the funding allocation to the College and new financial challenges resulting from the cut in student support and capital funding levels, the end of the NI rebate; and the introduction of the Apprenticeship Levy.

She reported that the budget was showing a small surplus but highlighted that this position would only be reached if the College can deliver on some challenging targets for commercial, international and fundraising activity.

[redacted]

She highlighted that, as a result of the continued reduction in capital allocations to the College, anticipated top-slicing of capital funds in relation to the new Falkirk campus would not occur.

a) Members approved the Budget for 2016/17

B/15/038 **Papers considered by Committees and recommended to Board of Management for Approval:**

a) Treasury Management Strategy

The Associate Principal and Executive Director of Finance presented the Treasury Management Strategy and noted that, due to the changes in College status, this would be the last year there would need to be a strategy.

a) Members approved the Treasury Management Strategy

b) Foundation Annual Plan AY 16/17

The Associate Principal and Executive Director of Finance presented the proposed plan for funding requests to the Forth Valley College Foundation. These requests would be to support the Falkirk estates developments and to fund the Student Association posts.

She confirmed that this item had been fully considered by the Strategic Development Committee.

a) Members approved the Foundation Annual Plan AY 16/17.

c) Print Tender

The Associate Principal and Executive Director Information Services presented a paper seeking approval for the award of the College print tender to Cannon.

The Associate Principal and Executive Director of Finance noted that, once Board approval was received, the College would also need to seek approval from the Scottish Funding Council as this is a condition of the financial memorandum.

a) Members approved the print tender paper

B/15/039 Remuneration Committee Remit

Beth Hamilton, Chair of the HR (Inc. Nomination) Committee, presented a revised remit for the Remuneration Committee to members. She confirmed that these changes had been made to increase transparency and scrutiny of the committee's activities in line with good practice.

a) Members approved the revised remit

B/15/040 Outcome Agreement 2016-17

The Associate Principal and Executive Director Information Services presented the Outcome Agreement 2016-17 for approval. He confirmed that the draft document had been seen and commented on by both the Strategic Development Committee and the Scottish Funding Council. The Principal noted that the development of the document had been subject to extensive review and achievement of objectives would be tracked via the College Operational Plan monitoring process.

Members queried when the next Strategic Dialogue meeting with SFC would occur and requested that, if one was not in place, SFC be invited to the next Board strategic session.

a) Members approved the Outcome Agreement 2016-17

B/15/041 **Operational Plan 2016/17**

The Principal presented the Operational Plan 2016/17 for approval. He provided background on the development of the plan and noted that the current 2014-18 Strategic Plan which this supports had been largely superseded and that work would commence on a 2017-2022 Strategic Plan.

a) Members approved the Operational Plan 2016/17

B/15/042 **Board Calendar**

The Associate Principal and Executive Director of Finance presented the draft calendar to members. She noted that an additional Board date had been added to support the approval process for the Full Business Case and that more meetings may be required in the future depending on the estates programme.

To enable forward planning, she also confirmed that the 2017/18 Board meeting calendar would be brought to the December 2016 meeting.

a) Members approved the Board Calendar

B/15/043 **Student Association Update**

The Student Association President provided an update on the activity of the Student Association since the last meeting of the Board of Management

She reported that the Student Association had won the Enterprise award at the recent NUS awards and has now been shortlisted for another NUS award.

She highlighted the very positive feedback received from Education Scotland and noted her thanks for the assistance of Fiona Brown and her staff.

She discussed a recent visit by the Student Association to an educational conference in Croatia and outlined the lessons learned from this visit.

The Vice Chair noted that the Student Association President had given a very interesting presentation on this visit to the Strategic Development Committee. It was agreed that this would be circulated to members.

a) Members noted the content of the update

B/15/044 **Second Cultural Survey**

The Associate Principal and Executive Director HR and Operational Effectiveness presented the outcome from the College's Second Cultural Survey.

He reported that the overall percentage of positive responses had increased.

He noted that there were a number of negative comments received and that these would be used to form the basis of an action plan to demonstrate the improvements being put in place in response to concerns.

a) Members noted the content of the report

B/15/045 Board Self Evaluation Activity and Chairs Evaluation (Verbal)

The Chair updated members on sector development regarding self-evaluation, evaluation of the Chair and independent assessment of the work of the Board.

He confirmed that further information on the independent assessment aspect would be circulated to the Board members and taken to the next meeting of the Audit Committee for approval.

a) Members noted the content of the report

B/15/046 The Code of Good Governance for Scotland's Colleges

The Chair presented the revised Code of Good Governance for Scotland's Colleges which is currently out for consultation. He sought feedback from members on the content of the document.

Members noted that the document was very much about compliance and did not reflect culture and relationships that are vital to the Board.

The Chair requested that the Principal feedback these comments.

a) Members noted the content of the report

B/15/047 Review of Risk

Risk were identified on each individual paper.

B/15/048 Any other competent business

The Associate Principal and Executive Director of HR and Operational Effectiveness reported that he had been appointed to Scotland's College's Employers Association which is heavily involved in national bargaining discussions.

The Chair closed the meeting by thanking Lorraine Simpson for her contributions as Student President and her leadership of the Student Association.

Boardroom, Falkirk Campus (commencing at 5.30pm)

Present: Mr Liam McCabe (Chair)
Mr Ken Richardson
Ms Caryn Jack

Apologies: Mr Andrew Carver

In Attendance: Mrs Alison Stewart, Associate Principal and Executive Director of Finance
Mr Stephen Jarvie, Corporate Governance and Planning Officer
Dr Ken Thomson, Principal
Mr Kieran McCallum, QMPF

F/16/001 Full Business Case for Forth Valley College – New Falkirk Campus – Financial Case

The Associate Principal and Executive Director of Finance outlined the key assumptions that underline the case for the financial affordability of the new campus.

These are –

- SFC providing capital grant funding up to £ 70 million
- Retaining the receipts from the sale of Alloa Branshill site and existing Falkirk campus site
- SFC advancing the receipt of Falkirk sale in 2019/20 to support the development costs, with the view this would be repaid in the same fiscal year
- Receipt of £5m funding from the Forth Valley College Foundation
- Additional SFC support of £1.1m
- Use net depreciation of £400k per annum 2016/17 – 2019/20
- SFC funding for 50% lifecycle maintenance costs

She noted that these assumptions had all been discussed with SFC during the preparation phase of the FBC and while no approval had been given no concerns were raised by SFC.

She outlined the risks associated with the assumptions. For land receipts the risk is that the land in Alloa and Falkirk would not generate the level of funding anticipated. This risk was deemed to be low as the FBC had been deliberately prudent in terms of the level of receipt anticipated. She also outlined the additional risk in relation to the sale of the Falkirk campus arising from the telecommunications masts on the existing Falkirk campus which are contracted to a third party with the contract not due to expire until 2023.

Board member Ken Richardson, who is the chair of the Project Board for this development noted that the Falkirk Campus Project Board were aware of this issue and were looking at remedies for this.

There was a full discussion of the financial case focussing on the certainty of the project funding streams, the financial impact of undertaking the project on the College's financial sustainability and the associated risks of both of these critical issues.

Members queried whether the Foundation had committed to providing the anticipated level of funding. The Associate Principal and Executive Director of Finance confirmed that, while the official request had yet to be submitted, she and the Principal had met with the Foundation chair to discuss the College's intentions. She also highlighted that the Foundation had previously approved £1.8m towards design costs, of which approx. £600k had been claimed to date. Moreover, while as a separate legal entity the donation from the ALF could not be taken for granted this did align with the Foundation's primary purpose.

Members queried whether this level of funding would leave enough funding in the Foundation for other projects including the Foundation's support for the Student Association. The Principal confirmed that it would leave £500k in the Foundation to fund the Student Association and other projects the Board of the Foundation deemed appropriate.

Members raised concerns regarding the financial projections in the FBC and appendices, noting that there were not large margins built in to absorb extraordinary costs or adverse fluctuations in the College's financial position. The Associate Principal and Executive Director of Finance informed members that the projections were accurate as the College has to reach a break even position. She confirmed that, in the event of an extraordinary event, the College would approach SFC for additional funding to mitigate the impact. The change in status of the College under ONS meant that it could not accumulate a reserve to cushion against financial shocks and it was expected to operate at a break-even position. Thus it would need to revert to SFC in the event of an adverse financial event.

Members queried whether, in an event such as the recent news story about the contractor for the new local Maggies centre going into administration, the College would be able to absorb a similar incident in the Falkirk campus build. Kieran McCallum, QMPF, noted that this risk would be mitigated through the procurement process and the selection of a robust main contractor. The procurement activity would be conducted by AECOM with assistance from APUC and long term financial viability of contractors would form part of the PQQ process.

Members queried the impact of FRS102 on the reporting of finances on an ongoing basis. The Associate Principal and Executive Director of Finance confirmed that this was being examined at the moment and outlined the potential impacts on the College accounts. This would be reported on to the Finance Committee under the normal course of business. The accounting treatment, it was agreed, should not be a barrier to proceeding.

Members queried whether the College had been in contact with Barclays and the impact on the covenants on the existing College debt. The Associate Principal and Executive Director of Finance confirmed that Barclays had been informed and noted that the College is still pursuing removal of the covenants owing to the current legal status of FE in Scotland meaning covenants are no longer required. The Associate Principal and Executive Director Finance also highlighted that permission to sell the Falkirk Site would be required from Barclays in line with the conditions of the current loan facility.

a) Members endorsed the financial case as contained within the FBC for it to proceed to the Board for approval as part of the overall project with the following caveats–

- Ensure the FBC covering paper for the Board fully outlines the assumptions, associated risks and proposed mitigating actions to allow members to make an informed decision. The cover paper should also refer to the need to reach a break even point each year for the College.
- That the College, when submitting the FBC to SFC, clearly set out in a covering letter what funding the College is asking SFC to commit to this project
- That the College obtain a letter of commitment from the Foundation for their contribution

6. Honorary Fellowship Nominations For Approval

25 August 2016
BOARD OF MANAGEMENT

1. Purpose

To seek approval for the award of Honorary Fellowships of Forth Valley College by the College Board of Management.

2. Recommendation

That members approve the award of an Honorary Fellowship to Nigel Scott, former Board Member.

3. Background

Forth Valley College Board of Management introduced a process for recognising outstanding contributions of individuals to College life and development through the award of an Honorary Fellowship. The Fellowships are recognised and celebrated at college graduation.

4. Proposal

There is a single candidate being put forward for consideration this year – Nigel Scott.

Nigel joined the Board on 12 December 2013 and, up until his resignation in February this year owing to a change in his work commitments, was a highly active member of the Board. He served on a number of committees and was a highly effective Chair of the Audit Committee.

Nigel was a very engaged member of the Board who provided real constructive challenge to the College, always with the benefit of students in mind.

As part of the approval it should be noted how much of an influence Nigel had as a board member outwith Board and Committee meeting. He represented the Board with external visitors, award nights, college events and at graduations as well as supporting the activities of the Senior Management Team in areas such as tender evaluations and mentoring support through an induction programme for one member of SMT.

5. Financial Implications

There are no financial implications relating to the award of an Honorary Fellowship.

6. Equalities

Assessment in Place? – Yes ☐ No ☒

Not applicable.

7. Risk

Please indicate on the matrix below the risk score. Risk is scored against Impact and Likelihood as Very Low through to Very High.

	Likelihood	Impact
Very High		
High		
Medium		
Low		
Very Low	**X**	**X**

Nigel Scott is well known to Board members as an advocate to the College and will continue to be a firm supporter in the future.

Risk Owner – Ken Thomson **Action Owner –** Alison Stewart

8. Other Implications –

Communications – Yes ☐ **No** ☒ **Health and Safety – Yes** ☐ **No** ☒

Paper Author – Stephen Jarvie **SMT Owner –** Alison Stewart

7. Falkirk Estate Full Business Case For Approval

25 August 2016
BOARD OF MANAGEMENT

1. Purpose

To seek approval of the New Falkirk Campus Full Business Case.

2. Recommendation

That members approve the Full Business Case.

3. Background

In 2014 the Board of Forth Valley College approved an Outline Business Case for the new Headquarters Campus in Falkirk and their centre for Science, Technology, Engineering and Mathematics (STEM). The building was based on the existing full time and part-time student and MA activity and specialist accommodation for STEM. The outcome was a building designed within a 21,766 sq metre envelope giving a 23% saving on the existing Falkirk footprint of 28,100 sq metres and costing an estimated £91m (incl VAT).

Since the announcement by the Scottish Government to earmark £70m for investment in Falkirk and then SFC agreement to progress to Full Business Case, the College and its advisors have been working hard to reduce their original design of £91m and 21,766 sq metres.

The revised development proposal completed in October 2015, equated to a development of £80m (in line with Scottish Government budget and FVC contribution) and 19,102 sq metres, a further reduction in footprint of over 12 % against the Outline Business Case.

The Board of Forth Valley College believed that the revised building and development budget were now severely compromised and would lead to a sub-optimal facility, below the standard required. Forth Valley College as one of the top performers in STEM activity in the UK college sector felt it was important that they were allowed to, as a minimum, replicate the successful activity currently in Falkirk, accommodate the planned number of students and meet the future needs of business and industry.

In order to balance at least some of the lost functionality against their original OBC proposals, the College revised the proposals to an optimal development of £83m and 20,148 sq metres, a slightly lower 8% reduction in area on the Outline Business Case enabling them to:

- Reintroduce workshop and laboratory accommodation with classroom breakout areas and increased student space and circulation, reflecting the needs of employers particularly in engineering who were looking for additional hand/practical skills for the apprentices.
- Reintroduce flexible space at the front of the campus to enable various functions from teaching and learning, to events, seminars, exams and student and community engagement.
- Maintain a reduction in non-teaching accommodation whilst future proofing learning and teaching accommodation.
- Achieve a minimum BREEAM category of Very Good for the building against a target of Excellent

- Deliver a construction cost per sq metre of £2,466 which is below that of the recently opened Riverside Campus of City of Glasgow College at £2,584 and above the benchmark mean of £2,351 for comparator projects (excluding abnormals)

4. Key Considerations

The attached document is the Full Business Case (FBC) for an £83m, 20,148 sq metres New Falkirk Campus Headquarters on the College's existing and extended Middlefield site in Falkirk. The document has been prepared by the College and a full Team of Technical, Financial and Legal Advisors, with support from SFT and SFC.

The proposed investment will deliver a regional, national and international centre for STEM, Care and Sport activity, providing progression from school through modern apprenticeship and tertiary education programmes to higher education and employment. It will provide the opportunity for the college to develop its current position and reputation for the delivery of specialist training for STEM industries particularly in oil and gas, manufacturing, chemicals, energy and life sciences.

The Full Business Case clearly demonstrates not only a strong and compelling case for progressing a new and sustainable Falkirk Campus, but also details the £83m cost, proposed programme and how it is to be funded via an SFC grant of £70m plus a further £13m from SFC additional support, sale of assets and grant from FVC Foundation and College In-Year funds.

In summary, this proposal is widely regarded as a transformational investment for the Region and for Scotland's National Education community. It will create a prominent, rich and quite exceptional new 'centre of excellence' in Falkirk, continuing the history of the College on this site and its contribution to Falkirk's economy and culture, whilst surpassing the standard of facility and College identity already established at Alloa and Stirling.

The Full Business Case was considered and approved by the Senior Management Team on 9 August 2016, endorsed by Finance Committee on 16 August 2016 subject to comments (which have been incorporated) and approved by Falkirk Campus Project Board on 18 August 2016 subject to caveats (which have been noted).

5. Programme

Key Milestone Table (from main programme)

Description	Date
Full Business Case Approval	23 September 2016
Issue OJEU Notice/ESPD	25 November 2016
Deadline for ESPD Submissions	30 January 2017
Complete Evaluation of ESPD	30 January - 13 February 2017
Shortlist Tenderers (Minimum of 5)	13 February 2017
Gateway 3 – SFT/SFC Approval	31 March 2017
Issue ITT Documentation to Shortlist	3 April 2017
Deadline for Tender Submissions	5 June 2017
Evaluation of ITT Submissions	6 June – 17 July 2017
Gateway 4 Final Approval by SFT/SFC	11 August – 1 September 2017
Contract Award	4 September 2017
Standstill Period	5 – 18 September 2017
Date of Possession of site by Contractor	18 September 2017
Construction Complete	16 August 2019
Fit Out Stage	19 August – 20 September 2017
Migration/Occupation of College	23 September – 4 October 2019

The dates indicated in the table above are proposed dates and may be subject to change as the project progresses

6. Financial Implications

Financially, the Full Business Case costs clearly demonstrate value for money. The affordability of the project includes a number of key assumptions, over and above the £70m capital funding from SFC.

Assumption	Risk	Mitigation
Forth Valley College Foundation Grant £5m	Grant not approved	The Foundation has already approved a grant of £1.8m which demonstrates their commitment to the project. Informal discussions already held with Chairman of the Foundation.
Capital Receipts **Alloa -** [redacted] **Falkirk -** [redacted]	SFC do not approve retention of receipts Timing and quantum of receipts not realised in line with forecast	SFC indication to date is that receipts can be retained. Both receipts are based on current valuations and are considered to be prudent. [redacted] Discussions ongoing regarding [redacted] on the Falkirk site to ensure the site can be sold in 2019/20.
Utilisation of "net depreciation" £400k p.a. until 2019/20	SFC/SG position on the utilisation of net depreciation changes	The majority of "net" depreciation arises due to existing Falkirk Campus revaluation. If the project is approved the campus value would be impaired. This would remove the impact of net depreciation and increase [redacted]
Additional support required from SFC £618k	SFC do not approve the additional support required	[redacted] The College has appointed a Fundraising Manager who is working to secure capital contributions to support the project.
SFC to fund 50% lifecycle costs in line with NPD projects. In addition SFC maintain existing levels of Capital & Maintenance grants	If funding is not available, the College will be unable to maintain the new building	SFC commitment to provide funding is required

Following the reclassification, as an arms length public body, the College is unable to hold cash reserves. The College will continue to work to maximise land receipts and generate additional contributions through Fundraising. **However, should any of the above risks crystallise and result in a funding gap which the College cannot fund the final assumption is that SFC will fund this gap**.

7. Equalities

Assessment in Place? – Yes ☒ No ☐

Will continue to be developed post FBC.

8. Risk

Please indicate on the matrix below the risk score. Risk is scored against Impact and Likelihood as Very Low through to Very High.

	Likelihood	Impact
Very High		
High		x
Medium	x	
Low		
Very Low		

Please describe any risks associated with this paper and associated mitigating actions

It is recognised as vital by all parties on the project that a Strategic Risk Register be produced, managed, maintained and reported as a live document which accurately reflects the risks associated with the project. This is noted in section 18 of the FBC.

A project specific risk register has also been prepared and is included in Appendix 9 of the FBC.

Risk Owner – Ken Thomson **Action Owner** – Tom Gorman

8. Other Implications –

Please indicate whether there are implications for the areas below.

Communications – Yes ☒ No ☐ **Health and Safety** – Yes ☒ No ☐

Please provide a summary of these implications –Included in FBC.

Paper Author – Tom Gorman **SMT Owner –** Tom Gorman

Full Business Case for Forth Valley College – New Falkirk Campus

August 2016

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Forth Valley College

AECOM

Reiach and Hall Architects

CBRE

CMS Law.Tax

QMPF

Caledonian Economics

1 EXECUTIVE SUMMARY

Forth Valley College is a regional College with its Headquarters Campus in Falkirk and two further campuses in Alloa and Stirling. The College provides high quality tailored learning and teaching for over 15,000 students, 3,400 studying full time of which 1,800 are based in our Falkirk Headquarters Campus.

This document is the Full Business Case (FBC) for a £83m (incl VAT), 20,148m^2 New Falkirk Campus Headquarters on the College's existing and extended Middlefield site in Falkirk. It follows on from the agreed Outline Business Case (OBC) completed in December 2014 and has been prepared by the College and a full Team of Technical, Financial and Legal Advisors, with support from SFT and SFC. The College firmly believes this Business Case demonstrates excellent value for money.

The proposal which has been reduced in area and cost from the previous OBC (£91m and 21,766 m^2) will be funded through a direct Capital Grant from the Scottish Funding Council of £70m plus SFC additional support, sale of assets and College Reserves totalling £13m.

This development is considered a truly transformational investment for the Region and for Scotland's National Education community.

The proposed Campus investment at Falkirk will deliver a regional, national and international centre for Science, Technology (including Construction Technologies and Computing), Engineering and Maths (STEM), and our regional centre for Care and Sport providing progression from school through modern apprenticeship and tertiary education programmes to higher education and employment. It will also provide the opportunity for the college to develop its current position and reputation for the delivery of specialist training for STEM industries particularly in oil and gas, manufacturing, chemicals, energy and life sciences. We are also taking forward the real potential for the Campus to become an international hub for STEM, providing a valuable opportunity for our communities and for the future benefit of the region and its people.

The Board's ambition for the New Falkirk Campus particularly lies in high level STEM, Care and Sport activity and innovation. In February 2015, the College won the UK wide Association of Colleges Beacon Award for Innovation in Further Education with its whole college approach to innovation. In making their award, the judges noted the College programmes produced a work ready graduate for Government priority industries and capitalised on the College's STEM, Care and Sport expertise and training facilities. In October 2015 the College was the first College in Scotland to be re-accredited with the prestigious NEF STEM accreditation first awarded to the College in 2012. Forth Valley College continues to be the College of choice for business and industry.

From an economic perspective, the new campus will also provide training, producing a skilled and experienced workforce for Forth Valley and the Grangemouth Investment Zone in developing and growing Scotland's chemical sector, helping to create new centres of excellence in industrial biotechnology, engineering manufacturing, power/energy and support low carbon initiatives.
In addition the new Campus will be very well placed to support the new Falkirk Economic Strategy and is likely to be seen as an enabling development for the adjacent Falkirk Gateway site, further increasing the potential for entrepreneurial opportunities and job prospects in the area.

Forth Valley College's vision is "Making Learning Work" and one of six key strategic themes within our vision is "Providing a superb environment for learning". The Board of Forth Valley College firmly believes there is a strong and compelling argument to progress the Full Business Case based on the College's minimum requirements of £83m and securing this objective. They have also asked the team to consider how they might go beyond this objective and deliver a quite exceptional low carbon building by including additional key support capital items of £1.5m, resulting in a potential overall CAPEX cost of £84.5m, should additional funding become available.

Forth Valley College's regional curriculum strategy is also a key contributor to our mission of ''Making Learning Work'' and is positioned alongside our Learning Strategy: Empowering Learners, within the strategic theme "cultivating a vibrant learning organisation where students develop skills, achieve qualifications valued by industry and progress seamlessly". Together these clear, synthesised and well-conceived strategies ensure that we continue to deliver the right high quality learning in the right place.

The College's ability to deliver effective learning across the region has already been significantly enhanced by our new estates development in Alloa and Stirling. These award winning buildings not only provide sustainable and well-equipped campuses for our students, but also provide excellent civic buildings which are well-used by their communities. As these new campuses have been developed, we have also developed our curriculum to further align the College's curriculum closely with local economic and demographic circumstances

Over the years and with the opening of the two new campuses, we have developed our curriculum strategy to provide an efficient "hub and spoke" system of learning provision across these buildings. In developing our campuses, we have located specialist facilities for curriculum delivery related to specific industry sectors in the geographical area where it best matches local business and industry need, with entry level provision available across all campuses where possible.

The curriculum strategy, supported by rigorous annual curriculum review and planning delivers a portfolio which is responsive to the needs of individuals, employers and the wider economy. It provides vocational education and learning related to employment in response to national, regional and local needs; positive and clear routes for students into employment or into higher education institutions; and support for students to develop the knowledge and skills they require for employment now and in the future. Our curriculum is and will continue to be a key driver of our estates strategy.

Falkirk, with its geographical adjacency to the Grangemouth petro-chemical industries and Scotland's largest oil refinery will continue to be the centre of our thriving Chemical Sciences and Engineering provision, including mechanical, electrical, instrumentation, energy and chemical engineering

Creativity is also at the heart of the learning strategy, both in terms of developing students' creative capacity and in terms of promoting creative approaches to learning, teaching and assessment, including flexible timetabling; collaborative projects; integrative and interdisciplinary working; and imaginative use of digital media, to name but a few. These approaches are developing well within the College, however they are far more readily implemented when they are supported and enabled by modern, flexible and technology-enabled spaces. The difference in the pace of change in learning and teaching within our two new campuses, as opposed to our current Falkirk campus, is clearly evident.

In our new Falkirk campus, we intend to surpass the impact on learning achieved in our Alloa and Stirling new builds. There will be a very strong emphasis on promoting flexible, collaborative and technology enhanced learning, to ensure that we can continue to Make Learning Work in a digital future. Our learning spaces (classrooms and informal learning spaces) will be equipped with the most flexible and future-proofed digital solutions available and will be carefully designed to support individuals and groups working independently and collaboratively. Our workshop areas will be designed to enable students in different practical disciplines to learn side by side in active learning spaces with ready access to technology.

Geographically, the Falkirk Campus is ideally positioned within central Scotland between Edinburgh, Glasgow and Stirling, and at the demographic centre for the Forth Valley. Within the town, the College campus is located at the interface between residential and business/industrial areas. The location is ideal in both symbolic and practical terms for an institution which seeks to be the gateway by which people may enter the world of commerce and industry.

From an Estates perspective, the College has benefitted from a comprehensive three phased Estates Strategy which was agreed with Scottish Funding Council in 2006/07. Since then the first two phases have been completed on programme and within budget. The third and final phase of this strategy is the new proposed Campus in Falkirk.

The design took as its starting point the new campus facilities recently completed by the College in Alloa and Stirling. These buildings have been particularly successful in their interpretation and support of the College's aspirations for the development of new patterns of learning, involving increased interaction and an attitude of respect.

While the Further Education sector do not generally seek building awards, recognition of the quality of the previously completed campuses were received when winning both RIAS and RIBA design awards in 2011 and 2012 and the Civic Trust Award in 2012, which independently recognises outstanding architecture, planning, design in the built environment and their contribution to improving the learning and teaching experience of both students and staff.

A Post Occupancy Evaluation (POE) was also carried out on the two newly completed campus buildings in 2013, 2014 and 2015 by haa design and Faithful and Gould, which was overwhelmingly positive in its conclusions.

There is a lot which may be learnt from the Alloa and Stirling projects. There are corrections to be made, things to do differently, but perhaps more, there are things which were done right, and these have been retained and improved in the current new Falkirk campus proposals contained within this document.

For the Falkirk project the evolution of both the brief and the design was achieved through a collaborative conversation between client and architect, developing the fundamental attitude and approach employed in the earlier projects. As with the previous schemes the design recognises the influence that architecture has on the social environment. The refectory is placed at the intersection of two key axes at the heart of the building, with most journeys passing through it. This encourages social interaction between students (and staff) from different disciplines.

The building has also been designed to make full use of natural light and ventilation, thereby limiting the requirements for costly mechanical and electrical systems. By limiting the depth of the rooms from the external wall to around 7.5m the average daylighting levels to the rooms are kept high with the majority of rooms able to be cooled and ventilated by providing a series of high and low level opening vents. The psychological benefits of being able to open a window to cool a space are well documented. Light, air, comfort and fitness have also been embedded into an overall wellbeing strategy that seeks to deliver a healthier and happier workplace environment.

Learning is a continuous process, and on today's campuses it extends beyond the classroom to every available space. As active learning increases in and out of the classroom, libraries, café spaces and other informal learning spaces have also been designed to accommodate a broader range of student needs, providing students with control, comfort and connection to technology in circulation spaces, common areas and lounge spaces leveraging often under-utilised real estate.

A study of low and zero carbon (LZC) options for the proposed new Falkirk Campus concluded that the most favourable option for the College, in terms of cost, payback and environmental considerations, was a Combined Heat and Power (CHP) proposal. For the purposes of the FBC, a CHP, Ground Source Heat Pump (GSHP) and a substantial roof mounted Photovoltaic panel system is included which, when combined with high levels of insulation and other low carbon innovations, will deliver a minimum of BREEAM very good, with a target for Excellent.

Early discussions have taken place with Falkirk Council and their Consultants regarding the potential for development of a major district heating network, covering a series of zones in the Falkirk-Grangemouth area (including business/community and residential assets). While the work is ongoing an early opportunity has been highlighted relating to the Gateway site and in particular the potential of a tie-in with the new College energy centre and the Phase 1 Gateway site. In conjunction with Falkirk Council the College have met with Silva Renewables, regarding their proposed development of a maximum 200MW Biomass plant (flexible for heat/power generation) at the Grangemouth Port and Ross Developments who are considering a deep well (2km) GSHP solution. This would be a major investment for Grangemouth and has attracted support from Scottish Enterprise and Government to assist in developing the proposal. In the course of this work the potential opportunity to focus on the delivery of the energy centre at the College/Gateway site has been discussed. While it is still at a very early stage, the College will include flexibility in their M & E service design to accommodate any future opportunities in the Falkirk/Grangemouth area.

As described in the previous Outline Business Case, the selection of an extended Middlefield site for the new Campus was carefully reached following extensive research and many separate options appraisal studies.

The proposed site comprises the existing 10.64 acre Middlefield site and a further 4.8 acre section of adjacent land to the East, which has been secured via conditional legal missive. This enabled the design solution to develop on an appropriately sized flat and efficient 15.5 acre site. Easy access to public transport, the motorway networks, proposed greenways, extensive views of the Ochil Hills, Kelpies and the town, also enhance the desirability of this site

A flood risk report on the proposed development also demonstrated that the site was within an area classed as being at little or no flood risk from coastal or fluvial flooding and was therefore suitable for development.

Financially, the Full Business Case clearly demonstrates value for money, its affordability over its lifespan and how it will be fully funded by a combination of Government support, sale of the Alloa and Falkirk campuses and contributions from the Forth Valley College Foundation (ALF).

A planning application was also submitted to Falkirk Council on 7th December 2015, was well received and approved on 8th April 2016.

We believe that all of the above elements will create a prominent new 'centre of excellence' and sustainable, low carbon Falkirk campus, continuing the history of the College on this site and its contribution to Falkirk's economy and culture, whilst surpassing the standard of facility and College identity already established at Alloa and Stirling.

In summary, Forth Valley College seek approval of the Full Business Case report procured via a capital funded single stage Design and Build contract and permission to progress to the next stage.

2 INTRODUCTION

2.1 Forth Valley College

Forth Valley College is a regional College with its Headquarters Campus in Falkirk with two further campuses in Alloa and Stirling. The College provides high quality tailored learning and teaching for over 15,000 students, 3,400 studying full time of which 1,800 are based in our Falkirk Headquarters Campus.

Forth Valley College (FVC) has a comprehensive curriculum strategy for the delivery of learning and teaching over the three campuses tailored to the needs of local, regional, national businesses and industry, responding to key Government policies and requirements. As a result, our existing Falkirk Headquarters Campus majors in Science, Technology, Engineering and Mathematics (STEM), with further specialisms in Care and Sport while our new Alloa Campus majors in Business at the HE level with our new Stirling Campus majoring in Creative Industries, Hospitality and Tourism. Entry level courses for most subjects are available across two or more campuses, as are subject areas that supplies skills for smaller businesses and public sector services such as Construction, Care, Sport and Salon Services. We have invested in comprehensive management information which tells us that we are achieving 85% to 90% utilisation across our three campuses.

2.2 The Full Business Case

The following document is the Full Business Case (FBC) for a £83m (inc VAT), 20,148m^2 New Falkirk Campus Headquarters on the College's existing and extended Middlefield site in Falkirk. This document follows on from the agreed Outline Business Case (OBC) completed in December 2014 and has been prepared by the College and a full Team of Technical, Financial and Legal Advisors, with support from SFT and SFC.

The proposal has reduced in area and is more economic than the previous OBC (£91m and 21,766m^2) and will be funded through a direct Capital Grant from the SFC of £70m, plus SFC additional support, sale of assets and College Reserves totalling £13m. This is a truly transformational investment for the Region and for Scotland's National Education community.

2.3 Forth Valley College Vision

Forth Valley College's vision is "Making Learning Work" and one of six key strategic themes within our vision is "Providing a superb environment for learning".

Figure 2.1: Making Learning Work: Forth Valley College Business Model

3 BACKGROUND AND CONTEXT

In 2014 the Board of Forth Valley College approved an Outline Business Case for the new Headquarters Campus in Falkirk and their centre for Science, Technology, Engineering and Mathematics (STEM), Care and Sport activity. The building was based on the existing full time and part-time student and MA activity and specialist accommodation for STEM, Care and Sport activity. The outcome was a building designed within a 21,766sq metre envelope giving a 23% saving on the previous Falkirk footprint of 28,100 sq metres and costing an estimated £91m (incl VAT).

Since the announcement by the Scottish Government to earmark £70 million for investment in Falkirk and then SFC support to progress to Full Business Case, the College and its advisors have been working hard to reduce their original design of £91m and 21,766m^2 to accommodate the lower than expected investment. After very careful consideration, it concluded that the following would be required to bridge the gap:

- Removing 15 classrooms from the original plan
- Removing a complete laboratory
- Reducing two electrical installation workshops by 30% and 60% respectively
- Reducing all other workshop space by 6%
- Reducing the Learning Resource Centre by 24%
- Removing the Assembly Hall
- Reducing all staff areas and circulation space
- Reducing building specification from BREEAM Excellent to Very Good

The above building proposal equated to a development of £80m and 19,102 sq. metres, a further unacceptable reduction in footprint of over 12 % against the Outline Business Case.

However, the Board of Forth Valley College believed that the proposed building and development budget were now severely compromised and would lead to a sub-optimal facility, below the standard required. Forth Valley College as one of the top performers in STEM and care and sports activity in the UK college sector felt it was important that they were allowed to, as a minimum, replicate the successful activity currently in Falkirk, accommodate the planned number of students and meet the future needs of business and industry.

In order to balance at least some of the lost functionality against their original proposals, the College revised the proposals to an optimal development of £83m and 20,148m^2, a slightly lower 8% reduction in area on the Outline Business Case area, enabling them to:

- Reintroduce workshop and laboratory accommodation with classroom breakout areas and increased student space and circulation, reflecting the needs of employers particularly in engineering who were looking for additional hand/practical skills for the apprentices
- Reintroduce a flexible space/auditorium type space at the front of the campus to enable various functions from teaching and learning, to events, seminars, exams and student and community engagement
- Maintain a reduction in non-teaching accommodation whilst future proofing learning and teaching accommodation
- Achieve a minimum BREEAM category of Very Good for the building with a target of Excellent
- Deliver a construction cost per m^2 of £2,466 which is below that of the recently opened Riverside Campus of City of Glasgow College at £2,584 and above the benchmark mean of £2,351 for comparator projects (excluding abnormals)

The £83m investment will deliver a regional, national and international centre for STEM, Care and Sport activity, providing progression from school through modern apprenticeship and tertiary education programmes to higher education and employment. It will provide the opportunity for the college to develop its current position and reputation for the delivery of specialist training for STEM industries particularly in oil and gas, manufacturing, chemicals, energy and life sciences.

From an economic perspective, the new campus will provide training, producing a skilled and experienced workforce for Forth Valley and the Grangemouth Investment Zone in developing and growing Scotland's chemical sector, helping to create new centres of excellence in industrial biotechnology, energy and support low carbon initiatives. The proposed New Falkirk Headquarters Campus will also be very well placed to support the new Falkirk Economic Strategy and potentially act as an anchor site for the new Falkirk Gateway development increasing entrepreneurial opportunities and improving job prospects in the area.

It is also worth noting that the Falkirk area population has increased by 8.5% since 2001 compared to an all Scotland increase of 5.5% over the same time period, with a corresponding increase of 4.5% of 16 to 19 year olds against a Scotland average of just over 1%. This is just one of the reasons why the College developed the award winning SCOTS programme with Falkirk Council one year ahead of the publication of Developing Scotland's Young Workforce. The Board's ambition for the new Falkirk campus lies in high level STEM, Care and Sport activity and innovation. In February 2015, the College won the UK wide Association of Colleges Beacon Award for Innovation in Further Education with its whole college approach to innovation. In making their award, the judges noted the College programmes produced a work ready graduate for Government priority industries and capitalised on the College's STEM, Care and Sport expertise and training facilities. In October 2015 the College was the first College in Scotland to be re-accredited with the prestigious NEF STEM accreditation which was first awarded to the College in 2012. Forth Valley College continue to be the College of choice for business and industry.

The College has a national reputation and with the New Falkirk Headquarters Campus has the opportunity to build on that reputation with the potential to be an international hub for STEM, Care and Sport activity for Forth Valley and Scotland, providing a valuable opportunity for our communities and for the future benefit of the region and its people.

Given the specialist STEM nature of the accommodation at Falkirk, the proposed investment of £83m also demonstrates excellent value for money for the public purse. As stated above, the original £80m (£70m + £10m) investment was overwhelmingly regarded as a compromise too far, a missed opportunity to meet the future needs of students, industry and the economy and significantly poorer value for money.

In summary the Board of Forth Valley College believes there is a strong and compelling argument for progressing a Full Business Case based on a College total of £83m (incl VAT) to meet FVC minimum requirements. This is fully funded via an SFC grant of £70m plus a further £13m collectively from SFC additional support, sale of assets and college reserves.

4 CURRICULUM STRATEGY

4.1 Introduction

Forth Valley College's regional curriculum strategy is a key contributor to our mission of Making Learning Work and is positioned alongside our Learning Strategy: Empowering Learners, within the strategic theme "cultivating a vibrant learning organisation where students develop skills, achieve qualifications valued by industry and progress seamlessly". Together these clear, synthesised and well-conceived strategies ensure that we continue to deliver the right high quality learning in the right place.

Our curriculum strategy, supported by rigorous annual curriculum review and planning, delivers a portfolio which is responsive to the needs of individuals, employers and the wider economy. It provides vocational education and learning related to employment in response to national, regional and local needs; positive and clear routes for students into employment or into higher education institutions; and support for students to develop the knowledge and skills they require for employment now and in the future. Our curriculum is and will continue to be a key driver of our estates strategy.

The College's ability to deliver effective learning across the region has already been significantly enhanced by our new estates development in Alloa and Stirling. These award winning buildings not only provide sustainable and well-equipped campuses for our students, but also provide excellent civic buildings which are well-used by their communities. As these new campuses have been developed, we have also developed our curriculum to further align the College's curriculum closely with local economic and demographic circumstances.

We have developed a regional curriculum strategy designed both around the needs of Forth Valley region and national priorities linked to Government key sector industries. The composition of our curriculum is subject to rigorous ongoing review and is influenced heavily by input from:

- Scottish Government and SFC guidance on priority areas
- Employers and sector bodies
- Regional stakeholders, through community planning partnerships
- Post-16 training providers and university partners
- Skills Development Scotland and other national bodies, such as Job Centre Plus
- Regional Skills Assessments and Skills Investment plans

4.2 The economic and demographic landscape

In developing and sustaining a curriculum that meets the needs of the regional and national economy, we pay close attention to economic, labour-market and demographic trends and predictions and the needs of specific key industry sectors and make effective use of the information available through the Regional Skills Assessments and Skills Investment Plans.

In general terms, the Forth Valley economy has had mixed fortunes over the last decade. After a period of significant growth up to 2006, outpacing both Scotland and the UK, the Forth Valley economy suffered a greater impact in the recession than the rest of the country, although it is now showing a more healthy return to growth. In economic terms, Falkirk is the largest of the three local authorities making up the Forth Valley region, generating half of all output from the area in 2012.

Population growth in Forth Valley over the past decade has outpaced Scotland. This growth is expected to continue over the coming decade, although at a slower rate than over the past ten years. The overall effect of this is that expected population growth in Forth Valley by 2022 will be 11% as opposed to 9% for Scotland as a whole. The greatest expected growth is in the Falkirk area, where growth by 2022 is expected to exceed that of Scotland by 4% – see Table 4.1 below.

Table 4.1: Demographic study of Central Scotland from 2002-2022

	2002	2012	2022	Change 2002-2022	No. %
Clackmannanshire	48,100	51,300	51,600	3,500	7%
Falkirk	145,900	156,800	164,200	18,300	13%
Stirling	86,600	91,000	96,700	10,100	12%
Forth Valley	280,600	299,100	312,500	31,900	11%
Scotland	5,066,000	5,313,600	5,519,600	453,600	9%

The greatest population increases in Forth Valley over the coming decade are expected to be amongst those over the age of 50. Growth in the over 50 age groups is expected to be even more pronounced in Forth Valley region than across Scotland as a whole. There is likely to be minimal change in the population in the age band 16-29, but a significant decline in the "prime" working age group of 30-49 across Forth Valley.

The 2015 Regional Investment Plan noted that expansion demand in the Forth Valley economy is expected to result in 6400 new job opportunities between 2012 and 2022, and replacement demand will result in 50,500 job openings in the region over this period. These openings are expected to occur in all types of jobs, the majority of which will require individuals with higher level qualifications – 72% will require individuals qualified to SCQF level 7 or above and the remainder will mainly require individuals qualified to SCQF level 5/6. There will be limited opportunities available to those with no qualifications at all.

All of these points clearly to the current and future need for:

- Skills development amongst the young people of Forth Valley, some of which will take place whilst they are still in the school phase of their education
- Up-skilling, re-skilling and cross-skilling the existing workforce or those not in employment
- Clear progression pathways, including those developed in partnership with universities, that incrementally develop skills and knowledge through the SCQF levels to enable individuals to achieve their full potential
- Increased support for Modern Apprenticeship and advanced apprenticeship provision

4.3 Regional Curriculum Strategy

Over the last 10 years and since the opening of our two new campuses, we have developed our curriculum strategy to provide an efficient "hub and spoke" system of learning provision across our campuses. In developing our campuses, we have located specialist facilities for curriculum delivery related to specific industry sectors in the geographical area where it best matches local business and industry need, with entry level provision available across all campuses where possible.

For example, Creative Industries (Art and Design; Sound Production; and Media and Communication) and Hospitality (Professional Cookery; Food and Beverage Service; Hospitality Management; and Events Management) are based in the Stirling campus, where we have also developed a strong relationship with Historic Environment Scotland and operate a national traditional skills training centre. These strands of activity are further accentuated by our joint degrees in Heritage and Tourism and Digital Media with the University of Stirling.

The Alloa campus is our main centre for Business and Administration and also for our developing curriculum in Facilities Management and Building Services, in partnership with FES, who have located their national apprenticeship training centre within the campus.

Falkirk, with its geographical adjacency to the Grangemouth petro-chemical industries and Scotland's largest oil refinery, is the centre of our thriving Chemical Sciences and Engineering provision, including mechanical, electrical, instrumentation, energy and chemical engineering.

Access provision, at SCQF levels 1-3, is available on all three of our campuses and non-advanced provision, at SCQF levels 4-6, is also distributed in many subject areas, to enable students to begin their studies locally before progressing to higher level study at designated campuses.

A summary of our curriculum delivery provision is noted in Table 4.2

Table 4.2: Curriculum delivery by campus and SCQF level

	Falkirk			Alloa			Stirling		
Curriculum	SCQF 1-3	SCQF 4-6	SCQF 7+	SCQF 1-3	SCQF 4-6	SCQF 7+	SCQF 1-3	SCQF 4-6	SCQF 7+
Access Provision	■	■		■	■		■		
Business		■	■		■	■		■	
Tourism		■	■		■			■	■
Hospitality								■	■
Construction		■	■		■			■	■
Care		■	■		■	■		■	■
Sport		■	■						
Creative Industries		■			■			■	■
Computing		■	■		■	■			
Science		■						■	■
Salon Services		■	■		■	■		■	
Engineering		■	■		■				

■ SCQF Level

4.4 Working in partnership to provide curriculum pathways

A key element of our curriculum strategy is to provide clear and seamless curriculum pathways into, through and beyond College and we pride ourselves on the strong partnerships we have developed with our regional local authorities and schools; universities; employers; and other stakeholders to enable this to happen.

We have a very well-developed school-College partnership portfolio and deliver vocational qualifications at SCQF levels 4 - 7 to over 400 senior phase pupils each year across our three local authorities and on all three campuses. Two hundred further S4 pupils benefit from a unique "School-College Opportunities to Succeed" (SCOTS) programme, delivered jointly by the College and its 18 partner secondary schools and aimed at pupils at risk of not achieving at SCQF level 4 in school. Successful completion of this programme guarantees progression to the school-College vocational portfolio in S5 and significantly increases the likelihood of pupils progressing to a full-time College course when they leave school. This year, we have also created opportunities for suitable qualified S5 pupils to access HNC courses in five subjects, which they will complete over two years.

We have well-developed partnerships and articulation agreements in place with a number of universities, including ground-breaking integrated degree provision with the University of Stirling (in Computing Science, Digital Media, Heritage and Conservation and Biological Sciences); University of Stirling validated degrees (in Art and Design and Media and Communication); and routes to Chemical Engineering degrees with Heriot Watt and Strathclyde universities.

We have a significant Modern Apprenticeship (MA) portfolio, with over 280 new starts in 2015-2016 over nine frameworks, the largest being in Engineering. We have developed Foundation Apprenticeships in areas and are developing a Graduate Level Apprenticeship with 2 universities. We had an ambitious target of 1,000 MAs in 2014-2015, and this has now been surpassed with over 1250 MAs being supported in College and in work place. We work closely with SDS, our employers and our community planning partners to align our curriculum to their needs and ensure we meet the skills demand locally.

4.5 Learning and teaching

As noted previously, our curriculum strategy goes hand in hand with our Learning Strategy: Empowering Learners, which provide a clear and comprehensive framework to shape Forth Valley College's approaches to learning and teaching. The strategy ensures that the College addresses current national priorities in relation to learning and teaching, embeds contemporary pedagogical thinking and capitalises on current and emerging technologies to support learning.

Specifically, the strategy sets out to ensure that learning within Forth Valley College:

- Equips individuals with the full range of vocational and broad essential skills they require to enter and progress within the labour market – skills for learning, life and work and the four capacities of Curriculum for Excellence
- Engages and empowers individuals to take responsibility for their learning; advances equality of opportunity and promotes a culture of inclusion and respect

Creativity is at the heart of the learning strategy, both in terms of developing students' creative capacity and in terms of promoting creative approaches to learning, teaching and assessment, including flexible timetabling; collaborative projects; integrative and interdisciplinary working; and imaginative use of digital media, to name but a few. These approaches are developing well within the College, however they are far more readily implemented when they are supported and enabled by modern, flexible and technology-enabled spaces. The difference in the pace of change in learning and teaching within our two new campuses, as opposed to our current Falkirk campus, is clearly evident.

4.6 Learning spaces

In our new Falkirk campus we intend to surpass the impact on learning achieved in our Alloa and Stirling new builds. There will be a very strong emphasis on promoting flexible, collaborative and technology enhanced learning, to ensure that we can continue to Make Learning Work in a digital future. Our learning spaces (classrooms and informal learning spaces) will be equipped with the most flexible and future-proofed digital solutions available and will be carefully designed to support individuals and groups working independently and collaboratively. Our workshop areas will be designed to enable students in different practical disciplines to learn side by side in active learning spaces with ready access to technology.

