POST OCCUPANCY REVIEW REPORT

SCHOOL OF VETERINARY MEDICINE AND SCIENCE

MAY 2009

Post Occupancy Evaluation of the
School of Veterinary Medicine and Science
For the University of Nottingham

1. **Introduction**

QTC