4.7 Enrolments by campus

In 2014-2015 our enrolment total for all campuses is 15,110. Table 4.3 illustrates these by mode of attendance. We expect these numbers to remain largely the same, as the existing curriculum being delivered at Falkirk will be delivered within the new Campus, as per our regional curriculum strategy.

Table 4.3: Enrolments by Campus

Campus	Alloa	Falkirk	Stirling	Total
Part time	320	4,913	720	5,953
Day release	40	605	152	797
Evening	237	817	473	1,527
Flexible	555	2,718	177	3,450
Full time	580	1,812	991	3,383
Total	1,732	10,865	2,513	15,110

4.8 Access, equality and diversity

The College has a separate Equality Outcome Plan which outlines how we will meet the General Equality Duty to eliminate discrimination, advance equality and foster good relations. The Equality Outcome Plan is aligned to the themes of the College Outcome Agreement and establishes key equality actions and measures to be achieved over the period 2015-2017 and beyond. As part of our continued process to mainstream equalities throughout all aspects of College operations, the priority equalities targets are included in this agreement.

4.9 Meeting additional support needs

Forth Valley College's Equalities team provides a needs-led learning support service for students with additional support needs. Support is tailored to individual circumstances with the learner at the centre of the process to ensure their needs are met effectively. High standard needs assessments are completed with students and the College is an accredited needs assessment centre for Disabled Student Allowance applications. All current and prospective students are informed of support available at College and how to access it – students are able to disclose any additional support needs at any time during College. We provide support annually to around 590 students with additional support needs, who are completing a range of programmes at various levels. The team also supports staff who support students through the provision of advice, guidance, training and staff development. A robust structure is in place which ensures effective links between the Equalities team and teaching departments.

4.10 Meeting diverse needs

Forth Valley College strives to improve learner's life chances ensuring that students with a disability have the opportunity to access educational provision that, where appropriate, best matches their abilities and allows them to reach their full potential and where suitable, progress on to either mainstream provision, training or employment.

5 THE EXISTING ESTATE

5.1 Overview

Ideally positioned within central Scotland between Edinburgh, Glasgow and Stirling, and at the demographic centre for the Forth Valley, the Falkirk Campus is the location for the College headquarters.

Within the town, the College campus is located at the interface between residential and business/industrial areas. The location is ideal in both symbolic and practical terms for an institution which seeks to be the gateway by which people may enter the world of commerce and industry.

5.1.1 Proposed location for the Forth Valley College New Falkirk campus

A new and rationalised Forth Valley College Campus will be located on the existing and extended College Middlefield site, an integral part of the overall Falkirk Campus, to the east of Middlefield Road; National Grid Reference for the site is 289960, 680630.

A College was originally established on this site in 1963 by Stirlingshire Education Authority and in this time the facility has become a prominent and important element of Falkirk. It is, therefore, appropriate that the new campus should remain on this site to maintain and reinforce those links with the town's fabric and community.

5.1.2 Location and brief site description

The existing Falkirk Campus is located on the eastern fringe of the town to the north of Grangemouth Road. The site is within easy walking distance of the town centre [5 minutes] and is approximately ¾ mile from Falkirk Grahamston Station, and 1½ miles from Falkirk High Station, which services the rail links to Edinburgh and Glasgow. The Falkirk campus is very well served by main bus routes on both Grangemouth and Middlefield Roads and is close to the M9 and A9. Combined, these pedestrian and transport links mean the site is exceptionally well served.
The two unequal sections of the Falkirk Campus are referred to here as the Main Campus, located to the west of Middlefield Road and the Middlefield Campus, which lies to the east. The Falkirk campus encompasses approximately 28 acres and is bisected by Middlefield Road which runs north-south through the site.

5.1.3 Location of Forth Valley College Campuses

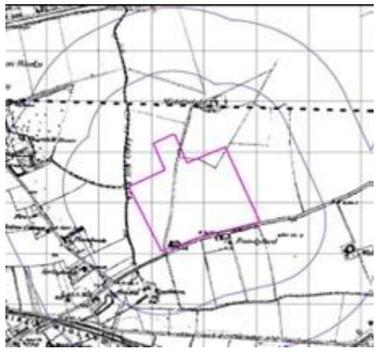
5.1.4 Site history

The town of Falkirk is mentioned in records from 1298 and developed as a market town based on the importance of agriculture in the local area, especially on the fertile plains of the River Forth and River Carron. The establishment of the Carron Iron Foundry and the advent of the industrial revolution changed the focus from agriculture to industry.

The construction and opening of the Forth and Clyde Canal [located 600m to the north of the College Campus] increased the industrialisation of the town with a resultant increase in manufacturing industries including tanneries, a distillery, timber yards and chemical works developing in addition to the iron industry. The last 50 plus years has seen a shift in the industries operating in the town and its surroundings with a move away from heavy industrial activities to light industry and the petrochemical and chemical works at Grangemouth to the east.

The earliest published historical map available of the site is dated 1864 [the College current campus site boundary is highlighted in pink on maps opposite] and shows this as agricultural land located approximately 1km east of the town of Falkirk. The site remained undeveloped until the 1960's, although by that time the town of Falkirk exhibited increased growth in an easterly direction predominantly by residential properties.

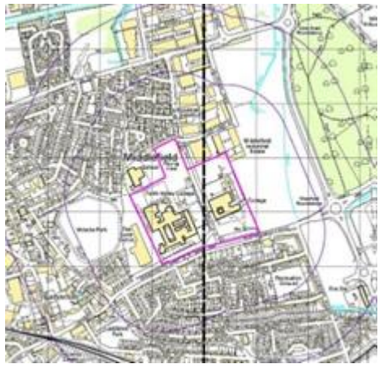
Victoria Park was formed as part of the town's expansion just to the West of the College site. By the late 1960's the area had undergone development with the construction of the new College to the west of Middlefield Road and an engineering works to the east. The operation of the engineering works in the eastern area of the site was relatively short term as by 1981 the building is identified on OS maps of the time as being part of the technical College. This was achieved by converting and extending the original engineering works. This OS map also shows the area to the north has been developed as Middlefield Industrial Estate.



1864 - 1885

1957 - 1958

1973 - 1982



2008 - 2009

5.1.5 Falkirk Herald Article

HALF A CENTURY SINCE FALKIRK COLLEGE OPENED ITS DOOR
by Ian Scott

7th September 2013

"On September 6, 1963, 50 years ago yesterday, the Secretary of State for Scotland, Michael Noble, was in town to officially open the spanking new Falkirk Technical College.

In last week's Herald my old colleague Ken Thomson, the new Principal of Forth Valley College, acknowledged that the Falkirk building may be nearing the end of its useful life but fifty years ago it was a state-of-the-art facility to rival any in Scotland.

As the Second World War drew to a close there was a growing recognition that if Britain was to compete in the new world then the workforce at every level required better education and training. In Falkirk the result was the four trade training centres where craft apprentices and technicians were offered off the job training to enhance the skills learned at work.

Former Falkirk Provost Peter Symon and then Director of Education William Goldie battled hard to win the approval of their colleagues for a large integrated College with the best facilities in Scotland. By 1958 the land next to the Ice Rink was earmarked and building work began in January 1960. It was not easy going. The soft glacial clay meant that 308 huge concrete piles were required, driven to an average depth of 100 feet, to support the weight of the building.

By August 1963 there were 75 full-time teachers and 2500 day release and 160 full time students, well over the College's designed capacity.

The following month Dr Easton welcomed Michael Noble to Falkirk and invited him to declare the building officially open. It had cost over a million pounds and was the largest further education centre built in Scotland since the war. The Herald declared 'educational project leads the country' and in his speech Mr Noble said: "the door we are opening today should not be closed on anyone who could benefit from turning the handle". Tens of thousands of students have turned the handle over the last fifty years and whatever the future holds in store I have no doubt it will stay faithful to this guiding principle which has served the people of Falkirk district so well."

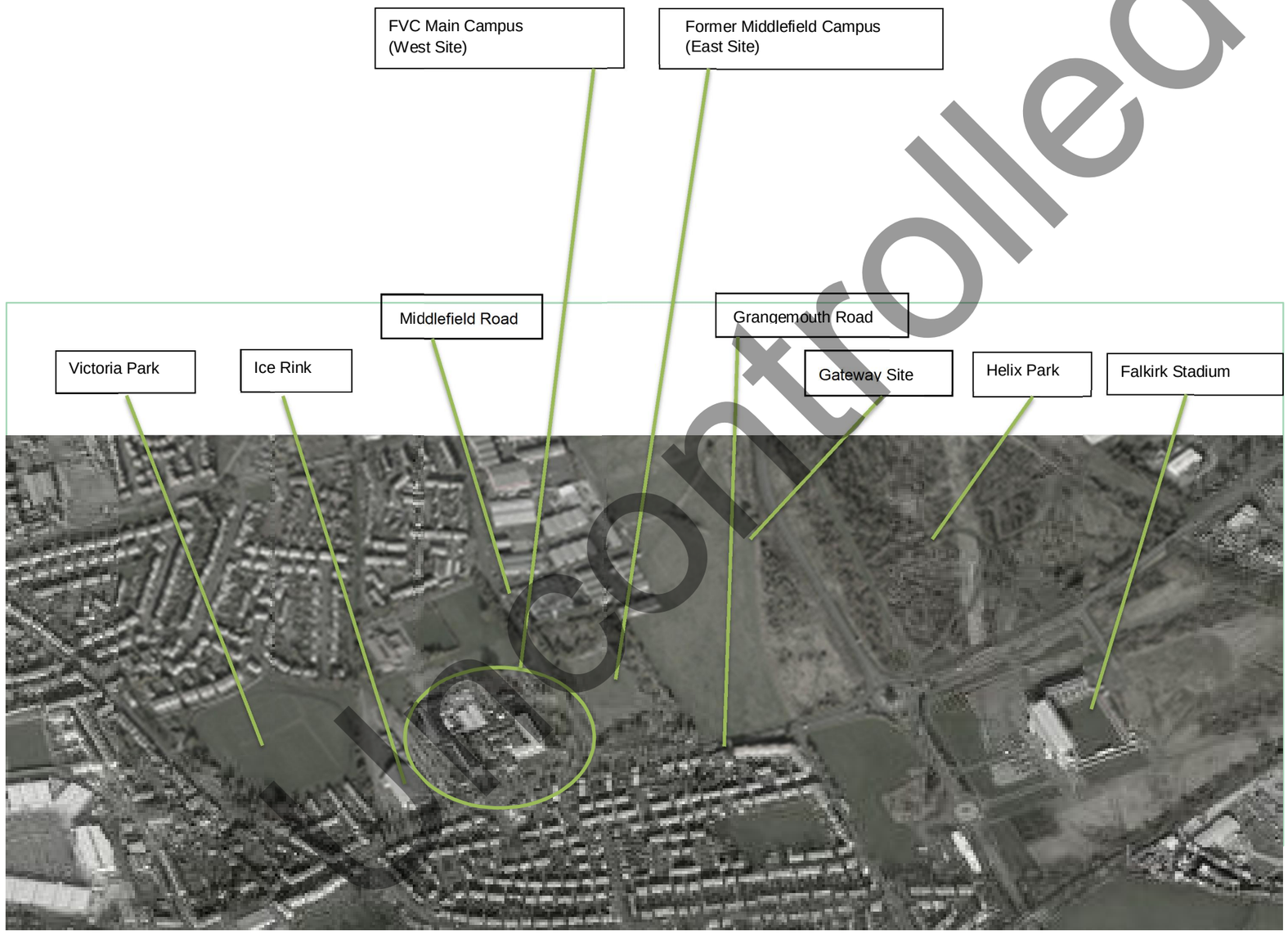
5.1.6 Existing Site of the main Falkirk Campus and previous Middlefield Campus separated by Middlefield Road

5.2 Existing FVC Falkirk Campus Site

5.2.1 Campus Area

Existing W Site	71, 697 m^2/ 17.72 Acres
Existing E Site	43, 055 m^2/ 10.64 Acres
Total Existing Campus Area	114,762 m^2/ 28.36 Acres

5.2.2 Aerial View of Falkirk Campus Site



5.2.3 Key Characteristics

The site is located on the eastern edge of Falkirk on a primary route to the town centre, Grangemouth Road. The road has not changed significantly since the 1960s, a variety of building types exists along this corridor, from houses and an ambulance station to the College itself.

The existing site is relatively flat, with the exception of a small section of higher ground in the south west corner. Shallow gradients on site fall from west to east, with elevations ranging from 8.3mAOD - 7.1mAOD. The lowest existing ground elevations within the site boundary are approximately 350mm above the 1 in 500yr flood levels in the adjacent field. In addition, it is anticipated that building thresholds will be raised from new ground levels to minimise surface water flooding. Further details can be found in Section 8.

There are well established reasonably dense groups of trees to the north section of Middlefield Road and along the north boundary to east and west screening the industrial units located beyond.

5.3 Existing FVC Falkirk Campus

5.3.1 Building use patterns and context

The properties neighbouring the campus vary widely in building type, use and scale typical for the outskirts of most towns of a comparable size. These include an indoor market (former ice rink) to the west, car showrooms and light industrial to North East, a primary school to North West and residential accommodation on the south side of Grangemouth Road. The land east of the campus is known as the 'Gateway Site' and was to be developed as a business park since 2007. It is not expected that this land will be developed in the immediate future, although a new masterplan has been developed for the area and is progressing well.

5.3.2 Site characteristics

Although the existing College campus has a frontage to Grangemouth Road some 700m long, its impact is comparatively weak. This is for three main reasons. First, the buildings are set well back from the road. Second, the buildings are architecturally disparate, and do not pull together to express a consistent character. Third, the external spaces to the South of the Campus consisting of soft landscaping, feeder roads and car parking, are cluttered, disorganised and make little positive contribution beyond the screening function of the mature trees.

5.3.3 Arrival and circulation

A significant problem in both physical and visual terms is that the buildings do not have an identifiable single point of entry, a fact made worse by the previous campus being divided by a main public road. Having grown incrementally since the 1960s, this was perhaps inevitable. A further weakness lies in the lack of an obvious, efficient and coherent vehicle entrance and parking facilities to the site. Increased use of cars by students over the years has made this worse and on certain days the surrounding streets are exceptionally busy, adding to the pressures on existing site traffic and on-street parking provision.

5.3.4 Campus parking provision

The lack of an identifiable single building entrance for pedestrians and vehicles is made worse by the fact that car parking is spread around the perimeter of the site, with a large number of spaces between the College buildings and the main road. A feeder road also runs between the buildings and Grangemouth Road, thus the potential 50m deep frontage almost entirely compromises tarmac and parked cars. In compensation, there are a number of fine mature trees around the site and alongside Grangemouth Road. The new campus layout had to address these issues from the outset as part of a redevelopment site strategy.

5.3.5 The Helix project and FVC Falkirk campus

In the distance the Ochill Hills frame the horizon to the North. These will be visible from upper levels of the College accommodation. More immediately to the north east, the Helix Park is now well established, having opened in 2013, connecting Falkirk centre with the Union Canal and the now famous Kelpies.

Within the College grounds there is an exciting opportunity for a route to be formed to link Victoria Park to the west and the 'Gateway Development' to the east and beyond to the Helix Project Central Park. This in turn introduces the possibility of links to the canal further to the north, and a whole network of pleasant "green routes" of varying types. The College is keen to provide a "green route" through the campus which would link with the Helix.

5.3.6 Wider context and connections

This green route takes advantage of the proximity of the Forth Valley College's Falkirk site to the Helix Park, providing enormous potential in many forms to link the canal with Falkirk Town Centre, and with Grangemouth. It has always been intended that the Falkirk campus masterplan be developed to realise the full potential of links with the Helix, as part of the wider transformation of under-used industrial land between Falkirk and Grangemouth. Through continued excellence in curriculum delivery and development across a wide variety of sectors including community and industry involvement, Forth Valley College will, through the introduction of connections formed as an integral part of its new campus, be well positioned to make a significant contribution to the success of this ambitious and popular initiative.

5.3.7 Aerial View of Neighbours

5.4 Lessons learned from Alloa and Stirling

A Post Occupancy Evaluation (POE) was carried out on the two new campus buildings in 2013, 2014 and 2015 by haa design and Faithful and Gould. This was overwhelmingly positive in its conclusions, which commenced thus:

Overall the client, occupants and the project team are very happy with the new buildings in both locations and from the intentions of the FBC the project has delivered on many of its stated drivers. The success of the project is due in no small part to the establishment of good relationships within the design team and across the College's internal project team.

The POE reports its findings in two main sections relating to Process and Building in Use. The principal points which relate to the Falkirk project are set out below.

5.4.1 Process

The study commends the process undertaken to include stakeholders in briefing and design conversations and to take their input seriously.

- Response: It is the College's intention that the same process will be continued in the Falkirk project

The study recommends that carbon reduction be addressed at a very early stage in the briefing and design process and anticipates using the BREEAM form of measurement, which was used in both the Alloa and Stirling designs.

- Response: The aspirations in this regard have been agreed at the start, and measures included in the design

The study finds that the level of detailed design available will directly impact upon the procurement route. Sufficient detail must be available if a form of design is to be progressed and achieved.

- Response: The College has completed a detailed design brief and is very clear in what is required at Falkirk. The College plans to complete a detailed brief (as before) and, with the appointed design team, to ensure that sufficient detail is available before involving a contractor/consortium in the process

The study commends the low level of client change imposed on the projects and attributes this to the high level of detailed work undertaken by the entire team in the early stages together with robust management by the College.

- Response: It is intended to run the Falkirk project in the same manner. Given the increased level of experience and mutual understanding across the team it may be anticipated that this will be at least as successful, if not more so

The study notes that the snagging procedure employed by the contractor was somewhat informal and led to frustrations around handover.

- Response: The team are very aware of this issue and intend to address it in the Contract documents for the Falkirk project, requiring bidders to detail their procedures in this regard

The study recommends the appointment of a specialist to manage the decant process.

- A specialist Moves Manager will be appointed at Falkirk, consistent with previous Campus developments

5.4.2 Buildings in use

Reaction from users is overwhelmingly positive. Whilst there are fairly wide variations in reaction between the two buildings, even on aspects where they are virtually identical, there are several points which clearly must be acknowledged in the briefing and design of the Falkirk campus.

Post Occupancy Evaluation:

Car parking must be sufficient in quantity and arranged with consideration for the route from car to entrance. The restrictions of the Alloa site made this a challenge.

- Response: This point has been taken on board by the team in the FBC for the Falkirk site layout with a 20% increase in car parking spaces and separate northern carpark entrance to building

There are issues with solar control and glare in both buildings.

- Response: This is acknowledged by the team, and lessons learned will be included in the Falkirk scheme

The study finds that both buildings have had a very positive effect on work patterns, teaching and levels of interaction.

- Response: The lesson here is to continue to develop the thinking from Alloa and Stirling in the biggest of the three at Falkirk. The increased size and diversity of the brief (which includes sport) opens up opportunities in this regard which will be realised through a detailed conversation between designers, managers and users

The overall quality of the buildings is commended

- Response: The design team have been using these buildings as quality benchmarks for the Falkirk scheme

In conclusion, therefore, there is a lot which may be learnt from the Alloa and Stirling projects. There are corrections to be made, things to do differently, but perhaps more, there are things which were done right, which should be held on to and repeated at Falkirk. These range from the retention of control of the design process within the College [building on the invaluable experience of FVC staff having delivered the extremely successful and popular new campuses at Alloa and Stirling], to the provision of flexible learning spaces (which are highly valued by staff and students alike and a form of which are also intended to be introduced in the Falkirk workshop areas).

Both the previous Alloa and Stirling new Campus Developments were delivered on programme and within budget.

6 PROJECT BRIEF

6.1 Forth Valley College Masterplan

6.1.1 Masterplan Strategy

The project brief started by referring to a number of previous masterplan strategies which have defined a hierarchical pattern of land use, enabling flexibility of future development within a disciplined framework. These masterplans still remain very relevant today and have been used to inform the development of these proposals.

A masterplan study and OBC in December 2014 confirmed the existing 10.6 acre site was insufficient for a new development and a site of 15.5 acres was required.

A further 4.8 acre section of adjacent land to the East has now been secured by FVC to ensure development of the optimum solution for the new campus development. The combined area of existing site plus new strip of land is 15.44 acres (10.64 + 4.80).

In preparation for the New Falkirk Campus development the college buildings on the existing 10.64 acre Middlefield Site were demolished in 2014.

6.1.2 Masterplan Brief

The brief and aspiration of the College Masterplans was to deliver the following:

- Increase main road profile / maximise frontage
- The plan should be phased to minimise disruption to the College activities
- The plan should be phased so that a complete working College is always available, bearing in mind possible pauses in the implementation which could leave the work partially complete for potentially significant periods
- Consider the re-use of existing buildings where appropriate
- Maximise new-build benefits: increased efficiency, sustainability & utility of performance
- Workshop & Teaching accommodation provision to reflect current and future demands from industry e.g. Flexible Learning Spaces
- Maximise useful land to be retained for future expansion of the College whilst allowing for appropriate land disposal to raise funds
- Increase use and enjoyment of existing mature landscaping and also to enhance perception of a green and pleasant campus with links to Helix Central Park

The FBC proposals have fully met these aspirations.

6.1.3 Artist impression of early New Falkirk Campus on extended Middlefield site, for OBC in December 2014

Table 6.2: Existing and proposed student numbers

STUDENTS	EXISTING	PROPOSED
Full time	1,812	1,907
Day Release	605	613
Part time	4,913	4,922
Flexible	2,718	2,718
Evening	817	939
TOTAL STUDENTS	10,865	11,099

6.2 Student, Staff and WSUMS/Credits Brief

As the main Forth Valley College headquarters, the Falkirk Campus will cater for over 11,000 students, including around 1900 full-time, 600 day release and 4,900 part-time students.

Although the Falkirk portfolio will support entry level programmes across all subjects, the key curriculum areas of electrical instrumentation and chemical engineering, applied science, mechanical engineering, computing, construction, oil and gas process technologies, sport, hairdressing and beauty therapy will be based in the new campus.

Table 6.1 : Existing and proposed wSUMs/Credits

WSUMs	EXISTING	PROPOSED	CREDITS
Falkirk	73,303 (60%)	75,303 (62%)	52,993 (62%)
Alloa	18,512 (15%)	18,512 (15%)	13,392 (15%)
Stirling	30,072 (25%)	27,849 (23%)	19,829 (23%)
TOTAL WSUMs	121,887 (100%)	121,664 (100%)	86,214 (100%)

Table 6.3 : Support Staff Numbers

Support Departments	Headcount	FTE
Exec Office	8	8
Senior Management Team	5	5
Support Staff	3	3
Buss Development	57	48.3
Head of Department	1	1.0
Support Staff	56	47.3
Curriculum and Quality	9	9.0
Support Staff	7	7.0
Teaching	2	2.0
Estates Development	12	12.0
Head of Service	1	1.0
Janitorial	7	7.0
Support Staff	4	4.0
Financial Services	14	13.8
Manager	2	2.0
Agency/Consultant	2	2.0
Support Staff	10	9.8
Student Services	13	11.3
Manager/HOS	1	1.0
Support Staff	12	10.3
Student Association	5	5.0
Support Staff	5	5.0
LRC	8	5.5
Manager/HOS	1	0.8
Support Staff	7	4.7
Equalities	12	11.58
Manager/HOS	1	1.0
Support Staff	11	10.58
Information Services	20	19.2
Manager/HoS	2	2.0
Support Staff	18	17.2
Information Technology	13	13.0
Manager/HoS	1.0	1.0
Support Staff	12	12.0
Communications and Marketing	10	10.0
Manager/HOS	1	1.0
Support Staff	9	9.0
Core Skills	17	15
Academic Staff	8	7.0
Support Staff	9	8.0
Grand Total	198	181.68

Table 6.4: Teaching Staff Numbers

Teaching Departments	Head count	FTE
Access and Progression (A&P)	15	12.4
Head of Department	1	1
Curriculum Managers	2	2
Administrator	1	1
Lecturing staff	9	6.4
Additional Support workers	2	2
Applied Science Maths Mechanical Engineering (ASMME)	51	43.34
Head of Department	1	1
Curriculum Managers	3	3
Lecturing staff	38	31.74
Technician	7	5.6
Administrator	2	2
Business (BS)	19	18.6
Curriculum Managers	1	1
Lecturers	18	17.6
Creative Industries (CI)	11	10.07
Lecturers	10	9.07
Curriculum manager	1	1
Construction (CO)	32	29.09
Head of Department	1	1
Curriculum Managers	2	2
Lecturers	21	18.29
Administrators	2	2
Technician and Assistants	6	5.8
Care Health and Sport (CR)	35	26.3
Head of Department	1	1
Curriculum Managers	3	3
Lecturers	27	18.8
Administrator/Support	4	3.5
Electrical Instrumentation Engineering (EICE)	54	49.5
Head of Department	1	1
Curriculum Managers	4	4
Lecturers	39	35.5
Administrator	1	1
Technician/Tech Assistant	9	8
Hospitality and Salon Services (HSS)	30	22.01
Operations Manager	2	2
Lecturer	13	9.28
Technician	1	1
Catering	14	9.73
Grand Total - Teaching	247	211.31

6.3 Schedule of accommodation

The previous Falkirk estate of 28,100m2, includes the area of the Middlefield Buildings (7,100 m2) which were demolished in April 2014 and was the first phase of our rationalisation. The Falkirk Campus continues, however, to have inefficiencies by the inherently inflexible spaces given the ageing nature of the buildings. By comparison, the new estate will offer efficient, flexible teaching and learning spaces that will readily adapt to future teaching pedagogies - all contained within a further reduced footprint of 20,148m^2 (GIFA).

The area of the new campus represents a significant 28% reduction on the area of the original estate at Falkirk. This will deliver 3.74 wSUMs/m2 (75,303 wSUMs ÷ 20,148m^2), creating a footprint which offers significant utilisation and efficiency improvements and is above the target of 3-3.5 wSUMs/m2 historically set by the Funding Council.

The project also benefits from a high planned room utilisation figure of 70.81%, well above the current target of 56%.

6.3.1 Area Benchmarking, GEMS calculator and comparative method

The size of the proposed new estate was determined following extensive user group consultation, close liaison with the College Estates team and cross checked against the Guidance for Effective Management of Space for Scotland's Colleges (GEMS) - Quick Calculator method.

The final agreed area of the new College estate was also robustly tested via benchmarking exercises, using data collected from similar new Scottish College facilities, to ensure the proposed new building area reflected current standards. Table 6.5 details the outcome of a review of wSUMs per m² of Gross Internal Floor Area for comparable FE projects.

Table 6.5: Comparison of : wSUMs/m^{2}GIFA

College	WSUM's / m² GIFA
Forth Valley College - Falkirk	3.74
Motherwell College	3.50
City of Glasgow College	3.22
Kilmarnock College	3.21
Inverness College	3.12
Dumfries & Galloway College	3.11
Anniesland College	2.87

As stated above the figure of 3.74 wSUMs/m2 is above the 3-3.5 wSUMs/m2 target guidance historically set by the Scottish Funding Council. It should be noted that the design process is in the early stages and opportunities for greater space efficiencies and utilisation will be monitored by the design team as the project moves to RIBA Stage 4.

Table 6.6: Area Comparison

Department	Current	Proposed Area - Sqm
EICE and ASMME Workshops	4459	-
Applied Science, Maths and Mechanical Engineering	-	1758.3
Engineering	-	1590.4
Construction	2303	1957.9
Exec Suite	313	180.9
Refectory (HSS)	614	972.7
LRC – Learning Resource Centre	483	453.8
Care Health & Sport	1438	1235.5
Business Development	425	340.8
Access & Progression	380	138.2
Business	664	242.3
Creative Industries & Computing	492	443.4
Core Skills	448	-
Salon Services (HSS)	429	419
Communications & Marketing	244	111.5
Estates & Facilities	173	153.1
Reception & Student Hub	288	252.8
ICT	245	43.8
Staff Workrooms	2056	1768.3
Assessment Centre	76	70.7
Flexible Learning Space	0	929.3
Shared Teaching	-	1638.7
Facilities Management	-	15.3
General classrooms outwith department	387	0
College Hall & Storage Savings	492	0
Total area (net) Sqm	16409	14716.7
BALANCE AREA- Sqm/Other	4591	5431.74
GIFA (sqm)	21,000 (28,100 – 7,100)	20,148.44

KEY

Electrical Instrumentation and Chemical Engineering (EICE)
Applied Science, Maths and Mechanical Engineering (ASMME)
HSS – Hospitality & Salon Services

6.4 2016 Business Case Brief

The design of the building was originally based on the existing and OBC schedules which were prepared and issued by Forth Valley College based on a review of the existing and anticipated need for the new Campus (Table 6.6). Numerous exercises have been undertaken with each Department Head, Student Association and Project Co-ordinator to further challenge and refine the space required.

The designs have evolved through a process of informal and formal dialogue and consultation that has taken place throughout the entire process involving all senior management, department heads, lecturers, facilities management and last but not least, students.

We are confident that the revised (proposed) areas in Table 6.6 and proposal set out within this report are capable of delivering on the aspirations of the FVC as well as building on invaluable experience gained in the process of designing and building the two campuses at Alloa and Stirling.

At the next stage, with funding and agreement in place, the appointed team will continue the process of dialogue to inform further development of the principle strategies adopted. This will be continued through a series of carefully coordinated detailed briefing 'user meetings' to discuss each individual space within the building, with a view to preparing a set of 'room data sheets' for each department. Detailed studies can then be carried out to further develop and validate key aspects of the building layout, such as department adjacencies and reviewing various technical aspects of accommodation that is unique within FVC family of buildings to Falkirk. Throughout this process, the intention is that the design team will build on the successful working relationship developed between design consultants and college personnel, plus the invaluable experience gained producing earlier buildings.

6.5 Spaces for Learning

The "Spaces for Learning" report also provided useful guidance for college's implementing estates developments. Although the report is now almost ten years old, many of its key findings are still relevant today, however we must also be mindful of more recently emerging trends in approaches to learning, in order to ensure that the learning spaces we design are also fit for the future.

"Spaces for Learning" identified that approaches to learning in educational settings were changing and that traditional "teacher-centred" models, involving the passing on of knowledge, were being replaced with "student-centred" approaches, emphasising the construction of knowledge through shared situations. This direction of travel has, indeed, gained pace in the intervening years and the emphasis continues to shift yet further towards student co-creation of; and engagement in decisions about how, when and where learning will take place.

A further trend is towards even greater collaboration in learning – what "Spaces for Learning" described as "learning through conversation". There is ever increasing emphasis on peer learning, groups researching topics and solving problems collaboratively and on integration and peer collaboration across subject boundaries 'transforming existing conditions into preferred ones'.

Technology, also, has moved on, particularly regarding the use of mobile learning. Most students now own their own smartphone or tablet and often wish to use their own devices to access learning resources and participate in virtual collaborative activities from wherever they choose, rather than be tied to a fixed computer terminal.

All of this is reflected fully in the college's current Learning Strategy: Empowering Learners and will continue to be fully reflected as we develop the next evolution of our learning strategy – yet more strongly focused on creative learning and technology for learning.

6.5.1 Group learning and teaching

These spaces fall into three categories: general classroom spaces; IT labs; and practical workshops. As advised in the report, we are providing relatively small, rectangular spaces for general classroom spaces, although we plan for these to be slightly larger than Alloa and Stirling to accommodate larger class sizes. These will be equipped with the most up to date technology possible and will include accessible facilities for students to use their own devices. Building on what we have learned from the design of our classroom spaces in Alloa and Stirling, we will design these spaces to positively encourage collaborative, student-centred learning and avoid a default to teacher-centred approaches. To achieve this, we will aim to have at least two "points of focus" within each room, for example on writable wall surfaces. We will also aim to

furnish classrooms with proven sector leading ideas on furniture to promote group collaboration and discourage didactic teaching approaches, whilst still retaining sufficient regulatory furniture for exam purposes.

A similar approach is planned for general IT labs, where inward-facing round furnishings will eliminate the isolation of "facing the wall" IT layouts. IT labs will be equipped with fixed or portable technologies, depending on their purpose.

Practical workshops, although also designed for group learning and teaching, will be specified in a later section, due to their more specialised nature.

Throughout all of our group learning and teaching spaces, we want to make learning open and visible, to promote feelings of inclusion, sharing and celebration of learning. To achieve this we would aspire to include significant use of glazing in corridor walls.

6.5.2 Simulated environments

Simulated learning environments are provided for health care, early years and business learning and also in specialist workshop and practical engineering facilities. Real working environments open to the public, will be included for hair and beauty learning. The same principles of openness and visibility apply to these learning spaces, as appropriate to the nature of the work.

6.5.3 Peer and social learning spaces

A wide range of collaborative and social "flexible" learning spaces are provided throughout the building, accommodating individual study spaces, as well as spaces inviting very small groups and slightly larger groups. These will be technology enabled and will support students bringing their own devices. These will vary in their level of "formality" to provide choice and variety. The importance of these spaces has been highlighted as a priority in the evaluation of the Alloa and Stirling campuses.

The social centre of the building is the refectory, situated at the heart of the campus to encourage maximum use and promote social interaction. The Learning Resource Centre will also include group study areas.

It is proposed that the Refectory will also be utilised for informal meetings/flexible learning spaces by the careful selection of appropriate furniture.

6.5.4 Learning clusters

The flexible spaces described above will be positioned within/adjacent to clusters of classrooms to encourage their use as breakout spaces, as well as the more creative timetabling of enclosed group learning spaces. This principle will be extended to the workshop areas of the campus, to provide greater flexibility and integration of theoretical and practical learning in the same space.

6.5.5 Individual learning spaces

Space within the centrally located Learning resource centre is dedicated to "quiet study" and, again, the flexible/social learning spaces will be designed to accommodate individuals as well as groups.

6.5.6 External spaces

The plan of the building includes three large courts. These will be landscaped in a manner which allows for a variety of educational uses, from outdoor gym exercise to individual study and group learning.

Spaces for Learning also identifies Twelve Keys to creating successful learning spaces:

Articulate a learning plan

Forth Valley College has spent considerable time and effort, not only in evolving a learning plan, but in ensuring that it is articulated and communicated to the project team. The essential parts of this were contained in the College's Strategic Vision document, supplemented by the more detailed information contained in the building brief. This has been developed in conversation with both.

Our comprehensive and well-established Learning Strategy: Empowering Learners, sets out a clear blueprint for learner engagement in and ownership of their own learning

Integrate your plans – Learning, Strategic development, Estates

The requirement for the current project was identified through a comprehensive process of investigation which was completed in summer 2008. The College undertook this process assisted by a professional team led by BDP Architects, and covered all relevant issues including the education needs of the communities to be served, suitability of existing estate, opportunities for rationalisation, future trends and consequent need for flexibility, transport etc. The vision which emerged was of one College on several campuses, a vision which has since been partly implemented through the developments in Alloa and Stirling and which the current project seeks to complete.

Involve all stakeholders: Academic, IT, Estates, Students

The briefing and design process for the current project is still being developed, but already has involved designers holding conversations with groups of stakeholders, whilst further consultation has been undertaken by the College management and Estates staff and the results incorporated.

Select an Informed Design and Implementation

The College originally assembled its design and implementation team by holding a competitively tendered selection process for each discipline utilising SFT Frameworks. As leaders of the creative process, the Architects tender also included a limited design competition. The resulting team is therefore not only one of the strongest available; it is in touch and in tune with the aspirations of the College. The success of this collaboration is evident in the projects so far completed.

Learn from others – site visits, case studies, discussion forums

During the course of the project, representatives of the project team (both designers and College staff) have visited a large number of new further and higher education buildings as well as other highly successful buildings in Scotland. This has allowed early identification of both successful and less successful areas, which have been taken into account during the briefing and design processes. This process of learning will continue through further planned site visits

Experiment with new ideas

As a college, we are strategically committed to promoting creativity in learning, both by encouraging and supporting staff to work with their students to adopt approaches to learning that develop students' own creativity skills and also to take more creative approaches to the use of resources, including, space and time. We intend that our spaces for learning promote these ideals and encourage staff and students to think well beyond the traditional timetable and traditional didactic teaching approaches, with learning activities taking place within a designated room or area for a designated slot of time. Our learning spaces should discourage a default to teacher-led approaches and positively encourage the experimentation with new ideas.

Integrate suitable IT and audio-visual tools

IT Provision has been the subject of careful study, resulting in the College seeking the most flexible and future-proofed solution available. We aim to ensure the entire building, along with adjacent outside areas are IT enabled to ensure the most flexible and mobile solution is available to meet the IT needs of our students and staff. This will be achieved through the provision of a high-density wireless network capable of meeting the connectivity demands of many concurrent users, supported through a robust and secure wired network. Our network will support a range of laptops, tablets, PCs, Macs and mobile devises. This sustainable, flexible system will bring long term benefits to the College. In line with current College policy, state of the art teaching aids will be installed in every teaching space, including those in the workshop areas. Access to computers will be generally available throughout the College building through both wired and wireless connections. Learning spaces will be equipped with ready access to recharging points for students wising to bring their own devices.

Introduce flexibility for different learning modes over time

The need for long term flexibility is paramount in the design of a further education facility. The overarching strategy therefore is to include as much general space as possible, with a corresponding reduction in specialised space. Combined with a careful selection of the size of spaces

provided, this will allow for maximum flexibility without the need for physical alteration. Where such alteration is required, the building has been designed with a flat slab structure and lightweight partitions to facilitate this work. Services are distributed through a raised floor and suspended ceiling, maximising, flexibility in the short and long term.

Re-skill users to make best use of new spaces in new learning modes

The college provides ongoing development for staff and students to enable them to make best use of facilities for learning and teaching. For staff this includes development in the use of ICT and the virtual learning environment, health and safety training and pedagogies, as well as general continuing professional development. Staff development will adjust and re-focus to incorporate the requirements of the new environment as the College prepares for relocation to the new building. FVC continues to have a strong strategic focus on creative learning and developing staff capacity to embed creativity in their approaches to learning.

Manage the space well – bookings, layout, maintenance

The overall layout of the building has been (and will be further) the subject of much conversation between the design team and College staff. Social interaction, ease of staffing, public access, security, views, flexibility, sustainability and acoustics have all been factors. Similar conversations will take place regarding the content and layout of the individual spaces.

Through the life of the overall project these discussions have allowed the College to consider more effective and efficient ways of working, and best practice in terms of Health & Safety and Learning & Teaching, and the building has been designed to reflect this.

Insist on learner and teacher feedback on learning effectiveness

The college has in place robust and effective systems for staff and student feedback and embeds reflective practice and evaluation within all learning and teaching. Staff are actively engaged in providing feedback on learning effectiveness through programme review meetings and a robust and inclusive self-evaluation process. All students are invited to engage in biannual Listening to Learners Focus Groups, which have a clear focus on learning effectiveness, and participation levels are consistently high. A strong class representative structure supports this activity and also feeds into regular Student Council meetings with members of the Senior Management Team.

These groups are critical in the college evaluation process and are key to influencing change. They will continue to review learner effectiveness within the learning spaces of the new building

Publicise the findings

The college will actively seek opportunities to share experiences of the process of consultation, briefing and designing spaces for learning, as well as the impact of the new building on learning effectiveness. This might take place through open events, published articles, for example Times Educational supplement, or entry into competitions.

Post occupancy evaluation

The College will participate in a three stage process of post occupation evaluation; Stage One 6 – 12 months after handover; Stage Two 12 – 18 months after handover; Stage Three, 3 years after handover.

7 PROPOSED PROJECT

7.1 Introduction

The proposed project is a £83m (inc VAT), 20,148m^2 New Falkirk Campus Headquarters on the Colleges existing and extended Middlefield Site in Falkirk.

The design takes as its starting point the new campus facilities recently completed by the College in Alloa and Stirling. These buildings have been particularly successful in their interpretation and support of the College's aspirations for the development of new patterns of learning, involving increased interaction and an attitude of respect.

It is often pointed out that the requirements of the further education sector are very different to those of higher education. A further education College serves the community, of which it is a part, providing the members of that community with the skills required to fulfil themselves as useful members of society. A university, on the other hand, tends to see the institution as an end in itself, and draws its students from a wider catchment due to the more specialised nature of its courses.

This difference has a profound effect on the buildings that each institution requires – a further education College is a multi-functional institution with an immediate and continuing requirement for flexibility. This arises from its desire to serve the needs of the community – needs which can change with astonishing rapidity. A university, with its more self-determined remit, has more opportunity to develop specialisms in the medium and long term, and to construct bespoke accommodation for them.

We believe, however, that in terms of attitudes to design there is, or should be, much common ground between the two. In particular, further education buildings should treat the student population with respect. The painting and decorating, hairdressing and engineering students should be made to feel valued by the care which has been taken in designing the learning environment – circulation and social spaces as well as the learning spaces themselves. Aspirations and expectations should be raised, and spirits should lift. Universities, who have long been in direct competition for the best staff and students, have perhaps placed more emphasis on this aspect of their architecture.

For the Falkirk project the evolution of both the brief and the design has been achieved through a collaborative conversation between client and the team, developing the fundamental attitude and approach employed in the earlier projects. As with the previous schemes the design recognises the influence that architecture has on the social environment. The refectory is placed at the intersection of two key axes at the heart of the building, with most journeys passing through it. This encourages social interaction between students (and staff) from different disciplines.

The relationship of the building to its surroundings and community is crucial. Active common facilities such as learner centre (including library), sports facility and hair and beauty address the approach to the campus and are associated with entrance, bringing prominent educational and community functions close to the public domain and allowing them to be used for non-College functions when available. Indeed the development of the architectural diagram reflects the need for the building to operate as flexibly as possible, with the ability for significant sections of the building to remain open and accessible to the public for evening and weekend functions.

It is intended that the development of the design will reinforce much of what was done at Stirling and Alloa, but taking on board the lessons learned to achieve further improvement. In this regard, as previously mentioned, the Post Occupancy Assessments of the new campus buildings at Alloa and Stirling provide a useful framework for the ongoing development of the new headquarters facility at Falkirk.

7.1.1 Forth Valley College Alloa Campus

7.1.2 Forth Valley College Stirling Campus

7.2 Site Strategy

Overview

Having been a dominant feature of the site since the 1960s, the new FVC Falkirk campus building on the Middlefield site will transform the character of the main artery into the town centre from the East, assuming a prominence that is appropriate to its standing within the local community and the wider educational field.

Overall strategy

Occupying this critical point on the edge of Falkirk, linking the town centre with the Helix Park, the Canal and beyond to Grangemouth with the Ochil Hills as backdrop, the importance of how the new building responds to this setting and addresses the main roads on the site boundary could not be more important. This site may lack the drama of the magnificent riverside setting and views at the Stirling campus, or the striking elevated setting in Alloa, but the existing context for the Falkirk College provides enormous potential.

The architectural proposals developed for the new FVC Falkirk Campus have been largely influenced by a deep and thorough understanding of the aspirations and working practices of the College which was developed through successful collaboration on the Stirling and Alloa buildings. The design development of the site layout and building layout, including its form and massing, have been developed simultaneously, informed by the principles established that increase the civic contribution of the College to the immediate and wider community.

The semi-urban townscape context of this edge of town campus development located on the periphery of Falkirk's eastern approach is extremely prominent and can be accessed readily from the M9 to the east and directly from Falkirk town centre to the west.

7.2.1 Strategic Location

Accordingly, the building has been located close to the primary southern edge, with the west frontage set back to maintain the existing mature tree belt which occupies the periphery of the site to Middlefield Road, thus ensuring that the new campus will retain the green and leafy benefits it has always enjoyed. In addition to the external public realm spaces, internal courtyards are formed to create interesting and useful sheltered spaces, introducing not only natural light and ventilation but providing the opportunity to utilise the courtyards as integral learning spaces. The areas of the building which will be extensively used by the wider public and community have been arranged along the southern frontage of the site addressing Grangemouth Road. By grouping these facilities along this edge it provides both ease of access and an important visual 'animation' to the adjacent primary route to Falkirk town centre.

7.2.2 Views and Connections

The general and specialist teaching spaces are arranged immediately behind this 'civic frontage' and to the east the workshops with their associated service yard are placed to take advantage of a new service access point from Grangemouth Road. The service yard is located in order that the workshops, energy centre and kitchens can all benefit from a central service point.

The building form and massing has been generated to develop a low level development in keeping with the surrounding single storey buildings to the north and the 2-3 storey domestic scale to the properties to the south of the site. In locating the form of the building to the southern part of the site, the parking component of the scheme has been arranged to the north of the site, largely away from public view. This varied massing of the principal southern elevation breaks down the apparent mass of this relatively large building, creating a rich and varied profile and appearance, configured to present a lively, interactive and attractive facade to the town.

A clay brick building is proposed completing the trio of Forth Valley College buildings, which have a similar vocabulary and treatment and obviously belong to the same family.

Site Hierarchy

The design of the building layout and location of functions will be dealt with in the following sections in greater detail, but a brief summary of the zoning of the site follows:

- The southern entrance is placed to the south west corner of the site addressing this key 'node' and approach from Falkirk town centre
- The sports building occupies the other key 'node' to the south eastern corner of the site, addressing both the main approach into Falkirk from the M9 and beyond and the adjacent 'Gateway' site to the east
- The key public spaces of LRC / Refectory / Hair and Beauty / Student Services Hub and Foyer space have been strategically located to the south to create the potential for a new 'civic frontage
- To the west, the staff functions are arranged on 2 levels in a 'strip' of accommodation running north-south, taking benefit of access and views into the central courtyard spaces and the mature belt of trees to Middlefield Road
- 'General Teaching' and flexible classroom spaces have been arranged in the central 'strip' of the main classroom block allowing them to be immediately accessible to the whole campus and taking benefit of pleasant views into the courtyard spaces
- 'Specialist' teaching spaces such as labs and engineering classrooms have been zoned to allow these more heavily serviced spaces to take advantage of the main rooftop plant spaces immediately above to provide mechanical ventilation and extract
- The workshop spaces have been arranged to the east of the site, taking advantage of a shared service yard
- A 'Green Link' has been developed to tie the building into its wider context and make important connections with the development on the adjacent 'Gateway' site. This link would provide a publically accessible green route which would strengthen connections from Victoria park in the east, through to the newly developed Helix Park and Kelpies to the west of the site

7.2.3 Green Link

- The majority of site car parking is formed to the North, away from the public edges which will be screened from view by the new buildings and existing mature tree belts

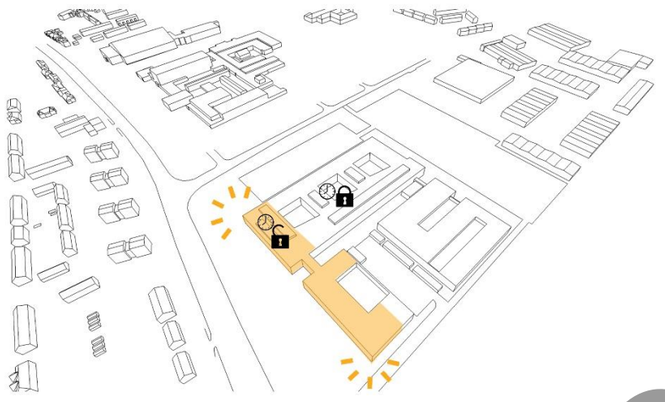
The placement, or zoning of external and internal activities and functions are inevitably intertwined. For a relatively large building a simple and logical arrangement of site layout, activities and building form and massing can be very effective and durable over many years provided that this incorporates issues such as orientation, priorities of site access for pedestrians, vehicles and services, deliveries, parking and services.

7.3 Outdoor space

Public Frontage

The new campus buildings are located close to the south of the site boundary and main artery into Falkirk assuming a prominence appropriate for the site context and the College's civic role.

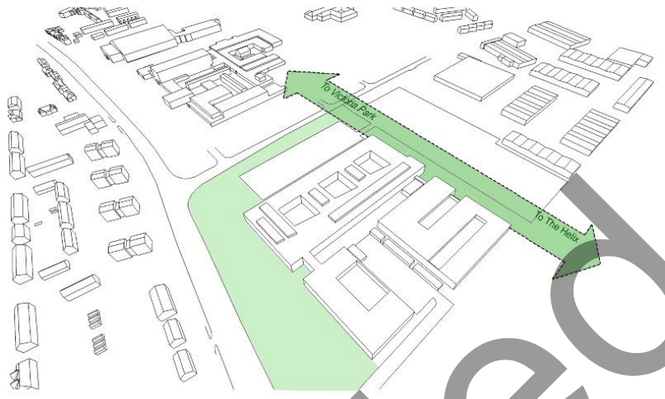
7.3.1 Public Frontage



Green Links and Open public space

As noted earlier there is, without doubt, a connection between intellectual activity and walking. A place to walk is therefore desirable, and the 'greenway' route passing across our site connecting Victoria Park to the Helix Park and beyond provides a perfect opportunity for the College to contribute to this

7.3.2 Green Belt

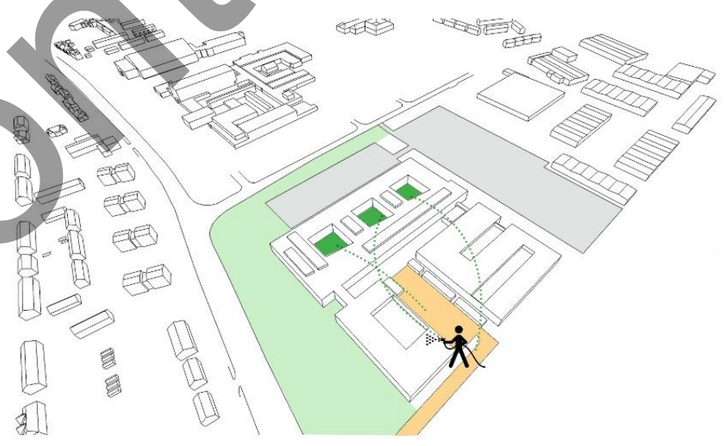


The building is approached, by foot, cycle or motor vehicle, over ground designed to be public open space. This includes access roads, drop off areas, parking, footpaths, cycle-paths and associated landscaping.

Academic courts

The courtyards will provide a place to study, a place to relax. Sheltered, with an element of privacy. As well as visual amenity these space provide the opportunity for the spaces around them to benefit from natural ventilation and daylight wherever possible

7.3.3 Courtyard Access



Service Yard

A dedicated service yard is provided, screened from the road and bulk of the Campus by the double height single storey workshops that use them.

Parking

Parking is an essential and often sadly undervalued urban realm feature of many new developments. The majority (circa 460 spaces) of the relatively large parking area required by the Campus has been placed to the North of the site, largely screened from view from Grangemouth Road by existing mature trees and the buildings they serve. In addition around 140 spaces have been created to the west of the development to provide additional parking (including accessible spaces) and a drop off area at this important node.

7.4 Arrival and Circulation

Key Moves

Pedestrian and vehicle access would be kept separate wherever practicable and clearly defined across the campus. Service vehicle traffic access is further separated from general vehicular traffic avoiding the risks and complications that are introduced when these two functions are combined on shared roads.

- The vehicle access strategy is that as a general rule, car traffic reduces as you travel towards the building and entrances
- Middlefield Road will be used as the principal entrance for staff, student and visitor vehicles using the College
- Services vehicles have a dedicated access to the east off Grangemouth Road, leading directly to the shared service yard
- Visitor parking is located as a distinct element in its own right, doubling up as drop off point for taxis and private vehicles, and providing accessible parking spaces located conveniently close to the entrance
- The bulk of staff and student parking is located to the north of the site
- The facilities are significant, based on the requirement of a substantial College building. The full extent of car parking will be largely screened from the site boundary given it is located behind the buildings on the site edges with an existing densely planted screen of mature trees on Middlefield Road
- Pedestrian routes from car parking to the building entrances are enhanced by tying into a landscaped green-link that passes across the site
- Building entrances are located on prominent, logical points on the site's south west and north facades. These provide strong connections to the existing public transport network and parking to the north.

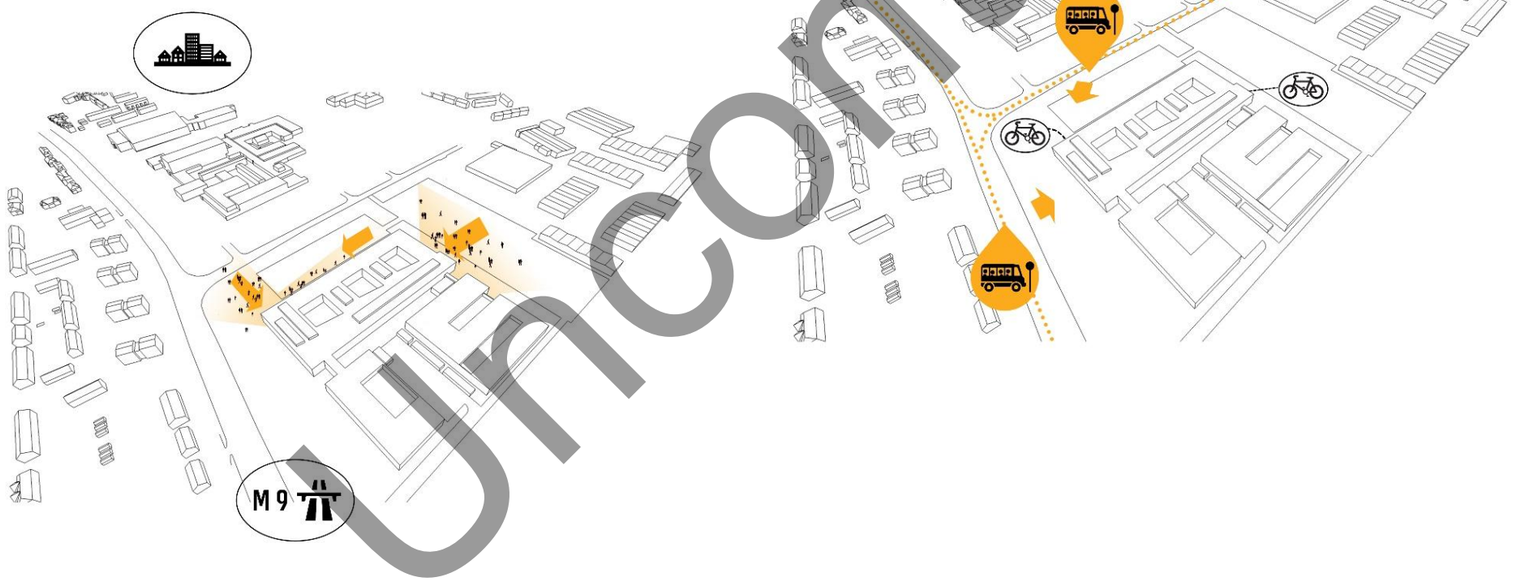
- Pedestrian routes connect to the building to a larger network of paths and routes that create an attractive, coherent landscape that is safe, efficient and a joy to use and which ties in with key pedestrian greenways planned to pass through the college site, connecting Falkirk town centre with the Helix, the Canal and Kelpies, Grangemouth and beyond.

Pedestrian Access

The layout pattern of arrival and circulation for pedestrians across the site will create a new campus with clear, attractive, direct and of course, safe routes to the building entrances.

Pedestrian access to the new campus building entrances are very straightforward; located to the west end of the site to tie in with existing bus routes and stops on Middlefield and Grangemouth Roads. For those arriving by public transport, the routes to the building entrances have been made as direct as possible to ensure these are easily located; and pedestrians will not have to mix with vehicular traffic within the site. Entrances are located to the west of the new building – one from north and one from south as indicated by arrows on the diagram below. These entrances provide access to a common space from which all of the public functions can be reached. From the north an additional and separate entrance has been provided to provide direct access to the building for those using the main car parking provision to this part of the site.

7.4.1 Pedestrian access



Vehicular Access

The main building entrances are clearly legible from the vehicular access points to the main campus, giving visitors a clear idea of the site layout and organisation to orientate themselves and to create an attractive, safe and stress free navigation across the site regardless of where they park.

- Staff, students and visitors enter the Campus off Middlefield Road
- The bulk of parking is provided to the north of the site with visitor parking and drop off provided to the west (adjacent to the public entrance)
- Bicycle Shelters and lockers will be located adjacent to the entrance points to allow easy access and passive observation of the facility
- Services vehicles use a separate access road to the east of the site via a new junction formed off Grangemouth Road

7.4.2 Public & Sustainable Transport

Drop off and accessible parking

Drop off point and parking for disabled drivers and visitors is provided to the south of the access road adjacent to the building's western entrance point. In addition, accessible parking is also provided to the north of the building adjacent to the staff and student entrance to the north.

The landscape design of this vehicle drop off and parking area is to be carried out in high quality surface materials consistent with buildings at the Stirling and Alloa Campuses.

A high quality surface treatment is proposed for this hardstanding area for vehicle traffic to enable this to merge with the adjacent area of open public space, which will be landscaped in a combination of hardstanding routes and soft landscaped planting to enhance the civic nature of this element of the building and to enable this to engage with the wider area.

Service Access

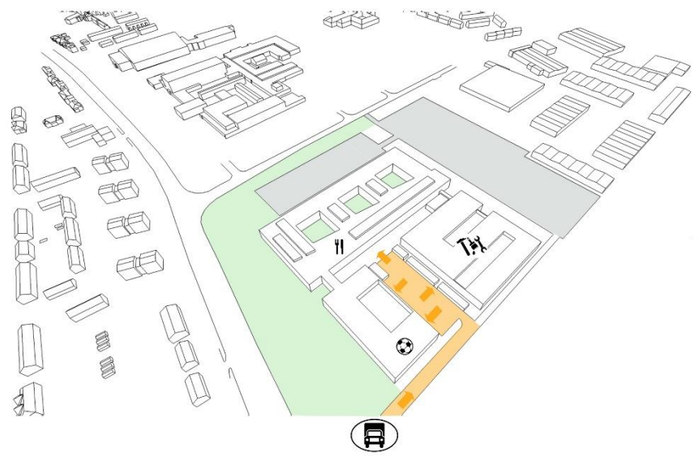
Service vehicles enter the site via a new dedicated access road formed on the southern boundary on the eastern section of Grangemouth Road boundary.

All vehicle deliveries - whether associated with the activities of the workshop, bulk storage or food for the College refectory - will drive into dedicated service yard located at the east.

Spaces requiring service access including workshops, kitchen, plant areas and storage compounds are located adjacent to the service yard which is sized to accommodate turning for the largest vehicles anticipated.

The service access is separate from the main car access - vehicles enter from Grangemouth Road as indicated on the diagram below. However, this route can also be utilised by the cars wishing to leave the site at peak times. This additional exit point would be controlled via a drop down barrier.

7.4.3 Service access



7.5 Parking provision

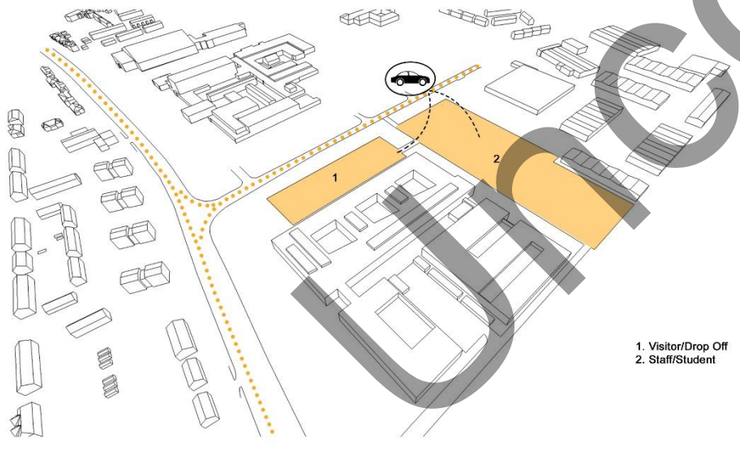
Campus Parking Provision

Details of parking are currently being developed through consultation with the College, Falkirk Council and the design team. The proposal currently indicates 455 spaces for staff and student parking to the north, with 139 spaces indicated for visitor and accessible parking to the west. A further 4 spaces are provided in the service yard bringing the total parking allocation to 598. The current parking provision in the existing Falkirk Campus is around 500 spaces. Falkirk Council have indicated that they will consider parkig proposals made by the project team via the planning process and that they would consider alike for like parking allocation to be reasonable proposal.

According to the Design Guidelines & Construction Standards for Roads in the Falkirk Council Area (1998) the provision of disabled parking spaces should equal 5% of the total number of parking spaces. Assuming the total number of parking spaces is around 600 the council will be looking for 30 disabled parking spaces. Disabled parking spaces are located adjacent to each of the principal entrance points. The requirement to achieve BREEAM credits dictates that no parking / road or set down should be within 10m of an opening vent or window, therefore there is an effective exclusion zone around the perimeter of the development, which means it may be difficult to place all of the 30 spaces within the recommended 45m of a building entrance. This point will need to be discussed more fully with building control to assess if the BREEAM requirement can be maintained.

Within the parking numbers described above there are also 15 priority spaces by the entrance for special guests or for the car sharing scheme. There is an additional allowance for 5 parking spaces for College vehicles within the private service yard. This comprises space for 1 van, 2 minibuses and 2 electric cars. Charging points for 6 electric vehicles will be provided, 1 dual point within the service yard and 2 dual points within the main staff and student car park.

7.5.1 Car Parking Zones



Motorbike Parking

Provision will be made for those travelling to the building by motorbike, with a total of 26 no. spaces provided adjacent to the south entrance.

Cycle Provision

The current proposals indicate 7no. covered cycle stands (14 cycles) under cover of the canopy at the south entrance, with a further 5no. Sheffield Stands (10 cycles) within a covered shelter. With the addition of 36no. cycle lockers to the north of the building providing secure parking this creates a total of 60 cycle parking spaces. All of these facilities will be located adjacent to the main entrance points of the building. The spaces to the south of the building will also allow easy access to the staff and student changing rooms and showers within the sports building.

Initial discussions with Falkirk Planning Department have indicated that the local authority will accept a cycle parking provision which is in line with the existing numbers provided at the current campus – confirmed by Forth Valley College as 35no cycle lockers and 3 stands (6 in each), combining to provide an existing provision of 53 spaces.

7.6 Building Design

Overall Diagram

The proposals introduce a large building onto a portion of the existing college campus in a manner that is intended to be both elegant and functional, creating an exciting building on this highly visible edge of Falkirk.

The intention is to create a building that enhances its civic role by placing a number of the College public functions onto the key frontage of Grangemouth Road whilst introducing a building form, scale and massing appropriate to the surrounding context.

The incorporation of the sports facility, learning resource centre, flexible learning space and refectory within the brief provides the opportunity for these areas to become part of a collection of 'front facing' activities directly addressing Grangemouth Road. This strip of accommodation provides the opportunity for an animated and dynamic façade, which connects visitors and passers-by with key activities within the building and increases the potential for commercial activity.

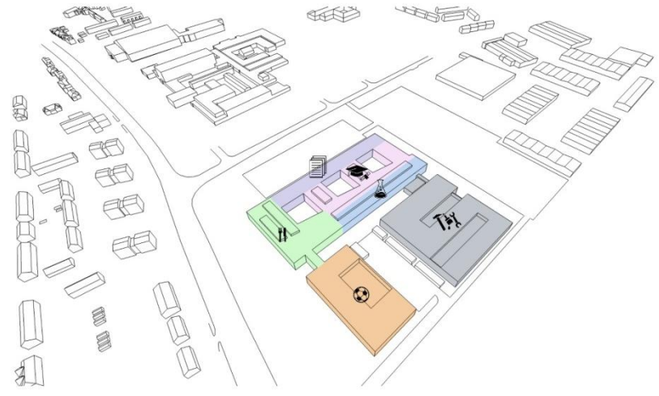
Brief and Building Diagram

Grouping similar activities and functions together provides additional advantages due to the fact that the spaces have similar servicing and structural requirements, and it allows a strategic diagram to develop which contains 4 main 'building blocks'.

An analysis of the required College brief schedule of accommodation revealed that the spaces can be placed into 4 broad categories:

- Workshop Space
- General Teaching Space
- Specialist Accommodation
- Social Space

7.6.1 Building massing



Entrance

The entrance strategy for the building recognises the concentrations of pedestrian and vehicular movements across the site. In consultation with the College, the need for a dual entrance was identified in order to provide a direct route into the building to the north from the staff and student car parking area (i.e. for those already familiar with the building layout). In addition a public / visitor entrance has been positioned to the south of the site to allow access to visitors arriving by car, those arriving on foot or via public transport.

The south entrance provides access to an entrance foyer space which contains the main reception point for the College, creating an open flexible space which links all of the public front facing functions of the brief. From this arrival point visitors will be able to make direct visual connections with external courtyard space and the key functions which form a 'cluster' around this important arrival space.

Refectory

The aim to introduce a main social space in the centre of the plan has encouraged a diagram which locates the refectory dining area at the heart of the scheme. This approach reflects the success of both Alloa and Stirling, where the refectory forms the spine of the building and works as a reference point while moving around the campus.

In Falkirk the refectory becomes a part of the main circulation – with its placement at the key intersection of the main axes of the building, it provides orientation for users as well as easy access to the rest of the building. The incorporation of the refectory within the 'route' ensures that movement through the building feels relaxed even at peak times. Part double and part single height glazed facades facing west and north allow access onto a secure courtyard space. These external spaces can be used in a variety of ways, including teaching, learning and studying.
The external areas provide good outdoor space with excellent landscape design that is sheltered from the wind.

The servery area, kitchen, stores and associate accommodation is located in the 'specialist' zone of the building where convenient access to the service yard is provided for deliveries

7.6.2 Main entrance view

Teaching Space

The teaching accommodation is split into 'general' and 'specialist' teaching. The specialist spaces comprise highly serviced areas such as labs and the hair and beauty salons. In grouping these spaces together a clear servicing strategy can be adopted and spaces which require mechanical ventilation due to their function can be gathered to extract efficiencies and make allowance for future flexibility.

The general teaching spaces will each overlook one of the landscaped courtyard spaces, with the specialist teaching areas taking access from the new College 'street' which runs north-south. The specialist spaces will face east towards the new gateway site with the Ochil Hills in the far distance.

Classrooms are evenly distributed across 2 levels of the main teaching blocks running west-east. General circulation routes allow informal break out spaces to be created at key 'node' points throughout the building. The aim is to provide a wide variety and choice of attractive, modern spaces that can accommodate a number of different activities and learning methods.

7.6.3 General classroom

Learning Landscapes

Learning is a continuous process, and on today's campuses it extends beyond the classroom to every available space. As active learning increases in and out of the classroom, libraries, café spaces and other informal learning spaces need to accommodate a broader range of student needs.

Providing students with control, comfort and connection to technology in circulation spaces, common areas and lounge spaces leverages often under-utilised real estate.

Corridor Circulation

The primary circulation route for students has been created running north-south in the new College 'street'. This space has been designed to progressively widen along its length to permit the opportunity for active learning in a variety of different settings and group sizes. A 'flexible learning space' is provided at the end of each of these circulation routes, animating the space whilst also allowing a visual and physical connection to the landscaped courtyard beyond. At ground floor these flexible learning spaces can also allow access to the external space of the courtyard.

Secondary corridors in both the workshop and teaching blocks have been provided at 2m wide, in order to allow a sense of generosity and also to mitigate the potential for damage that comes with a narrower dimension. Doors across corridors would be provided with electro-magnetic hold open devices which would retain the doors in the open position other than in a fire alarm condition, further adding to the sense of openness. Voids are provided at key locations to allow visual connections between floors, but also to allow natural daylight to flood in through strategically placed generous rooflights.

The key teaching spaces will be provided with internal glazed screens, not only to allow natural light to penetrate deep into the heart of the building, but to give visitors and learners alike a sense of the activities happening beyond.

7.6.4 Breakout area

Teaching Block

The building has been designed following the success of the Stirling and Alloa buildings to make full use of natural light and ventilation, thereby limiting the requirements for mechanical and electrical systems to the minimum. A full summary of the M+E strategy is contained in section 9 of the report. By generally limiting the depth of the rooms from the external wall to around 7.5m the average daylighting levels to the rooms are kept high with the majority of rooms able to be cooled and ventilated by providing a series of high and low level opening vents. The psychological benefits of being able to open a window to cool a space are also well documented. In general the internal environment will be user controlled. It is anticipated that the lower window opening will be operated by a handle, however due to the high ceilings of the classrooms the upper opening will require to be operated mechanically, the operation of the upper vent could also be linked to the BMS to allow the buildings to operate on a demand controlled ventilation strategy. This element of the design will be progressed during the Stage 3 & 4 design stages.

Glazing which faces South, West and East will be specified as high performance solar control glazing in order to reduce the overheating effect of direct solar gain. Blinds will be provided to the majority of spaces to combat glare.

7.6.5 Classroom Spaces in Stirling Campus

Workshop Block

Consistent with the original master plan strategy: workshops & particularly vehicle servicing are to be separate from all other vehicle traffic and pedestrian access.

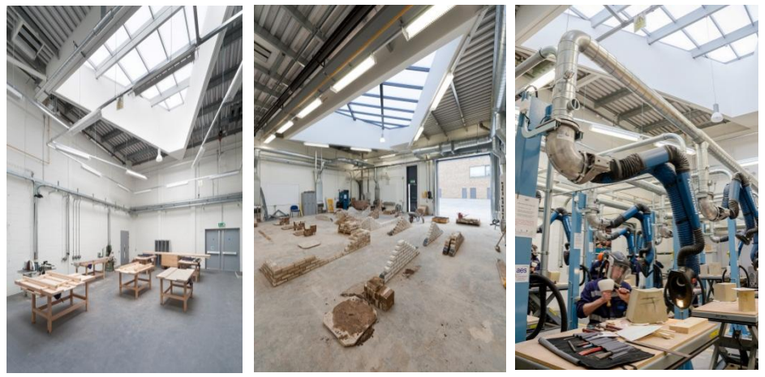
Consistent with overall building design strategy, the workshop accommodation is separated from all other general and teaching accommodation to create a rational and economic structural solution that avoids difficulties of conflicting space, volume and building services requirements.

A single storey double height workshop block is placed to the north east of the site, taking benefit of the adjacent service yard immediately to the south. The service yard is screened from the main road by the sports building and screen wall, providing a physical and visual barrier to activities beyond. Out of hours the screen will also serve to provide a secure zone at the rear of the workshops.

The workshops are designed in line with industry requirements and to provide flexibility, learning and teaching creativity. In keeping with the concept of creating flexible spaces for learning, the workshops will also benefit from the inclusion of break-out classroom spaces which can either be used for classes within the workshop block or can be used by the wider College community.

The access corridors which link the workshop to the main teaching block will be punctuated with carefully placed rooflights to allow natural light into what are essentially deep plan spaces. In strategic areas the workshops will be opened up with 'shop front' windows to reveal the activity taking place within. This was carried out very successfully at both Stirling and Alloa. In addition a series of glazed screens internally will provide views into each of the workshop spaces from the circulation routes, helping to infuse a typical journey through the building with an awareness of the 'learning' taking place within.

7.6.6 Workshops – Stirling Campus



Sports

Sports facilities are unique to the new FVC Falkirk site. The new campus replicates the majority of facilities provided within the current curriculum at Falkirk. The new campus will provide good contemporary sports facilities at an appropriate level for the intended use. Externally the sports facility is a significant component of the south-east corner of the facade and is strategically connected to the main entrance to allow the building to be used 'out of hours' if the College decided to run the facilities as a commercial concern.

The games hall addresses the approach from the M9 towards Falkirk town centre to the west and will incorporate glazed elements enabling views in and out. This is common practice in a number of sporting facilities and creates a dynamic facade when viewed from the street, especially in low light when the hall is illuminated. These facilities will provide the following accommodation:

Back of House and support accommodation

- Adequate equipment storage
- Changing Rooms and lockers

Games Hall

- Games hall can accommodate: badminton courts, basketball court and volleyball
- Opportunity to be used by external clubs
- Double height space
- Large open room within the campus suitable for variety of uses, including community use
- Views from corridor on floor above

Fitness suite

- Double height space
- Overlooking landscaped external space [views out while exercising]
- Potential to be used separately by the public out of hours through membership scheme

Gymnasium

- View out and natural light
- Ground floor location
- Single height space

7.6.7 Sport Facility Stirling Campus

7.6.8 Sports Village Aberdeen

7.6.9 View from the flexible space into the LRC Space

LRC

The LRC brief strives to create a variety of learning spaces that vary in scale, location and nature in keeping with the broad range of different learning techniques and methods that are now found in every further and higher education establishment and broadly covered in the section on Learning Landscapes. Situated on the first floor the LRC will be predominantly open to the surrounding circulation space – reflecting a subtle shift away from the traditional notion of 'library' as a hushed space created solely for quiet reflection and study.

Provision is made for quiet study in and around the bookstack area with the provision of glazed acoustic screens which will create a 'quiet zone' without cutting off the activity of these spaces from the remainder of the LRC spaces.

The requirement for IT enabled space which facilitates a flexible group learning approach will be provided in the 'open' areas of the LRC brief, with informal groupings and furniture which lends itself to both learning and social activity. In providing a flexible space at the heart of the plan this part of the brief can also be utilised as break-out if required.

The space planning of the LRC and furniture strategy will be carefully configured through discussion with the College to give an appropriate environment for each of the varied constituent activities.

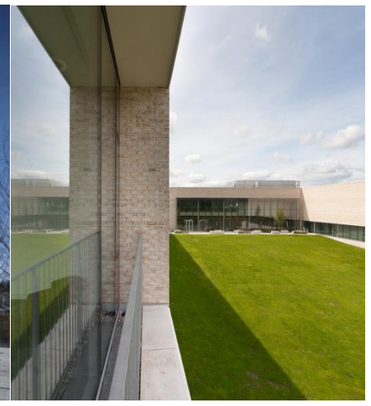
7.6.10 LRC Stirling Campus

7.7 In summary

We believe that these proposals create a prominent new 'centre of excellence' campus, continuing the history of the College on this site and its contribution to Falkirk's economy and culture, whilst extending the standard of facility and College identity already established at Alloa and Stirling to the headquarters campus in Falkirk..

7.7.1 St Andrews University, Bute Building

7.7.2 Forth Valley College - Stirling



Some important features of the architectural proposals are:

- Utilising the Middlefield section of the original campus enables an immediate & fresh appearance from the outset that phased alternatives could not achieve
- Clear zoning diagram giving efficiency and legibility to the building
- Consistent with original masterplan strategy commissioned in 2009 & 2011 which was well received by local authority planning officers
- Consistent with original masterplan strategy which could influence future pattern and use of development on adjoining Gateway site
- Provides an enhanced civic role within the community
- Provides a Campus with a safe, coherent & efficient vehicle access, parking & servicing strategy
- Vehicle entry at the west, pedestrian, public transport from south – with service access from the south via Grangemouth Road
- All 'general teaching' and staff accommodation areas of the building have shallow plan footprints to ensure these can be naturally ventilated where possible either via single sided or cross ventilation, reducing requirement/use of artificial lighting
- Benefits of increased efficiency associated with well-designed sustainable new buildings
- At two storeys the scale of the building and distance from boundary sits well within its context of other campus buildings, allowing Forth Valley College to contribute positively to the streetscape of this mixed use area
- Potential for the College site to tie in successfully with the Helix Project and related initiatives, and further, ideally raising expectations, ambition and scope for the connections to the gateway proposals immediately east of the new FVC site
- Increased use and enjoyment of existing mature landscaping and enhanced perception of a green and pleasant campus with links to Helix Central Park

Drawings

The list of drawings below are contained in appendix 1 of this report:

- 4254 (00) 003 K Site Plan
- 4254 (00) 100 N level 0
- 4254 (00) 101 P level 1
- 4254 (00) 103 H Roof Plan
- 4254 (00) 300 H Elevations - North/East
- 4254 (00) 301 H Elevations – South/West
- 4254 (00) 302 - Elevations – Workshop/Teaching/Sport
- 4254 (00) 303 - Elevations – Courtyards
- 4254 (00) 200 G Section AA/BB
- 4254 (00) 201 G Section CC/DD
- 4254 (00) 202 - Section EE-HH
- SCO 05/0454-01 B Proposed kitchen and servery
- SCO 05/0454-02 A Proposed coffee bar
- 833/H+M/OLL/01 D Outline landscape layout

7.7.3 Proposed new campus viewed from South East

7.7.4 Proposed new campus viewed from South West

7.8 Landscaping

Introduction

The landscape strategy outlines the response to the site and its context, explaining the key design proposals and providing sample images indicating the general character of the proposals.

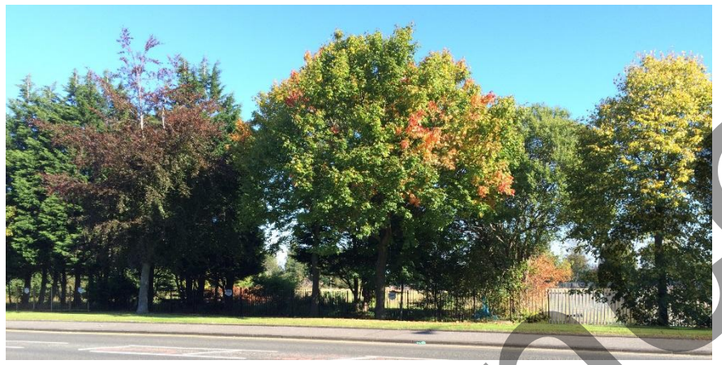
Influences on the Landscape Design Approach

As previous noted the site occupies an edge of town location, fronting onto the A904 Grangemouth Road, one of the major approaches into Falkirk from the M9 motorway. This route provides a major public frontage to the proposed campus site, and an opportunity to contribute to a new urban built and landscape edge to the A904. Residential, light industrial and educational land uses surround the site on three sides, with open agricultural fields lying to the east of the site, part of which forms the eastern portion of the proposed site.

Views from within the site are generally limited by a combination of boundary vegetation of trees and hedges, trees within the site and also by tree cover and buildings in the wider surrounding landscape. The site therefore has limited visual connectivity with the surrounding townscape/landscape.

A series of mixed mature trees occur on the site, predominantly along the western and southern edges and set within broad grass verges, and these contribute to defining the character of the site, particularly along Middlefield Road. The site is now levelled following demolition of the previous college buildings which occupied the site.

7.8.1 Trees Belt to Middlefield Road



The architectural design of the building in relation to its scale, massing and form, its material palette in terms of colour, texture and proportion and its layout in terms of entrance locations, has been a key factor in both the design of the various spaces around the building and the selection of specific materials and treatments.

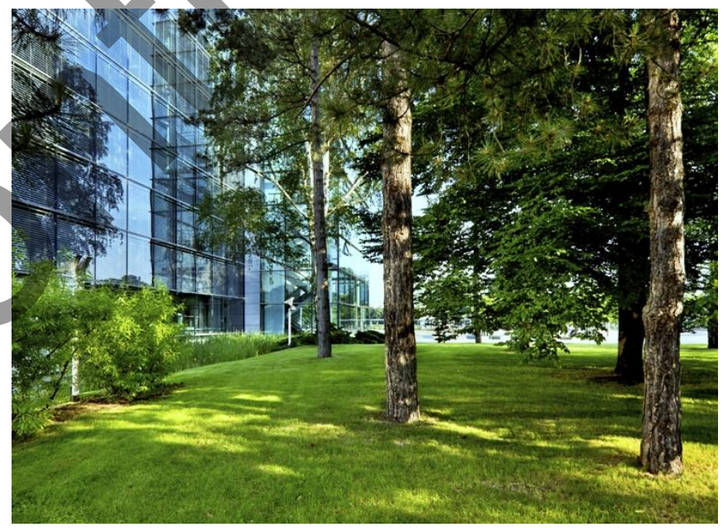
Landscape Design Approach

The landscape design approach is focussed on establishing an appropriate setting to the new Campus in relation to its landscape context, whilst aiming to create a pleasant learning environment for students. This approach responds to four main areas of the site:

- The public realm frontage of the building facing Grangemouth Road
- The entrance frontage and forecourt
- The landscape treatment of the car parking areas and their approach routes to the building
- The service court and other external spaces

The building frontage to Grangemouth Road comprises a linear parkland edge which wraps around the building as a continuation of the existing parkland along Middlefield Road. A combination of existing retained trees, new parkland trees, multi-stemmed birch and bands of perennial planting create colour and seasonal interest in a sequence of spaces between the public footpath and the building which articulate the approach to the building.

7.8.2 Parkland Edge



Existing retained trees at the junction of Grangemouth Road and Middlefield Road within a retained area of higher ground become a key landscape feature at this important intersection. The layout has the potential to extend further in the future to integrate with the proposed widening of Grangemouth Road and its associated new roundabout.

7.8.3 Aromatics & Linear Paving

The public forecourt provides vehicular drop off, accessible and visitor parking within a clearly defined area separate from the main college car park. This forecourt is delineated by a change in road surfacing material from the visitor car parking area, and is defined by broad kerb edgings and ramp access. High quality concrete block paving, using different block modules to define particular areas and uses, unifies the forecourt, which acts as a raised plinth to the building, and extending into an entrance plaza by the main entrance. Avenue tree planting clearly structures the layout of the space and reinforces the route to the entrance to the building. Bands of aromatic planting on the approach route and along the face of the building introduce colour and sensory interest. A formal hedge defines the boundary of the forecourt with the adjacent parkland edge to Middlefield Road.

Tree avenues and hedge/ground cover plantings break down the scale of the staff/student parking area, which is structured to create a central avenue approach to the northern entrance to the building. The planting assists in structuring pedestrian circulation within the car park and in minimising the impact of a large number of cars on the surrounding area and in views from the building itself.

7.8.4 Tree Avenue Planting

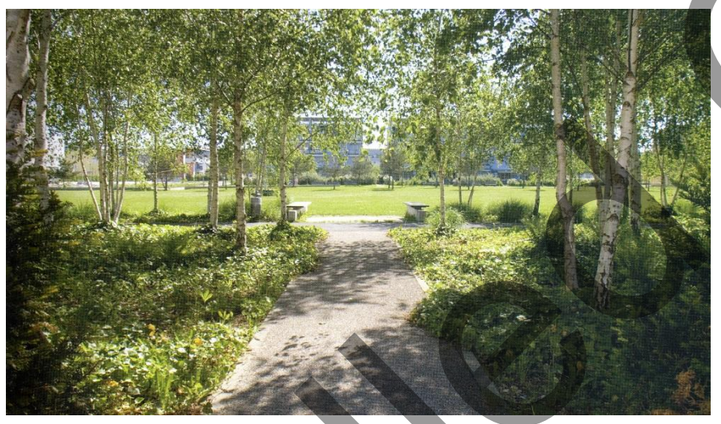
Along Middlefield Road, existing mature trees are retained and supplemented with new parkland tree planting to create an established parkland edge to the campus. A mixed native species hedge is introduced along the new eastern boundary of the site, connecting to and extending the existing hedge along the northern edge of the A904

7.8.5 Parkland tree planting

The service yard separates service access from staff, student and visitor areas, and comprises a simple utilitarian space, screened from views from Grangemouth Road. Gated access secures this area from use out-with college opening times.

The layout of the building and main car parking area creates a major east-west axis through the centre of the site, forming a 'green link' offering a pedestrian connection eastwards to the parklands and attractions of The Helix and The Kelpies and westwards to future development sites and the town centre. High quality concrete block paving using a distinctive module size forms the key pedestrian route. Formal groups of birch trees set within an informally arranged sequence of planting beds of native and ornamental ground covers and perennial plantings form a major defining element to its overall character.

7.8.6 Green link corridor



Species rich lawns are introduced throughout the site, containing low growing grasses and wildflowers which are maintained at a low height throughout most of the year but which are left to grow and flower between May and August, where they provide seasonal colour and diversity.

The three courtyards within the building are given distinctive minimal treatments, each focussing on a key plant type as its defining feature – bamboo; flowering dogwood; magnolia. The northern and central southern court is predominantly paved with seating as an extension to the refectory and café.

7.8.7 Bamboo / Dogwood / Magnolia Planting

The landscape architects drawing is included in appendix 1

8 CIVIL AND STRUCTURAL PROPOSALS

8.1 Introduction

This section of the report discusses the structural and civil engineering rational behind the Full Business Case. It also highlights any assumptions made while developing the scheme design.

This stage of the design of the building and infrastructure has been developed taking into account requirements of and constraints imposed by the following sources.

8.2 Existing buildings

The site has been cleared of the existing building and infrastructure. For the new College facility, the proposed main building is shown to be present in the central-south area of the development footprint with car parking to the north. It is taken that the main building will comprise a steel framed structure supported on columns with ground beams supporting exterior walls and ground bearing or piled ground slabs.

Development of the site is anticipated to require site groundwork, including provision of a compacted working platform.

Details have been provided of the demolition and site clearance works which have been undertaken, which include a relatively small area of remaining foundations. These may cause an obstruction to piling, foundation and drainage work.

8.3 Transport and Traffic

Introduction and Scope

A Transport Statement was produced in support of the planning application for planning permission in principle (PPIP) submitted in December 2015. The application was granted conditional planning consent by Falkirk Council on 4th April 2016.

The Transport Statement was preceded by scoping discussions held with Falkirk Council in which the parameters and overall methodology of the document were agreed. A full Transport Assessment is conventionally required for a development of this size, however, considering the site already had consent for education premises and involved in relocation of a similarly sized site, a Transport Statement was considered sufficient.

Access Arrangements

Vehicular access to the new site will be predominantly taken from two new priority junctions located on Middlefield Road which will connect directly with the car park to be located at the rear of the premises.

A further '*left in-left out'* priority access junction will be located on Grangemouth Road which will provide egress to and from the servicing yard. The service yard layout itself has been designed around a turning circle to allow for safe movement by delivery vehicles.

This junction on Grangemouth Road will also serve as a secondary exit route from the car park for use by staff, students and visitors during busy periods which would negate the need for traffic to queue on Middlefield Road. A suitably narrow carriageway of less than 4 metres accompanied by traffic management measures will be employed to ensure appropriate usage.

Walking and cycling access to the site will be provided by means of a series of footpath connections on Middlefield Road and Grangemouth Road. The *'Green Link'* in particular, will provide future pedestrian and cycling onward connectivity to the neighbouring Falkirk Gateway site.

A new controlled toucan crossing facility will be located on Middlefield Road which will ultimately replace the existing facilities located approximately 100m to the south of this. These facilities will be equipped with dropped kerbs and tactile paving. Further pedestrian crossing facilities will also be provided as part of Falkirk Council's committed local road improvement scheme on Grangemouth Road.

Access to the site by bus will be from the bus stop and associated layby located on Grangemouth Road at the frontage of the site. A footpath connection is proposed to integrate the bus stop with the main building entrance.

In accordance with Condition 1 (a) and Condition 2 (a) of the consent granted for the site, the access arrangements, which includes the intended parking and traffic management approach, remain subject to final agreement with Falkirk Council before work can commence on site.

Parking

The car park for the site will be located to the north and west of the facility and will constitute approximately 600 spaces for use of staff, students and visitors of the facility. Incorporated within this provision will be 30 disabled bays as well as six electric car spaces. In addition to this, there will also be 26 motorcycle spaces.

It is worth noting that this car parking provision is in excess of standards for new developments of this nature. This has been accepted by Falkirk Council on the basis that parking surveys demonstrated that there is already evidence to suggest that notable parking overspill from the existing College on to the surrounding network occurs. In addition to this, the car park will continue to perform a shared use function by providing overspill parking for Falkirk FC's Falkirk Stadium on home match days.

All access and parking provision within the development will be vested by and maintained by the College. Nevertheless, access and car parking within the site will be designed to the adoptable road standards. In addition to this, the access and parking areas will be designed to the appropriate specifications and all turning areas, parking and curve radii will be designed and tested for suitable vehicle tracking. Parking bays will incorporate permeable paving such as the Marshall system or similar to allow treatment and attenuation of run-off.

Well-appointed cycle parking facilities will also be provided as part of the development in order to encourage more sustainable travel behaviour and reduce car dependence. This will initially consist of 60 spaces, however, additional provision will be explored should it be deemed necessary as part of the ongoing monitoring process of the Travel Plan.

Traffic Modelling

Falkirk Council are progressing a phased programme of local road improvements to Grangemouth Road, Falkirk Road and the A9 in the vicinity of the new College campus. Phase 1 of improvements which are due to be delivered by 2017/18, involve improvements to the A9/A904 roundabout as well as the dualling of the A904 from this roundabout to a new mini-roundabout to be located at the frontage of the new College site. Phase 3 of this programme involves the replacement of the existing signalling junction between Grangemouth Road and Middlefield Road with a roundabout.

In establishing the validly of these improvements, the council have undertaken microsimulation modelling for the proposed network which incorporated demand to and from the College site. As the vehicular trip generation for the College had already been accounted for, scoping discussions identified that there was no formal requirement to undertake any road capacity assessment.

Despite this, a traffic modelling assessment of the existing signalised junction between Grangemouth Road and Middlefield Road was undertaken within the Transport Statement to understand how the junction will operate within the interim period prior to its upgrade.

The assessment demonstrated that the junction will already be over capacity within the 2018 AM Baseline Scenario. Reassignment of trips on the network as a result of the proposed development has a minor impact on the junction performance but not as significant as that seen with the addition of traffic flows from the committed developments.

Microsimulation modelling undertaken by Falkirk Council has already identified that queuing is expected to be alleviated by future capacity improvements to the A904 Grangemouth Road to upgrade the junction to a roundabout.

Travel Plan

In accordance with Condition 5 of the consent granted for the site, a full travel plan is required to be produced and agreed with Falkirk Council prior to occupation of the facility. This will expand upon the Framework Travel Plan already contained within the Transport Statement which

already identifies indicative objectives as well as potential measures to implement to increase sustainable travel mode use at the future site.

External Hardstanding Areas

The design of the external works are to be developed to reflect the likely end use and vehicle usage.

Roads and car parking areas are to be designed to adoptable standard road construction and plan geometry, or other relevant guidance as required. The design also incorporated an access to the strategic off site road improvement promoted by Falkirk Council. If these works have not progressed or are delayed then the access location may have to be adjusted to suit the existing road corridor.

External hard landscaping areas are also to be designed to reflect end use and potential for occasional vehicle access if required.

A low CBR will be associated with the natural (clay) soils. It is anticipated that some form of capping or ground improvement layer will be required in support of the hardworks.

Low CBRs may dictate the requirement to incorporate suitable geotextiles to manage differential settlement and load transfer to the sub soil horizon. This will be explored as part of the technical design.

Non frost susceptible material will also be required within 450mm of the finished ground level. This requirement will dictate the construction depth of some hardwork construction thicknesses such as pathways. The overall construction of roads and parking will include a construction depth greater than 450mm.

Site Levels

External levels to landscaping and hardstanding areas will be laid to falls to suit site topography and to reflect the required drainage strategy. This includes shaping levels within the car park areas to utilise the available storage within any permeable paving areas.

Gradients to finished ground levels should be no greater than 1 in 12 (8%) or 1 in 20 (5%) where accessible access routes are provided as part of the development proposals.

The proposed levels also include upfilling to areas of the site. Upfilling below the building footprint should recognise the requirements of the structural platform. Upfilling below external hardstanding is to method compacted and formed using appropriate general fill as defined in the Specification of Highway Works. Upfill below external hardstanding areas may also include class 6F material.

8.4 Drainage

Introduction

It is understood that drainage associated with the former building included a number of outfall connections to the existing Scottish Water combined sewerage network. This included both foul and surface water flows.

Surrounding combined sewers are located within Middlefield Road to the west, Grangemouth Road to the South and a further combined sewer along the eastern boundary. No surface water sewers are known to be located within close proximity of the development. However, there is a surface water ditch located approximately 100m to the east of proposed development boundary.

The location of the surface water ditch is outwith the land ownership of the proposed development. It is considered unlikely that a new surface water outfall to the ditch can be delivered due to land ownership challenges.

The design of the drainage has been developed on the principle that foul and surface water flows will ultimately discharge to the existing Scottish Water combined sewerage infrastructure.

When outfalling surface water flows to a combined sewer consideration should be given to the potential to remove surface water draining to the combined sewer at a later date.

It is understood that the land to the east is zoned for future development. This development may ultimately enable the rerouting of surface water flows to the ditch subject to various approvals and acceptance from Scottish Water and other relevant stakeholders. The design of the development infrastructure should therefore recognise the potential for surface water flows to ultimately outfall to a surface water network rather than the combined sewer. This will influence the proposed sustainable drainage systems (SuDS) strategy as part of the wider drainage proposals.

Flood Risk Assessment

Scottish Planning Policy (SPP) identifies the principles for managing flood risk to and from new developments. Interpreting the requirements of SPP with regard to the proposed developments, it is concluded that:

- The educational nature (essential infrastructure) of the development should be located within an area that has a 'little or no risk' of flooding

It is proposed that the development will manage post construction overland flow paths associated with high intense storm events by:

- Setting the flood level of the buildings above the surrounding ground level
- Ensuring that the surrounding ground falls away from the buildings
- Ensuring that surface water can flow through the site without ponding or otherwise posing an unacceptable flood risk; and
- Limiting development generated overland flow to avoid potential impact to off site areas
- Maintaining any existing overland flow/pluvial flooding pathways

Existing Flood Risk

A review of flood risk to the proposed development has shown that the site is within an area classed as being at little or no flood risk from coastal or fluvial flooding and is therefore suitable for development.

Parts of the site, based on current conditions are potentially at risk from pluvial flooding during the 1 in 500 year event as a result of localised low topography. Currently, a higher section of land in the southern part of the site prevents the pluvial flow route down Grangemouth Road from affecting the site in all but the most southern corner. In order to ensure that the proposed development in particular any buildings are not a risk during such an event it is recommended that threshold levels of any proposed buildings should be located 150mm above external ground levels and a minimum of 300mm above the level of Grangemouth Road adjacent to the building (at a minimum of 8.35m above Ordinance Datum).

In taking account of all recommendations, the development will not be at risk from surface water (pluvial) flooding from rainfall events up to a 1 in 500 year event and will be capable of remaining operational and accessible during such extreme events. The proposed development will be considered to meet the flood risk guidance in Scottish Planning Policy (SPP) following completion of the recommended works.

Drainage Strategy

The foul and surface water drainage strategy has been developed with reference to current best practice where the development looks to provide a separate foul and surface water drainage network.

The surface water and foul water will be constructed as separate networks within the site which will both discharge into the combined sewer subject to agreement from Scottish Water. The combined sewer is identified as the most suitable drainage network to accept post development pass forward flows.

Ground conditions are unlikely to be suitable for the use of soakaways or infiltration systems. Therefore, surface water run-off is to be directed to supporting drainage infrastructure.

Surface Water

The drainage strategy has been designed to manage and control surface water run-off in order to mitigate any adverse impact associated with flood risk to be proposed development and surrounding areas. The main criteria for the drainage design are:

- Restricting the surface water discharge to an appropriate greenfield release prior to outfalling to the public combined sewer as agreed with the relevant Stakeholders
- Providing below ground attenuation for the 1 in 30 year critical storm event. This includes a further factor for 20% climate change and 10% urban creep as referenced in Sewers for Scotland 3
- Providing on-site storage for the 1 in 200 plus 20% climate change event or as otherwise indicated by Falkirk Council
- Checking that the building is protected against the 1 in 1000 year storm event due to the 'essential infrastructure' nature of the educational development in line with Scottish Planning Policy

It should be noted that the existing development site drained directly to the combined sewer system at un-attenuated run off rates. The provision of on-site attenuation as noted above will greatly reduce peak flows draining to the combined sewer when compared to the pre development scenario. The attenuated surface water discharge will therefore provide betterment with regard to loading of the combined sewer system which should allow the existing system to provide an improved standard of service. However, the increase density of the development will ultimately discharge a greater volume of water to the public sewerage network.

Sustainable Drainage Systems

Treatment

As noted above, there may be potential for surface water flows to be separated from the combined sewer at a later date. Where possible the design of the SuDS treatment is therefore developed to provide appropriate treatment as if discharging to a surface water system.

The SuDS Manual (CIRIA C753) defines a risk based approach to SuDS treatment selection based on land use and site specific contaminants. SuDS treatment will therefore be selected with reference to pollution hazard for the land use. This considered the following pollution hazard levels:

- Roof. Low Pollution Hazard
- Car Park. Medium Pollution Hazard
- Delivery Access Road. Medium Pollution Hazard

It is understood that the service yard will include deliveries of paints and other such materials. The provision of SuDS will be unable to remove the pollution risk associated with these deliveries. Surface water run-off from the service yard area will ultimately be routed to the foul drainage network.

Attenuation

Run-off rates are to be attenuated to an equivalent undeveloped 'greenfield' run-off rate for all return periods up to the 1 in 200 year plus climate change event or other as defined by Falkirk Council.

The required attenuation volume based on the 6.2 ha site with an estimated impermeable area of 4.8 ha contributing to the surface water drainage system is estimated to be around 1600m^3 including a 20% allowance for climate change, the attenuation volume could be around 1900m^3. This will be subject to detailed design.

It is anticipated that the required attenuation can be provided in below ground storage; within permeable paving, beneath car park and/or beneath any suitable open space (e.g. landscaping/public space). The required surface water attenuation volume could be accommodated using subsurface cellular storage within around 2,000m^2 of the car parking area; the proposed development contains over 16,000m^2 of car park area. It may also be possible to provide the required storage within the road base/sub-base of permeable paving if used within the car park. This will be subject to the finished ground level and the connecting sewer.

The provision of surface water attenuation on the site will greatly reduce surface water run-off draining to the combined sewer, for example in the 30 year event, flows are reduced from a peak of 305 l/s to circa 71 l/s.

Foul Drainage

The overall foul discharge rate from the proposed development will broadly match the pre development foul flow discharging to the combined sewer. It is expected that the foul and surface water from the new development are to discharge to the combined sewer in Middlefield Road.

Attenuation of flows from the service yard may also be required.

8.5 Sub-structure

A desk based review was carried out to guide requirements for a ground investigation, and the ground investigation was undertaken. The draft Interpretive Report on Ground Investigation (Structural Soils, July 2016) is the basis for the following recommendations.

Ground Conditions and mining

The ground investigation indicates the following generalised soil profile:

0-1m depth: topsoil/made ground
1-5m depth: marine deposits (firm to soft clay)
5-20m depth: glaciomarine deposits (soft and firm clay)
20-45m depth: glacial till (varies firm/stiff to loose)
45m depth: sandstone bedrock

Groundwater is present at shallow depth, and is likely to be seasonal (near-surface in winter). Artesian water with a head of the order of 3.0m above ground level is present in the underlying bedrock, and in some areas immediately above the glacial till.

The Coal Authority information, reviewed at desk based review stage, indicates that the site is not affected by shallow mine workings or shafts or adits.

Geotechnical requirements Groundwork and earthwork

The existing site is shown on the topo survey to be relatively level. Following strip of topsoil and unsuitable made ground, bulk filling will be required to bring the site up to the levels required by the flood risk assessment with a working (piling) platform constructed over the building footprint.

Foundations

The estimated settlement of ground bearing foundations is excessive, so foundations will be piled. The most suitable piling method is driven precast reinforced concrete segmental piles, driven to refusal in the rock at 40- 45m depth.

400mm square piles with a capacity of approximately 1500kN used singly or in pairs, or groups of smaller piles, will be adopted in the design.

The contractor will be required to install appropriate temporary works to support the piling works. This will include a piling platform. The design of the piling platform is to be confirmed by the contractor and should recognise the design of the permanent works if to be retained in situ post completion of the works.

Piles will need to be checked to ensure they can accommodate additional loading from negative skin friction as a result of settlement of the Tidal Flat Deposits, and to accommodate tensile and horizontal loads where necessary.

The underlying 20m of soft compressible soils give excessive estimated settlements of ground bearing slabs, so the ground slab will be supported on piles.

Excavations and below ground structures

Trenches for pipework etc. have been known to be unstable where excavated below the desiccated crust on other projects carried out in the vicinity of the site. The works will require an enhanced bedding for drainage runs to manage the risk of settlement and movement of the installed pipework. There may also be a requirement to suspend strategic drainage infrastructure if passing below the proposed building. Groundwater ingress into excavations is likely below depths of about 1.5m, and locally shallower.

Contamination and gas requirements

The ground investigation interpretive report concludes that little soil contamination has been identified.

Further local soil and groundwater investigation is recommended.

The ground gas assessment is based on an insufficient number of readings, and further ground gas monitoring is required to confirm the CS1 (very low hazard) which is indicated by the initial data.

8.6 Super-structure

Summary

The structural design has been developed through this stage of the project to provide a description of solutions which are compatible with the overall building design. A key aim for this stage is to describe specific items in sufficient detail to provide Forth Valley College with the confidence that the final facility provided by the design & build contractor will be as expected. In general, visible areas will be prescriptively defined in the Employers Requirements, while non-visible elements may be changed if proposed by the D&B contractor and agreed with the College.

Grids

Structural grid and columns positions have been provided and agreed with the architect to allow the external envelope to be defined in detail and to inform compatibility with the internal layouts. The D&Bcontractor must finalise the detailed structural design to meet the prescriptive parts of the Employers Requirements.

Grids are set out on the Architectural layouts contained in appendix 2.

Structural zones

The horizontal structural zones are defined. These are fixed to allow the external envelope to be confirmed. The structural zone must be compatible with the MEP zones, internal clear heights and the development of the external facade.

A zone for columns, walls and bracing is defined to permit the use of a number of materials whilst preserving the required spaces and finishes.

Structural zones are set out on the Architectural Sections and Elevations.

Base Solutions

A base solution for each area of the building has been defined at this stage to allow a cost plan with a suitable level of accuracy to be defined.

Teaching Blocks

The base solution for the Teaching Blocks is a braced structural steel frame over two storeys. The roof structure will consist of concrete slabs supported on steel beams in order to provide the required thermal mass in the building. These will be of the same construction as the upper floor structure. The upper floors slabs shall consist of precast hollowcore slabs with an insitu concrete topping. These slabs form part of a Corus 'Slimflor' or Westok ultra shallow floor beam system type of construction, and span between steel beams concealed within the depth of the slab. All beams will be supported on hot-rolled steel columns that will transfer loads to the foundations.

The ground floor slab will be suspended reinforced concrete, supported on piles, to eliminate differential settlement between slab and frame.

Lateral stability will be provided by vertical braced bays around lift, stair and MEP risers.

Foundations will be precast reinforced concrete driven piles.

Fire protection will be required to provide the appropriate level of protection.

Workshop Block

The workshop block is a single storey steel frame building with large clear spans. In order to achieve the long spans the roof material will be of a light weight construction. A structural roof deck will span between steel rafter beams which will be positioned to frame out large feature roof lights. Lateral stability will be provided by steel plan bracing in the roof, and steel vertical bracing in suitable wall zones.

Sports Centre

The Sports Centre suspended floors will take a similar form to the teaching block. The long span roof over the sports hall will support lightweight roofing similar to the workshop block.

9 MECHANICAL, ELECTRICAL & ICT SERVICES PROPOSALS

9.1 Incoming utilities

The following section provided a high level overview of the incoming utilities strategy for the new campus.

Water

An Envirocheck assessment has been carried out and no issues with the existing water infrastructure within the proposed site boundary have been identified. A Water Impact Assessment (WIA) has not been completed at this stage, however the site is well served by existing water infrastructure and there are no envisaged capacity issues anticipated in establishing a new connection to the site.

A new mains water connection will be installed for the new College building. The preliminary estimated water consumption for the building is approximately 3500 m^3/annum. The connection will be supplied by Scottish Water and it is anticipated that this will be connected to the main located within Grangemouth Road, see the External Services Drawing. The new incoming mains pipework distribution (assumed to be barrier pipe, until such times as the design and build contractor has carried out an appropriate risk assessment in accordance with UKWIR guidance to inform the incoming mains water pipe material) will be routed from this incoming point to a new external cold water storage tank plantroom located adjacent to the primary energy centre.

A dedicated mains water supply to the building will also be routed to the building, following similar route as the boosted cold water supply. All external mains water pipework serving the building has been assumed to be barrier pipe.

The incoming water supply shall be metered at the site boundary by Scottish Water and a further incoming meter on entry to the water storage plantroom. The Client's incoming water meter shall be suitable for directly linking to the Colleges Building Energy Management System (BEMS). This shall be for the purposes of monitoring the buildings water consumption. The primary water meter shall utilise the Meter Bus (M-Bus) communication protocol.

New ground hydrants will be installed around the perimeter of the College campus in accordance with the Scottish Technical Standards and the local fire officer's recommendations. The mains water supply to hydrants shall be unmetered.

Gas

An Envirocheck assessment has identified existing low pressure gas main within the new site. The low pressure gas main is currently owned and managed by SGN.

SGN have also been consulted regarding a new gas connection for the development. The site is well served by existing gas infrastructure and so it is not envisaged there will be any issues with capacity and establishing a new connection.

A new gas connection will be installed from the existing low pressure gas main running along Grangemouth Road to the new College Campus. The preliminary peak gas load is estimated to be 1700 kW (158 m^3/hr) and an estimate annual gas consumption of 530,000 kWh. Refer to the proposed External Services drawing for further detail. The building gas will be terminated by the gas network provider within a dedicated gas meter room immediately adjacent to the primary energy centre. The purpose built meter room will be constructed in accordance with IGEM regulations. A new meter will be supplied by the Colleges preferred gas shipper and installed within the purpose built gas meter room. The main gas meter will be a pulsed output type linked to the College BMS system.

The new gas pipework will then be routed from the gas meter enclosure and distributed to all gas fired plant and equipment within the energy centre and within the main college building. The gas pipework to the main two storey teaching block building & the workshop building will be routed below ground from the energy centre. Refer to the external services drawing for further detail. All gas pipework routed internally within the building will be suitably ventilated in accordance with IGEM regulations.

Sub-metering will be installed within the building to areas where high levels of gas consumption is anticipated. These will include the main kitchen and workshop areas (gas-fired radiant heating).

All gas installation works should be undertaken by Gas Safe qualified engineers.

There is an existing gas supply pipe serving the adjacent site to the north of the development. Following further consultation with the gas network operator (SGN) regarding any potential requirement to divert this pipe,. SGN has confirmed that this pipe is not located within the FVC site boundary and is in fact within the adjacent properties boundary.

Electrical

An Envirocheck assessment has identified an existing buried Scottish Power and Energy Network (SPEN) 11kV cable within the new site. The 11kV cable is currently owned and managed by Scottish Power Energy Network (SPEN). SPEN will be engaged to undertake the relocation of the 11kV cable to the East side of the site boundary.

A new, 1600kVA electrical supply will be established to service the new College site. An initial application for a new connection has been lodged with Scottish Power, who have indicated that due to the magnitude of the load requested, the new connection cannot be supplied at low voltage. Scottish Power will therefore provide an 11kV incoming supply and ring main unit (RMU) connection. In turn this will supply a client owned 11kV/400V Oil Natural Air Natural (ONAN) step down transformer. The low voltage side of the transformer will then supply a client owned main switchboard. The main switchboard will contain incoming automatic disconnection protective devices (both instantaneous, overcurrent and time-overcurrent) to protect against overload and fault conditions. 11kV/LV shunt trip relays will also be provided to protect against the propagation of a fault between the 11kV and LV connections. All DNO metering will be at 11kV.

The Scottish Power RMU and client owned transformer will be located externally, south of the workshop block. The RMU will be segregated and access restricted to Scottish Power personnel only.

Adjacent to this space will be a dedicated electrical switchroom to house the main LV switchboard.

It should be noted that SPEN require 24 hour, 7 days per week access to the RMU enclosure to conduct maintenance and repairs. In addition, it is common practice for SPEN and the client (Forth Valley College) to establish a wayleave agreement, granting SPEN right of access to any piece of land above which the 11kV cable is buried. This agreement allows SPEN to repair the 11kV cable in the event the cable is damaged.

The 11kV cable route from the site boundary to the substation should be determined in consultation with SPEN, ensuring the final route does not pass under free standing structures or any other obstruction which will make future access to the HV cable difficult.
As of July 2016, Scottish Power have indicated that due to high fault levels within their existing network infrastructure in the surrounding area, they currently do not permit 'back feed' into the grid from private electricity generation sources, such as photovoltaic cells PV or combined heat and power CHP connections. This may also restrict the potential authorisation for paralleling of client owned generation sources with the DNO network. Initial discussions with Scottish Power have indicated that grid reinforcement works, required to support paralleling site generation and the electricity grid are anticipated to be completed by 2018. The proposed design strategy for the new college facility is based around Scottish Power authorising the parallel connection of the proposed PV array and CHP installation, by means of a G59 application. The design strategy is also based on a 'load only' connection. The G59 application will be progressed by the appointed contractor.

In the event that Scottish Power do not permit the paralleling of the PV and CHP installations, there are 2 potential solutions that could be considered by the appointed contractor to facilitate the use of the PV and CHP site generation. Costs have been included for both options as a 'risk contingency' within the cost plan.

Option 1 would be to connect the PV and CHP (electrical connection) in 'island' generation mode. Island mode effectively means that the PV and CHP can never be paralleled with the grid. The PV and CHP would then supply designated loads under normal operation and should at any point the output from either source drop below a designated threshold, a 'break before make' automatic transfer switch would be utilised to transfer to the mains. Once the output load of the PV/CHP was within acceptable levels the transfer back from mains would then take place. It is anticipated that if this option was to be implemented, the PV installation would supply the central UPS switchboard so that the UPS batteries would prevent any short term power outages. The CHP electrical connection will be much smaller in magnitude and would be

utilised to supply non-essential loads such as electric vehicle charging points.

Option 2 would be to utilise a 'fault reducing reactor' and earth fault reducing device connected in series to the LV or HV (client side) feeders on the incoming supply. These devices would be intended to reduce the prospective fault levels to an acceptable level such that Scottish Power would permit the paralleling of the PV/CHP installations with the DNO network. This is capitally the most expensive option and the option, and forms the basis of the contingency sum allocated within the cost estimate.

Communication

External connectivity for voice and data services will be provided in a resilient manner. This will be provided as two separate routes from the site boundary to two separate entry points to the building. Different providers such as Openreach and Virgin Media will utilise the separate routes.

It is anticipated that the Primary incoming (potentially Openreach) circuits will be provided from Grangemouth Road. The Secondary circuit (potentially Virgin Media)will be provided from Middlefield Road. In both instances, buried containment - commencing from the site boundary and terminating at designated points within the building - will be provided. A number of spare ducts will be provided within the trench to allow for future flexibility.

9.2 Services Strategy

The following section describes the outline MEP and ICT services strategies for the new college campus. The MEP systems will be designed to optimise the campus energy consumption and to take cognisance of the BREEAM targets and aspirations. Renewable technologies will be adopted and intelligent open protocol systems will be adopted to provide an integrated MEP design.

A single structured cabling system and single active IP Network will be provided as described in the Information and Communication Technology (ICT) section of this document. Both of these single solutions will be provided to meet the physical connectivity and communications needs of all systems employing IP communications. This importantly includes Building Services solutions for BMS, CCTV, Access Control and Security.

Primary energy centre

The new College building is to be served by a primary energy centre sited adjacent to the sports hall & changing facilities, integrated into two storey accommodation to the south east of the site. The building will be constructed to ensure that all plant installed within the energy centre can be easily installed, maintained and removed (if required) for future replacement.

Adjacent to the primary energy centre is the incoming gas meter room, cold water storage tank room (including associated booster pumps) and LV electrical switchroom.

The primary energy centre will house the following plant and equipment:

Primary heat generation plant (ground source heat pump, back-up gas boilers & Combined Heat & Power (CHP)

- Primary & Secondary Low Temperature Hot Water (LTHW) pumps
- Primary & Secondary Chilled Water (CHW) pumps
- GSHP CHW & LTHW thermal stores
- LTHW pressurisation unit
- CHW pressurisation unit
- Potable cold water storage tank & associated packaged cold water booster set (within dedicated plantroom)
- 3 x 3 m space provision for facilitate a future connection to a local district heating system (space for plate heat exchanger (PHX) & pumps)

The following primary mechanical services will then be distributed from the energy centre to the main College building via direct buried service connections or through the main building, via the Sports block:

- High Temperature (80°C flow, 60°C return) Constant temperature LTHW circuit for space heating & hot water generation
- High Temperature (80°C flow, 60°C return) variable temperature, weather compensated LTHW circuit for space heating
- Low Temperature (50°C flow, 30°C return) Constant temperature LTHW circuit for space heating, hot water pre-heat, air handling unit (AHU) coils & active chilled beams for space heating
- Natural Gas
- Chilled water
- Mains Cold Water
- Boosted Cold Water

The internal environment overview

Ensuring the right internal environment is critical not only to the success of the building but also to the learning environment as a whole, it is for this reason that from the earliest stages of design the internal environment is at the forefront. There are currently a range of different guides, reports and standards all of which try to define the parameters of what creates a good internal environment with the Department for Education and Skills: Building Bulleting 101: Guidelines for Environmental Design in Schools is the standard typically adopted by Schools, Colleges and Universities throughout the United Kingdom.

The BB101 guidance is currently under review with a much more prescribed and onerous guidance expected in early 2016. It is for this reason that the approach for the new College building is a hybrid of figures taken from BB101 as well as guidance from the Chartered Institute of Building Services Engineers (CIBSE) and also that of the British Council of Offices (BCO) Guide.

With the aid of the criteria and guidance listed above, the use of computational dynamic thermal analysis software and a holistic design approach, the buildings can be designed to ensure the highest levels of thermal and environmental standards whilst limiting the requirements for mechanical heating, cooling and ventilation.

It is important that the College is not only "seen to be green" but also proactively encourages and demonstrates these green credentials; it is with this aim that it is proposed that the Building Research Establishment Environmental Assessment Methodology (BREEAM) is used.

The College's targeted BREEAM 2014 rating is 'very good' for cost reasons with an aspiration for 'excellent'. This is no small task and will require commitment and engagement from all involved parties from the earliest stages.

The required BREEAM '2014' rating will also require that Low and Zero Carbon (LCZ) technologies are integral to the building services strategies where a benefit to the building can be demonstrated.

Design criteria

The external design criteria for the building is as follows:

Summer: 23.7°C db. 17.0°C wb.(@ 0.4% exceedance)
Winter: -4.2°C db. 100% RH (@ 99% exceedance)

The internal summer design conditions, including limitation on overheating, will be dependent upon the use of the individual spaces and the anticipated activities to be undertaken within these spaces. Internal design criteria will be derived from a combination of various industry recognised sources including CIBSE Guide A DfES: BB101, CIBSE TM52 and the BCO guidance.

Ventilation Rates: As stated by the Scottish Technical Standards, CIBSE Guides, DfES: BB101 and also by the HSE. The minimum recommended values will be achieved in all spaces.

Acoustic requirements of the spaces will be as given in DfES BB93 along with guidance from CIBSE. Reference should also be made to the acoustic study undertaken.

The Mechanical and Electrical servicing strategy drawings within appendix 3 of this report provide further details on the proposed ventilation, heating and cooling strategy for each space. These will be subject to further development as the design progresses through to RIBA Stage 3.

For the purposes of determining water storage requirements, the building design occupancy has currently been based on Reiach & Hall Architects calculations assessment of the building occupancy. The occupancy has therefore been based on 2581 people (design occupancy level based on 408 Staff & 2173 Students/Visitors)

Low and zero carbon technologies and statutory compliance

A study of low and zero carbon (LZC) options for the proposed College Campus development has been conducted previously. The purpose of the study was to determine the most cost effective solutions to achieve carbon reduction through the use of low or zero carbon (renewable) energy technologies, to meet the performance criteria in terms of CO2 emissions laid out in Section 6 of the Scottish Technical Standards whilst ensuring that the targeted BREEAM ratings are met.

The LZC technologies considered in our original analysis were:

- Biomass boilers
- Solar thermal hot water (STHW)
- Ground source heat pumps (GSHP)
- 1500 m^2 Photovoltaic panels (PV)
- Combined heat and power (CHP)
- Wind power

It should be noted that at the time of writing this report it has not been possible to complete the energy modelling assessment to demonstrate and confirm compliance with Section 6 of the Scottish Technical standards and to determine the potential BREEAM credits available for the solutions and strategies proposed. Further validation will be carried out once the architectural scheme is more fully developed.

The current LZC strategies for the purposes of the FBC are as follows:

- Tri-valent Heating & Cooling systems (Ground Source Heat Pump, Combined Heat & Power, Gas-fired boilers)
- Photovoltaic Array

On completion of the energy modelling exercise should the strategies proposed fail to comply with Section 6 of the Scottish Technical standards or achieve the necessary BREEAM credits,the following options will be explored:

- Additional GSHP provision (if estimated heating/cooling profile is favourable/feasible) or other feasible LZC options
- Additional area of photovoltaics
- Improvements to the external envelope thermal performance & air tightness
- Review of the glazed areas including curtain walling & roof light glazing specification and shading

It should be noted that should there be a requirement to adopt any further enhancements noted above there may be potential impacts on the project cost that will require careful monitoring and review during the next design stage and be met from contingency, if required.

Tri-valent heating & cooling strategy overview

To satisfy building regulation requirements, planning conditions and the targeted BREEAM rating requires a source of renewable heat to satisfy a substantial proportion of the heating & cooling demand within the building. Albeit unconfirmed at this stage.

The Low and Zero Carbon (LZC) Study undertaken in earlier design stages for the new College building identified that one of the more favourable options for the provision of heating & cooling in the building was a ground source heat pump (GSHP) system.

Following discussions with FVC, there is a desire to adopt an innovative low carbon solution to satisfy the heating and cooling demands of the college. The proposed LZC strategies will adopt a tri-valent heating & cooling solution consisting of a combination of a ground source heat pump (GSHP), gas-fired CHP (for domestic hot water generation) and back-up gas fired condensing boilers.

It is envisaged that the GSHP unit will be run during the heating season as lead heat generator. It is also envisaged that the GSHP will also be capable of providing a pre-heat to the buildings domestic hot water systems. A micro CHP unit will be sized to satisfy the base domestic hot water load and will operate as lead to the backup boilers whilst maximising operating time and efficiency.

Modular gas boilers will be sized to meet the peak demand however will be used for supplementary heat and back-up to the GSHP system (primary heating source) and micro CHP.

The GSHP will be sized for the peak cooling load within the building, which is currently estimated to be approximately 200 kW. At this stage it is anticipated that the GSHP system will also provide approximately 20%-30% of the buildings peak heating load and around 80% of the annual heating demand

The GSHP, CHP unit and gas-fired boiler modules will be located within the primary energy centre.

The gas-fired boilers and CHP unit will supplied with twin walled stainless steel flues and drain connections. The gas-fired boiler flues will connect to a common primary flue. A separate twin walled stainless steel flue will be provided for the CHP unit. Chimney heights have been estimated and incorporated into the architectural design to meet the requirements of the Clean Air Act and the chmney height technical memorandum

It is anticipated that the tri-valent heating/cooling strategy will be further developed by specialist contractor who will design, engineer, install, and commission the complete system including the primary circuits & controls/system integration.

The secondary circuits would be design and installed by the M&E sub-contractor. The specialist contractor responsible for delivering the trivalent heating/cooling system will require experience in delivering ground source heat pump & energy piles and a proven track record for integrating these technologies with other systems such as gas-fired boilers and CHP.

Ground source heat pump

A ground source heat pump is a system that extracts heat from the ground at low temperature and rejects it at a higher, more useful temperature. The rejected heat is commonly used in space heating applications. The cycle requires electricity to move the heat against the natural temperature gradient. The system can also be used in reverse to provide cooling, whereby the energy rejected from cooling is rejected to the ground and stored for extraction later.

A heat pump exploits the vapour compression refrigeration cycle, but differs from a refrigerator in that it is controlled to provide heating, rather than cooling. The cycle takes heat from the source by using it to evaporate low pressure liquid refrigerant into a low pressure gas. This gas is passed through an electrical compressor which raises its pressure and temperature. As the high pressure gas is cooled, it condenses back to a liquid, giving off heat. The high pressure liquid is then passed through an expansion valve to lower the pressure and the cycle repeats.

Heat pump efficiency is typically denoted by the Coefficient of Performance (COP), which is a dimensionless number that describes the amount of useful heating energy obtained per unit of electrical power input.

The COP is highly dependent on the temperatures of the source (i.e. the ground) and the temperature of the heating supply, with improvements made if the difference between the two is reduced. Due to ground temperatures being typically warmer than ambient air in the UK, GSHPs can achieve higher COPs than air or water source heat pumps.

With good ground properties and proper system design, , seasonal heating COPs of between 4.5 – 5 can be expected.

The UK government's Renewable Heat Incentive (RHI) scheme pays a per kWh rate for heat generated by renewable means. For ground sourced heat pump systems, this tariff is split into two tiers and is dependent on the installed capacity and the renewable heat delivered. Income from RHI for a 200kW installed capacity GSHP could amount to £23,500 per annum. Reliance on government subsidies for this technology is a risk, given the government's recent track record of withdrawal of such incentive schemes e.g recent withdrawal of feed in tariff (FIT) for solar photovoltaic installations.

In order to exchange heat with the ground, pipes carrying a working fluid such as glycol must be installed underground. The number, dimension and design of the heat exchangers is dependent on the building the system is serving, the prevailing ground conditions under the building and other factors such as heating load, cooling load, required supply temperatures and flow rates. Heat emitters with large surface areas such as underfloor heating systems permit low heating supply temperatures and maximise heat pump COP by narrowing the difference in source and supply temperatures.

The ground loop will also be used to provide free cooling (i.e. where cooling is provided straight from the ground loop with no requirement for mechanical cooling), when available, and a low temperature condensing medium for cooling systems, thereby improving their efficiency.

The Seasonal Coefficient of Performance (SCOP) of a heat pump is a calculation that attempts to average the COP over the year as it changes with operating temperatures. Accurately calculating the SCOP of a GSHP is difficult as it relies on knowing or predicting the ground loop temperatures. This is inherently difficult as each system is bespoke and temperatures are dependent on site specific ground conditions and present and historic heat demand.

The coefficient of system performance (COSP) accounts for the energy use of the ground loop pumps (typically 5% of overall energy use) as well as that of the heat pump itself. It is designed to give a more holistic view of the system performance. The COSP gives the operator the best view of the cost of operating the system as a whole.

The feasibility of various ground sourced heating and cooling systems available has been reviewed. This has included consulting specialist ground source heating/cooling analysing installation considerations, cost implications, operational and maintenance aspects and the effects on system performance of the different technologies.

This focused on three distinct subsurface/ground loop technologies which will be used to extract (in heating mode) or reject (in cooling mode) energy to or from the ground. The subsurface/ground loop technologies which have been investigated are as follows:

- Horizontal ground heat exchanger array: pipes are laid close to the surface in an open area such as a carpark.
- Vertical borehole heat exchangers (BHE): holes are drilled in the ground, within which pipes are installed.
- Energy piles: Pipes are laid in the building's piles as they are installed, or prior to installation.

The most cost effective ground heat exchanger method of those considered would be installing a horizontal ground heat exchanger array, near the surface, which removes the need for vertical drilling. Temperatures fluctuate more near the surface, so systems with horizontal ground arrays are typically less efficient than vertical BHE or energy pile systems. Horizontal arrays must provide a similar pipework heat exchange length as the equivalent vertical array for the same installation.

The proposed car park within the new College development is the only area of open space that would be available for a horizontal ground array. The car park is a rectangle of approximate dimensions 190m x 90m. Minimum spacing between pipework is 10m, meaning a total of 1,900m total pipework could be installed in the car park, which is not sufficient to satisfy the heat requirements of the ground sourced heating and cooling system. Unless more free space in close proximity to the College campus can be acquired, a horizontal ground array is an impractical solution for this project.

There are a range of vertical BHEs that exist which include coaxial, U-tube and double U-tube. Coaxial BHEs are comprised of an inner tube that sits concentrically inside an outer tube. The fluid flows into the BHE through the inner tube and up the outer annulus. U-tubes consist of two plastic pipes joined at the bottom with a 'U' bend whilst double U-tubes combine two single U-tubes per drilled borehole.

In all cases pipework is installed within a hole drilled to a given depth (up to 250m before costs become prohibitively high) and backfilled with thermally enhanced grout. Pipework is typically plastic, with some installations using steel due to its better thermal properties.

The vertical borehole array could be installed in the car park area; typical dimensions being 100m x 40m. This area would allow for around 60 BHEs with an 8 metre separation, and 80 BHEs with a 7m separation.

Initial outline calculations suggest that the total required length of BHEs to satisfy the heating requirements of the building will be in the region of 1,500 – 3,500m (depending on ground conditions, BHEs used and a number of other parameters). For example, if coaxial BHEs are chosen it is expected that the required total length will be at the lower end of this scale. A U-tube installation would be at the upper end of this scale.

If BHEs are 50m deep, this gives a maximum BHE requirement of 80, which with a 7m separation would fit in the car park. Typically BHEs are installed to a depth of around 150m in order to minimise their numbers and minimise capital cost.

Site investigation works carried out on site have indicated the presence of artesian water. As a result , each vertical BHEs would need to be sleeved attracting a greater capital cost of between 20 and30%

Based on the analysis undertaken a ground loop installed as part of the piling installation, using the piles as heat exchangers to reject and extract heat to and from the ground, is the most practical and cost effective ground loop strategy.. The ground conditions, piling type, spacing and number inform the heat capacity available for a particular building. The design of the GSHP should not be used to inform the design of the piles. The piling contractor will advise on the available length of pipework per pile; ensuring that adequate spacing is given between piles that are used as energy piles will give the total amount of usable pile length for heat exchange. Adequate spacing is required to minimise thermal interference between ground loop heat exchangers.

Energy piles require careful installation in order that the ground loop pipes do not become damaged. Leaks that develop in energy pile pipework are irreparable and would require isolation of that leg of pipework. This would impact system capacity therefore the piling designer/contractor will require to account for the associated risks include appropriate contingency and mitigation measures.

Piles at the new campus are likely to be square driven precast concrete 275mm x 275mm with an expected depth of 40m. Driven piles are typically sectional and can be used as energy piles where the bottom section is unavailable for heat exchange pipework (so as not to damage the pipework as it is driven into the ground).

As a general rule of thumb, 30W/m can be expected for an energy pile, assuming adequate spacing. Following consultation with specialist contractors, they have advised that the lower 0.5m of pile is not utilised for heat exchange. Preliminary analysis on a 11 x 5m column grid in the new building, and a footprint of 10,000m^2, gives approximately 181 columns. 3 piles per column is expected, but for the purposes of ensuring adequate spacing between energy piles, it is assumed that only 1 pile per column is used as an energy pile, i.e. 181 available energy piles at 44.5m each gives 8054m usable length, equivalent to 241kW peak energy extraction/rejection. With a maximum assumed COP of 5, this translates to a maximum heating load of 302kW.

This high level design analysis is based on preliminary assumptions on structural grid and available columns, as well as awaiting the final recommendations from the SI interpretive report.

The GSHP design would also be subject to the assessment of ground properties, system modelling, consultation with the piling contractor

and further refining of costs.

This project is particularly well suited to energy piles due to the expected depth of 45m (deeper than average piles). However, ground conditions and therefore the total required usable length of heat exchanger are still unknown. Typical subsurface temperature increases at a rate of 0.025°C/m below a depth of around 8m where the temperature is approximately 10°C. The anticipated temperature at the bottom of the energy piles is therefore 10.93°C.

Ground properties vary significantly with location and must be assessed as part of the design process where pile heat exchanger arrays are proposed. Various methods exist that provide the designer with the necessary parameters which include a drilling test piles or commissioning a geological desktop study.

In-situ conductivity testing is the most reliable method by which the thermal conductivity can be measured accurately. This accurate measurement allows the specialist contractor responsible for the geothermal design to avoid oversizing the ground loop to cover potential variations in conductivity on any particular site. The conductivity test also provides an accurate measurement of the undisturbed ground temperature which is also important in geothermal design.

The test piles option would require 2 piles driven to the design depth.

This process gives the specialist installer/designer the geological profile with depth on site, i.e. the type of geology present and their respective layer thicknesses. A thermal response test (TRT) is conducted in the test piles. A heat exchanger is installed to the design completion standards. Fluid is circulated through the heat exchanger over a number of days such that the temperature stabilises. The resultant constant temperature is then the undisturbed average ground temperature. A known heat load is then input into the circulating fluid and the resultant temperature profile is measured (over a period of more than 50 hours). This gives the overall pile thermal conductivity and pile heat exchanger resistance.

It is recommended that the test pile thermal response testing is pursued at the earliest possible stage to inform the GSHP and piling design to ensure the risk is appropriately transferred to the specialist contractor

Heating system

The efficiency of ground source heat pump is maximised by reducing the temperature difference between the source and the supply temperature.

Therefore it is advantageous to design the secondary side of the building heating system in tandem with the with heat pump design parameters, to ensure that the two are aligned and that maximum efficiencies can be achieved.

Ensuring low heating supply temperatures to maximise the benefits of the GSHP system will be achieved by utilising underfloor heating, where feasible, active chilled beams and other heat emitters with large surface areas including air handling unit (AHU) coils.

Heat pump systems are not well suited to conventional heating systems with 80°C plus flow temperatures, such as wet LTHW systems. However weather compensation curves will be employed on the building secondary side variable temperature heating circuits, ensuring supply temperatures are lowered during times of higher ambient temperature and therefore improving seasonal efficiencies.

The proposed tri-valent heating system will adopt a sliding header principle, via a series of two port motorised control valves installed on the primary header pipework. The sliding header concept is designed in a manner to maximise the run hours and overall seasonal efficiency of the LZC technologies depending on demand, load profile and external ambient conditions.

The secondary circuits proposed to serve the College building are as follows:

- High Temperature circuit 1 : 80°C flow, 60°C return, constant temperature LTHW circuit for heating & hot water generation
- High Temperature circuit 2: 80°C flow, 60°C return, variable temperature, weather compensated LTHW circuit for space heating
- Low Temperature circuit: 50°C flow, 30°C return, constant temperature LTHW circuit for space heating, hot water generation pre-heat, air handling unit (AHU) coils & active chilled beams for space heating

The GSHP will act as the primary heat source to feed the low temperature circuit which would supply all air handling unit coils, active chilled beams with heating coils and areas of underfloor heating. The GSHP will also provide a pre-heat circuit to the indirect hot water generation systems distributed around the building. Subject to further load profile analysis and heat emitter sizes, this circuit could also potentially serve some radiator circuits.

The gas-fired boilers will serve the higher temperature circuits to provide LTHW for space heating (weather compensated, variable temperature circuit) and satisfy the peak domestic hot water demand, in conjunction with a micro CHP unit.

At times when there is a required load/demand & the flow & return temperatures within the high temperature weather compensated circuit are favourable, the GSHP can be utilised to supplement the variable temperature circuit load, therefore maximising the use of the GSHP load and reducing demand on the gas-fired boilers.

The CHP unit, which is sized to deliver the base domestic hot water load, will act as the lead high temperature circuit for hot water purposes. When the base load is exceeded the gas fired boilers are capable of delivering supplementary heating to this circuit via the sliding header

To maximise the micro CHP run time, to improve the overall system efficiency and replenish the heat removed from the ground circuit, the CHP system will be in-directly connected to a ground loop replenishment circuit (via a plate heat exchanger).

Reference should be made to the outline heating and cooling schematic for further detail of the proposed plant configuration

The heating system will be split into zones based upon the expected occupancy of the building and the potential for out-of-hours use. Local zone valves will be provided to allow the heating to the various zones to be controlled on a time schedule basis via the BMS. This will allow the heating system to be appropriately zoned to allow for the building to be used efficiently out of hours and during periods of low occupancy.

Low Temperature Hot Water (LTHW) pipework will be insulated throughout the building. The pipework will be routed within ceiling voids or raised access floors within teaching spaces and within ceiling voids along main distribution routes. The pipework will be distributed between floors through the designated service risers.

All visible pipework connections to heat emitters will be chrome plated or provided with another aesthetic finish to be agreed with the architect.

Each thermal zone will be provided with adequate valves for commissioning and isolation. Each space will be capable of being isolated and drained to allow for simplification of room modifications.

LTHW will be generated and distributed from the primary energy centre by variable speed twin pump sets. Pump sets will be provided with auto-changeover to prevent disruption from individual pump failure and have inverter control.

For the areas heated from the LTHW system pressure independent control valves will be utilised to operate the system under variable flow to maximise energy savings associated with pumping energy.

Radiators and trench heating within the building will be supplied via the variable temperature (VT) pump circuits.

Where there are large areas of curtain wall glazing, such as the main reception/refectory area & open plan office areas (staff workrooms), trench heating will be provided to counteract cold downdraughts from the glazing and supplement the heating systems in these areas.

Trench heating may be delivered via natural or fan-assisted means

depending of the space heating demands and extent of glazed facades.

All radiators will be provided with lockable, tamper proof thermostatic radiator valves (TRV).

The proposed method of heating for each area is summarised in the heating strategy drawings.

Within general classrooms heating will be via wall mounted or floor standing radiators. In classrooms with floor to ceiling glazing where there is limited wall space, trench heating will be used. The can be as the primary system or in combination with chilled beams (where cooled rooms can also be heated via chilled beams). Their final selection will be subject to final fixtures, fittings and equipment (FF&E) layouts. Generally, there is a desire for these to be located under windows supplying natural ventilation into the space. Within accessible toilets or spaces used by people with assisted special needs, low surface temperature radiators will be used.

Where spaces are cooled by active chilled beams, subject to room loads, these rooms will also be heated using the installed chilled beams. Where passive chilled beams are sufficient to achieve the required cooling load the spaces will be heated by other means such as radiators, trench heating or a combination of both.

In workshops, where wall space is at a premium and where anything at low level is liable to get damaged, the space will be heated via high level, gas fired radiant heating.

Large circulation spaces, reception and refectory will have underfloor heating. Any of the external doors within these spaces which are expected to be in frequent use will incorporate warm air curtains. All warm air curtains will be controllable via the BMS.

The main sports hall will be heated via a central air handling unit at roof level supplying warm air to the space via high level ductwork and diffusers.

Within the gymnasium and fitness areas heating will be via a variable refrigerant flow (VRF) air conditioning system. Changing areas will be heated via underfloor heating.

The gymnasium and fitness suite will have the ability to be controlled by the occupants and adjusted according to their needs and user comfort requirements. All other areas will be controllable via the BMS.

The heating system will be linked to the College BMS system allowing for, but not limited to, monitoring of flow and return temperatures of LTHW and the thermal conditions within specific zones and spaces.

Ventilation strategy overview

The importance of the internal environment to the overall success of a building requires the ventilation systems to be considered holistically with the other building environmental strategies. Numerous studies have shown that poor ventilation, resulting in high concentrations of Carbon Dioxide (CO2), greatly impact upon a learning environment drastically reducing concentration of users within it.

It is expected that natural ventilation will be used predominately through-out the new building where space geometry, internal heat gains, room acoustics and anticipated activities make it practical to do so.

Mixed-mode and full mechanical ventilation will only be provided in spaces only where it is absolutely necessary to do so. The identification of spaces requiring mechanical ventilation will be dictated by the room use/process needs, the number of occupants and the room geometry (natural ventilation is ineffective in spaces with deep floor plans).

The external noise levels will also have an impact upon whether openable windows or vents can be used. Refer to the ventilation strategy drawings for further detail. Note these will be subject to further development as the design progresses, the architectural design intent around the elevations is better understood and further dynamic thermal analysis has been undertaken.

Acoustic considerations

Whilst the use of predominately natural ventilation has benefits in terms of air quality it can increase the potential of excessive external noise into the spaces. The Department for Education and Skills have an additional building bulletin relating to noise (BB93) though this does not specifically apply to further education buildings the principles can still be applied. The bulletin sets out a range of noise criteria for different spaces within the College setting upper limits for acceptable noise levels within the spaces.

The planned increase in capacity of the road network surrounding the College will require additional measures to ensure the acoustic requirements are achieved. Classrooms with openable windows facing directly onto the carriageways may require acoustically attenuated ventilators or a full mechanical system in order to overcome this. Facades facing away from the carriage way will benefit from the building itself providing a barrier to the traffic noise.

A Noise Impact Assessment has previously been undertaken for the site. This assessment deemed that the maximum allowable specific noise level at the receptor (Receptor 1 - 41 to 51 Grangemouth Road and Receptor 2 - 11 to 73 Midthorn Crescent) during the daytime is 57 dB, and during the night it is 45 dB.

All M&E plant associated with the College development will be selected to ensure the operational noise of the M&E plant will not result in the maximum allowable specific noise levels being exceeded.

All air handling units and fans will include attenuators and all external plant will be within acoustic enclosures as required. Analysis will be undertaken to ensure desired noise levels are achieved.

For further detail on the operational noise and internal ambient noise levels refer to the Noise Impact Assessment report.

Natural Ventilation

In the majority of naturally ventilated spaces within the College building, natural ventilation will be via opening windows.

The style and selection of which can greatly impact the overall effectiveness, consideration will need to be given to both the size and locations as part of the elevation arrangements.

Good planning and coordination will ensure that the natural ventilation system is able to provide not only fresh air into the spaces but also thermal comfort benefits in summer and also provide effective ventilation under winter conditions. The natural ventilation strategy will be designed to minimise the ingress of pollutants whilst ensuring occupancy comfort is maintained as far as possible.

Overheating Assessment

An assessment of the proposed College building was undertaken using Integrated Environment Solutions (IES) <Virtual Environment> software, with regard to assessing the risk of overheating within naturally ventilated classrooms. The extent of overheating has been assessed in line with the DfE Building Bulletin 101 (BB101): Ventilation of School Buildings' (2006), although the building is a College building the same criteria should be met.

There are no standards or guidance covering the design of teaching and learning spaces in further education (FE) buildings. As a result of the lack of directly relevant guidance documents, the standards for school classrooms, published by the Department for Education, is often used to define the requirements for the acoustic and thermal environment.

The performance standards for summertime overheating for teaching and learning areas as described within Building Bulletin 101, apply outside the heating season and are for the occupied period of 09:00 to 15:30, Monday to Friday, from 1 May to 30 September, when tested against the appropriate CIBSE Test Reference Year (TRY) Weather File.

It is expected that the daytime teaching hours will be between 09:00 and 18:00, the overheating testing period and associated occupancy and usage profiles were extended to cover this period.

The BB101 performance standards for summertime overheating for teaching and learning areas are:

- There should be no more than 120 hours when the air temperature in the classroom rises above 28°C
- The average internal to external temperature difference should not exceed 5°C (i.e. the internal air temperature should be no more than 5°C above the external air temperature on average)
- The internal air temperature when the space is occupied should not exceed 32°C

In order to show that the proposed building will provide comfortable conditions for occupants and not suffer from overheating two of the three criteria must be met.

In order to stress test the natural ventilation strategies the overheating criteria within the recently issued Chartered Institute of Building Services Engineers (CIBSE) Technical Memorandum (TM) 52 has also been adopted. This document utilises the principles of 'Adaptive Thermal Comfort'.

The assessment criteria within CIBSE TM 52 can be summarised as follows:

- The number of hours that the internal temperature of a room/zone exceeds the threshold comfort temperature by 1 degree centigrade (^{o}C or K) should not be more than 3% of the occupied hours between 1st May to 30th September
- The severity and frequency of overheating is represented as a single figure which must be less than or equal to 6 for any one day. The figure is calculated by multiplying the temperature difference between maximum room temperature and the predicted room temperature in intervals of 1^{o}C by the frequency of occurrence (using a half hourly timestep)
- The indoor temperature should not exceed 3^{o}C above the maximum daily temperature for a room/zone

The guidance states that a room or building that fails any two of the three criteria listed above, is classified as overheating.

This is a more refined assessment that takes account of how long a room stays hot, how severe (high) the temperature may be and how humans adjust to different weather patterns over a few weeks of warm weather.

The CIBSE TM 52 methodology adopts a more onerous set of criteria in comparison to BB101. This guidance has been used as an alternative assessment criteria for thermal comfort adaptability for projected climate change scenarios, as per the targets BREEAM credit (HEA 04).

A summary of the ventilation philosophies for the teaching areas is given below.

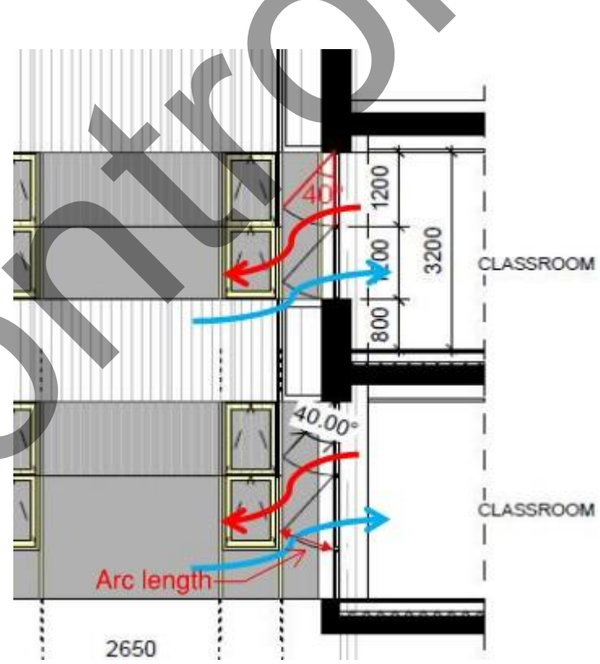
The control of the external openable windows is based on both internal temperature and CO_2 concentration. The windows start to open when the internal temperature exceeds 20°C or start to open at a CO_2 concentration of 1000ppm and are fully opened at 1500ppm between 08:00 and 18:00, Monday - Friday.

In practice, the windows will be manually opened by the lecturer or students with only the high level opening controlled automatically under the dictates of an temperature/air quality control loop via the BMS system. There will also be a local override facility provided to enable users to open/close the automated window as and when required.

Natural Ventilation Openings

Based on the current architectural proposals both the low and high level windows have unrestricted and are able to open to a minimum opening angle of 40^{o}

Figure 9.1: Natural ventilation openings/ measurement criteria



For the purpose of the modelling analysis a variety of window opening areas and arrangements has been assessed. Tables 9.1 and 9.2 outlines our assumptions on the window openings assumed and demonstrates compliance with the targeted BREEAM credit (Hea 02).

Window opening areas have been specified as shown in Tables 9.1 and 9.2, these areas are in accordance with BREEAM Hea 02 requirements, this specifies that "the opening window area in each occupied space is equivalent to 5% of the gross internal floor area of that room/floor plate".

Table 9.1: Typical Window Opening Area (1200mm high bottom opening, 1200mm high top opening)

	Window Height (m)	Arc Length (m)	Window Length (m)	Area of Window Pane Opening (m2)	Total Window Opening Area (m2)
1200/1200mm window opening split	1.2	0.84	0.88	0.73	1.46

Table 9.2: Typical Window Opening Area (1600mm high bottom opening, 800mm high top opening)

	Window Height (m)	Arc Length (m)	Window Length (m)	Area of Opening (m2)	Total Window Opening Area (m2)
1600mm bottom opening	1.6	1.12	0.88	0.98	1.47
800mm top opening	0.8	0.56	0.88	0.49	

It should be noted that as a result of the acoustic study and the level of road noise recorded, it has been determined that all rooms of the west elevation of the proposed building will need to be mechanically ventilated.

This area of the building will predominantly be occupied by staff workrooms/offices and the internal gains attributed to these spaces due to occupancy, small power and lighting would rule out the potential for natural ventilation to these areas

Further analysis will be required to the rooms/areas on the south façade (learning resource centre and first floor care, health & sports teaching areas), adjacent to Grangemouth Rd, where natural ventilation is the preferred solution.

Overheating Scenarios

A number of overheating scenarios have been modelled for various classrooms around the internal courtyard areas and along the east façade. These have been chosen to reflect typical classrooms with an exposed concrete soffit. Classrooms have been modelled without internal blinds. Blinds reduce solar penetration into the space by reflecting and absorbing short-wave solar radiation. A proportion of the absorbed heat (sometimes called retransmitted heat) is transferred into the room by convection and long-wave radiation.

If internal blinds are considered in naturally ventilated spaces it is recommended that only those types of blinds are installed that do not cover the window opening and hence do not affect the ventilation rates (i.e. blinds attached to a window leaf).

Table 9.3: Overheating Analysis based on CIBSE TM 52 criteria

Simulation Run	Window Height	Perforation %	Window Columns	Openable Area (m2)	Shading?	Temperature Threshold	No. of Rooms passing TM52	No. of Rooms failing TM52
1	1200/1200	30	3 Windows	4.40	Shading	20	39	5
2	1200/1200	30	2 Windows	2.93	Shading	20	21	23
3	1200/1200	50	3 Windows	4.40	Shading	20	39	5
4	1200/1200	50	2 Windows	2.93	Shading	20	19	25
5	1200/1200	70	3 Windows	4.40	Shading	20	39	5
6	1200/1200	70	2 Windows	2.93	Shading	20	18	26
7	1200/1200	NA	3 Windows	4.40	No Shading	20	21	23
8	1200/1200	NA	2 Windows	2.93	No Shading	20	5	39

Table 9.4: Overheating Analysis based on BB101 criteria 1 less than 120 hours over 28°C

Simulation Run	Window Height	Perforation %	Window Columns	Openable Area (m2)	Shading?	Temperature Threshold	No. of Rooms Passing BB101 Criteria 1	No. of Rooms Failing BB101 Criteria 1
11	1200/1200	30	3 Windows	4.40	Shading	20	44	0
12	1200/1200	30	2 Windows	2.93	Shading	20	44	0
13	1200/1200	50	3 Windows	4.40	Shading	20	44	0
14	1200/1200	50	2 Windows	2.93	Shading	20	44	0
15	1200/1200	70	3 Windows	4.40	Shading	20	44	0
16	1200/1200	70	2 Windows	2.93	Shading	20	44	0
17	1200/1200	NA	3 Windows	4.40	No Shading	20	43	1
18	1200/1200	NA	2 Windows	2.93	No Shading	20	44	0

Table 9.5: Overheating Analysis based on BB101, Criteria 1 –Rooms not exceeding 32°C

Simulation Run	Window Height	Perforation %	Window Columns	Openable Area (m2)	Shading?	Temperature Threshold	No. of Rooms Passing BB101 Criteria 3	No. of Rooms Failing BB101 Criteria 3
11	1200/1200	30	3 Windows	4.40	Shading	20	44	0
12	1200/1200	30	2 Windows	2.93	Shading	20	43	1
13	1200/1200	50	3 Windows	4.40	Shading	20	44	0
14	1200/1200	50	2 Windows	2.93	Shading	20	43	1
15	1200/1200	70	3 Windows	4.40	Shading	20	44	0
16	1200/1200	70	2 Windows	2.93	Shading	20	43	1
17	1200/1200	NA	3 Windows	4.40	No Shading	20	37	7
18	1200/1200	NA	2 Windows	2.93	No Shading	20	44	0

The results of all overheating scenarios are illustrated below. The effects of solar shading can have a significant impact of achieving the overheating criteria. Further studies will be undertaken during the next design stage to inform the extent of external, façade mounted solar shading required.

Note further improvement and enhancement of comfort conditions could be achieved through the deployment of a “night-purge” ventilation strategy whereby during the summer months upper hopper windows would be opened automatically at night, to gain the benefit of the lower ambient temperature externally. This would help to cool the structural mass by purging the structure of the heat accumulated during the day from internal heat gains prior to the following day’s occupation. A further 10-20% reduction in time where internal comfort temperatures exceed 28^{o}C should be possible.

Consideration would however need to be given to any potential security issues associated with adopting a night time ventilation strategy, therefore at this stage the effects of night time cooling for the purposes of this report has not been considered. Further coordination and development of the final shading solutions with the architect may change this stance.

Proposed Natural Ventilation Strategy

Based on the analysis carried out it is proposed that within naturally ventilated spaces such as classrooms low and high level openings will be incorporated into the glazed facades. To provide the users with local control of their environment whilst maximising the opportunity for night time cooling it is proposed that the lower opening will be a manual opening and the high level opening is automated via an actuator.

During the warmer summer months both the high-level top hopper and main lower windows within the space will need to be openable, increasing the flow into the space and maintaining improved summer design temperatures, in winter, only the upper section of the window is anticipated to be open periodically to purge the room and maintain high levels of indoor air quality

The use of only the upper section in colder temperatures ensures that the space can still be naturally ventilated as the cooler external air can sufficiently mix with the warmer internal air reducing the risk of discomfort to the occupants from nuisance draughts.

Each naturally ventilated space will be provided with BMS sensor to monitor the temperature and air quality within the space. Automated window actuators on the high level openings linked to the BMS will monitor the room conditions and react accordingly along with a room user control override.

In larger naturally ventilated spaces such as the refectory/café areas low level openings will be via openable elements within the glazed curtain walling. High level automated openings will be incorporated via a combination of openable elements within the glazed curtain walling system, in the glazed roof lights or at high level within facades and roofs.

To protect fire escape stairs and assist escape in the event of fire, an automatic opening natural ventilator (AOV) will be provided at the top of each fire escape stair core. The AOV will be suitably weather proofed and open on activation of a call point or fire alarm detector. The system will also incorporate a remote reset facility. A bypass facility is to be incorporated on the fire alarm system to permit fire alarm testing without activating the vents.

Mixed mode ventilation

There will be a number of spaces within the new College building where the reliance upon openable windows alone for adequate ventilation will not be possible; these generally are of larger floor areas where cross ventilation cannot be achieved, or in IT intensive classrooms with high internal gains.

In these spaces, additional mechanical ventilation will be installed to work in conjunction with openable windows to maintain conditions with respect to overheating and air quality.

Based on the current status of the architectural and engineering design there are a number of areas that will require further dynamic thermal analysis to validate any potential for natural ventilation. Where the over-heating criteria cannot be achieved it is envisage these areas will require boost extract systems to mitigate against overheating during peak summer conditions. On the basis that FVC are using ‘Thin Client’ PCs with minimal internal heat gains, the extent of mixed mode systems deployed will be investigated further during the RIBA Stage 3 design stage.

Mechanical Ventilation

In areas of the building where natural ventilation cannot be used or where it is not able to achieve the internal comfort criteria using mixed mode ventilation, supply and extract systems will be installed. These areas of the College will include the gymnasium/games hall, print unit, fitness suite, staff workrooms, kitchen, labs and workshop areas. Reference should be made to the ventilation zoning drawings for further detail of the ventilation strategies to each space.

The supply and extract ductwork will run within the ceiling void on each floor. Ductwork will be routed from plantrooms & external plant spaces via dedicated service risers. All the supply and extract ductwork will be fully insulated. The supply and extraction of air from the space will depend upon the use, available space and flowrates.

Each system will be zoned and include dedicated air handling units. Air handling unit systems will incorporate demand control, where appropriate, to modulate the volume of fresh air supplied to meet occupant demand/space usage.

Air handling units (AHUs) will generally be a combination of custom built or packaged units, incorporating all necessary components including:

- Atmospheric Attenuation
- Room side Attenuation
- Insulated double skin, acoustic, casing (weatherproof where external)
- Intake plenum
- Open/close motorised automatic damper (intake & exhaust)
- Combined panel/bag filter (where applicable)
- Thermal wheel, total energy (sensible/latent energy) wheel or cross flow plate heat exchanger (where applicable)
- Pre-heat / frost coil
- Heating coil
- Cooling coil (CHW/DX, where applicable)
- Variable speed supply fan
- Variable speed extract fan
- Exhaust plenum
- Condensate trap and pump (where applicable)

Extract systems will incorporate the extract fan and filter located upstream of the heat recovery device.

The mean specific fan power of all AHUs and fans will be selected to meet with the guidance identified in the Scottish Technical Standards, Section 6.

Specialist workshops and laboratories will have their own dedicated mechanical ventilation systems installed either with supply/make-up air, extract or a combination of both. These areas will be dealt with on a system by system basis and tailored to suit the requirements of each space. For further details refer to the ventilation strategy drawings.

All supply and extract ductwork installation will be in accordance with DW/144 & DW/172 for kitchen ductwork (fire rated).

All of the supply and extract ductwork will be leakage tested in accordance with HVCA Document DW/143.

All supply ductwork (including inlet to AHU’s or fans) and extract ductwork downstream of a heat recovery device will be thermally insulated.

Access and cleaning panels will be provided in all ductwork in accordance with DW/144 Appendix M and HVCA TR/19 for inspection, maintenance, testing and cleaning. Also in compliance with DW/172 for kitchen systems.

The insulation finish will be reinforced aluminium foil where concealed in ceiling voids, bulkheads and risers and by aluminium sheet cladding in plantrooms (including roof areas).

All external ductwork will be thermally insulated and water proofed with rigid aluminium sheeting, or an alternative of an equivalent standard, installed in accordance with the specialists' recommendations and mastic sealed at all edges.

Acoustic ductwork insulation will be as required to achieve room acoustic performance.

Any fire rated ductwork will provide stability, integrity and insulation for fire both inside and outside of the ductwork.in accordance the fire strategy,

Fusible link fire dampers or fire/smoke dampers will be provided where ductwork passes through fire compartment walls or cavity barriers and in accordance with the building fire strategy. Fire/smoke damper systems will be fully addressable type. All fire dampers and fire/smoke dampers will be fully accessible for maintenance and testing.

Where ductwork passes through a fire fighting lobby or through a primary means of escape this will be fire rated and insulated to maintain the fire rating of the fire compartment it passes through.

The ventilation systems will be provided with adequate Volume Control dampers to ensure the entire system can be commissioned. All branches will, as a minimum, be provided with volume control dampers.

Sound attenuators will be employed on all supply and extract systems to achieve the noise level requirements and acoustic requirements of the space.

Cross talk attenuation will be provided to reduce the transmission of airborne ducted noise between acoustically sensitive spaces or for privacy reasons. This will include common ductwork serving male/female toilets and changing areas, between adjacent cellular offices/meeting rooms for privacy reasons and in penetrations to rooms requiring high acoustic performance.

Cooling strategy overview

The primary cooling strategy within the new College will be to make use of natural or mixed mode ventilation. This makes use of the usually cooler external temperatures, with increased air change rates, to maintain the desired internal thermal condition during the summer months. Initial simplified analysis has shown that this will be achievable in the a large proportion of rooms within the College however; full thermal analysis is ongoing to identify any spaces where these measures will not be sufficient and where mechanical cooling will be required.

Despite the passive measures included in the design of the College some spaces due to the activities being undertaken within the space, high occupancy levels, high internal heat gains and high solar gains will inevitably require some form of mechanical cooling to be installed. These spaces are generally of similar use and located near each other, for example IT intensive classroom spaces.

Refer to the cooling strategy drawings included within appendix 3 of this report for further detail.

Cooling plant and equipment

In areas with high occupancy and internal IT related heat gains such as IT intensive teaching spaces and large open plan office areas these spaces will be cooled by active chilled beams with elevated chilled water generated from the low grade CHW circuit generated from the GSHP system.

Using chilled beams as a means of comfort cooling the space allows chilled water temperatures to be delivered at around 14^{o}C. These chilled water temperatures are aligned with the low grade cooling provided by the GSHP system. During mid-season when ground conditions permit, free cooling from the ground loop seasonal storage will satisfy the low grade cooling requirements.

However due to the elevated chilled water temperatures, even when utilising the GSHP's refrigeration cycle, the chilled water system is able to operate at very high efficiencies.

The latent heat load from spaces served from chilled beams will need to be addressed via the central air handling unit system providing the primary fresh air to the space. This is because the chilled water coils within the chilled beams are designed to run 'dry' and deal with sensible heat gains only.

The primary fresh air system will be selected to deliver air to the space to maintain a room dew point below the entering chilled water temperature, thus avoiding potential condensation forming on the chilled beam coil.

To maximise the efficiency of the GSHP it is proposed that the cooling requirements associated with the primary fresh air systems to these spaces will be complete with a high efficiency packaged direct-expansion (DX) heat pump & rotary heat exchanger capable of recovering sensible and latent energy. This rotary heat exchanger will maximise the efficiency of the DX heat pump installation by dehumidifying and cooling the outdoor air and transferring the waste heat and moisture to the exhaust air, thus reducing the cooling load capacity associated with this system.

For the areas provided with comfort cooling via a centralised chilled water system pressure, independent two-port control valves and variable speed pumps will be utilised to maximise energy savings associated with pumping energy.

There are spaces within the College building that may require cooling where chilled beams are not practical due to the function of the space and the level of latent gains.

In spaces such as the gymnasium and fitness suite where high latent gains are anticipated due to occupant activities, comfort cooling will be provided be via a Variable Refrigerant Flow (VRF) system, with multiple indoor fan coil units connected to single outdoor condenser unit.

The system will be capable of simultaneous heating and cooling operation within the same zone, i.e. south facing rooms may require cooling whilst north facing require heating. It is also proposed that comfort cooling, via a VRF system, is provided to other spaces which are remote from the areas cooled by chilled beams. This is to avoid the need for large chilled water pipe runs and the need for smaller local AHU systems with integral cooling to address the latent gains. These spaces will be provided with local room controllers and a central controller capable of being linked to the BMS.

The external condenser units will be located near to the area they are to serve in a location to be agreed with the architect, generally at roof level, where it can be easily accessed but does not impact upon the aesthetics of the building.

Within the UPS room local DX split cooling systems will be installed and provide 'n+1' resilience. The internal units will be wall mounted type with local wall mounted controllers. Heat rejection will be via external outdoor units which will generally be roof mounted in close proximity to the patch/hub rooms to limit pipe lengths.

Remote BMS monitoring of the temperatures within the UPS room will be provided. All local cooling units to these spaces will be complete with set point adjustment and run and fault indication via BMS system.

Comms rooms cooling

These areas will be cooled via dedicated comfort cooling systems for each space. The main server room on Level 01 will be cooled via computer room air conditioning (CRAC) units in a 'down flow' arrangement. The CRAC units will provide 'n+1' resilience. Duty/standby units will be capable of being rotated to a defined cycle (typically weekly).

The CRAC units will be chilled water type and will be selected to be

capable of operating at elevated chilled water temperatures to maximise the use of the GSHP in 'free-cooling' mode. Operating at elevated chilled water temperatures also eliminates the risk of any condensate however a leak detection system will be provided within these spaces.

Within the secondary server room (within the workshop building) and IT patch/hub room's local DX 'split' cooling systems will be installed. The DX 'split' system within the secondary server room will provide 'n+1' resilience. Similar to the main server room CRAC units, duty/standby DX 'split' units will be capable of being rotated to a defined cycle (typically weekly).

The internal DX units will be wall mounted type with local wall mounted controllers. Heat rejection will be via external outdoor units which will generally be roof mounted in close proximity to the patch/hub rooms to limit refrigerant pipe lengths.

No other mechanical pipework or services will be distributed through the server rooms and hub/patch rooms other than the condensate drain connection from the cooling unit. Chilled water pipework within the server rooms to serve the CRAC units will be limited to the final connection to the unit and will be kept as short as possible.

Remote BMS monitoring of the temperatures within the server rooms and patch rooms will be provided. All local cooling units to these spaces will be complete with set point adjustment and run and fault indication via BMS system.

9.3 Water Services Overview

General

The domestic water service systems will be installed in accordance with The Water Supply (Water Fittings) (Scotland) Byelaws, BS 6700, BS EN 806 and the WRAS Water Regulations Guide.

All domestic water services will be designed and installed in line with the guidance contained in CIBSE TM13 and HSE's Approved Code of Practice and Guidance L8 - Legionnaires Disease: The control of legionella bacteria in water systems.

Pipework will generally drop from the ceiling void to low level within services voids or within Integrated Partitioning Systems (IPS). Where pipework is run within inaccessible partitions, there shall be no joints. In main toilet areas, low level distribution pipework will run in dedicated services voids or beneath vanity units.

Local ball-o-fix isolation valves will be fitted at all final connections to catering appliances. All other appliances, including WCs and taps at wash hand basins, will be fitted with ball-o-fix isolation valves and flow regulators. Drain valves will be fitted at all system low points.

Potable cold water distribution

The potable cold water storage tank will be located within the energy centre building. The tank will be sized to accommodate a 12 hour interruption to the mains water supply and will comply with BS6700, The Water Supply (Water Fittings) (Scotland) Byelaws and be WRAS approved.

The tank will be split with a central partition and be capable of allowing one half of the tank to be drained down for the purposes of maintenance and cleaning, whilst the other supplies water to the building. The tank will be pre-insulated to prevent unnecessary heat gain to the water in order to maintain safe and hygienic water within the guidelines and the system sterilisation will be carried out in accordance with BS6700.

Each tank section will be complete with high/low level sensors and temperature sensors linked to the BMS. Ball valves will be the delayed action type installed within a raised ball valve chamber.

The storage tank will be connected to a packaged booster set which will in turn distribute boosted cold water to all outlets, appliances and hot water generators within the building. The booster sets will comprise of at least three vertical, multi-stage inverter driven pumps capable of supplying water at the required pressure and flow to all outlets. The number of pumps supplied as part of the packaged set will be selected so as to allow best efficiency during varying site demands. All booster sets will include an appropriatly sized pressure vessel.

The external boosted cold water and mains water pipework from the primary energy centre to the main building will be routed via direct buried pipework to the building. Pipework will be sufficiently separated from any heating pipework or electrical cables that could result in warming of the water supply to the building.

Boosted and mains cold water to areas local to the energy centre will be routed via ceiling voids to areas such as the care, health and sports facilities.

Similar to the incoming mains water supply, all external mains & boosted cold water will be installed in barrier pipe, until such times as an appropriate risk assessment is carried out by the Contractor in accordance with UKWIR guidance. Refer to the external services drawing for further detail.

The internal pipework distribution within the building will be copper where concealed and chrome plated where exposed. Pipework will be distributed between floors in the designated mechanical services risers and within ceiling voids.

This boosted cold water supply will serve all potable outlets throughout the building, and the distribution will be complete with any necessary pressure reducing valves to ensure correct operation at each individual outlet.

The necessary backflow prevention devices will be provided in the domestic cold water systems in accordance with water byelaws.

A dedicated break tank will be provided local to laboratory areas within the building. A packaged break tank and booster set will be provided to any external hose union taps.

There will be a means of controlling water movement through the potable cold water system to ensure that required temperatures are maintained throughout, minimising any risk of bacterial growth due to an increase in flow temperature. Careful consideration will be given to the design and routing of the cold water pipework with consideration given to the following:

- Avoid routing cold water pipes through areas with high heat gains & heat generating equipment
- Limit the amount/extent of internal pipework and maximise the use of external pipework distribution
- Avoid routing pipework in parallel with domestic hot water and LPHW pipework. Where unavoidable, ensures minimum distances between cold water pipes and domestic hot water/LTHW pipework are maintained where routed in parallel
- Route pipework in a manner that promotes regular draw off through the cold water system (e.g. ensuring frequently used outlets are the last outlet on the system)

As a result of increased heat pick up and cold water circulation issues associated with modern buildings, temperature relief solenoid valves and temperature probes will be fitted on the cold water system installation as a further measure to prevent water within the system from rising above 20°C.

Drinking fountains will be installed in a number of locations throughout the College building, mainly in break areas and areas of high physical activity to provide chilled water supplies. Each unit will be connected with recessed pipework to the boosted cold water system with isolation valves & water stop devices on all. Each unit will have an in-line filtration system, have automatic cut-off valves and have an integral drain which is connected to the buildings drainage network. Flexible connections to drinking fountains will not be permitted. Drainage connections local to the drinking fountains will also be provided for disposing waste liquid.

The boosted potable water system will be installed in accordance with BS 6700, BS EN 806 and the Water Supply (Water Fittings) Regulations 1999 and the WRAS Water Regulations Guide.

In accordance with BREEAM credit WAT 02 & 03, additional water meters will be installed within the College building in areas where high levels of water usage are anticipated. These will be within areas of the building that will consume more than 10% of the buildings water demand which is likely to include the following areas:

- Main kitchen area
- Sports changing areas
- Health & beauty department

The provision of sanitary supply shut off systems to toilets will not be permitted.

The primary meter and sub-meters will be linked to the BMS system to enable the water consumption of the various meters to be compared. In doing so the BMS will be configured to provide a leak detection system with the following functionality:

- Audible when activated
- Activated when a continuous flow of water passes through it at a flow rate above a pre-set minimum for a pre-set period of time
- Able to identify different leakage rates e.g. continuous, high and/or low level leaks over set time periods
- Programmable to suit the owner/occupiers' requirements
- Designed to avoid false alarms caused by normal operation of large water consuming plant

All water meters will utilise the Meter Bus (M-Bus) communication protocol.

Domestic hot water services

Domestic hot water (DHW) to serve the College will be generated locally to the areas served via packaged plate heat exchanger (PHX) and buffer storage. The packaged domestic hot water generators will have two plate heat exchangers. The first plate heat exchanger will be connected to the low temperature LTHW circuit (fed from the GSHP) to provide DHW pre-heat. The second PHX will be fed from the constant temperature (CT) LTHW heating circuit (fed from the CHP & gas-fired boilers). Each packaged domestic hot water generator will be sized to meet the peak demand for each zone. All buffer storage will be complete with expansion vessels and associated safety devices.

The proposed zoning is shown on the HWS zoning drawing contained in appendix 3.

The benefit of distributed hot water plant ensures that hot water can be generated more efficiently local to the areas served and minimise significant distribution losses associated with a centralised hot water generation solution.

Where there are remote outlets, to limit distribution runs, consideration will be given to utilising local 'point-of-use' or instantaneous electric water heaters.

The domestic hot water services will be designed and maintained in accordance with the Health and Safety Executive document L8 Legionnaires disease, the Control of Legionella Bacteria in Water Systems (approved code of practise and guidance) and CIBSE TM13. This includes but is not limited to ensuring that hot water storage temperature is 65°C, the distribution temperature of the hot water does not fall below 60°C and the return temperature below 55°C.

The domestic hot water will be distributed through the College building from the point of generation to each outlet via insulated copper pipework where concealed and chrome plated where exposed. Where pipework cannot be insulated and the runs exceed 3m in length trace heating will be provided. The pipework will run in hot water services flow and return arrangement. Isolation valves will be supplied to each appliance with automatic balancing valves fitted to the return pipework; in addition the branch into each room/area will have isolation valves and fitted with drain cocks on all low points.

Each wash hand basin will be fitted with a thermostatic mixing valve to ensure that water from the outlets is at 43°C (± 1°C). Where water is required to be supplied at a higher temperature such as cleaners sinks or for process each outlet signage should be provided clearly warning of the risk of scalding from very hot water.

Above ground drainage

The above ground drainage will be designed in accordance with BS EN 12056-2 2000 and the Scottish Technical Standards. The drainage will include, but not be limited to connections from all sinks, wash hand basins, toilets, showers, kitchen equipment, mechanical plant & other Client supplied equipment (e.g. workshop equipment).

Condensate drainage will be installed from indoor cooling units, heat recovery devices and air handling units.

Cast iron floor gullies will be installed in all plant areas spaces and in the locations of water heaters.

Cast iron floor gullies will also be installed in workshops, where required, and co-ordinated with the FF&E and suitably rated for the anticipated traffic. Within the kitchen areas floor stainless steel drainage channels and stainless steel finish grating will be installed. All floor gullies are to have removable traps to allow cleaning. Grease traps and enzyme dosing units will be provided to drainage from pot wash areas, co-ordinated with the kitchen specialists requirements.

The drainage within the laboratories and other areas where chemicals are to be used will be made of chemical resistant materials such as vulcathene or high density poly ethylene. Dilution traps will be provided to all waste outlets within laboratories where chemical discharges are present. Where specialist equipment requires drainage these will be installed in materials to meet the requirements e.g. high temperature discharge will be installed in copper or stainless steel.

Where drainage pipework passes through firewalls/floors fire sleeves and collars will be installed and all drainage pipework will be insulated where there is a risk of condensation or noise. The drainage pipework will connect between the floors in designated riser space and terminate externally at roof level.

Specialist piped installations
Gases

The workshops within the new College require a number of gases to be delivered to the spaces. These will be fed from an externally located bottle store in close proximity to the workshops and adjacent to the piped directly into each space. The location of the store needs to be convenient and local to the supply whilst also being safe, secure and well ventilated.

The storage of oxygen, acetylene, argon CO_2 and propane should follow all HSE guidelines and best practice in terms of segregation, ventilation and security. Within the workshops there will also be smaller movable bottles which will also require a secure well ventilated storage solution. Spatial requirements and MEP service requirements will be detailed during subsequent design stages in conjunction with Forth Valley College and the architect.

A natural gas supply is also required to a number of science laboratories within the building.

Within the workshops and science laboratories a gas proving panel will be provided in each space. The panel will carry out a gas proving test on the pipework to highlight if there is a gas appliance open or a gas leak. The panel will also include an emergency stop button capable of shutting off the supply to the room.

A gas safety ventilation interlock system will be installed in kitchen areas to ensure that the gas supply to the space is isolated unless the ventilation system is proven to be running.

Compressed air and steam systems

Compressed air will be supplied into the workshops/laboratories for equipment, appliances and general hand tool usage. The compressor will be located externally, adjacent to the service yard and in close proximity to the workshops. The compressors will be designed and installed to ensure that the acoustic design criteria is achieved. Acoustic enclosures

will be provided where required to satisfy the acoustic criteria.

The compressed air pipework will be distributed internally in a ring main arrangement. All internal pipework will be Aluminium, Galvanised Steel or ABS/Polyethylene.

Valve branches will drop from high level from the top of the ring main pipework to serve the equipment & general hand tool usage as required.

Compressed air drops will include a quarter turn isolating valve, lubricator, filter regulator, gauge and outlets will terminate with a quick release coupling.

Isolation valves will be provided at regular intervals along the ring main to allow ease of tapping in future connections.

All pressure regulators will be provided with matched safety valves. Compressed air automatic drain valve will be provided on all system low points and air vents on all high points.

A local steam generator will be provided locally to the chemical distillation laboratory.

Gas Suppression

Gaseous suppression systems will be installed in the main server room on Level 01 and the secondary server room within the ground floor workshop building. The extinguishing medium to be employed will be an inert gas. The contractor will employ a specialist to establish the quantity of gas and number of gas bottles required for each area to be protected.

The gaseous extinguishing system will be fully interfaced with the Fire Detection and Alarm System and the BMS system, and will initiate an alarm activation in the event of a discharge of gas as well as notification on the College BMS system.

BEMS Strategy Overview

A fully integrated building energy management system (BEMS) will be provided to monitor the mechanical, electrical and public health systems.

The building management system will provide a priority rating to all incoming alarm and events recorded. A head end system supervisor PC will be provided and will be located within the College FM office. Forth Valley College's existing Alloa/Stirling site BEMS will also link back to the new BEMS front end within the new College building.

The system will be based upon a network of intelligent controllers (outstations) to control the mechanical plant and equipment within the building. The system used will be selected to meet the specific requirements of this project.

Control outstations will generally be located within control panels. The outstations will carry out control and monitoring functions of the engineering services plant. The outstations will execute (via defined software) all necessary optimisation, time and temperature requirements for the mechanical plant and equipment, ensuring that the building services operate safely and efficiently.

All outstations will be linked via the College's IP communications network to a central operator station. By integrating the BMS onto the College's IP network the building will be capable of functioning as a fully integrated IP network. This will give the College full visibility of the BMS system from their network. The additional benefit of the BMS IP communications being via the College network is that the College network is resilient by design and has no single points of failure.

The operators' station will act as a viewing platform only for the control functions carried out by the outstations. The BEMS will operate and control the building services installations within the building and provide key features and functions which have been summarised below:

- Comprehensive Control of main plant (such as boilers) via 24 hour, 365 day time clock scheduling
- Optimum start
- Night set back
- Fabric low limit protection
- Demand operation
- Interlocking of plant (control functions only)
- Underfloor heating manifolds
- Duty rotation of plant
- Auto changeover of duty/standby plant
- Plant monitoring and status indication
- General and critical alarm indication
- Common fault (general plant)
- Individual fault (main plant – boilers etc.)
- Energy consumption monitoring – primary incoming utilities & sub-meters (gas, water, heat and electrical metering)
- Monitoring and control of space conditions (including door curtains) – general (as and where required)
- Temperature monitoring within cold water storage tank(s)
- Mechanical plant shut down (where required) in the event of a fire
- Automated natural ventilation openings
- Status monitoring of miscellaneous electrical and other plant/equipment where required
- Fan and pump motors will be supplied via frequency inverter drives for duty modulation (where applicable) and/or commissioning purposes
- All control and monitoring functions will be performed by DDC Control, with the exception of safety and fire alarm/fireman's override interlocks, which will be hard wired
- The BEMS will also comprise all necessary motor control panels (MCPs), remote controllers and enclosures, unitary controllers, sensors, activators, power, control and network wiring to provide a complete and operational control system
- All external perimeter and car park lighting capable of being zoned for automatic and manual control

9.4 Electrical Distribution

Overview

The new college facility will be supplied at high voltage from the District Network Operator (DNO). All metering will be at HV, with the client electrical distribution network commencing on the output side of the High Voltage (HV) Current Transformers (CTs) provided as part of the DNO connection.

The output side of the HV CTs will then supply a client owned 11kV/400V ONAN transformer located externally adjacent to the DNO HV ring main unit compound. In turn the 400V side of the transformer will then supply the client owned main switchboard, located internally within a dedicated room adjacent to the transformer compound. The main switchboard will then supply smaller switchboards located within the main teaching block and workshop block respectively. The smaller switchboards will then act as the main point of distribution within the respective teaching and workshop blocks.

The main switchboard will be Form 4B construction, type 6 segregation and contain the following:

- Circuit breakers (typically air circuit and moulded case circuit breakers) to provide protection to various electrical loads internal to, and external to the building
- Outgoing circuit breaker for supply of Power factor correction (PFC) / Active harmonic filtering (AHF); to correct low power factor due to linear (motors) and non-linear (variable frequency driven motors) devices. Note PFC/AHF will be external to the main switchboard

- Transient Voltage Surge Suppression (TVSS); to supress voltage spikes due to lightning strikes
- Metering; to record various electrical parameters during the operation of the new building
- 20% spare outgoing circuit capacity; allows the College to add new electrical circuits in the future as the requirement arises
- G59 relay

The switchboards within the teaching block and workshop block will be Form 4B construction, type 6 segregation and contain the following:

- Spare compartments to contain equipment necessary to receive, detect, protect and synchronise an electrical supply from a Photovoltaic array (to be determined in subsequent design phases)
- Spare compartments to contain equipment necessary to receive, detect, protect and synchronise an electrical supply from the CHP plant (to be determined in subsequent design phases). (Teaching block switchboard only)
- Various circuit breakers (typically air circuit and moulded case circuit breakers) to provide protection to various electrical loads internal to, and external to the building
- Transient Voltage Surge Suppression (TVSS); to supress voltage spikes due to lightning strikes
- Metering; to record various electrical parameters during the operation of the new building
- 20% spare outgoing circuit capacity; allows the college to add new electrical circuits in the future as the requirement arises

The switchboards within the teaching and workshop blocks will then supply final distribution boards, feeder pillars and section boards. Section boards will be located throughout the facility to minimise the number of outgoing ways from the switchboards and potential pinch points within ceiling void spaces by reducing the quantity of sub-main cable routes.

Power Factor Correction (PFC) / Active Harmonic Filtering (AHF)

A PFC/AHF unit will be provided for the new College. The unit will be stand-alone unit, installed adjacent to the main switchboard. The primary function of the PFC/AHF is to ensure a power factor > 0.95 lag is maintained at all times. The final size of the PFC/AHF will be determined during the detailed design phase of the project.

Section Boards, Distribution Boards (DBs) & Feeder Pillars

Section boards containing Moulded Case Circuit Breakers (MCCB) will be provided throughout the facility to act as an intermediate point of distribution. These in turn will supply final distribution boards. Section boards will be located within dedicated electrical cupboards & risers.

Distribution boards will be provided throughout the new building to provide power to equipment internal to the building. Distribution boards will generally be installed in dedicated electrical cupboards.

Electrical cupboards will be located on main corridors and thoroughfares, and provided with locks to prevent unauthorised access.

All distribution boards and external pillars will be provided with a suitably rated on-load isolation switch (to remove power to the board to facilitate replacement and maintenance of electrical equipment). Distribution boards and feeder pillars will utilise miniature circuit breakers (MCB) or Residual Circuit Breakers with Overcurrent Protection (RCBO) for supply of final circuits. The requirement for the use of an MCB or RCBO will be determined with consultation with the relevant British Standard (BS 7671). Generally separate distribution boards will be provided for lighting and power loads respectively.

Containment

All electrical cabling will be supported via electrical containment – comprising of cable ladder, cable tray, cable basket, conduit, galvanised steel trunking and buried ducts for external cabling. Cables will be suitably supported for their entire length of travel. Submain cables emanating from switchboards and section boards supplying Distribution Boards and other large pieces of mechanical equipment (such as chillers, air handling units and fans) will be securely installed on containment to the final point of termination. Final sub circuits (such as power outlets, lighting and other electrical equipment) will be securely supported on containment and/or other means of fixed support until final point of termination. Any conduits used for final drops will be galvanised stainless steel. All electrical cabling which is required to supply external services will be suitably rated for external use and installed on containment within the building or within buried ducts externally as appropriate.

Generally the following containment types will be used:

- Cable tray/ladder – Sub-main cabling
- Galvanised steel trunking – Lighting & power final circuits
- Cable tray – fire alarm cabling
- Cable basket – communications, IT cabling
- Cable tray – miscellaneous extra low voltage cabling

General Small Power

Small power wiring will general comprise of Low Smoke Zero Halogen (LSZH) cabling installed in galvanised steel trunking and utilising metallic conduit for final drops. Wiring to any under floor bus-bar track will be completed using thermosetting steel wire armour cable (XLPE/SWA/LSZH) with either integral or separate earth cable to meet the high integrity earthing requirements of BS7671. All ICT socket outlets will be provided with dual earth terminals as per the requirements of BS7671. Tap-offs from bus-bars will also utilise dual earth connections.

RCD protection will be provided for all general purpose socket outlets, as well as cleaner's outlets in accordance with BS 7671. Typically, 30mA, type AC RCD's will be provided.

Generally, small power outlets will be provided using the following methods;

Method 1: In areas with raised floor access, small power outlets will be provided via floor boxes recessed into the raised floor. Power to floor boxes will be provided by proprietary tap-off connections from the underfloor busbar. Underfloor busbar will be typically be single phase, c/w high integrity earthing. Tap-off connections will typically utilise 3m flexible leads. Typically floor boxes will be 4 compartment, with 2 no. compartments reserved for small power outlets, 1 no. compartment reserved for IT outlets and 1 no. spare compartment.

Option 2: In areas with no raised floor, small power outlets will be provided via wall mounted outlets. Outlets will be flush mounted within the wall.

Option 3: In areas with a high density of equipment requiring power and data connections, the use of floor grommets and integrated desk power/data management systems will be considered. In these spaces the proprietary desk power management modules will be supplied directly via proprietary tap-off's from the underfloor busbar and IT consolidation.

Small power provisions will be provided to suit individual room and equipment requirements. Indicative provisions for typical space types are as follows (note final requirements will be as per the room data sheet and FF&E requirements):

Classrooms:

Each floor box will typically contain:

- 2 x 13A twin power outlets
- 2 no. RJ45 data outlets

Floor boxes will generally be distributed to accommodate the final agreed furniture layout of the classrooms

In addition, to the general small power provision, dedicated wall mounted cleaner's sockets will also be provided. Power outlets for miscellaneous equipment will also be provided as required for items including but not limited to electronic whiteboards, printers, copiers and ceiling mounted projectors and wireless access points

I.T Classrooms:

Each floor box will typically contain:

- 2 x 13A twin power outlets
- 2 no. RJ45 data outlets

Floor boxes will generally be distributed to accommodate the final agreed furniture layout of the IT classroom.

In addition, to the general small power provision, dedicated wall mounted cleaner's sockets will also be provided. Power outlets for miscellaneous equipment will also be provided as required for items including but not limited to electronic whiteboards, printers, copiers and ceiling mounted projectors and wireless access points

Offices (including Work Rooms):

Floor boxes and grommets will be utilised as required to provide maximum flexibility to the end user dependant on final FF&E layouts. Typically 1 floor box will be provided per 2 desks containing the following:

- 2 x 13A twin power outlets
- 4 no. RJ45 data outlets

Spaces with a higher concentration of equipment requiring power and data may utilise grommets and an integrated power/data cable management system to minimise the quantity of floor boxes required.

In addition to the general small power provision, dedicated wall mounted cleaner's sockets will also be provided. Power outlets for miscellaneous equipment will also be provided as required for items including but not limited to electronic whiteboards, printers, copiers and ceiling mounted projectors.

Workshops:

Workshops will be provided with a dedicated distribution board to meet the power requirements of each room. Emergency stop buttons should be installed at several points throughout the workshop, to allow the quick and effective disconnection of power to the entire workshop served by the distribution board in case of an emergency. The distribution boards provided to these areas will utilise a drop out contactor to ensure that the power to the lighting circuits is maintained at all times – only the power section should be de-energised upon activation of an emergency stop button.

Radial circuits will be provided to fixed equipment such as lathes, drills, saws and compressors. One dedicated circuit should be provided for each piece of equipment - no other equipment should be powered off the circuit. Supplies to fixed equipment should utilised lockable isolators in close proximity to the item being served.

Galvanised trunking will be provided at high level within the workshops (co-ordinated with the architectural layouts). Flexible or rigid steel conduit drops will be utilised (as appropriate) from the high level trunking for provision of supplies to fixed equipment as required. Additional unistrut supports for drops will be provided where required.

Extra Low Voltage (ELV) supplies will be provided as required via local step-down transformers within each workshop. Typically, a 230V/110V step-down transformer will be provided, but other output voltages will be considered and provided for as required in consultation with the client. Power outlets for 110V supplies will typically be IEC 110V 16A outlets or via retractable reels mounted at high level.

Kitchen and Servery:

The Kitchen and Servery area will be provided with a dedicated distribution board, supplying all circuits within the kitchen and servery area. Emergency stop buttons will be installed at several points throughout the kitchen, allowing the quick and efficient isolation of power to the kitchen and servery in case of emergency. The distribution board will utilise a drop out contactor to ensure that the power to the lighting circuits is maintained at all times – only the power section should be de-energised upon activation of an emergency stop button.

Final confirmation of power supplies for kitchen and servery equipment will be determined in consultation with the client and kitchen specialist in subsequent design stages. It is expected that dedicated radial circuits for large pieces of kitchen equipment (walk in fridges, freezers, ovens, dishwashers) will be provided, with a means of manual isolation provided adjacent to the piece of equipment.

Single and three phase supplies will be provided as necessary for smaller pieces of equipment. Dedicated cleaners sockets will be provided and located near kitchen entrance/exit points and main thoroughfares.

Toilets and Changing rooms:

Where provided, electric hand dryers and hair dryers will be supplied via dedicated radial circuits. No other piece of equipment should be supplied from these circuits. Ancillary power to miscellaneous equipment such as solenoids, will be provided as required.

Learning Resource Centre:

Floor boxes will be provided where required to supply fixed pieces of equipment with the LRC such as photocopiers, computer and scanners. Floor boxes will also be provided to each staff desk, typically with 1 no. floor box provided per 2 desks.

Each floor box will typically contain:

- 2 x 13A twin power outlets
- 4 no. RJ45 data outlets

Where appropriate, power and data outlets may be provided as an integrated feature of the LRC furniture. The feasibility of such integration will be reviewed with the project architect and client during subsequent design stages.

In addition to the general small power provision, dedicated wall mounted cleaner's sockets will also be provided. Power outlets for miscellaneous equipment will also be provided as required for items including but not limited to electronic whiteboards, printers, copiers and ceiling mounted projectors and wireless access points as required.

Breakout and Flexible Spaces:

Floor boxes will be provided where required within breakout and flexible spaces

Each floor box will typically contain:

- 2 x 13A twin power outlets
- 2 no. RJ45 data outlets

Where appropriate, power and data outlets may be provided as an integrated feature of furniture. The feasibility of such integration will be reviewed with the project architect and client during subsequent design stages.

In areas where no raised floor is provided, perimeter recessed power and data outlets will be provided as required.

Power for Mechanical Services

A number of motor control centres (MCCs) will be provided throughout the facility for supply of major mechanical plant loads.

Electrical supplies to MCCs will be undertaken as part of the electrical contractor package of works. Field wiring – wiring from the motor control panel out to the mechanical equipment will be undertaken as part of the mechanical contractor package of works. All field wiring will be installed on fixed containment.

Smaller local mechanical loads, including fans, solenoids, etc. may be derived from the nearest local power distribution board.

Metering

Sub-metering will be provided to align with the principles listed within CIBSE TM39 and the BREEAM metering requirements. Electrical metering will be provided to distribution boards serving lighting, power and mechanical services as required under the BREEAM guidelines. In addition, metering will be provided for large electrical loads supplied directly from the main switchboards (including the teaching block and workshop switchboards), such motor control centres. Consultation with Forth Valley College will take place during subsequent design stages to ensure any other loads that the college require to be sub-metered are captured in the overall site metering strategy. Metering data will be collected by Dataserve, and sampled on a half-hourly basis.

Examples of where metering will be provided are:

- Main Switchboards
- Lighting and Power distribution boards
- External feeder pillars supplying power to external lights and other external services
- Photovoltaic panels
- Mechanical control centres
- Combined Heat and Power (CHP)

UPS

A centralised Uninterruptible Power Supply (UPS) will be provided, servicing all Server and Node rooms within the new College building. The UPS will provide power to active IT equipment within the server and node rooms in the event of a power outage.

The centralised UPS will be configured in an "N+1" arrangement. The autonomy of the centralised UPS will be 30mins. This autonomy figure will be available at the battery banks "end of life" (10 years minimum)

The depth of discharge of the battery bank will be no greater than 50%
The UPS manufacture will offer a 10 year warranty (inclusive of parts and labour) on all UPS items installed.

Standby Power Requirements

No requirement for standby power outside the UPS provision has been identified through the initial design stages and therefore has not been included within the scheme or the costs.

LIGHTING: Internal

Internal lighting will be designed in accordance with the appropriate British Standards, CIBSE guidelines and other relevant international standards as applicable. The achievement of a BREEAM rating is of high importance; as such, low efficacy light sources (efficacy ratings < 60lm/circuit watt) will not be used. Lamps and electronic ballasts will only be sourced from a reputed manufacture with a known and verifiable history of operation in the UK and a proven ability to supply lights appropriate for the functionality, operating environment and operation of the new building.

The lighting design will take cognisance of the architectural form of respective spaces and be as non-intrusive as possible, whilst complimenting the building structure. Within areas where rafts/baffles are extruded from the ceiling, suspended luminaires will be provided between the rafts. Indicative renders of potential lighting schemes are shown below.

In spaces conducive to activities where there will be a release of dust, grit, or water, all lights installed within those spaces will be appropriately IP rated. Typically, toilets and change room spaces will feature IP44 (or greater) rated lights, whilst workshops, kitchen, wet areas and plant spaces will feature IP65 (or greater) rated lights.

LED lamp sources will be utilised throughout where practicable.

Generally, the standard colour temperature for all light sources will be 4000K. Other colour temperatures may be specified as necessary to support specific activities.

Automated lighting control will be provided throughout the new building. Where practical, PIR sensors will be provided, controlling the operation of the lights within a space in accordance with the occupancy of the space. It is envisaged spaces such as open plan offices and toilets will be controlled via PIR sensors. In addition, lights located adjacent to external window walls will be controlled via photocell daylight linking in order to reduce the artificial light output when adequate daylight is available.

Within open plan spaces, luminaires may be grouped into multiple control zones to maximise the energy efficiency of the design and to meet BREEAM requirements.

Dimming of lights will be provided to spaces where an adjustable lighting level may be desirable (for example meeting rooms). Typically, a Digital Addressable Lighting Interface (DALI) dimming protocol will be adopted, which will require the selection of appropriate DALI compatible light fittings and control modules.

LIGHTING: External

The external lighting design will adopt the same philosophy as the internal lighting strategy. All external lighting will be designed in accordance with British Standards, CIBSE guidelines and other relevant international standards as applicable. Low efficacy light sources (efficacy ratings < 60lm/circuit watt) will not be used. Lamps and electronic ballasts will only be sourced from a reputed manufacture with a known and verifiable history of operation in the UK and a proven ability to supply lights appropriate for the functionality and operating requirements of the new College. LED lamp sources will be utilised throughout where practicable.

All external lights will be provided with a colour temperature of 4000K.

All external lights will be IP65 (minimum) or greater rated. Where practical, the electronic ballast will be integral to the light.

External lighting will generally be controlled via a timeclock and photocell arrangement, complete with manual override facility.

Lighting solutions will be selected to allow the easy maintenance and replacement of lamps.

Emergency lighting

Emergency lighting will be provided throughout the facility in accordance with the relevant British Standards, including BS5266. The emergency lighting installation will consist of illuminated LED emergency

exit signage, (maintained) emergency luminaires (integral to the main lighting installation) and standalone non-maintained LED emergency luminaires. In all instances emergency luminaires will be complete with self-contained emergency battery backup, capable of providing 3 hours emergency use. All emergency lighting will be capable of 'self-test' via a dedicated self-test system.

Security systems

The security system will comprise of the following elements:

- Intruder Alarm
- Electronic Access Control
- Closed Circuit Television (CCTV) cameras
- Panic Alarm

The above elements will be IP solutions and will utilise the passive structured cabling system and active IP network to meet physical connectivity and communications requirements.

Intruder Alarm

An intruder detection and alarm system will be installed to detect unauthorised access to internal spaces of the new building outside of standard operational hours. The system will be zoned to allow flexibility of use out of standard hours, whilst still maintaining 'secure zones' within the college facility. Initial consultation with the college has taken place and indicative zoning drawings are included within appendix 3. The final zoning requirements will be further developed in subsequent design stages.

The system will generally utilise door contacts and presence detectors to detect the presence of intruders. Generally the provision of intruder detection devices will be limited to building entrances and spaces on the ground floor adjacent to the building perimeter. The system will also operate on a 'double knock' basis to minimise the potential for false alarms

In the event the intruder detection system registers an event, all Close Circuit Television (CCTV) cameras in the vicinity of the event will activate.

The intruder alarm will be RedCARE compliant, and will feature two methods of sending externals signals to a remote monitoring station.

Typically, signals will be sent via landline and 3G/4G. The final requirements for remote monitoring will be agreed with the College during subsequent design stages.

Electronic Access Control

An electronic access control system will be installed to control the movement of staff and students to restricted spaces internal to and external to the building.

Initial consultation with the College has been undertaken to identify the extent of electronic controlled access required. Initial requirements are noted within the drawings contained within appendix 3. Electronic controlled access requirements will be further developed with the College in subsequent design phases.

The electronic access control system will generally comprises of:

- Access card: Provided to users. The card contains the access privileges which will allow the user to access a restricted space
- Proximity card readers: Typically installed in close proximity to the entrance point of the restricted space, on the 'secure' side. The user will present their card to the reader. The entrance point will unlock if suitable credentials have been allocated to the user's access card
- Electronic lock: Come in several forms, such as magnetic lock, electric strike and a mortice lock. The lock is used to secure the entrance point. The final lock type will be determined in conjunction with the architect based on the ironmongery schedule
- Push to exit button: Provided on the side of the door approached by occupants in direction of escape to de-energise the lock and permit egress. Where this could be from both directions provide on both sides
- Emergency exit break glass: Provided on the side of the door approached by occupants in direction of escape to de-energise the lock and permit egress in the event of an emergency. Where this could be from both directions provide on both sides

All electronic access control doors will fail 'safe' (i.e. in the unlocked position) in the event of a loss of power to the door controller or under a fire alarm condition.

CCTV

The CCTV system will consist of security cameras installed in pre-selected locations internal and external to the new building. The CCTV system is provided as a deterrent for malicious activities across the campus and to provide an additional level of security with respect to staff and student welfare/safety. Through consultation with the College, the requirement for as close to 100% CCTV coverage as possible across the external portion of the site has been identified. CCTV "blind spots" within the external system will therefore be avoided as far as practicable. Internally all communal circulation areas will be provided with CCTV coverage, in addition to potential high risk areas such as cash machines (ATM's) and reception desks.

All CCTV cameras will be of the IP type and feature high definition colour output, as well as vandal resistant protective covers.

The CCTV system will be provided with sufficient electronic storage to store up to 28 days' worth of recorded vision for all security cameras installed. This will integrate into a common front end, with network capability for remote viewing. The CCTV system will also be compatible with the existing FVC system, as that acts as the front end for the Stirling and Alloa Campuses respectively.

Panic Alarm

A panic alarm system will be provided at specific locations throughout the facility to be identified in conjunction with the college to help to protect the welfare of staff and students.

Typically panic alarm buttons will be installed at front of house spaces, such as reception desks and counters where financial transactions are conducted. Spaces including the LRC reception desk and meeting rooms primarily used to conduct meeting with the public and other non-staff/student personnel will also be provided with panic alarm buttons. A local alarm will be initiated upon activation of an alarm, with repeater alarms provided at strategic locations throughout the facility (complete with note of alarm activation area).

Lightning Protection System

A lightning protection system will be installed in accordance with BS EN 62305. A concerted effort will be made to ensure all lightning protection system components are concealed as far as practically possible to prevent a detrimental visual impact to the building. Copper conductors will generally be used for the lightning protection system. The use of dis-similar metals will not be permissible.

The lightning protection will consist of the following components:

- Air termination network: An air termination consisting of a mesh grid and finials will be provided. All exposed metallic equipment and material installed on the roof (such as mechanical plant, lights, satellite dishes etc.) will be bonded to the lightning protection system.
- Down conductors: The down conductor's primary purpose is to safely direct lightning which has struck the air termination network to ground. The final form of the down conductor will be determined during the detailed design stage, but is likely to take the form of a copper tape conductor. Elements of the building structure may be used dependant on the final form of the structure. This will be investigated further as the design develops.

- Earthing network: The earth network allows the lightning charge carried by the down conductors to safely discharge to earth. All down conductors will be bonded together, via a buried copper conductor, which will form an equipotential ring around the building. Earth rods and pits will be installed as required.

Vertical Transport

Forth Valley College will be provided with two no. passenger lifts. The passenger lifts will traverse 2 levels: Ground, First floors. A lift traffic analysis has identified the required capacity/parameter of the lifts as follows:

- 13 Person Capacity
- 1000 Kg Load Capacity
- 1 m/s Rated Travel Speed

The Lift installations will comply with BS EN 81, BS EN 81(DDA) and The Lift Regulations 1997. Compliance with disabled access requirements will be included.

All lifts will incorporate energy efficient motors, regenerative drives and controls to meet the requirements of BREEAM credit Ene.8. No requirement has been identified by the Fire Engineer for any evacuation or firefighting lifts, therefore no provision for the same has been made.

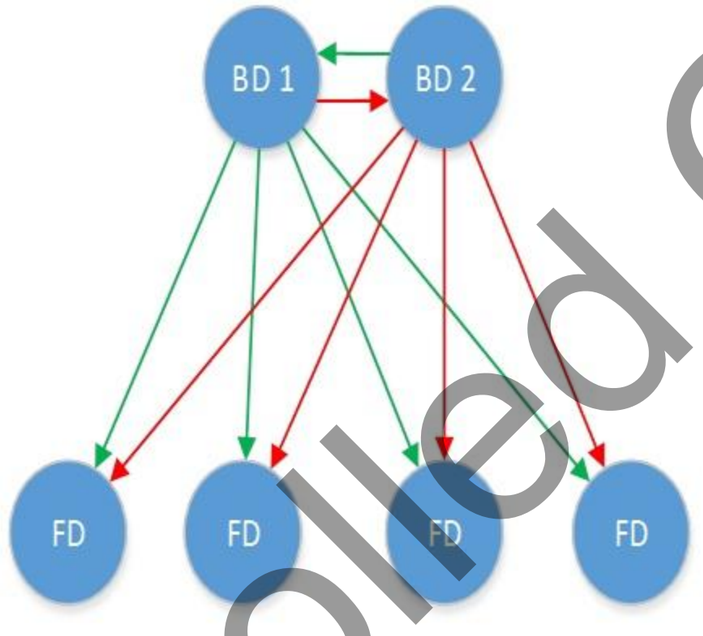
9.5 Information and communication technology

A single Structured Cabling System will be utilised for the physical connectivity of all IP capable solutions, such as:

- Data, Voice and Video
- Security systems, CCTV and access control
- Building Management Systems
- Audio Visual

The building's IT and Communications systems will be served by a single Structured Cabling System, centred on two Main Comms Rooms. These will be supplemented by a number of Comms Rooms, strategically located throughout the building to ensure the Standards defined maximum horizontal cable length, of 90m, is not exceeded.

A single manufacturer Structured Cabling System will be designed based on the industry recognized Distributed Network Architecture.



The Main Comms Rooms will house the Building Distributors and the Comms Rooms will house Floor Distributors. The Main Comms Rooms may also house Flood Distributors if necessary.

The cable types will be:

- Backbone
  - A blown fibre solution will be provided
  - 8 cores of OM4 fibre will be diversely routed from each Main Comms Room to each Comms room;
  - 12 cores of OM4 fibre will be in each of the two diverse routes between the Main Comms Rooms,
  - 50 pair CW1308 from one (Primary) Main Comms Room to each Comms room and the second Main Comms room
- Horizontal
  - Category 6A U/UTP
  - Consideration will be given to installing shielded cabling

Ad-hoc cabling will not be installed throughout the College.

The Main Comms Rooms will be provided to host all Servers / SAN andactive equipment. All active equipment will be hosted within the Comms rooms.

A single Active IP Network will be utilised for all IP capable wired and wireless solutions, such as:

- Data, Voice and Video
- Security systems, CCTV and access control
- Building Management Systems
- Audio Visual

The Active IP Network will be provided as a standard three layer solution of Core, Distribution and Access layer Ethernet IP network.

The Core / Distribution layer will be a resilient pair located within both of the Main Comms rooms to provide a highly resilient solution.

The Access layer will provide PoE and 10/100/1000Mbs connectivity for all End User Devices in either 24 port or 48 port stackable switches. Uplinks to the Distribution / Core layer will be resilient 10Gbs that have a known migration path to 40Gbs and 100Gbs.

Server connectivity will be provided at 10Gbs.

A Telephone System, which will be implemented by the College, will be deployed and use the Structured Cabling System. However, a telephone handset and a PC will not share the same RJ45 outlet.

Wireless Network coverage will be provided across all indoor areas as well as key outdoor areas, such as outdoor reception/spaces, seating areas and courtyard spaces. The solution will be based on the current ratified standard, 802.11ac and four RJ45 outlets will be provided at each required access point location. Consideration will also be given to designing outdoor access points into other outdoor hardware, such as external lighting.

Low power desktop devices will be deployed within classrooms where fixed machines are required. This reduces power consumption as well as the amount of heat ejected into the room when compared to using a regular PC. USB charging stations for mobile/tablets will be considered in areas such as the LRC and staff workrooms.

The majority of classrooms will utilise laptops connected via the Wireless Network as and when required. One solution may be having Laptops residing in a Laptop Trolley/Storage Area within each classroom, which would also provide charging.

RADIO PAGER SYSTEM

A radio pager system will be provided to select staff and students to raise awareness of incidents on campus as follows:

- FM pagers – Emergency incidents and first aid response
- Students and personnel with hearing difficulties – alerts for fire alarm or emergency evacuations

Campus wide coverage will be provided. The existing FVC paging system is expected to be removed and redeployed for use within the new college building.

AUDIO VISUAL SYSTEMS

Audio Visual systems will be required through the college, and include systems such as:

- Video Conferencing
- IPTV
- Display Screens
- Sound Systems for specialist areas (ie Beauty, Sports Hall, fitness suite etc)
- Interactive classroom display and audio systems
- Specialist systems (such as specialist signage)

These systems will utilise the single Structured Cabling System and Active IP network.

Detailed design of these systems will be developed at a later stage by a specialist and Forth Valley College IT staff. Final requirements will be discussed and agreed with Forth Valley College during the subsequent design stages..

FACILITIES FOR THE DISABLED

The following facilities will be incorporated for the assistance of staff, students and other personnel who may be require specific disabled facilities:

- Hearing Induction loop: A hearing induction loop system will be provided within boardrooms, commercial spaces, reception desks, library counters, servery areas and other customer facing spaces. During subsequent design stages the requirement for portable units for temporary use in meeting rooms and classrooms will be discussed and agreed with the College.
- Disabled Alarm System: In addition to the Panic alarm requirements stated within the Security section, panic alarm buttons and calling facilities will be installed in locker rooms, change rooms and accessible toilets. The call facility will interface with the reception desk and FM office.

Emergency Voice Communication systems: To be installed in refuge areas in all escape stairwells.

FIRE DETECTION AND ALARM SYSTEM

An automatic fire detection and alarms system to Category L1 of BS5839 will be provided to the facility. A category L1 system will provide coverage throughout the facility.

The main fire alarm panel will be located at the main entrance to the college, with a fully functional repeater panel provided at the rear entrance. All panels will be provided with 72 hour battery backup.

Automatic detection will be provided throughout the facility, comprising primarily of dual technology smoke/heat detectors. Heat detectors only will be utilised in spaces such as the workshops, kitchens and mechanical plant spaces. Aspirating systems will also be used within the primary IT rooms and other spaces where the use of conventional 'point' detectors may not be appropriate.

Manual call points will be provided at all external exit points, entrances to escape stairwells and other areas as required by BS5839. Visual beacons and sounders will be provided throughout to alert staff, students and other personnel of a fire alarm condition.

The fire detection and alarm system will also interface with other systems including the electronic access control and mechanical plant installation. This will ensure that in the event of an alarm condition, appropriate fail safe conditions and plant shut downs can be implemented automatically.

A full cause and effect schedule shall be developed during subsequent design stages, however it is envisaged that with respect to automatic detection a 'double knock' system will be utilised and a 'single knock' utilised for manual call points.

ASPECTS REQUIRING FURTHER RESOLUTION

Following approval of the full business case and progression to the next stage (development of scheme RIBA Stage 03+) the following items require further development and resolution:

- Conclusion of dynamic energy modelling exercise following further co-ordination with the architectural elevational treatment to establish compliance with Section 6 of the Scottish Technical Standards and determine if the targeted BREEAM Ene.01 credits are achievable.
- Conclusion of the dynamic thermal simulation overheating assessments following further co-ordination with the architectural elevational treatment to verify the extent of naturally ventilated and mechanically ventilated spaces.
- Conclusion of the dynamic thermal simulation annual heating and cooling load profile to inform the sizing of the LZC technologies.
- Ongoing architectural and engineering co-ordination including review of riser spaces, primary services distribution routes, roof plant zones & relationship with roof lights etc.
- Co-ordination of M&E strategies with proposed architectural ceiling strategies
- Co-ordination of M&E design in accordance with the space/room FF&E requirements including specialist installations.
- Further workshops and liaison with Forth Valley College to inform system specific MEP requirements to help inform and define the appropriate level of information required for subsequent RIBA Design Stages.

10 LIFE CYCLE COSTS

AECOM has undertaken an estimate of the life cycle costs for the new Falkirk Campus development based on the capital costs produced by AECOM and the design information produced by Reich & Hall Architects and AECOM and for their sections of the Full Business Case Report.

The model includes a significant amount of detail, analysing the impact of costs on an annual basis over the 60-year design life of the building against the Building Cost Information Service (BCIS) Elements which is a standard industry recognised practice.

The methodology adopted when determining the lifecycle provisions assumes that the buildings and systems will be subject to a robust maintenance regime during this period and the components of these systems are situated in the environmental conditions specified by the manufacturers. We have not included for any technological upgrades of systems, which may be required over the period. The model assumes that all equipment has been fitted in appropriate positions within the building, allowing the required access to complete maintenance and lifecycle replacement works.

The Lifecycle model has been based wholly upon the cost information provided, with the allocation of funds and allowances predicated by the level of detail established within those and the design data provided at the time of production.

It is an industry standard comparator, for the purpose of benchmarking, to express Lifecycle costs as a cost per m2 against the GIFA of the building, per annum (£/m2/pa). The Lifecycle costs for the facilities in scope are detailed in Table 10.1 below, along with the benchmark comparator for similar education facilities.

Table 10.1

Facility	GIFA	Review Period (Years)	Total Lifecycle costs	Cost per m2 per annum	Benchmark Comparator (£/m2/pa)
Forth Valley College	20,148m2	60	£29,424,103	£ 24.34	£22 - £32

*Lifecycle costs are base date Q3 2016 and net of VAT and inflation.

The 60 year Life Cycle Model is contained in appendix 4

11 HEALTH AND SAFETY

11.1 Introduction

The consultation process on the replacement of the Construction (Design and Management) Regulations 2007 was completed on the 6th June 2014, with draft regulations subsequently published on the 9th January 2015. At that time they were still very much subject to change; with wide ranging speculation on practical implementation and possible amendments whilst the Regulations awaited Parliamentary approval.

The finalised version of the regulations and guidance were published on Thursday 2nd April 2015 year and came into effect on Monday 6th April 15, scheduled below are the obligations and requirements for the new campus in Falkirk.

11.2 Obligations

The regulations set out a number of requirements that Forth Valley College as the client are required to complete and which they are being supported on by their advisory team. Regulations 4 and 5 set out the Client's duty to make suitable arrangements for managing a project and maintaining and reviewing these arrangements throughout, in order that the project is carried out in a way that manages the health and safety risks. The new campus project given its scale and composition shall involve multiple trades sitting underneath one main contractor appointment, under the regulations this is defined as appointing more than one contractor. On this basis the Regulations require the Client to appoint a Principal Designer and a Principal Contractor and make sure they carry out their duties.

11.3 Requirements

Regulation 4 - Client Duties in relation to Managing Projects:

- A Client must make suitable arrangements for managing a project, including the allocation of sufficient time and other resources.
- Arrangements are suitable if they ensure that:
  - The construction work can be carried out, so far as is reasonably practicable, without risks to the health or safety of any person affected by the project; and
  - The facilities required by Schedule 2 (Welfare) are provided in respect of any person carrying out construction work
- A Client must ensure that these arrangements are maintained and reviewed throughout the project.
- A Client must provide Pre-Construction Information (PCI) as soon as is practicable to every Designer and Contractor appointed, or being considered for appointment, to the project.
- A Client must ensure that before the Construction Phase begins:
  - A Construction Phase Plan (CPP) is drawn up by the Contractor if there is only one Contractor, or by the Principal Contractor; and
  - The Principal Designer prepares a Health & Safety File for the project, which
    - Complies with the requirements of Regulation 12(5)
    - Is revised from time to time as appropriate to incorporate any relevant new information; and
    - Is kept available for inspection by any person who may need it to comply with the relevant legal requirements
- A Client must take reasonable steps to ensure that
  - The Principal Designer complies with any other Principal Designer duties in Regulations 11 and 12; and
  - The Principal Contractor complies with any other Principal Contractor duties in Regulations 12 to 14
- If a Client disposes of the Client's interest in the structure, the Client complies with the duty in paragraph (5)(b)(iii) by providing the Health & Safety File to the person who acquires the Client's interest in the structure and ensuring that that person is aware of the nature and purpose of the file.
- Where there is more than one Client in relation to a project
  - One or more of the Clients may agree in writing to be treated for the purposes of these Regulations as the only Client or Clients; and
  - Except for the duties specified in sub-paragraph (c) only the Client or Clients agreed in paragraph (a) are subject to the duties owed by a Client under these Regulations
  - The duties in the following provisions are owed by all Clients
    - Regulation 8(4); and
    - Paragraph (4) and Regulation 8(6) to the extent that those duties relate to information in the possession of the Client

There are no changes to the duties with regards the 2015 regulations and on this basis The College shall be the client for the purposes of CDM. The role of principal designers is being separately tendered and will therefore be a separate appointment by the client.

The client must take reasonable steps to ensure that the principal designer and principal contractor comply with their duties and they have visibility of these duties being carried out. This is particularly relevant where the Contractor shall take on the role of principal designer post contract signing. Practically a great deal of these shall be covered under the contractor's obligation to the client and captured with the tender documentation.

Regulation 5 Appointment of the Principal Designer and the Principal Contractor

- Where there is more than one Contractor, or if it is reasonably foreseeable that more than one Contractor will be working on a project at any time, the Client must appoint in writing
  - A designer with control over the Pre-Construction Phase as Principal Designer; and
  - A contractor as Principal Contractor.
- The appointments must be made as soon as is practicable, and in any event, before the construction phase begins
- If the Client fails to appoint a Principal Designer, the Client must fulfil the duties of the Principal Designer in Regulations 11 and 12
- If the Client fails to appoint a Principal Contractor, the Client must fulfil the duties of the Principal Contractor in Regulations12 to 14

Regulation 2: includes the following definition of construction work:

'Construction work' means the carrying out of any building, civil engineering or engineering construction work and includes;

- The construction, alteration, conversion, fitting out, commissioning, renovation, repair, upkeep, redecoration or other maintenance (including cleaning which involves the use of water or an abrasive at high pressure, or the use of corrosive or toxic substances), de-commissioning, demolition or dismantling of a structure
- The preparation for an intended structure, including site clearance, exploration, investigation (but not site survey) and excavation (but not pre-construction archaeological investigations), and the clearance or preparation of the site or structure for use or occupation at its conclusion

- The assembly on site of prefabricated elements to form a structure or the disassembly on site of the prefabricated elements which, immediately before such disassembly, formed a structure
- The removal of a structure, or of any product or waste resulting from demolition or dismantling of a structure, or from disassembly of prefabricated elements which immediately before such disassembly formed such a structure
- The installation, commissioning, maintenance, repair or removal of mechanical, electrical, gas, compressed air, hydraulic, telecommunications, computer or similar services which are normally fixed within or to a structure

The regulations do not include the exploration for, or extraction of, mineral resources, or preparatory activities carried out at a place where such exploration or extraction is carried out.

The only change here is that pre-construction archaeological investigations are explicitly excluded from the definition of construction works however they are not applicable at this time as identified from surveys to date.

Regulation 6 Notification

- A project is notifiable if the construction work on a construction site is scheduled to
  - Last longer than 30 working days and have more than 20 workers working simultaneously at any point in the project; or
  - Exceed 500 person days
- Where a project is notifiable, the client must give notice in writing to the Executive as soon as is practicable before the construction phase begins.
- The notice must
  - Contain the particulars specified in Schedule 1
  - Be clearly displayed in the construction site office in a comprehensible form where it can be read by any worker engaged in the construction work; and
  - If necessary, be periodically updated

This is now a client duty; however Principal Designers shall issue this on behalf of Forth Valley College.

Regulation 12 Construction phase plan and health and safety file

The following is extracted from the Regulations that define the requirements under the regulation.

- During the pre-construction phase, the principal designer must prepare a health and safety file appropriate to the characteristics of the project which must contain information relating to the project which is likely to be needed during any subsequent project to ensure the health and safety of any person
- The principal designer must ensure that the health and safety file is appropriately reviewed, updated and revised from time to time to take account of the work and any changes that have occurred
- During the project, the principal contractor must provide the principal designer with any information in the principal contractor's possession relevant to the health and safety file, for inclusion in the health and safety file
- If the principal designer's appointment concludes before the end of the project, the principal designer must pass the health and safety file to the principal contractor
- Where the health and safety file is passed to the principal contractor under paragraph (8), the principal contractor must ensure that the health and safety file is appropriately reviewed, updated and revised from time to time to take account of the work and any changes that have occurred
- At the end of the project, the principal designer, or where there is no principal designer the principal contractor, must pass the health and safety file to the client

It is proposed that at contract signing and for the construction phase, the Principal Designer provides the File information to the Principal Contractor who then reviews, updates and revises the H&S File. On completion, the Principal Contractor issues the H&S File to the Principal Designer for review and comment before final issue to the client .

Summary

The above commentary summarises the approach regarding CDM 2015 in relation to Forth Valley College and the new Falkirk Campus.

12 BUILDING INFORMATION MODELLING (BIM)

The Stage 3/4 design undertaken by the College's consultants has been supported by the use of Building Information Modelling (BIM) for collaboration and co - ordination purposes. The college is aspiring to BIM Level 2 and is in the process of preparing a set of employer's information requirements (EIRs) in accordance with PAS 1192-2: 'Specification for information management for the capital/ delivery phase of construction projects using building information modelling'. This document will set out the contents, format and level of detail, aspiring to a level 2 BIM model that the contractor will prepare for the college and will be developed in parallel with the design of the building and the colleges' facilities management strategy

The EIR is contained in appendix 5

13 PROJECT GOVERNANCE

13.1 Overview

The governance arrangements adopted by the College for the project must ensure that the College is able to procure its new building in an efficient and effective manner, whilst also allowing adequate scrutiny at key decision points. The governance structure must also reflect the capital financed nature of the project procured on a single stage Design & Build contract.

It is crucial to the future of the College that the most economically advantageous tender is identified and that the selected contractor has values that are compatible with those of the College and the College's educational aims. The College must be confident that it can afford the new building and the associated Facility Management services.

Since agreement to progress beyond OBC to FBC there have been three significant changes to the project:

- The funding of the project has changed from Revenue to Capital
- The procurement of the project has changed from NPD over 25 years to a Single Stage Design & Build contract
- The incorporation of an Arts Venue funded by Falkirk Council has been deleted

The College has successfully progressed the revised strategy and continued with its role of intelligent client. By continuing to adopt this role the College will be able to question and challenge bidders at each stage of the development process.

There is a balance to be struck between the college deploying its own resources and the use of external advisers. It is quite normal for procuring organisations to make extensive use of external advisers and given the scale and complexity of the project, this is inevitable. Since OBC, a full team of Technical, Legal and Financial Advisors have been tendered and appointed by the College with a design competition assisting the procurement process for the Architect, as a sub consultant to the Project Manager. These contracts have also been revised to incorporate the revised funding and procurement strategy outlined above. This approach has delivered a very experienced, skilled and efficient project team led by the College and is working well to deliver on the College aspiration of a new 21st century Falkirk Headquarters Campus, opening in 2019.

The following Governance structure has been adopted for all aspects of the project going forward.

13.2 Investment Decision Maker

Board of management of Forth Valley College (BOM)

The BOM must consider whether the project fits with the strategic direction of the college, whether the project is affordable throughout its life and whether or not it represents value for money. The BoM will ultimately be accountable to the Scottish Funding Council and Scottish Government for the successful delivery of the project. To date, the BOM has ensured that the agreed Governance structure has been implemented with the Project Director in place and the Technical team appointed and operating effectively.

Meeting Frequency: Predetermined frequency of BOM meetings. Further meetings may have to be called at crucial points in the project

Chaired by: Chair of College Board of Management Hugh Hall

The College Board of Management are supported by Falkirk Campus Project Board

The BOM have delegated certain of its powers to the Falkirk Campus Project Board, through a formal scheme of delegation.

The Falkirk Campus Project Board (FCPB) are responsible for the organisation and functioning of the project. It ensures that the project remains to timescale and within budget. The FCPB will take important decisions on all aspects of the project throughout the project's life. It has a wide and experienced senior membership from a range of stakeholders including. three board members and a co-opted ex board member with experience of construction projects, as well as senior College and Government representatives. The FCPB believes the right balance has been struck between allowing wide representation and having too many individuals on the board such that decision making becomes difficult.

The Project Board operates in an advisory capacity to the Project Owner, it is not a democracy. The Project Owner retains responsibility for the successful delivery of the project and is supported by a full time Project Director.

The Falkirk Campus Project Board, supported by others will oversee the work of the Project Director and ensure that the Project Director has adequate human and financial resources to run the project on a daily basis.

Meeting Frequency: Monthly, more frequently at crucial points

Chaired by: Board member Ken Richardson.

Agendas and papers: issued at least five clear business days in advance of meetings.

Minutes: issued no more than ten working days after meetings with named individuals and timescales identified for each action via an action tracker.

The new Falkirk Campus board minutes are considered at all BOM meetings.

Table 13.1: FCPB Membership

GROUP	MEMBERSHIP
Falkirk Campus Project Board	Chair – BOM member BOM Members x 2 SFT Representative Project Owner (College Principal) Project Director (Estates Director) Finance Director Head of Communications & Marketing (observer) IS Director Ex Board member – co opted Head of Estates – in attendance College Secretary (Secretary of the committee) – in attendance Technical Advisor /Project Manager in attendance

13.3 Project Owner

The Project Owner is the College Principal who retains responsibility for the successful delivery of the project. The Project Owner is supported by a full time Project Director/Sponsor.

13.4 Project Director/Sponsor

The Project Director/Sponsor is the senior individual working on the project on a full time basis and is the College Director of Estates Development. As such, his responsibilities are wide-ranging, complex and time consuming. He is supported by a Project Team of experienced individuals and provides reports on project progress for each meeting of the Project Board. He leads the work of the Project Team.

13.5 Project Team

The Project Team will be the forum where issues are discussed, work is commissioned and reports are considered before going up to the Project Board for decision. The Project Team organises its work through a number of work streams as follows:

- College Educational Team (including IT)
- Technical Team including Architect
- Legal Team
- Financial Team
- Student Support, as appropriate

The Project Director has identified appropriate Work Stream Leads in each case and those individuals are members of the Project Team who meet monthly to formally progress all aspects of the project. Formal written progress updates are also issued by each lead ahead of the monthly Project Team meeting to ensure appropriate ownership and support for key decisions.

Every fortnight significant progress is also achieved via individual detailed operational and technical meetings.

- Chaired by: Project Director
- Frequency: monthly

Agendas and papers: issued at least five clear business days in advance of meetings

Minutes: issued no more than ten working days after meetings with named individuals and timescales identified for each action via an action tracker.

Table 13.2: Project Team Membership

GROUP	MEMBERSHIP
Project Team	Project Director – Chair
Educational Team	Project Manager Finance Director IS Director Academic Head Marketing Manager Procurement Manager
Technical Team	Project Manager: AECOM Architect: Reiach & Hall M&E Engineer: AECOM Structural & Civil engineer: AECOM Cost Consultant: AECOM Principal Designer: to be appointed Property Consultant: CBRE, R J Dunn
Legal Team	CMS Cameron McKenna
Financial Team	Caledonian Economics/QMPF

The work streams above define the project team structures which are currently in place to ensure the optimal management of the new Falkirk Headquarters Campus project through all development stages including the FBC, Procurement, Appointment of Contractor, Site Operations and 12 months beyond completion (generally referred to as the Defects Liability period).

Following identification and review of the requirements and skills required to successfully procure this project, the College is fully satisfied that it has established a highly skilled and experienced team, who are capable of applying their extensive experience and skilled resources to all stages of the project.

13.6 Stakeholder groups

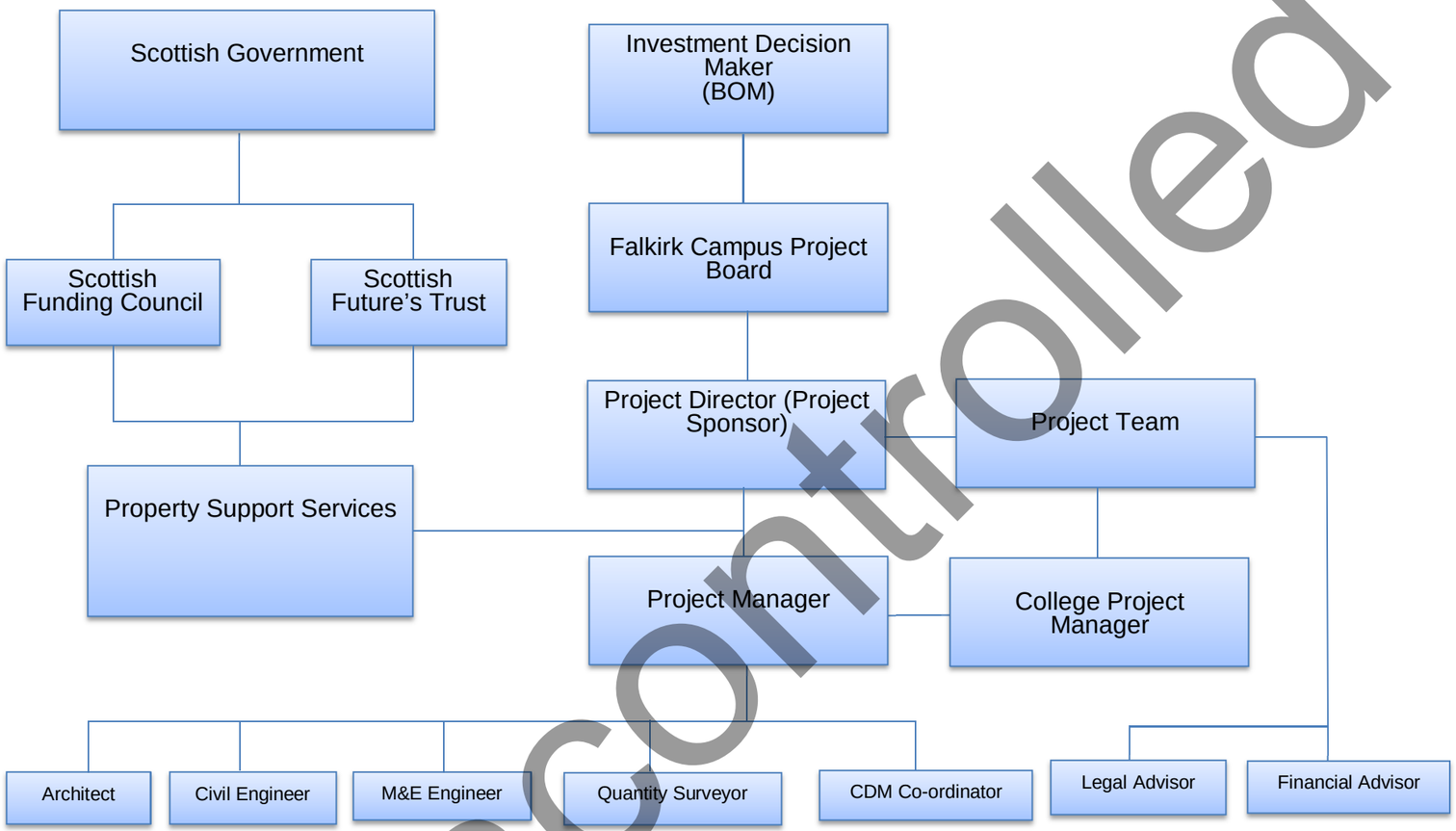
The college is also considering establishing one or more stakeholder groups. This would give the opportunity for wider input to the project from individuals representing groups with an important stake in its successful delivery and who may not be well represented on the Project Team or Project Board. Stakeholder groups might cover academic staff, support staff, secondary head teachers, local/regional business and commercial interests and community interests.

13.7 Delivery of new Campus Development – all stage Project Structure

The College has, through the development of their Governance structure, embraced best practice, the achievement of which will be fully supported by the Consultant teams. The structure outlined below reflects the particular requirements of this capital funded single stage design & Build model and provides an effective and robust framework, which will successfully deliver the project.

This structure is designed to ensure that adequate and appropriately experienced resources are in place to effectively manage the project from its current stage, through to completion on site including the appointment of a Design & Build contractor. This structure clearly allocates individual responsibilities and resources to enable the necessary decision making processes to take place in a timely manner and ensure the efficient and cost effective implementation of the contract.

Figure 13.1 – All Stage Project Structure



14 LAND ACQUISITION AND DISPOSAL

14.1 Overview

The proposed site for the new College comprises 2 parcels of land: one is entirely within the ownership of the College (Existing Land) and the other is owned by the trustees of Callendar Estates (CE Land). The Existing land extends to 10.64 acres and the CE Land to 4.805 acres, total 15.44 acres.

14.2 Land Acquisition

14.2.1 4.8 Acre Middlefield Site

The CE Land is to be acquired by the College subject to satisfaction or waiver of certain conditions precedent in terms of a conditional legal missive (CLM) dated 9th October 2015.

The CLM is a contract between the College and the trustees of Callendar Estates. It has been drawn up in formal Scottish legal terms. The CLM contains a number of conditions precedent that may be satisfied or waived by the College before the acquisition becomes unconditional and binding on the College. This gives the College the certainty that the CE land can be acquired at a later date without exposing the College to the risk of having to pay for the CE land in the absence of formal approval to proceed with the Project. The CLM contains a Long Stop Date (13th October 2019) by which the CLM must become unconditional, failing which either the College or the trustees of Callendar Estates may terminate the CLM.

In terms of the CLM, the College is permitted to take access to the CE Land to carry out surveys subject to compliance with an access license attached to the CLM.

The purchase price is £961,000 plus stamp duty, with two small uplifts in price, if delayed, towards the long stop date of 5% and 2.25% respectively. Progress on satisfying the conditions are noted in table 14.1.

Table 14.1: Progress on satisfying the conditions precedent for purchase of additional 4.8 acres

Description of Condition Precedent (CP)	Anticipated date for satisfaction or waiver	Long Stop Date for satisfaction or waiver	Actions to date
Site investigations	Before Long Stop Date	14 October 2019* (obligation to carry out such investigations as soon as practicable following conclusion of missives (13 October 2015))	Structural Soils appointed as contractor. Work completed July 2016.
Planning condition (receipt of satisfactory planning consent beyond the point of challenge)	Before Long Stop Date	14 October 2019	Application for Planning Permission in Principle lodged with Falkirk Council. Formal consent granted on 4th April 2016.
Drainage and utilities condition	Before Long Stop Date	14 October 2019* (obligation to make enquiries re capacity, makes applications for consent, obtain wayleaves etc)	No utility capacity issues raised by suppliers when obtaining quotations. A Drainage Pre-Development enquiry has been submitted to Scottish Water with no negative response to-date. Wayleaves required for HV cable relocation, along with wayleaves for Gas and Water utility infrastructure crossing the site ongoing.
Funding condition	Before Long Stop Date	14 October 2019*	This will be resolved as part of the formal process
Board approval condition	Before Long Stop Date	14 October 2019 (obligation to intimate approval within 21 days of receipt of Board Approval)	This will be dealt with as part of the formal approvals process once procurement complete.
Other necessary consents condition	Before Long Stop Date	14 October 2019 (obligation to keep Seller informed of progress at least once every 3 months)	Formal progress update issued to Seller 2nd June 2016.

14.3 Land Sales

14.3.1 17.8 Acre Falkirk Campus

Strategy to pursue sale of 17.8 acre site

CBRE provided Forth Valley College a planning strategy in March 2016 in relation to the land surplus to requirements at Grangemouth Road to help inform the College to maximise value for the site through the planning process, and therefore preparing the site for sale.

CBRE are currently drafting a report which will illustrate the different options of how the site could be brought forward for sale and the likely indicative affects that each option could have on the value received in the form of a capital receipt. CBRE are also reviewing issues around the existing telecommunication contract on-site and any examples of where we have come across such, and advise on options.

The sale of the surplus land is bound by the Scottish Public Finance Manual, Property Advice Division. This process would not guarantee, and often does not lead to the sale through an internal disposal, but is required to be investigated in advance of any sale on the open market.

Notwithstanding the above, it is recommended that planning permission in principle should be sought for the surplus land and this should be done with an objective of delivering a consent that has addressed as many of the issues including affordable housing, ground conditions, transportation and financial contributions, as possible.

Due to the size of the site and capacity it could accommodate, any planning application for residential development would be defined as a 'major' application and therefore would require a minimum 3 month pre-application process, and a 4 month determination period. Including concluding a potential Section 75 legal agreement, it is anticipated that it would take approximately 9 – 12 months to secure a planning permission in principle consent. The Falkirk Local Development Plan has designated the surplus land for residential development and therefore the use has been agreed in principle at that location subject to site specific issues being resolved.

To successfully achieve a sale of any residential site, it is critical to minimise the potential conditionality of any proposal through providing as much supporting information as possible, including a clear sales pack. This should include where available, details of Section 75 legal agreement, topographical and ground condition surveys. The nature of the Invitation to Bid will also influence the clarity of the proposals received and their conditionality, although it is always challenging to distil residential bids down to a net figure.

The market has now reached a point where it is increasingly possible to create competitive tension between parties and this should be the objective at Grangemouth Road. Once a planning permission in principle consent has been achieved, it is recommended that an open marketing campaign is initiated.

It is recommended that a short set of particulars is compiled and a data room created into which all relevant information including the planning consent, title information and any available surveys are placed. Who accesses the data room and how long they spend there can be monitored. Dependent on interest secured a closing date would be set with very clear guidelines as to the nature of bids that would be accepted.

It is recommended that the site is disposed of to a single purchaser and that phased payments are considered along with top-ups to allow the house-builders to propose structures which meet their ROI requirements. In analysing proposals received, an NPV analysis would be undertaken. It is likely for a site of this size that house-builders will look to spread the land payment over 2 or 3 years, with an initial payment on receipt of detailed planning permission.

In undertaking the disposal of residential land it would be advisable to minimise the conditionality attached to any bid through very clearly setting out what the vendor is prepared to accept by way of potential deductions and requesting a net figure which effectively equates to a guaranteed minimum price. Experience notes that the house builders that are sufficiently interested are reasonably willing to bid on this basis as the certainty of payment amounts and timings has some attraction to them.

Following the identification of a preferred bidder, tight timescales would be put in place to ensure an early conclusion of missives

The FBC is currently assuming a conservative sale price of £[redacted] and this is included in section 16 Affordability.

14.3.2 13 Acre Branshill Site

The 13 Acre Branshill Site in Alloa currently benefits from a Planning Permission in Principle (PPP), a cleared site and limited section 75 issues.

The FBC is currently assuming a conservative sale price of [redacted] and this is included in Section 16 Affordability.

While the site has not been formally marketed the College are currently negotiating conditional legal missives on a phased payment basis in excess of this amount.

14.4 [redacted]

[redacted]

[redacted]

15 COSTS AND VALUE FOR MONEY

15.1 Introduction

The proposed project is close to completion of Stage 3 of the RIBA 2013 Plan of Work with the current design now approved by the College Board. Since OBC stage the cost plan has continually been updated on a "re-measure" basis by AECOM, directly measured from the Design Drawings as they have evolved. An elemental cost plan has been prepared and a breakdown of the key elements is included in appendix 6 of this report.

The project has a strong focus on value for money. Delivering to budget has been broadly achieved through critical techniques measured against the following headings:

- Affordability – rigorous updating of the Cost Plan through the early design stages has ensured that the design has evolved within the affordability parameters. This has been supplemented by the continuous monitoring of market conditions and review of inflation indices
- Design – through the design evolution process cost checks have been carried out which has identified the need to make adjustments to both area and specification to align with budget. Robust allowances for design risk/contingency have been retained to take account of design development throughout subsequent design stages
- Benchmarking – the proposed project has been benchmarked against sector comparators with a cost comparison exercise included as part of this submission within appendix 6. Furthermore materials and systems have been tested, not only from a cost perspective, but also with consideration given to longevity and life cycle costs
- Change Control – from Stage 3 onwards the project team will manage the construction budget using a Change Management Process. The formal approval of change will provide the mechanism for the management and control of contingency expenditure

15.2 Construction Costs

Executive summary

Under the selected Design & Build Procurement Route the estimated construction costs for this project are confirmed in the amount of £71,628,340, based upon a Gross Internal Floor Area of 20,148 m²

The estimated construction cost is inclusive of all building and external works elements, groups 1&2 fixtures, fittings and equipment (FF&E), preliminaries (benchmarked at 15%) with an allowance of 6% design development risk/contingency equating to £55,349,489.

Further costs are included for post contract award design fees which are benchmarked against comparator projects, with a 4% Client contingency allowance retained to be utilised for change control.

An allowance for construction Inflation has been included, this is calculated on the basis of the BCIS indices which are applied from the base date of the estimate, 3rd Quarter 2016, to construction mid-point which is estimated 3rd Quarter 2018.

Inflation is calculated by applying the BCIS "all-in" tender price index from the base date to the point of contract award, with the BCIS "building cost" index used to forecast inflation from contract award to construction mid-point. Using this calculation inflation is currently projected at 0.38%. It should be noted that the tender price index saw a sharp fall at the time this FBC estimate was prepared and the outturn inflation is predicted to be very low / negative over the coming three years. Inflation will be closely monitored through subsequent stages and updated as required.

Value Added Tax is applied to all construction activities/fees in the current amount of 20%, resulting in a total Construction Estimate of £71,628,340. Refer to Table 15.1 which highlights the cost plan allowances and associated £/m² calculation.

Table 15.1: Construction Costs

Forth Valley College, Falkirk Campus	GIFA (m²)	20,148
Construction Costs	**Cost (£)**	**£ / m²**
Building & External Works Prime Cost	£45,405,650	£2,254
Preliminaries, Overheads and Profit	£6,810,848	£338
Design Development Contingency	£3,132,990	£155
Contractor Design & Build Fees (benchmarked)	£1,830,000	£91
Client Contingency	£2,287,180	£114
Inflation (to Construction Mid-Point 3Q 2018).	£223,615	£11
Construction Sub-Total	£59,690,283	£2,963
VAT (Included at 20%).	£11,938,057	£592
Construction Estimate	£71,628,340	£3,555

It should be noted that a separate capital / revenue budget exists for items deemed to be out-with the Construction Funded costs. All items which fall into this category are funded via the Employer's capital and revenue budget and managed externally to the Design & Build Contract. This is discussed in detail within the subsequent sections of this report.

Building and External Work Prime Cost

Following the OBC the initial benchmarking exercise has been updated to current day to draw comparison to similar projects. The current design information has now been tested through cost modelling and preparation of an elemental cost plan, it is noted that this compares favourably with the benchmark projects and generally aligns with the schemes competed at Alloa and Striling Campus for Forth Valley College

FF&E Groupings

The definitions for FF&E items which are included as part of the Construction element is as follows:

Group 1: Contractor procures and installs.

- Examples of Group 1 include fixed benches, worktops, shelving, serveries, notice boards, white boards, cabinets, water dispensers/fountains, hand dryers, mirrors, vanity units, racking etc

Group 2: College procures and Contractor installs.

- Examples of Group 2 include telephone handsets, safes, specialist equipment, hair works stations etc

Group 1 and 2 FF&E costs are included at £1,984,324 (£98/m²) which is based upon benchmarked rates from previous similar projects.

Contractor Design Fees

The Design & Build form of procurement requires that the successful bidder of this project will be responsible for completion of the design from RIBA Stage 3/4 onwards. On this basis an allowance for Contractor design fees has been included; this is benchmarked against similar projects of both size and complexity. Through the tendering process the bidders will be asked to declare their retained cost allowances for all design work for transparency.

Client contingency

In additional to the design development risk / contingency allowance of 6% included with the building & external works costs, an allowance has been made for a separate Client contingency which shall be utilised from Stage 3 onwards to cover design change managed via the change control protocol. Client contingency is currently included at 4% equating to an

allowance of £2,287,180 (£79/m²). It is planned that all retained contingency funds be reviewed at subsequent cost check stages and reviewed accordingly as the design becomes further detailed.

Cost checks will continue up to contract award and where budget pressures are identified, the philosophy is to consider alternative solutions and value engineering options so that the overall budget can be maintained minimising draw down of Client contingency. Adopting a reactive approach such as this is an effective tool to avoid cost increases but would note that not all matters will be able to be managed in this way thus the retained contingency.

Following contract award it is planned that any residual Client contingency will be transferred and retained by the Client to fund potential post contract variations.

BCIS inflation

Inflation has been measured against the current BCIS forecast index and is based upon the current target development programme. Based upon the recent BCIS index very low levels of inflation are forecast with a sustained period of deflation anticipated over the coming years with growth not apparent until mid-2019 which spans the entire construction programme. It is unknown how the market place will react and if indeed this forecast will hold true. In the event of any subsequent upward movement in the indices forecast, this shall be managed within the contained contingency allowances; however should there be an equally sharp rise this may exceed the contingency allowances. Inflation shall be monitored and updated through all key stages in line with BCIS trends however, changes in market conditions cannot be ascertained and as such this remains a significant project risk.

15.3 College Capital / Revenue Costs

Executive summary

Table 15.2 illustrates a number of costs which are separate to the D&B Construction budget and will be funded by the College directly through their capital and revenue budget.

Table 15.2: Capital / Revenue Costs

Forth Valley College, Falkirk Campus	GIFA (m²)	20,148
Capital / Revenue Costs	**Cost (£)**	**£ / m²**
Design Fees to Contract Award	£2,460,000	£122
Public Sector & Technical Fees	£1,687,900	£82
Land Acquisition (incl VAT)	£999,440	£50
ICT Equipment	£1,954,356	£97
FF&E Group 2 (supply)	£141,036	£7
FF&E Group 3 (loose furniture)	£1,007,400	£50
FF&E Group 4 & 5	£402,960	£20
Inflation on ICT and FF&E	£13,183	£1
FF&E & College Contingency	£1,002,967	£51
Capital / Revenue Sub-Total	£9,669,242	£480
VAT (excluding land purchase)	£1,733,960	£86
Capital / Revenue Estimate	£11,403,202	£566

Design fees to contract award

The fees included are based upon actual agreed amounts with AECOM multi-disciplinary technical advisor and Reiach & Hall Architects. The fees are agreed on a fixed basis and any additional services if deemed required shall be managed within the cost cap of £2,460,000.

Public sector and technical fees

The fees included are based upon agreements with CMS legal advisor and Caledonian Economics financial advisor. Within this budget further allowances have been included for College move/decant costs, survey work, statutory consents, post contract "clerk of works" services, specialist appointments such as BREEAM, landscape, fire and IT consultant along with an allowance for College costs at this stage. This budget shall be firmed up as further appointments are confirmed.

Land purchase

Land purchase costs, inclusive of stamp duty, have been confirmed by the College in the amount of £999,440.

ICT Equipment

ICT equipment is defined as all IT installations and associated equipment which is over and above the structured cabling, patch panel and outlet installation which is included within the prime cost. As the OBC, the costs for ICT equipment have been based on the outturn costs at Stirling and Alloa, which have been updated for inflation to present day.

FF&E Groupings

The definition for FF&E items included as part of the Capital / Revenue element is as follows:

Group 3: College procure, install and commission.

- Examples of group 3 include loose furniture such as desks, tables and chairs, filing cabinets, sofas, free standing tool cupboards, workbenches, trolleys, bins, lathes, drills, grinders, saws and workshop equipment generally etc

Group 4: College procure and install.

- Examples of group 4 include tools, cutlery, beanbags, table covers, floor mats, books, stationary etc

Group 5: College dismantle existing, decant, install and commission.

- Examples of group 5 include fixed machinery / equipment moved from the existing College to the new development

Facility Management

Soft and Hard FM Services and Lifecycle replacement do not form part of the D&B Contract and shall be the sole responsibility of the College similar to the arrangement for the existing Falkirk Campus.

15.4 Overall budget summary

Combined Construction & College Funded Summary

Table 15.3: Overall budget

Construction Costs	Cost (£)
Building & External Works Prime Cost	£45,405,651
Preliminaries, Overheads and Profit	£6,810,848
Design Development Contingency	£3,132,990
Contractor Design & Build Fees	£1,830,000
Client Contingency	£2,287,180
Inflation (to Construction Mid-Point).	£223,615
Construction Sub-Total	£59,690,283
VAT (Included at 20%)	£11,938,057
Construction Estimate	£71,628,340

Capital / Revenue Costs	Cost (£)
Design Team Fees	£2,460,000
Public Sector / Technical Advisor	£1,687,900
Land Acquisition (inclusive of VAT)	£999,440
ICT Equipment	£1,954,356
FF&E Group 2	£141,036
FF&E Group 3	£1,007,400
F&E Group 4 & 5	£402,960
Inflation on ICT and FF&E	£13,183
FF&E and College Contingency	£1,002,967
Capital / Revenue Sub-Total	£9,669,242
VAT (Included at 20%)	£1,733,960
Capital / Revenue Estimate	£11,403,202
Combined Estimate	£83,031,542

15.5 Additional Funding

Aspirational Items

Throughout the FBC process the College have maintained their aspiration to introduce potential additional items should the budget be available through the next development stages of the project. On this basis a list of aspirational items has been compiled in conjunction with the Client and Design team, which may be instructed to the brief additional funding permitting. Table 15.4 illustrates a number of items under consideration along with approximate budget costs

Table 15.4: Aspirational Items

Preferred College Aspirational Items	Cost (£)
Additional credits to Achieve BREEAM rating of "Excellent".	£750,000
Additional lockers (based upon approximate allowance of 100 Nr meantime)	£50,000
Electronic panel room booking system (excluding software)	£90,000
Enhancement of finishes to the main entrance area (to be fully defined)	£130,000
Sub-Total (pre uplifts)	£1,020,000
Uplift for preliminaries, contingency, inflation & VAT (based upon percentages as noted in the tables above)	£500,000
Total Aspirational Items	£1,520,000

Table 15.5 illustrates further items which may be considered should not all of Table 15.4 items be taken forward or should greater additional funding be available over and above the items listed in Table 15.4.

Table 15.5: Additional Aspirational Items

Additional College Aspirational Items
Matching high technology industry equipment as a training provision in areas of STEM - £450,000
Increasing specification on IT infrastructure and equipment £500,000
Additional glazed screens to classroom areas to potentially create full length glass walls.
Shower cubicles added to every toilet block.
Damage protection to circulation space walls in the form of a robust plasterboard system and protective lacquer finish.
Additional external electrical car charging points over and above nominal allowance included meantime.
Extension and enhancement of gym / leisure facilities with potential sauna / steam room facilities included.
Car park monitoring and entrance control system.

16 FINANCIAL CASE

16.1 Ascertaining affordability

Undertaking a financial appraisal of the project is an essential component of the selection of an affordable option which also presents good value for money (VFM). The affordability analysis helps determine whether the College can afford the Project. It seeks to ensure that the College can both afford to fund the initial development expenditure (construction costs, fees and land) and maintain the new facilities to an acceptable standard over the longer term (soft and hard FM, lifecycle).

It is however essential to consider both affordability and value for money together, to ensure the overall structure is the best preferred solution in terms of the College's objectives, business requirements and funding constraints.

This section analyses the Preferred Option and Base Case from an economic and financial perspective and includes:

- A review of the College's forecast Income and Expenditure and how this may be used to support the cost of the Project
- A review of the proposed Project costs
- The availability of funding and resources for the Project – both upfront and operational; and
- An analysis of affordability - assessing the resources that will be available to the College to pay for the facilities

16.2 Office of national statistics and ALF

As from 1 April 2014, Scottish Further Education Colleges were brought within the Scottish Government's direct funding structure and therefore included within the public sector as defined by the Office of National Statistics (ONS). As part of this process, it was agreed that cash balances not required for working capital could be donated by Colleges to separately created Arms-Length Foundations ("ALF"). However, debt remains on the College's balance sheet and is accounted for as part of the Scottish Government's overall borrowing.

As a result of this transfer, and in accordance with the wider public sector, the College is unable to borrow on its own account, without Scottish Government consent. A consequence of this is that the College would not be able to undertake a major redevelopment project (such as was recently achieved with Alloa and Stirling campuses) without direct intervention from the Scottish Government (via the Scottish Funding Council) in the form of grant or other funding.

The funding structure proposed by SFC / SFT therefore provides an opportunity for the College to undertake a significant development of its Falkirk campus, with the majority of the capital cost being provided by the Scottish Funding Council via a capital grant.

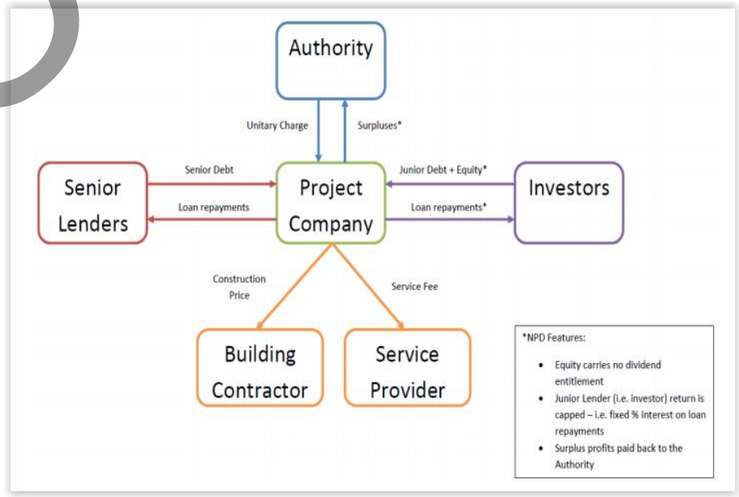
16.3 Financial case context: non-profit distributing (NPD) model

It was previously intended that the project was to be funded through the Non Profit Distributing (NPD) Model, and this was the working assumption at earlier OBC and FBC stages. The NPD project budget of £70m had defined the level of capital expenditure and design assumptions.

The NPD funding approach had previously assumed the following:

- A Special Purpose Vehicle or Company (SPV) will be appointed to design, build, finance and operate (hard FM and lifecycle) the new Falkirk Campus over a 25 year period from construction completion
- In return, the College would make an annual payment to the SPV ("Annual Service Payment" or "ASP") for provision of the building and services
- The Scottish Funding Council ("SFC") would fund all of this payment with the exception of hard FM and 50% of lifecycle costs within the project excluding Authority Maintenance Obligations ("AMOs") which account for specialist installations, wall coverings, floor coverings and ceiling finishes
- The SPV is responsible for the build, finance and basic operation of the new campus building, undertaking hard FM and lifecycle works only
- The College therefore directly funds the hard FM element of the ASP and 50% of lifecycle costs (including AMOs)
- The College continues to procure / undertake soft FM itself and meets these costs in full. It also remains responsible for utility costs incurred and rates
- College remains responsible for maintenance and lifecycle on its other buildings
- Upfront expenditure, such as design costs, advisory fees, enabling capex, land costs and some elements of fit out is not funded directly by the NPD procurement. This must instead be funded by the College or SFC
- The diagram below shows a typical NPD Structure

Figure 16.1 – Typical NPD Structure



16.4 Revised approach – capital grant funding

The Scottish Government's NPD programme has been under review recently, following the introduction of the European Statement of Accounts 2010 (ESA10), to replace ESA95. It is the European System of National Accounts guidance on how public finances are presented, including public sector net debt and public sector net borrowing. ESA10 was brought into effect to better align how European nations compile and present their National Accounts.

We understand that SFT have been in detailed discussions with the Office for National Statistics & the Eurostat (official statistical office for the EU) to better understand the way that the guidance is to be interpreted and applied. The accounting treatment of the NPD model on new (post-September 2014) projects has remained uncertain, and in future amendments to NPD project terms may be required to result in an acceptable accounting treatment for these public sector projects.

However by letter of 12 April 2016 the Scottish Government informed the College that the project would not proceed under the NPD model, but would instead receive a direct Capital Grant from Scottish Funding Council (SFC Capex), providing certainty to the project structure, procurement and timetable. The other key project assumptions have remained unchanged, so besides the natural design evolution and refinement of cost assumptions, we are now assuming that the equivalent facilities (having removed the Falkirk Council's Arts Theatre) will be funded by an equivalent capital grant from the SFC. The College will procure a construction partner and then retain responsibility for

operating the building from practical completion. The relatively complex project company structure of the NPD model over the 25 year concession period is not therefore required, although some services may still be subcontracted by the College during operations.

16.5 FVC's underlying financial position

The College has provided its actual financial results for the period ending 31 July 2015 and financial forecasts for the years ended 31 July 2016 and 2017. The values used are sourced from the "FFR" or "Financial Forecast Return" which is presented annually to SFC – and are shown in table 16.1. Scottish Colleges have been advised by the Scottish Funding Council that they should revert to a 31 July year end as was previously the case (pre-ONS). As a result the College presents results for a 16 month period to July 2015 (from prior year end of 31 March 2014). This extrapolation is also shown in the table with the relevant prior year periods.

The College is not forecasting an increase in core grant funding from the new Project, and is assuming that income will remain relatively constant. In the year 2016/17 total income is forecast to fall by c. £2m (6%), of which £1.4m relates to recharges of apprentice salaries which is matched with a reduction in staff costs. The remaining £600k is due to the College receiving funding from Forth Valley College Foundation in 2015/16 to support the estates project. Neither of these reductions in income impact on the operational surplus of the College. The forecasts show that the Preferred Option produces a more favourable financial position for the College as it would have been required to spend c. £11m in backlog maintenance in order to ensure that the existing Falkirk campus is statutorily compliant. These costs are based on the Conditions Survey prepared by CBRE for the College. The longer term forecast also includes an increase in lifecycle costs at the new campuses at Stirling and Alloa

Table 16.1 therefore also summarises the base case forecasting assumptions made in the financial model, without inclusion of the Falkirk Campus project, in the right hand column.

Table 16.1: Base Case financial forecast

Forecasts - Excluding Project £'000	31 July 2013 to 31 March 2014 (8 months)	2014/15 (16m to July)	2015/16 (12m to July)	2016/17 (12m)	Forecast Assumption (thereafter)
Income					
SFC grants	17,071	31,522	23,116	23,288	2.50%
Tuition fees & education contracts	5,311	9,926	8,179	6,859	2.50%
Donation from FVC Foundation	-	-	637	-	-
Other income	1,372	1,946	1,779	1,560	2.50%
Endowment and investment income	86	26	15	11	0.00%
Total Income	**23,840**	**43,420**	**33,726**	**31,718**	
Expenditure					
Staff costs	(14,643)	(28,925)	(23,485)	(22,950)	2.50%
Falkirk Campus project costs	-	(176)	(1,749)	-	
Other operating costs	(5,632)	(11,711)	(6,671)	(6,778)	2.50%
Grant to FVC Foundation	(4,400)	(1,100)	-	-	0.00%
Depreciation / amortisation	(1,755)	(3,542)	(2,235)	(2,014)	0.00%
Interest payable	(170)	(224)	(186)	(179)	0.00%
Total Expenditure	**(26,600)**	**(45,678)**	**(34,326)**	**(31,921)**	**-**
Operating (Deficit) / Surplus	**(2,760)**	**(2,258)**	**(600)**	**(203)**	**-**
Backlog Maintenance on existing Falkirk Campus	-	-	-	(2,200)	Remaining £8.8m over 4 years.
Operating (deficit) / surplus following backlog maintenance	**(2,760)**	**(2,258)**	**(600)**	**(2,403)**	**-**

In recent years non-essential maintenance and lifecycle costs at Falkirk have been scaled back in anticipation of its replacement by a new build facility. These forecasts do not assume that the current level of maintenance costs attributed to Falkirk Campus will be sufficient to fund its maintenance over its long term useful life. although it is noted that the maintenance needs of the College (revenue and capital) are supported by a maintenance grant from the Scottish Funding Council. The majority of this grant is currently spent on Falkirk campus maintenance, in addition to ongoing IT spend. In addition, the College has assumed that it will have c. £2.2m backlog maintenance costs for the five years from 2016/17.

In forecasting beyond 2016/17 we have assumed that maintenance and lifecycle costs at the Alloa and Stirling campuses will increase as the buildings age and converge with sector benchmarks. We assume that additional funding will continue to be made available in the form of SFC maintenance grant to support each facility (Falkirk, Stirling and Alloa) to an acceptable condition. This is shown below in the property cost analysis.

16.6 Property costs

The College estate includes new facilities in Stirling and Alloa in addition to the existing campus in Falkirk which is the subject of this business case. The current College estate comprises of:

Table 16.2: existing estate

Site	m^2	% Overall Estate	Comments
Alloa	5,786	16.7%	New build, capital funded – completed 2011
Stirling	7,859	22.7%	New build, capital and loan funded – completed 2012
Falkirk	21,000	60.6%	Redevelopment proposed
Total	**34,645**	**100%**	

Source: College Information

16.6.1 Existing property costs

The College estate incurs property running costs (including lifecycle costs) of approximately £3.1m per annum (2016/17 forecast) after demolition of Middlefield. These running costs include staff costs, utilities, general maintenance, FF&E and lifecycle costs. Staff costs are allocated by site and the College does not anticipate any change in staffing levels as a result of the new campus procurement as hard FM and some soft FM is currently out-sourced to FES and FES undertakes a proportion of the ongoing capital maintenance/lifecycle works.

The current running cost of the overall Estate is £89.3/ m^2 (2016/17) following demolition of Middlefield. The premises costs for the existing Falkirk estate equate to £25.38 / m^2 per annum in 2016/17 (excluding Soft FM, some staffing and Middlefield which incurs minor grounds maintenance costs) as can be seen in table 16.3. Adding in average soft FM rates gives a total FM cost of c. £87.2/ m^2 for Falkirk which we believe is comparable with other educational institutions at the lower end of some benchmarks thus evidencing efficiencies in the current operations. We note that Falkirk costs are lower than Alloa and Stirling in anticipation of the College moving its new campus, so the College has deferred non-essential expenditure.

Table 16.3 existing property costs

2016/17 Property Cost Summary	Alloa		Stirling		Falkirk (Main building only)		Total	
Cost Heading	Total	Per 5786 m^2	Total	Per 7859 m^2	Cost Heading	Total	Per 5786 m^2	Total
Hard FM (incl. water / sewerage)	42,761	7.39	43,635	5.55	84,844	4.04	171,240	4.94
Utilities	62,661	10.83	116,753	14.86	241,017	11.48	420,431	12.14
Rates	34,905	6.03	48,202	6.13	49,313	2.35	132,420	3.82
Lifecycle maintenance	28,958	5.00	42,102	5.36	157,909	7.52	228,969	6.61
Sub Total	169,285	29.26	250,692	31.90	533,083	25.38	953,060	27.51
Soft FM	357,818	61.84	486,017	61.84	1,298,683	61.84	2,142,518	61.8
Middlefield							9,665	
Total	527,103	91.10	736,709	93.74	1,831,766	87.23	3,105,243	89.63

16.7 Financial modelling approach

The financial model was prepared by QMPF with the financial forecast inputs provided by the College and project cost data provided by AECOM.

In order to undertake an assessment of affordability and VFM, it is necessary to consider the project over the longer term. This allows the project costs to be evaluated on a whole life costing basis, taking account not only of initial capital costs but also of the costs of maintaining and renewing the buildings over a longer period.

A term of 25 years from 1 August 2019 has been adopted as the assessment period, the year ending 31 July 2019 being the anticipated year of main construction completion with 60 years of operations following this.

The model assumes that the new facility will be accounted for on the college's balance sheet as a fixed asset, and depreciated over 60 years.

The capital grants received for the project will be capitalised and amortised over a matching 60 year period.

16.8 Model forecast assumptions

As a base position, the model uses the College forecasts as detailed above in its 'pre-project' FFR. The specific assumptions relating to the new project, such as estates costs are then also applied in the VFM analysis. In addition, any variations to income, operational expenditure, premises costs and capital expenditure are also considered in the forecast and model when comparing the Preferred Option and the Base Case.

16.9 The preferred option

The scope of this Preferred Option is:

- Redevelopment of the Falkirk Campus, replacing 21,000m^2 of existing facilities with 20,148m^2 of new buildings
- A core capital grant from the SFC of £70m is received for the capital expenditure
- The College will be responsible for procuring Hard FM, lifecycle, Soft FM and Utilities provision at the new facility
- Project funding is also supported by land sales at Alloa and Falkirk (forecast [redacted] and [redacted] respectively) in addition to £5m funding being provided by the ALF during the development phase
- The SFC provides funding during operations of 50% of lifecycle costs at Falkirk, as continuity with the NPD approach, and ensuring proper maintenance of the new facilities over the long term

Operational efficiencies – Premises Running Costs

The Preferred Option will involve construction of 20,148m^2 of new College facilities on the extended Middlefield site, replacing 21,000m^2 of existing facilities. The estimated running cost of the new Falkirk Campus is set out in table 16.4. These benchmark rate running costs are consistent with those provided to SFT and SFC at earlier stages.

Table 16.4: New Falkirk Campus Forecast Premises costs

Cost Centre	Forecast 2016/17 Falkirk Premises Costs based on 20,148m^2	
	Total (£)	£ / m^2
Hard FM	302,220	15.0
Utilities	231,239	11.48
Rates (based on Alloa and Stirling costs)	120,888	6.0
Lifecycle (AECOM benchmark rate)	490,402	24.34
Total per annum	**1,144,749**	**56.82**

Note: costs to be indexed up to year of operational commencement

Under the Preferred Option, the running costs for the existing campuses are assumed to increase to reflect lifecycle costs as the buildings start to need maintenance. Lifecycle costs at the new campus are based on information provided by AECOM. Stirling and Alloa lifecycle costs are lower than those proposed for Falkirk due to differences in the design and construction of these campuses. Hard FM costs are already evidenced through current contracts.

It can be seen that from table 16.4 (in 2016/17 prices), that the total operating cost of the new campus, excluding soft FM (which is anticipated to broadly the same as current costs) is c. £1.1m per annum or £56.82/m^2. This is forecast to generate an increase in total running costs of c. £600k p.a. in 2016/17 values which is primarily caused by an increase to Rates and Lifecycle costs at the new campus. However, as noted above, should the College choose to remain at the existing campus, it shall be required to fund (or secure funding to support) c. £19m of backlog maintenance to ensure statutory compliance. The financial model also assumes that should the College remain at the existing Falkirk campus, lifecycle costs will increase to £15/m^2 to account for ongoing maintenance costs at the refurbished campus.

These cost assumptions result in table 16.5 which shows the running costs under the Preferred Option for all campuses – the grey shaded boxes show where changes have been made from the Base Case as set out in table 16.4.

Table 16.5 shows the revised property costs, taking into account the provision of new facilities at Falkirk, which are effective in the financial model from 2018/19. Updated assumptions which differ from recent actual expenditure are highlighted in grey. These include revised lifecycle forecasts, based on sector benchmark rates for minimum required average lifecycle expenditure. The total premises increases by around £18 per square metre, as expenditure steps up from the minimal current level at Falkirk. This slightly higher than anticipated annual operating cost should be viewed in the context of the £11m backlog statutory maintenance at Falkirk which would be avoided with the construction of a new facility. Soft FM and central staffing costs are assumed to be unchanged, as there is no material difference in provision

anticipated, given the internal area of the new facility will be very similar to the current.

Table 16.5: Planned Property Costs – including Falkirk Campus project

Property Cost Summary - including Project (16/17 prices)	Alloa		Stirling		Falkirk		Total	
Cost Heading	Total	Per 5786 m^2	Total	Per 7859 m^2	Total	Per 20148 m^2	Total	per 33793 m^2
Hard FM (incl. water / sewerage)	42,761	7.39	43,635	5.55	302,220	15.00	388,616	11.54
Utilities	62,661	10.83	116,753	14.86	231,239	11.48	410,653	12.20
Rates	34,905	6.03	48,202	6.13	120,888	6.00	203,995	6.06
Lifecycle maintenance	86,790	15.00	117,885	15.00	490,402	24.34	695,077	20.64
Sub Total	227,117	39.25	326,475	41.54	1,144,749	57.16	1,698,341	50.44
Soft FM	357,818	61.84	486,017	61.84	1,298,683	61.84	2,142,518	63.63
Total							3,840,859	114.07
Deduct 50% lifecycle at Falkirk funded by SFC (per NPD)					-245,201		-245,201	
Total	584,935	101.09	812,492	103.38	2,198,231	119.01	3,595,658	106.79
						Increase from current costs	490,415	

Table 16.6: Summary forecast total premises costs incl. new Falkirk Campus

Cost Area	Premises Costs Comparison	
	Base Case 2016/17	Revised Costs – including new campus
Hard FM, Utilities, Rates and Lifecycle	953,060	1,698,341
Soft FM and Other	2,142,518	2,142,518
Middlefield	9,665	-
Total	**3,105,243**	**3,840,859**
Additional unfunded costs:	+ £11m backlog maintenance at Falkirk + additional LC at Alloa, Falkirk and Stirling: £291k p.a.	N/A

Pre-Financial Close Advisory Costs (up to 2016/17)

As is typical on a large-scale capital project the College will incur significant fees on design development, land, site investigation, preparation of procurement documents and advisory fees during the procurement process (financial, legal and technical). These costs have reduced slightly to reflect the change from NPD to a capital funded project. It is anticipated that total costs will be c. £5.3m including VAT and a contingency on advisory costs. These costs include, inter alia, Design, Financial, Legal, Architect, Landscaping and IT. Up to 2016/17, it is anticipated that the College will incur costs of c. £4m. All efforts will be made by the College to keep these costs to a minimum by close management of advisors from within its in-house team and by rigidly keeping to the delivery programme and specification.

These costs have been included in the financial model with the College funding them from College Cash, grant funding from Forth Valley College Foundation(noting that the College is not in control of these funds and will have to request them from the Foundation) with the remainder of funds being supported via top-slicing of the maintenance grant, Branshill land receipt, net depreciation, and Scottish Funding Council. It is assumed that these costs will be incurred in accordance with the programme up until the projected date for contract award of September 2017.

Capital Costs

The total anticipated construction cost for the new campus is £59.7 million excluding VAT (c. £71.6m incl. VAT). This does not include the cost of purchasing land at Middlefield (£999k) or FF&E Costs. This also excludes revenue costs which are shown in table 16.7. The construction & fit-out is forecast to be completed by September 2019 and the majority of the construction costs would be incurred in the years ending July 2018 and 2019.

Land Costs

The project involves construction of the new campus on the existing Middlefield site which is now surplus to requirements. However, a small additional parcel of land is required to provide sufficient area for development. This is expected to cost c. £1.0m in 2016/17 and details are provided elsewhere in this business case.

Subsequent to the development phase, the existing Falkirk campus will be demolished and sold for development. A receipt of [redacted]m is anticipated for this land although it will not be received until 2019/20. It is currently assumed that [redacted]m of total funds required to support Project costs will be provided by way of SFC capital grant. It is also assumed that the sales proceeds from the disposal of the existing Falkirk site will be returned to SFC in 2019/20.

The above costs and receipts have been included in the financial model.

16.10 College cash contribution

The College has assumed grants from the Foundation of £5m will be utilised against initial project development costs. The College also holds land at Branshill in Alloa which is in the process of being sold. It is currently assumed that these funds shall be used towards project development costs.

The financial model currently assumes that for 2015/16 only, £200k from maintenance grants is used to support project development costs.

16.11 Sources and uses of funding – summary

Table 16.7: Sources and uses of funding

Uses – Year ended 31 July	2015	2016	2017	2018	2019	2020	Total
Design Team Fees (ex FBC fees)	-	561	555	126	117	-	1,359
Public Sector / Technical Advisor	-	217	730	172	202	367	1,656
VAT	-	164	286	63	68	88	669
Contingency - Revenue Costs	-	43	146	15	21	73	331
Other	-	-	382	-	-	-	382
Sub-Total - Revenue Costs	-	985	2,099	377	408	528	4,397
Capex	-	-	-	30,591	25,731	858	57,179
Contingency - Capex (4%)	-	-	-	1,224	1,029	34	2,287
Inflation on capex	-	-	-	120	101	3	224
Land Purchase	-	-	999	-	-	-	999
FF&E etc. incl. inflation	-	-	-	660	2,859	-	3,519
Contingency - FF&E (20%)	-	-	-	132	572	-	704
VAT	-	-	-	6,545	6,058	179	12,783
Sub-Total - Capital Costs	-	-	999	39,272	36,350	1,074	77,695
Costs Incurred to Date	176	764	-	-	-	-	940
Total	176	1,749	3,098	39,648	36,758	1,602	83,032

Sources – Year ended 31 July	2015	2016	2017	2018	2019	2020	Total
In year surplus / Net Depreciation	19	1,069	525	400	400	400	2,814
Capital Maintenance Grant 15/16	157	43	-	-	-	-	200
Forth Valley College Foundation	-	637	2,573	-	1,206	584	5,000
SFC - £70m Grant	-	-		38,108	31,892		70,000
SFC - Additional Support	-	-			-	618	618
SFC - Forward Funding Falkirk Receipt	-	-			2,500	(2,500)	-
Receipts - Branshill	-	-		[redacted]	[redacted]	[redacted]	[redacted]
Receipts - Falkirk	-	-					
Total	176	1,749	3,098	39,648	36,758	1,602	83,032

Current Project costs result in the College having a funding gap of c. £618k. This is primarily caused by the removal of "top-slicing" of the grant funding of £200k p.a. between 2016/17 & 2019/20 and the reduction in net depreciation available to use to support Project costs. These reductions are a consequence of SFC cuts to both the Capital & Maintenance and Student Support funding respectively in 2016/17.

The financial forecasts include the prudent assumption that the sale of Branshill will generate [redacted] to support Project costs. There is potential for this receipt to be up to [redacted] higher which would reduce required SFC & FVC Foundation support.

It is currently assumed that if sales receipts for Alloa and Falkirk are not realised, SFC shall meet any shortfall.

Financial Model Forecasts

Table 16.8 shows the forecasts under the Preferred Option which demonstrate that operating surpluses remain at reasonable levels after the Project impact is included. These forecasts show the existing Falkirk campus being fully written down in 2018/19 with the College receiving £[redacted] in 2019/20 from the sale of the existing Falkirk site. This reduces the College's annual depreciation charge from 2019/20 onwards but this is offset by depreciation for the new campus. Full details of the forecast Income and Expenditure Statement and cash flow statement are included in appendix 7.

The financial forecasts indicate that the College will continue to generate cash from its operating activities during the development period and beyond. Average net operating cash flow from 2019/20 to 2028/29 is forecast to be c. £370k.

Table 16.8: Financial forecasts incl. New Falkirk Campus

Forecasts (including Project)	31 July 2013 to 31 March 2014 (8 months)	2014/15 (16 months, July year end, extrapolated)	2015/16 (12m to July)	2016/17	2017/18	2018/19	2019/20	2020/21
Income	**£'000s**	**£'000s**	**£'000s**	**£'000s**	**£'000s**	**£'000s**	**£'000s**	**£'000s**
Funding council grants	17,071	31,522	23,116	23,288	23,791	24,321	26,303	26,877
Tuition fees and education contracts	5,311	9,926	8,179	6,859	7,030	7,206	7,386	7,571
Other income	1,372	1,946	1,779	1,560	1,599	1,639	1,680	1,722
Endowment and investment income	86	26	15	11	11	11	11	11
SFC funding new campus lifecycle	-	-	-	-	-	-	263	271
Total Income	**23,840**	**43,420**	**33,089**	**31,718**	**32,431**	**33,177**	**35,644**	**36,452**
Expenditure	**£'000s**	**£'000s**	**£'000s**	**£'000s**	**£'000s**	**£'000s**	**£'000s**	**£'000s**
Staff costs	(14,643)	(28,925)	(23,485)	(22,825)	(23,396)	(23,981)	(24,580)	(25,195)
Other operating costs	(5,632)	(11,711)	(6,671)	(6,778)	(6,947)	(7,121)	(8,099)	(8,304)
Donation to FVC Foundation	(4,400)	(1,100)	-	-	-	-	-	-
Depreciation / amortisation	(1,755)	(3,542)	(2,235)	(2,014)	(1,991)	(1,980)	(2,728)	(2,728)
Interest payable	(170)	(224)	(186)	(179)	(175)	(168)	(160)	(152)
Total Expenditure	**(26,600)**	**(45,502)**	**(32,577)**	**(31,796)**	**(32,509)**	**(33,250)**	**(35,568)**	**(36,380)**
Operating (Deficit) / Surplus	**(2,760)**	**(2,082)**	**512**	**(78)**	**(77)**	**(73)**	**76**	**72**
Release of SFC Provision	3,000	-	-	-	-	-	-	-
New Falkirk Campus Costs	-	(176)	(1,749)	(2,099)	(377)	(408)	(528)	-
Grant from FVC Foundation	-	-	637	1,574	-	-	-	-
SFC Funding – Additional Support	-	-	-	-	-	-	618	-
Branshill revaluation	-	(615)	-	-	-	-	-	-
Write down of existing Falkirk campus	-	-	-	-	-	(16,411)	-	-
Operating Surplus / (deficit) following project costs and asset disposals	**240**	**(2,873)**	**(600)**	**(603)**	**(454)**	**(16,892)**	**166**	**72**

16.12 Falkirk arts venue

The College had been in negotiations with Falkirk Council in relation to provision of an 'Arts Venue' within the new College facility. The College and its advisory team had explored the various technical and commercial options for its inclusion in the project, partly on the Council's behalf. The Council ultimately decided not to proceed with the Arts Venue. We expect that the College will be able to agree a recovery of the aborted costs on this element of the Project from the Council, although at the time of this Business Case a fixed settlement is not yet agreed. Once finalised, any proceeds received from the Council may be available to support project costs.

16.13 Optimism Bias and risk analysis

The Treasury's Green Book highlights that the public sector has a tendency to under-estimate the cost of projects. This can occur for a variety of reasons including:

- Pressure to keep costs down and maintain affordability
- Change in requirements
- Risk occurrence (e.g. poor ground conditions, delays, etc.); and
- Impact of inflation (construction or land costs)

The Green Book calls this tendency 'Optimism Bias' and recommends that an allowance is introduced into cost planning, with higher amounts used at the earlier stages of project appraisal. It recommends that as a more detailed understanding of the risk profile of the project develops, that the Optimism Bias is reduced and replaced with specific risk allowances.

An important aspect of project planning is therefore the identification and mitigation of identified risks, to ensure that appropriate steps are taken to avoid risks and that allowances are made where applicable for risks that might arise. The approach to risk management is dealt with later.

Rather than apply optimism bias as might be suggested by Treasury guidance, a project contingency has been provided for in the cost assumptions. This is in addition to the cost analysis which is built up from recent benchmarked costs, particularly taking account of recently procured Further Education projects in Scotland and elsewhere. As a result, the College has sufficient evidence and advice to justify a reduction in the initial level of contingency applied to the cost estimates. This is consistent with the Green Book approach where optimism bias is reduced to almost zero just prior to project commencement.

Inflation

In order to evaluate future costs and revenues, it is necessary to model the impact of general inflation, particularly where costs and revenues are not expected to increase (or decrease) at the same rate. An underlying assumption for RPI of 2.5% has been used in the financial forecast model.

16.14 Benefits appraisal

Financial Benefits

By constructing a new build facility in Falkirk, the College will benefit from avoiding the onerous maintenance spend required on its current site – noting that the base financial forecasts do not take account of the required refurbishment expenditure at Falkirk of c.£25-30m but do include c. £11m of backlog maintenance costs which will be required to be statutorily compliant with minimum health and safety standards and also the required increase to lifecycle costs to maintain the campus to a suitable standard.

With a newly built campus, the College will be in an excellent position to build on its ability to generate new income streams and strengthen its financial position. Using a discount rate of 6.0875% (as per Treasury Green Book guidance), the net present value of premises costs without and with the project can be compared to highlight the savings which will be made by the College as a result of the new Falkirk campus. Over the period 31 July 2017 – 31 July 2044, without the project, the NPV of premises costs are forecast to be c. £53m compared to c. £46m with the project – a saving of c. £7m in NPV terms.

Non-financial/qualitative benefits

In addition to the financial benefits of the Preferred Option, there are a number of qualitative benefits attributable to the redevelopment of the Falkirk Campus. These may also translate into increased student uptake and improve revenue generation. However, this has not been assumed in the economic appraisals.

The benefits of the scheme have been assessed by the College management at various stages from early project appraisal through to this FBC stage.

16.15 Conclusion and financial anaylsis

The College anticipates that the project will deliver benefits in terms of cash generation despite the increased premises costs associated with the new campus. As a result of increased depreciation costs associated with the new campus, I&E surplus is reduced however this reflects accounting treatment as opposed to cash generated.

Figure 16.2 Cash surplus comparison

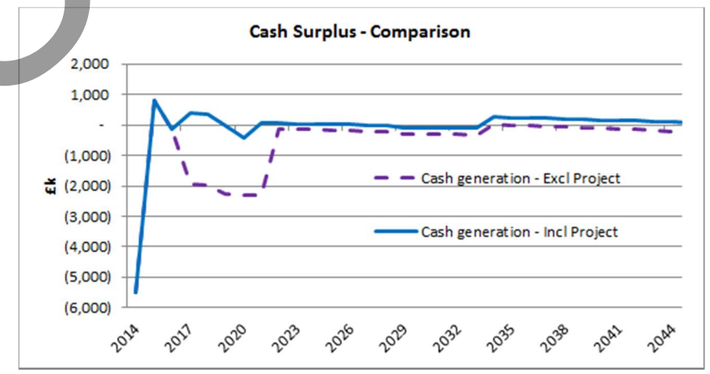
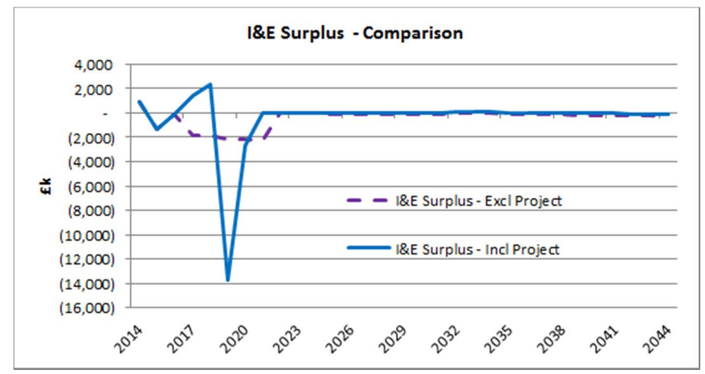


Figure 16.3 I&E surplus comparison



16.16 Risks and sensitives

The primary sensitivities which the College would be exposed to would be decreases in the level of financial support received from SFC, fluctuations in inflation and increases in operating costs.

Land sales – valuation: The College has currently made prudent assumptions in relation to both the timing and quantum of sales receipts for Branshill and the existing Falkirk site. However, there is the risk that these forecast receipts will not be generated which would result in the College having to obtain additional support from SFC / SFT.

16.17 Affordability conclusion

The affordability analysis demonstrates that the College can support the costs of the Project through anticipated premises cost savings during operations at the new campus and SFC support through the form of funding for College costs in the lead up to contract signing and also through the lifecycle contribution during the operations phase. In addition, should the College choose to remain at the existing Falkirk Campus, not only will it have to fund c. £11m of backlog maintenance to ensure that it is compliant with legislation (which has been included in the forecasts), it will likely incur increased ongoing premises costs in order to maintain the existing campus at a suitable standard. In addition to backlog maintenance costs, the College estimates that it would also incur refurbishment costs of c. £25-£30m. These ongoing refurbishment costs have not been included within the financial forecasts.

17 PROCUREMENT STRATEGY

17.1 Introduction

The Scottish Government Budget announcement in November 2014 indicated support to deliver the project through the Non Profit Distributing (NPD) procurement model. Subsequent to that, a strategy was developed in conjunction with the Scottish Futures Trust, the Scottish Government and the Scottish Funding Council to ensure that it met the requirements of these key stakeholders.

However by letter of 12 April, 2016 the Scottish Government informed the College that the project would not proceed under the NPD model but would instead receive a direct capital grant from Scottish Funding Council (SFC CAPEX)

Given that this was a fundamental change to the procurement strategy, the College had to consider what alternate procurement options were open to it for both the procurement of a Professional Design Team and a Construction Team

The College advisors (AECOM) were asked to prepare papers setting out possible routes for both. In late April, 2016 they submitted a paper which set out the possibilities.

They were:

Professional Design Team

- Retain the existing Design Team with a revised Appointment
- Re-procure the Design Team with a fresh Appointment

Construction Team

- Traditional Contract
- Design and Build (Single Stage or Two Stage) Contract
- Construction Management Contract
- Management Contract

For reasons set out below (paragraph 17.10), the retention of the existing Professional Team and the Single Stage Design and Build ("Restricted") route was recommended by AECOM and approved by the Falkirk Campus Board in July 2016.

17.2 Scope and key features of design and build contracting

Under a 'design and build' route, a single contractor assumes the risk and responsibility for designing and building the project, usually in return for a fixed-price lump sum. There are a range of approaches that can be referred to as 'design and build':

In its purest form the contractor will be left to interpret the requirements of the client and provide a building as a completed package. In extreme cases, the contractor may be responsible for obtaining planning permission and even for project funding;

Alternatively, the client will employ a design team to carry out some preliminary design work and prepare the project brief and other tender documents, including 'Employer's Requirements' (a term used in standard contracts to describe the basis for the contractor's submission), outlining the key objectives for the project and significant criteria for a successful outcome;

'Develop and construct' assumes the client appoints designers to prepare the concept design before the contractor assumes responsibility for completing the detailed design and constructing the works. In this case, the contractor develops the design from the detailed brief or specification, submitting detailed proposals to establish that they are in accordance with the requirements of the specification. Clients are, therefore, in a strong position to ensure that their interpretation of the specification takes preference over the contractor's; and

'Novation', where this is desired requires the successful contractor to assume responsibility for the incumbent design team and use the preliminary information to produce the detailed design i.e. the contractor agrees in the tender submission to 'novate' the contract the client has with his or her designers to the contractor (The basis of the appointment of the design team will need to be amended accordingly). Novation will not be required for this project.

17.3 Development of the design and build Procurement Strategy

The development is proceeding with the existing Design Team preparing the Employer's Requirements (see above) for a Single Stage Design and Build form of Contract.

This will be advertised in the Official Journal of the Europe Union (OJEU) in November, 2016.

Preliminary "soft" market testing has been done by AECOM Project Management by soliciting comments from Contractors on the proposed contract particulars, tendering and contract periods. Responses to date have been positive and encouraging.

17.4 Key Objectives

The Procurement Strategy has been developed having regard to the following key objectives:

- Limit the College exposure to financial uncertainty as far as is possible
- Maximise the degree of control being retained by the College over the design and construction processes
- Maximise the extent of design information available at the time of tender that is still compatible with Design and Build being retained (to this end the Architect has been appointed to design to RIBA Stage 4- and the M&E and C&S Engineers have been retained to design to RIBA Stage 3+)
- Agree the organisational arrangements that distribute risk, responsibility and accountability
- Employ a strategy that is based upon price competition
- Incentivise the designers and contractor to advise the College on factors that may benefit the life cycle and operational costs of the completed facility

Extracts from the interpretative report on the ground investigations along with the preliminary risk assessment are contained in appendix 8.

17.5 Public procurement legislation update

Significant changes to public procurement regulations came into force in Scotland on 18th April 2016. These changes resulted from the implementation of the new EU Procurement Directives through the Public Contracts (Scotland) Regulations 2015 (which supersede the 2012 Regulations); and also the introduction of the Procurement Reform (Scotland) Act 2014.

These changes to legislation shall apply to this project, and therefore the main duties and requirements will be considered fully when developing tender documentation for the procurement process.

The main duties and requirements to be considered from the updated EU Directives, relevant to this project, are outlined below:

- Mandatory use of the European Single Procurement Document (ESPD) for pre-qualification of bidders, this process presents substantial changes to previous approaches taken to pre-qualification and limits the ability of the College to amend the criteria to suit the specific needs of the project. (see section 17.6 below for more detail)

- New Selection and Award Criteria, including the principles of 'appropriate measures' to ensure compliance with social, economic and labour law
- New definition of Most Economically Advantageous Tender (MEAT)
- Greater flexibility around pre-market engagement

Further duties and requirements from the updated EU Directives, which are less relevant to the procurement of the Main Contractor but may apply to other procurements for FF&E, include:

- Mandatory consideration of lotting
- Reduced minimum timescales for some procurement procedures (including the 'restricted' procedure)
- Broader definition of Supported Businesses

To date there has been no formal Guidance produced in relation to the EU Directives; as such it is advised that the Project Team should refer to the Regulations and the Scottish Government's 'Procurement Journey' for guidance on each aspect. Should any formal guidance be issued prior to the issue of the OJEU notice for this project, the Project Team shall refer to it.

In addition, the main mandatory considerations brought in by the Procurement Reform (Scotland) Act 2014 include:

- Community Benefits for contracts with a value of £4m or above. Please see section 17.6 below for details
- Fair Working Practices including the Living Wage which also seeks to address bidders policies in relation to fair and equal pay, respecting employee rights, avoiding exploitative employee practices, supporting progressive workforce engagement, stability of employment and avoiding zero-hours contracts wherever feasible
- Sustainable Procurement Duty (including SME, 3rd sector and supported business opportunity; payment of contractors and full supply chain; social, environmental and economic considerations), compliance of H&S Act (including sub-contractors)
- Selection and Award criteria, including some new exclusion grounds such as blacklisting and breaches of tax or social security obligations

The Scottish Government has published Statutory Guidance for each of the above considerations relating to the Procurement Reform (Scotland) Act 2014, and this will be referred to when developing the specification and evaluation criteria on this project.

17.6 ESPD (Scotland)

The ESPD was introduced with the updated EU Procurement Directives for use across all EU Member States for OJEU level procurement exercises, replacing all previous PQQ documents including the Scottish Government's standard PQQ. The intention of the ESPD is to standardise the pre-qualification stage of OJEU procurements, while reducing administrative burden for bidders, especially SME's by removing duplication and the need to complete a PQQ each time they bid for a public contract.

Furthermore, the aim of the ESPD is to:

- Remove the need for all bidders to provide evidence or certificates up-front when submitting their pre-qualification response (i.e. they are only required to provide these if they are shortlisted). However, where it is deemed necessary to ensure the integrity and conduct of the process, the College may request such information to be provided at any stage of the process
- Allow bidders to self-declare that they meet all stated criteria (or where they do not automatically meet a specific exclusion criteria, they have the opportunity to demonstrate 'self-cleansing measures' they have taken)

The ESPD (Scotland) contains the standard ESPD questions which cannot be amended, or new questions added. Standard questions can only be removed from the ESPD where they are deemed not applicable to the requirement of the contract.

Specific exclusion criteria (minimum standards) and selection criteria must now appear within the OJEU notice, including weightings and evaluation criteria. The Scottish Government have produced a list of standardised statements that should be included within the Contract Notice to help detail the requirements of the ESPD stage

In addition to submitting an ESPD in respect of its own capability and capacity to deliver the contract, bidders are also required to request ESPD submissions from any sub-contractor or consortia members who they rely upon to meet the capability and capacity of the contract. Where this is deemed to be a requirement of the contract, this must also be included within the Contract Notice.

Where any sub-contractor is deemed to fail any minimum standards, the College may request that they be replaced by the bidder

Shortlisting of bidders can be undertaken within the Technical and Professional Ability section of the ESPD, by using the standard questions in this section with an explanation of the specific criteria and weightings to be used to evaluate these questions contained within the Contract Notice.

The Project Team are fully aware of the requirements of the new ESPD (Scotland), and will ensure all relevant guidance is referred to at all stages of the process in order to ensure compliance.

17.7 Community benefits

As part of the Procurement Reform (Scotland) Act 2014, there is now a requirement to consider the inclusion of Community Benefits in all contracts with a total value in excess of £4m.

As set out in the Statutory Guidance accompanying the Procurement Reform (Scotland) Act 2014, community benefit requirements in procurement should consider the following:

- Where an opportunity exists to deliver community benefits through a contract, appropriate requirements should be included
- Community benefits should be considered in relation to the specific contract, including factors such as value and duration of contract, local factors and the nature of the supply base
- Requirements should be relevant and proportionate to the contract and should be based on objective and measurable outcomes
- The requirements should be included within the tender specification and should be objectively measured as part of the evaluation process
- Monitoring of contract deliverables and outcomes is essential to ensure contract compliance

Within the Act, Community Benefits are defined as a contractual requirement imposed by a contracting authority relating to:

(a) training and recruitment
(b) the availability of sub-contracting opportunities
(c) which is otherwise intended to improve economic, social or environmental wellbeing of the authority's area in a way additional to the main purpose of the contract in which the requirement is needed.

Community Benefit requirements may include:

- Employment and training opportunities for priority groups
- Vocational training
- Upskilling existing workforce
- Equality initiatives

- Sub-contracting opportunities for SME's, 3rd sector and supported businesses
- Supply chain development activity
- Educational support initiatives, including work experience opportunities for school, college, university students

The Scottish Futures Trust (SFT) have produced a useful document *'Community Benefits Toolkit for Construction'* which provides helpful information about types of Community Benefits to consider, how these should be specified and evaluated within the procurement documents and how these should then be monitored and managed by the Contracting Authority and Contractor during the contract period.

In addition, the Construction Industry Training Board have produced a similar useful document *'Client based approach to developing and implementing an Employment and Skills Strategy on construction projects in Scotland'*, this document includes a useful benchmark of the types and volume of benefits that could be achieved by type of construction project and contract value. This is contained in appendix 8.

As part of this project, the College will refer to these documents and to develop our Community Benefit requirements for inclusion within the tender documents, as well as making use of the template clauses and selection and award criteria as a starting point to assist with evaluation of bidder responses.

The College shall also consider more generally how these Community Benefits will be monitored and reported on throughout the contract stage and develop a strategy for this aspect.

17.8 Review of Scottish public sector procurement in construction

The report into the Review of Scottish Public Sector Procurement in Construction was published in October 2013, looking at how public bodies involved in construction related procurement adopt practices that are streamlined and deliver value for money.

The report contained 67 recommendations, of which 66 were accepted by the Scottish Government for implementation, with the one recommendation not to be implemented being the appointment of a Chief Construction Advisor.

A programme for implementation of these recommendations has been developed over the next year for new projects, with SFT leading on 11 work streams which cover 29 of the 66 recommendations with the Scottish Government leading on the remaining 37

The implementation of the recommendations of this review is aligned to the implementation of the Procurement Reform (Scotland) Act 2014, and links to some of the main considerations of the Act including the Sustainable Procurement Duty and consideration of Community Benefits.

As outlined in previous sections of this Procurement Strategy, the Project Team will consider all guidance and recommendations in relation to the Act and this review when developing tender documentation including specifications, methodologies and selection and award criteria.
Procurement Reform (Scotland) Act 2014

17.9 Other relevant Scottish Procurement Policy Notes (SPPN's)

In February 2016 the Scottish Government issued an SPPN *'Guidance on the application of social issues for projects with a significant steel composition'*, (see appendix 8) which gives guidance for consideration of how barriers for UK steel suppliers can be addressed in public procurement through considerations under the Sustainable Procurement Duty within the Procurement Reform (Scotland) Act 2014 using social, environmental and economic criteria.

Further guidance has been produced by the Scottish Government *'Steel procurement in major projects: Guidance on the application of social issues'*, (see appendix 8) which applies to all public bodies within the scope of the Scottish Public Finance Manual, outlining how to apply this guidance within such procurement exercises.

In summary, the guidance is relevant to capital projects over £2m with a 'significant steel composition', and places obligations on contracting authorities to ensure that Tier 1 suppliers have a credible supply chain plan and have these requirements included within resulting contracts that cannot be subsequently amended between the appointed Contractor and the supply chain.

The Project Team will consider this guidance and apply it if deemed appropriate within the tender specification and evaluation criteria within the tender documents, as well as within the final contract with the preferred contractor.

17.10 Procurement route - overview

In line with EU public procurement legislation, there are a number of potential procurement routes which the College could follow for the procurement of the Main Contractor. The Project Team have considered the following options:

17.10.1 Restricted procedure

This procedure is a two stage process which includes the pre-qualification stage where any Contractor in the marketplace may respond to the OJEU notice and submit an ESPD for evaluation by the Project Team.

The College, in conjunction with the Project Team, shall then reduce the number of bidders to be taken through to Invitation to Tender (ITT) stage likely to be 3 and these shortlisted bidders shall then be required to submit their detailed proposals against the College's requirements as detailed within the ITT. The Project Team shall then evaluate all proposals in line with the published evaluation criteria, with the bidder who receives the highest score being appointed to deliver the contract.

Advantages

- Enables the College to consider aspects such as technical, economic and financial aspects of bidders, including previous relevant experience, technical and financial capacity and capability. This improves the opportunity to shortlist the most suitable bidders for tender stage
- Reduces the number of fully detailed tender submissions to be evaluated, including from potentially unsuitable bidders
- This process is typically used for construction projects with similar characteristics to the College project

Disadvantages

- Two stage process, thereby requiring the development and administering of two separate stages of the procurement phase (pre-qualification and invitation to tender) including associated documentation and evaluation criteria for each stage
- Time and resource requirement associated with the development and administration of the two stage process may take longer than the Open Procedure.

17.10.2 Open procedure

This procedure is a single stage process which allows any Contractor in the marketplace to respond to the OJEU notice and submit an ITT for evaluation by the College. The main difference between the Open and Restricted procedures is the inability to reduce the number of bidders to be taken through to final stage tender within the Open procedure, therefore the Project Team would be required to fully evaluate a potentially higher number of detailed proposals and from companies who are potentially unsuitable for a project of this scale.

Advantages

- Single procedure which includes mandatory requirements and contract award criteria, therefore removing the need to conduct two separate, defined stages

- Normally used for routine procurements or where there is a limited supply base

Disadvantages

- Any organisation in the supply base within the European Union can submit a tender, thereby providing a potential for an unlimited number of bids being received to be evaluated in a fair, equitable and transparent manner
- This procedure does not permit consideration of aspects such as previous relevant experience, capacity and capability therefore potentially unsuitable organisations may submit full a full tender response, which is an inefficient use of resource for both bidding organisations and the College team
- This procedure is generally deemed unsuitable for major projects such as the College's due to the complex nature and the size of the supply base

17.10.3 Competitive dialogue procedure

The Competitive Dialogue procedure can be used in defined circumstances, including

- where the works required include a design or innovative solutions
- a contract cannot be awarded without prior negotiation due to the complexity of the works
- where a technical specification for works cannot be established with sufficient precision by the College prior by following another procedure such as the Open or Restricted procedures
- where the legal or financial make up of a project cannot be objectively specified in sufficient detail by following another procedure

It was the intention to follow this procedure when the project was following the NPD funding model, however due to the change to Capital funding this procedure is not appropriate as the College's requirements can be more easily met by following an Open or Restricted Procedure.

17.10.4 SCAPE framework agreement

This is a Framework Agreement which has been procured by an organisation called SCAPE, who are a public sector organisation owned by six Local Authorities in England, with the aim of delivering a range of EU compliant Construction and Estates related Framework Agreements for access by all public bodies across the UK.

The Major Construction Works Framework Agreement has been awarded to a single Contractor, Robertson Construction, and is aimed at projects of a value over £2m.

The Framework is due to expire in May 2017.

Advantages

- OJEU compliant Framework Agreement offering a route to market
- Removes requirement to follow OJEU timescales and procedures as this has already been done, thereby potential time saving
- A stated requirement within the SCAPE Framework for the Contractor to provide 'guaranteed spend levels within the communities where the work is taking place', relating to sub-contract packages

Disadvantages

- With this being a single Contractor Framework, there is a lack of competitive tension available when calling off of the Framework. Although the Framework operates as 'open book' it is difficult to establish value for money as the Contractors fees and percentages are not subject to any market competition at time of calling off
- Despite time savings from avoidance of OJEU process, there may not be an overall time saving with the work involved in agreeing scopes and fees with the Contractor before appointment. Due to the nature of the call-off procedure for the Framework, there could be potential for time wasted due should the process be aborted prior to appointing the Contractor where the parties cannot agree scope/fees
- Although overhead and profit percentages are pre-agreed, it is difficult to assess whether these provide best value as these are not market-tested against our specific project requirements
- The Major Construction Works Framework Agreement has not been used for a project of the value of this project for the College

17.10.5 PAGABO framework agreement

This is a Framework Agreement which has been procured by an organisation called PAGABO (Procurement, Advice, Guidance and Buying Organisation), who are a private owned procurement consultancy, whose aim is to deliver a range of EU compliant advice and Framework Agreements for access by Contracting Authorities across the UK public sector.

The Major Works Framework Agreement, for projects with a value above £50m, has been awarded to 3 Contractors:-

- Sir Robert McAlpine
- Galliford Try
- Robertson Construction

Call-off would be via a further competition issued to the 3 Contractors based on the detailed and specific requirements of the College, and would incorporate some Framework specific requirements, including use of the NEC3 Engineering and Construction Form of Contract.

This Framework Agreement has no charges for accessing, however there is a fee applied to the appointed Contractor's contract cost which is payable to PAGABO.

The Framework is due to expire on 18 April 2019.

Advantages

- OJEU compliant Framework Agreement offering a route to market
- Removes requirement to follow OJEU timescales and procedures as this has already been done, thereby potential time saving
- An element of competitive tension is provided by having 3 Contractors on the Framework Agreement

Disadvantages

- PAGABO is a relatively unknown organisation/concept and the Framework has no track record for projects of this size
- Despite time savings from avoidance of OJEU process, there may not be an overall time saving with potential extra work in complying with the Framework procedures and subsequent agreement with the appointed Contractor
- Although overhead and profit percentages are pre-agreed, it is difficult to assess whether these provide best value as these are not market-tested against our specific project requirements

In addition to the consideration of procurement route aligned to public procurement legislation, the Project Team have also considered a number of procurement routes aligned to best practice Construction procurement methods, as follows:

17.10.6 Design and construction team procurement

Given the fundamental change to the procurement strategy, the College has to consider what alternate procurement options are open to it for both the procurement of a Professional Design Team and a Construction Team.

The College advisors (AECOM) were asked to prepare papers setting out possible routes for both. In April, 2016 they submitted a paper which set out the possibilities.

They were:

Professional design team

- Retain the existing Professional Design Team with a varied Appointment
- Re-procure the Professional Design Team with a fresh Appointment

Retain existing Professional Design Team with a varied Appointment

Advantages

- Currently, AECOM has been appointed in competition through a form of call-off contract under the (now expired) Scottish Futures Trust Framework Agreement in respect of the Procurement for the Provision of Technical Advisory Services, which was procured through OJEU Contract Notice 2011/S 112-185055. Reaich & Hall are providing Architectural design services as a sub-consultant to AECOM
- Varied appointments would involve a negotiated process and other than cost effect of varied appointments there will be no direct impact on project affordability. There will also be a 50% cap on the increased fee to comply with public procurement rules
- The existing team has amassed significant knowledge of the College and their requirements for not only this project but in the case of the Architect for the previous Alloa and Stirling campus Developments

Disadvantages

- An element of the consultants fee will be agreed via negotiation rather than competition. This, however, will be dealt with by employing an independent verifier to check that value for money relative to the revised consultants work scopes and fees has been achieved
- FVC will be required to re-procure all other consultants services which fall outwith the revised appointments which are required to complete the project

Re-procure the Professional Team with a fresh Appointment

Advantages

- This would provide the opportunity of re-introducing competitive tension into the process, and could potentially lead to cost efficiencies

Disadvantages

- An expected delay to the availability of the facility for the staff and students of 4 – 6 months beyond the current planned occupancy date of October 2019
- Additional cost to FVC to engage third parties to carry out a new professional team procurement exercise. There is obviously an unknown element of risk associated with re-procured professional team fee levels and ultimately the cost of the project
- Less tangible impact on the project associated with the loss of accrued knowledge and understanding of both project and client built up over the last twelve months

Construction team

Engage the Construction Team using one of the following:

- Traditional Contract
- Design and Build (Single Stage or Two Stage) Contract
- Construction Management Contract
- Management Contract

Traditional

Normally considered the 'least risk' approach, as there is a level of certainty about design, cost and duration inherent in the strategy if it is properly implemented. The sequential nature of the strategy, which is necessary to assure low risk, does mean that it can be relatively slow prior to the commencement of construction.

The route requires that the Design should normally be completed before competitive tenders are invited and before the main construction contract is let. To a limited extent, however, a contractor can have some design liability for part of the Works specifically identified and usually the subject of a provisional sum or part of a contractor's design portion.

The tender documents for the selection of the contractor should include drawn designs and a specification of workmanship and materials which the contractor should use in the preparation of a price. It is usual for each contractor to submit a price based upon the same work extent. Client is responsible for the accuracy of these quantities, prepared in the form of a bill of quantities.

Advantages

- competitive fairness, as all tendering contractors are bidding on the same basis
- the fact of being design-led, with the client able to have direct influence, thus facilitating a high level of performance and bespoke quality in the design
- reasonable price certainty at contract award, based upon market forces (subject always to design changes or client-led changes, which will have cost implications)
- auditability; a satisfactory strategy in terms of public accountability, as it is transparent and based upon competition
- well-known procedures, ensuring confidence in those involved throughout the supply chain; and
- changes are reasonably easy to arrange and value where the design needs vary due to changes in client demands or technology (though this ease can prove a disadvantage as price certainty may be less secure)

Disadvantages

- it is not generally advisable to shorten the process by producing tender documents based on less detailed design as this can result in less cost and time certainty and can be the cause of expensive post contract variations and disputes
- the overall project duration may be longer than for other strategies as the strategy is sequential and construction cannot be commenced prior to the completion of design with no parallel working possible
- there is no input into the design or planning of the project by the contractor and supply chain, who will not be appointed at the design stage
- the strategy is based upon price competition, which can result in adversarial relationships developing and is likely to result in the client paying a high-risk premium; and
- the designers and contractor have little incentive to advise the client on factors that may benefit the operational costs of the completed facility

Design and build

Under a 'design and build' route, a single contractor assumes the risk and responsibility for designing and building the project, usually in return for a fixed-price lump sum. There are a range of approaches that can be referred to as 'design and build':

- in its purest form the contractor will be left to interpret the requirements of the client and provide a building as a completed package. In extreme cases, the contractor may be responsible for obtaining planning permission and even for project funding
- alternatively, the client will employ a design team to carry out some preliminary design work and prepare the project brief and other tender documents, including 'Employer's Requirements' (a term used in standard contracts to describe the basis for the contractor's submission), outlining the key objectives for the project and significant criteria for a successful outcome
- 'develop and construct' assumes the client appoints designers to prepare the concept design before the contractor assumes responsibility for completing the detailed design and constructing the works. In this case, the contractor develops the design from the detailed brief or specification, submitting detailed proposals to establish that they are in accordance with the requirements of the specification. Clients are, therefore, in a strong position to ensure that their interpretation of the specification takes preference over the contractor's; and
- 'Novation', where this is desired requires the successful contractor to assume responsibility for the incumbent design team and use the preliminary information to produce the detailed design i.e. the contractor agrees in the tender submission to 'novate' the contract the client has with his or her designers to the contractor (The basis of the appointment of the design team will need to be amended accordingly). Novation will not be required for this project

Advantages

- The client has only to deal with one firm, giving single point responsibility, and significantly reducing the need to commit resources and time to contracting with designers and contractors
- Changes are reasonably easy to arrange and value where the design needs vary due to changes in client demands or technology
- Client risk is reduced due to the single point responsibility
- The strategy enables an integrated constructor contribution to the design and project planning
- Price certainty is obtained before construction starts, provided the requirements are adequately specified and changes are not introduced; and
- The total project time of a design and construction route may be reduced, because of overlapping activity

Disadvantages

- Difficulties can be experienced in preparing an adequate and sufficiently comprehensive brief or set of employer's requirements, or in defining requirements
- The client is required to commit to a concept design at an early stage; often before the detailed designs are completed
- Bids can be difficult to compare: each proposal will be different; prices and the project programme will vary
- There is no design evaluation, unless separate consultants are appointed by the client for this purpose
- Client changes to the scope of the project can be expensive and affect programme; and
- This route may result in a project having less aesthetic appeal where price and space dictate how the available budget will be spent

Single stage design and build contract

In this form of Design and Build procurement the contract is designed, tendered and contracted as a whole with the entire lump sum cost and programme commitment being known and agreed prior to commencement. We believe this route offers a suitable risk profile for further consideration at this juncture.

Advantages

- The Employers Requirements can be more thoroughly prepared before issuing tenders thus avoiding potential claims during the construction phase
- More thorough comparisons and evaluations between tendering Contractors Proposals can be made and the most advantageous tender can be determined
- Potential subcontractors can be identified and approved before the contract award is known
- Cost certainty for the project is obtained before the contract is awarded
- Programme certainty for the project is obtained before the contract is awarded

Disadvantages

- Commencement on site is delayed while full Employers Requirements are prepared by the Employer and full Contractors Proposals submitted by the tendering contractors and evaluated by the Employer, leading to a longer construction phase than two stage design and build

Two stage design and build contract

An alternative is a Two Stage Contract where the contractor is engaged before the entire design, cost and programme has been established and agreed. The advanced engagement of the contractor is procured on the basis of, for example, Preliminaries, foundations, frame and other major items where the design has been established. The remaining costs are tendered and agreed as the design progresses, so therefore the entire lump sum cost and programme commitment are not known and agreed prior to commencement. Although the advantage is that a commencement on site can be obtained earlier than the single stage option, we do not believe this route offers a suitable risk profile for further consideration at this juncture.

Advantages

- An earlier site commencement can be made than single stage design and build leading to a shorter construction phase

Disadvantages

- The Employers Requirements are prepared for Preliminaries and early work packages only before issuing tenders thus opening the possibilities for potential claims during the construction phase
- More thorough comparisons and evaluations between tendering Contractors Proposals cannot be made and the most advantageous tender can be determined as tenderers submit Contractors Proposal on Preliminaries and early work packages only
- Cost certainty for the project is not obtained before the contract is awarded
- Programme certainty for the project is not obtained before the contract is awarded

Construction management

On the basis that price or time certainty is not achieved until the last trade packages have been let, we do not believe this route offers a suitable risk profile for further consideration at this juncture.

Management contracting

On the basis that generally, poor certainty of price is offered (until the works are at an advanced stage); the potential cost commitment depends upon design team estimates; and there is the increased potential of exposure to contractual claims, we do not believe this route offers a suitable risk profile for further consideration at this juncture.

Recommendation:
The Project Team recommends that the most suitable procurement route for the appointment of the Main Contractor for this project is to follow a Restricted Procedure in accordance with EU procurement legislation, and via the Single Stage Design and Build process in line with Construction Industry best practice approved by the Falkirk Campus Project Board in July 2016.

17.11 Key Steps & Timescales for selected procurement route

The Project Team will ensure that the procurement process will be undertaken in compliance with EU procurement legislation, including the use of the ESPD documentation and all other mandatory requirements.

Furthermore, the following structured approach addresses the project's objectives and is consistent with SFT and Scottish Funding Council guidance. The timescales will be adjusted, where necessary, to reflect major holiday periods.

17.11.1 Complete FBC and obtain approval to proceed to procurement

This is the current stage of the project and aims to confirm the fundamental aspects of the project including scope, method of procurement and delivery, and funding.

17.11.2 Prepare procurement related documentation

The OJEU notice and ESPD will be prepared and ready to be published by mid-November 2016, in line with the detail provided in Section 17.6 above. Invitation to Tender documentation, including detailed specifications, designs and drawings shall be prepared and ready to issue to the shortlisted bidders by April 2017.

Furthermore, the notice and associated ESPD documents are expected to provide a level of detail about the project as available by the time of publishing the OJEU notice, including as a minimum award criteria and any available details of the project and ITT specification. The detail provided however should ensure a level of flexibility to allow subsequent changes in scope to be made as the detailed design and project information is developed between pre-qualification and ITT stages; however the stated award criteria cannot materially change at this stage.

The ITT will also provide bidders with details of the evaluation criteria that will be used to score bids on the basis of Most Economically Advantageous Tender (MEAT). This shall include specific weightings per criteria and the methodology by which the scores will be awarded

17.11.3 Informal market soundings

It is anticipated informal meetings will take place with potential contractors to seek feedback on the strategy prior to publishing the OJEU notice.

A Prior Information Notice (PIN) may be issued via OJEU for this purpose to give the market advanced notification of the project and is a good means of opening dialogue with the market. Issuing of a PIN is not mandatory but is a good form of governance and provides transparency for the process.

Meetings will be recorded for audit trail purposes and to demonstrate that the informal meetings do not lead to changes that uniquely benefit those consulted.

17.11.4 Publish OJEU and hold bidders day

The OJEU notice will be submitted electronically thus triggering a minimum thirty (30) day statutory period for bidders to register their interest in the pre-qualification (ESPD) process. The bidders' day will be held shortly after the OJEU is published. The programme allows for a total of 63 calendar days for ESPD submissions to be made.

17.11.5 Select bidder shortlist

The programme allows two (2) weeks to complete the ESPD evaluation process and identify the proposed bidder shortlist. A further three (3) weeks have been allowed for approvals by SMT, FCPB and College Board, with a further three (3) weeks again for Gateway 3 SFT/SFC approval.

It is anticipated that a minimum of five (5) bidders will be shortlisted to participate in final ITT stage.

17.11.6 Issue ITT documentation

The programme allows nine (9) weeks for this stage of the process in order to allow the shortlisted bidders to develop and submit their final tender proposals for evaluation It is proposed to hold mid-tender interviews with the bidding Contractors.

Following completion of the ESPD evaluation process and notification to bidders of the outcome, the shortlisted bidders will be issued with the ITT documentation, including detailed specifications, design information and drawings.

The ITT documentation will also include details around the procurement process, including timescales, clarification procedures, the evaluation criteria against which bidders ITT submissions will be evaluated, and details of how bidders should submit bids.

17.11.7 Preferred bidder selection

The Project Team will evaluate final tender submissions strictly in accordance with the MEAT evaluation criteria as published within the OJEU notice and tender documents.

Following completion of the evaluation process, including any post tender clarifications, the Project Team will recommend a preferred contractor and present this recommendation for approval to the College's Senior Management Team, Falkirk Campus Project Board and Main Board.

Approximately six (6) weeks has been allowed in the programme to complete the evaluation process, with a further three and a half (3.5) weeks for approvals by SMT, FCPB and College Board.

The recommendation will then be put forward to SFC and SFT for review and approval (three (3) weeks allowed).

17.11.8 Contract award

Upon receipt of approval for the appointment of the preferred bidder, the College shall notify all bidders of the outcome of the evaluation process by issuing formal Intention to Award letters. This triggers the start of a mandatory ten (10) day statutory standstill period before which the contract can be formally awarded and entered into by the College and the preferred bidder.

The purpose of the standstill period is to allow any unsuccessful bidders to request a formal debrief about their tender submission, and raise any challenge to the award of the Contract if they deem any aspect of the process to be non-compliant or not in line with the stated process and criteria.

Following the expiry of the standstill period, a Contract Award Notice must be published via OJEU not later than thirty (30) days after the date of Contract Award. This is a legal requirement under EU regulations.

Table 17.1 - Key Milestone Table (from main programme)

Description	Date
Full Business Case Approval	16 September 2016
Issue OJEU Notice/ESPD	25 November 2016
Deadline for ESPD Submissions	30 January 2017
Complete Evaluation of ESPD	30 January - 13 February 2017
Shortlist Tenderers (Minimum of 5)	13 February 2017
Gateway 3 – SFT/SFC Approval	31 March 2017
Issue ITT Documentation to Shortlist	3 April 2017
Deadline for Tender Submissions	5 June 2017
Evaluation of ITT Submissions	6 June – 17 July 2017
Gateway 4/FBC Final Approval by SFT/SFC	11 August – 1 September 2017
Contract Award	4 September 2017
Standstill Period	5 – 18 September 2017
Date of Possession of site by Contractor	18 September 2017
Construction Complete	16 August 2019
Fit Out Stage	19 August – 20 September 2019
Migration/Occupation of College	23 September – 4 October 2019

The dates indicated in the table above are proposed dates but may be subject to change as the project progresses

17.12 Form of contract

The project will adopt the standard form SBCC Design and Build (2011) contract for use in Scotland.

17.13 Approach of FF&E procurement

Procurement of items of FF&E will be grouped as follows:

- Group 1 – supplied and fitted by the contractor (this includes procurement, installation and commissioning)
- Group 2 – supplied by the client and fitted by the contractor – specialist kit that the client wishes to retain control of the specification
- Group 3 – supplied and fitted by the client but have a space requirement and may plug in/require services, e.g. computers, photocopiers, desks, tables and chairs, etc
- Group 4 – supplied and fitted by the client, small items like filing trays, waste paper bins
- Group 5 - existing equipment, which is to be decommissioned, uninstalled, transferred, reinstalled and re-commissioned. Such as the Westfield Plant, Distillation Lab, VCC Lab

Where the College is responsible for the procurement of FF&E (Groups 3,4 and 5) these will be procured in line with the College's Procurement Policy and Procedures.

As far as reasonably practical, the College will look to utilise collaborative Framework Agreements which are available, including APUC, Procurement Scotland and any others which meet the College's needs, and to maximise efficiency and value for money. These Framework Agreements will not be available to the Design and Build Contractor for Group 1 and 2 requirements.

The delivery of items within Groups 3, 4 and 5 will be managed by the College's project team, with assistance from the Design Team. Design, construction and migration interface requirements and risks are understood. These will be managed through the careful definition of requirements and responsibilities to ensure that cost, programme and risks including health and safety are effectively managed.

17.14 Procurement risks

Procurement risks have been specifically identified and included within the project's risk register together with appropriate management strategies. Please refer to appendix 9 for further details.

Some risks to consider:

1) Significant changes to procurement legislation with new processes and procedures to be adhered to by the College and Bidders, which may impact on the outcome of the procurement process.

Specific risks to the College:

- Non-compliant process which is challenged by a bidder during the process, potentially meaning the procurement process is abandoned and restarted. Mitigate by referring to Statutory Guidance and Legislation when preparing tender documentation and throughout the procurement process, and seek Legal Advice where required
- Key criteria are omitted from the pre-qualification stage due to misunderstanding of ESPD requirements, meaning that the most suitable bidders may not be included on shortlist for ITT stage. Mitigate by carefully considering mandatory requirements and selection criteria and including within OJEU Notice and accompanying documentation
- The most suitable companies do not bid for the project due to unfamiliarity with the new legislative requirements, perceiving them to be too complex. Mitigate by hosting bidders day and explaining the requirements of the legislation in more detail at the early stage of the process

Specific risks to bidders:

- Unfamiliar with the new procedures and requirements of the legislation, and they fail to address key requirements or provide Key information meaning that they are not included in the shortlist for ITT stage. Mitigate by hosting a bidders day and going through the new procedures and requirements for complying with the ESPD requirements in particular
- The most suitable company is not selected as preferred bidder due to inadequate selection and award criteria within the evaluation process. Mitigate by carefully considering relevant criteria at for each stage and allocate suitable weightings to each criteria relative to overall importance to the project
- Criteria used and/or justification for scores awarded to bidders during evaluation are deemed to be subjective and/or discriminatory and may be challenged by affected bidders, potentially delaying or cancelling the award of the Contract, with potential negative consequences for the College and the project as a whole, including delay of the programme. Mitigate by ensuring scoring criteria is clearly defined at each stage of the process for evaluators, and is objective and transparent for all bidders. Also ensure that the evaluation process is carefully managed by the Project Team and justifications provided by evaluators are recorded for de-briefing purposes

2) Re-procurement of additional services outwith 50% modification limit permitted by EU regulations (fee budget £300k)

Specific risks to the College:

- While the existing members of the Project Team are permitted to bid for these additional services, there can be no guarantee that they will be re-appointed for the additional services
- Important aspects of scope may be missed from new appointments causing delay and additional cost to the project
- If the existing members of the Project Team are not re-appointed, the following risks may exist
    - Lack of co-ordination between incumbents and new advisers
    - Delays to the project programme as new advisers get up to speed with the detail of the project
    - Impact on quality of the final project, due to misunderstanding or misinterpretation between various parties
    - Contractual disputes around allocation of responsibilities between parties, resulting in delays and potential cost increases

Mitigation proposals are being implemented to minimize these risks.

17.15 Project Team and Professional Advisors

The procurement process will be led by the College's Project Director supported by the other members of the College's Project Team. The Project Director and Team have extensive client site and consultancy experience in the management, procurement and delivery of large and complex projects including capital funded public sector projects, including the Alloa and Stirling Campus projects.

The in-house Team will be supported by the existing team of Professional Advisors (all up to the 'development of tender documents' stage as a minimum)* all of whom have extensive experience of similar capital funded procurement projects.

* Due to the change from NPD to Capital funded approach to the project, and subsequent requirement to re-scope the existing Advisors appointments to reflect the change in approach, the College will require to re-procure some additional Technical and Architectural services from procurement stage through to post contract completion stage of the project. The need for re-procurement of these additional services is due to EU procurement legislation which caps the level of contract modification to 50% over the original contract value.

As a result, there is a potential for additional advisors to be responsible for some aspects of the project after the OJEU notice has been issued, however the College will ensure through the re-procurement exercises that any Advisors appointed to deliver these services are suitably skilled and experience to meet the objectives of the Project.

The combination of these internal and external capabilities with support from SFT and SFC puts the project team in a very strong position to lead the procurement and successfully deliver the project

18 RISK ANALYSIS AND MANAGEMENT

18.1 Overview

The Design and Build model of procurement can be seen as an effective route towards achieving value for money in education projects. The key aim is to combine the advantages of a competitive tender with the transfer of risk away from the public sector (with the final risk allocation agreement being reached along with the overall contract agreement). It is therefore important for the client and the bidders to assess all of the potential risks through the whole project life.

Within the context of the College project, risk has been considered at both a Strategic level and at a Project Specific level.

As the D&B process has evolved, it has become more apparent that Best Value/Value for Money can be obtained by optimal risk allocation as opposed to maximum risk transfer to the private sector.

Although risk must be identified before a contract is concluded, there will be risks, which will remain to be managed during the lifetime of the project. Monitoring projects to ensure that they continue to provide the desired service must occur and effective risk management should be utilised to identify any potential threats to successful service delivery.

18.2 Project Specific Risk Register

A Project Specific Risk Register has been prepared and is contained in appendix 9 of this report.

18.3 Strategic Risk Register

It is recognised as vital by all parties on the project that a Strategic Risk Register is also produced, managed, maintained and reported as a live document which accurately reflects the risks associated with the utilisation of the Design and Build model.

The Strategic Risk Register, included in the Table 18.1 overleaf, details the high-level risks which have been identified by the project team as relevant to the use of Design and Build for the delivery of the Falkirk College project, along with the anticipated allocation of risk between parties.

Table 18.1 - Strategic Risk Register

RISK/REWARD		College's proposed allocation RESPONSIBILITY		
		BIDDER	COLLEGE	SHARED
PLANNING & REQUIRED CONSENTS				
1	Risk of delay caused by the planning process or inability to obtain planning permission before contract signing.		X	
2	Risk of delay if amendment to Planning required for construction change post contract signing.	X		
TITLE ENCUMBRANCES				
1	Obtaining vacant possession of site.		X	
2	Title encumbrance affecting site. (post-contract signing)			x
CONSTRUCTION				
1	Delay or increased cost due to:			
(a)	force majeure			X
(b)	relief events			X
(c)	default by Bidder's contractor/professional team	X		
(d)	Site/ground conditions	X		
(e)	delay in handover	X		
(f)	utilities capacity / condition	X		
(g)	compliance with planning conditions	X		
(h)	change in law			X
2	Cost overruns	X		
3	Design faults causing higher maintenance costs	X		
4	Availability and capability of service utilities	X		
FINANCIAL				
1	Inflation increases			x
2	Commercial income		x	

RISK/REWARD		College's proposed allocation RESPONSIBILITY		
		BIDDER	COLLEGE	SHARED
LEGISLATION/REGULATION				
1	Change in Legislation			x
TERMINATION				
1	College default		X	
2	Bidder default	X		
3	No fault termination			X
INSURANCE (Construction phase)				
1	Increased cost of insurance	X		
2	Inadequate insurance to cover reinstatement	X		
3	Excess/deductibles on insurance	X		
TAX				
1	Changes in general tax law		X	
2	Change in scope of VAT		X	
3	Change in VAT rates.		X	

19 PLANNING STATEMENT

19.1 Planning

At the start of the process, Forth Valley College confirmed that they will be progressing an application for Planning Permission in Principle (PPP) and a Detailed Planning Application. A Planning Permission in Principle was granted by Falkirk Council on 4th April 2016. Details of the PPP are noted below.

As the proposed development is classified as a 'major' development, FVC were required to undertake a minimum 12 weeks pre-application consultation. The submission of a Proposal of Application Notice (PAN) to Falkirk Council requests approval of the form of consultation that they proposed to undertake. The submission of the PAN also started the 12 week consultation process. Only after this 12 week period passed can a planning application be submitted.

FVC submitted the PAN to Falkirk Council on 08 September 2015, which precluded a planning application could not be submitted in advance of 02 December 2015.

The description of development within the PAN was:

'Development of a new Educational College Campus with Arts Centre (including associated ancillary office, retail provision, refectory and bar), parking, infrastructure and landscaping.'

FVC hosted a public event, using the College Campus as a venue to allow interested members of the public to come along and review consultation boards and ask the design team any questions they had. The event took place on Monday 5th October 2015 from 17.30 to 21.00.

An unstaffed exhibition was held from 6th to 13th October which allowed those that could not attend the staffed exhibitions to come along and review the consultation boards and leave comments.

The Technical Team met with Allan Finlayson (Development Management), Alistair Shaw (Planning Policy) and Kevin Collins (Transportation) of Falkirk Council on 29th September 2015 to brief them on the proposal, gauge initial feedback, gain initial comfort on potential EIA requirements, agree a list of supporting documents, and propose a processing agreement to act as a project management tool to agree timescales for the planning process. The proposed plans were well received but no meaningful comments were made due to the early stage of the proposal.

It was agreed that the PAN was acceptable and no additional consultation would be required; the Technical Team would need to liaise with the Council team instructed to draft a Development Framework for the wider area including the College sites, and neighbouring Gateway site; and would be required to submit a Screening Opinion regarding an Environmental Impact Assessment (EIA).

The Technical Team met with Think Curious Architects/WSP regarding the wider Development Framework and overall Falkirk area Masterplan on 23 October 2015. The meeting was positive and it was agreed to swap information to ensure a flow of information between parties and that the connectivity between the sites would be fluid.

The Technical Team submitted an EIA Screening Opinion Request to Falkirk Council on 16th October 2015 and the Council responded on 03 November 2015 which stated that the proposal is not likely to have significant effects on the environment, and that an EIA is not required in respect of the proposal.

The Technical Team met with the Grahamston, Middlefield and Westfield Community Council on 03 November 2015 which was a positive meeting.

A planning application was submitted to Falkirk Council on 7th December 2015 with a statutory determination period of 4 months, with the determination target date being 7th April 2016. Forth Valley College signed a Processing Agreement with Falkirk Council on 9th December 2015.

The proposed development is acceptable in principle at that location as the site is designated for education use for a new College, subject to site specific issues being agreed upon.

Throughout the planning process, the design team liaised with Falkirk Council on a regular basis to ensure the application was progressing, and to discuss any issues as they arose.

The original case officer (Allan Finlayson) left the Council prior to the determination of the application, and a new case officer (Julie Seidel) was allocated.

The design team met with Julie Seidel (Development Management), Ken Short and Kevin Collins (Transportation) on 10th March 2016 to discuss outstanding issues regarding the application. All items were agreed, and the design team submitted further information on 18th March 2016.

Julie Seidel drafted her report recommending planning permission's be granted which was put on the member recommendations list on the 24th March 2016. No local member called the application to committee and Planning Permission in Principle was granted on 4th April 2016 with four associated planning conditions. No Section 75 Legal Agreement was required.

The decision notice for the application is contained in appendix 10 of this report.

The Detailed Planning Application is programmed to be submitted to Falkirk Council in September 2016.

20 MONITORING AND EVALUATION STRATEGY

20.1 Monitoring & Evaluation

An effective monitoring and evaluation strategy will be adopted for the project. It will ensure that all the project parameters are fully considered and robust procedures put in place for their effective management including monitoring, evaluation, co-ordination and recording of the various actions and procedures throughout the duration of the project.

In addition it will ensure that there is a satisfactory capture of relevant information to inform a full Post Project Evaluation.

In particular the report within the Supporting Documentation will act as

- A channel conveying the nature and reason for decisions and subsequent instructions
- Method for establishing priorities and resolving issues
- A record of decisions, information gathered, agreements, revisions and as a reference document for Post Project Evaluation
- A basis for assessing the resources required to compile the project within the stipulated cost, time and quality standards

By implementing this strategy, agreed control measures are put in place which should effectively minimise the rise of deviation from the project plan and also limit the ability for unnecessary or unauthorised change during the construction phase of the project.

21 STAKEHOLDER ENGAGEMENT AND COLLABORATION

The College has created a specific Communications and Marketing Plan for the Falkirk Campus Development Project which focuses on pre-construction, construction and post-Construction. Stage one of the plan has gained Board approval and stakeholder engagement and collaboration activities are integral throughout. The purpose of the Communications and Marketing Plan is to provide a framework to raise awareness of the project and provide details on our progress. It also aims to reach and consult with our stakeholders using clear and consistent messages to maximise engagement and to support the creation of a superb environment for learning.

There is a dedicated section on the College website where information on the project will be contained and regularly updated. The College's in-house team will produce communication materials in a variety of formats including on and off-line, to ensure all stakeholder groups are fully informed on recent activities and importantly will have an opportunity to share their views using feedback forms. Physical displays of architectural drawings and a series of dedicated events commenced in mid-October 2015 to provide all stakeholder groups with the opportunity to view, discuss and provide feedback on the project.

21.1 Staff and board engagement

Employee engagement is embedded within the culture and ethos of Forth Valley College and this is reinforced in the delivery of our Mission – Making Learning Work. This innovative business model is fully embraced by staff at all levels of the organisation and in all aspects of our activity.

As a result, staff consultation is central to the development of the College's plans for a new Falkirk Campus. This consultation work centred on the facilitation of staff focus groups, which included teaching and support representatives from across all areas of the College and was supplemented by regular updates in the College's weekly e-newsletter.

From key senior managers across the College to lecturers and support staff – everyone at Forth Valley has embraced the concept of a new campus and has actively engaged in dialogue and discussion in terms of proposed layouts and plans. Staff have provided feedback on their experiences of our new campuses in Stirling and Alloa, where they reflected on 'what we should keep' and 'what we should seek to do differently' for the new Falkirk Campus. This is testament to the knowledge and valuable insights that many have gained throughout their experience of the two previous new builds.

The concept of the new campus has been strongly supported and welcomed by staff and viewed as the final piece in the College's Estates Development Strategy – producing a sector leading headquarters to complement the existing Alloa and Stirling Campus sites.

21.2 Student engagement

Forth Valley has a very strong ethos of listening, engaging and empowering students both directly and in collaboration with our Student Association. This approach and level of engagement will ensure their views and opinions are considered in the development of the new campus.

Our students are a critical stakeholder group and the engagement process throughout the project will be linked to our 280 class representatives - who will cascade key messages to our student community of approximately 15,100 students. Initial focus groups have already taken place to gather feedback from our students on what currently works for them at other campuses, to gather suggestions for improvements and to explore different approaches to maximise their learning experiences. This approach is planned to continue throughout the entire estates planning process and will be complemented by visual displays on-campus with information cascaded through the online student blog, Moodle and official social media platforms.

21.3 Public sector collaboration

Forth Valley College benefits from high levels of positive support from a number of partner organisations, such as our three local authority partners, third sector agencies, Skills Development Scotland, Scottish Enterprise, Education Scotland, Colleges Scotland and Scottish Canals. Members of the College's Senior Management Team are in regular dialogue with our organisations and this level of engagement will continue at a strategic level to provide updates on the project.

The proposed development of the Falkirk Campus has been prepared in close collaboration with Falkirk Council and they are highly supportive of the plans for the local area and see the College as an integral part of the economic development plans for the Falkirk area.

As one example, Falkirk Council and Scottish Canals recognise and support the importance of the new Falkirk Campus to the local area and are enthused by the proposals; initiating discussions on links to the Falkirk Gateway and Helix developments for the area. Together with Skills Development Scotland, Scottish Enterprise and Education Scotland they see the new campus proposal as an extremely important initiative to meet the skills needs of local and national employers.

Letters of support are attached in appendix 11

21.4 Private sector collaboration

Forth Valley College has strong and effective employer engagement across a variety of initiatives and provision in the College. These strong collaborative partnerships have been built and nurtured with major private sector employers, both within the Falkirk area and nationally, such as Ineos, PetroIneos, Scottish Power, FES, BP, ADL, FMC Technologies WGM Engineering and Shell plus many others.

The employers we work with recognise the importance of the College in supporting them to up-skill their workforce which will benefit both the local and national economy. The relationship with our employers allows for cross pollination of services as well as an opportunity for our employers to act as ambassadors. In the past year the partnerships created with FES, Scottish Power and the oil and gas sector have provided the opportunity to co-create training programmes and apprenticeship models to meet the needs of these key industry sectors. As a College we will continue to benefit from collaboration activities in terms of income, resources and educational knowledge transfer.

In terms of engagement, the initial indications from our key partners in the private sector has been very positive and supportive of the concept of a new Falkirk Campus. The College has already produced and issued an employer survey via social media platforms and their business magazine, In-touch, to gather support and feedback from this key group. The College has gained 56 followers on our dedicated new Falkirk campus twitter page. The next stage will be to host a series of events specifically targeting employers to engage on the design and layout to ensure the practical elements of the skills development meets both their current and future skills requirements. Many of our employer partners have innovative and forward thinking processes and procedures within their organisations in terms of manufacturing systems. We hope that our new Campus development proposals can adopt some of this thinking to benefit both our staff and students.

Specific examples of our employer engagement activities have included presentations from our Senior Management Team at high profile business events to raise awareness of the new campus development project and to gather support. The College has also hosted a dedicated Learning for Work Dinner - which brought together schools, employers and partner agencies – and was used as another vehicle to raise awareness of the project.

Letters of support are attached in appendix 11

21.5 Academic collaboration

The new Falkirk Campus development is widely supported by the College's Higher Education partners and the creation of a flagship headquarters in Falkirk will further enhance the College's position as one of the leading providers of education locally, nationally and internationally.

The College has built an unrivalled reputation as an organisation which produces highly-skilled graduates, who are equipped with the necessary skills and knowledge to successfully progress onto a programme of higher level study at University. In particular, the College has well-established links with some of Scotland's leading universities including Stirling University, Heriot Watt University and Strathclyde University.

These partnerships have flourished over recent years and have included the creation of five integrated degree programmes funded via the Higher Education Investment programme. This has allowed students to articulate to university on completion of one or two years of study at Forth Valley College. These highly innovative programmes would benefit from a new Falkirk Campus development – providing work-ready graduates in the areas of heritage and conservation, applied science and computing, digital media and chemical engineering.

The College is also developing stronger links with Stirling University in the international arena by linking with the integrated degree programme for international students coming to the Forth Valley area.

Further collaborative discussions are ongoing with Heriot-Watt in relation to developing Graduate Apprenticeship programmes, to provide more cost effective progression routes for students and employers in order to continue to deliver work ready engineers for the sector.

In summary, the College has been extremely encouraged by the positive support from all our key stakeholder groups. Our focus during the project will be to ensure that we maintain this level of engagement and promote openness, accountability and transparency at all times. We will seek to gather feedback from our key stakeholder groups and continue to consult their opinions at key project milestones.

Letters of support are attached in appendix 11

22 NEXT STEPS AND DELIVERY STRATEGY

22.1 Schedule of key dates

Table 22.1 summaries key milestones within the project.

Table 22.1: Key Milestones

Description	Date
Issue OJEU Notice	November 2016
Shortlist - 5 Bidding Contractors	February 2017
Issue D&B Tender	April 2017
Contract Award	September 2017
Construction Complete	August 2019
Occupation of College – From	October 2019

22.2 Programme

The programme for the College is contained in appendix 12 of this report.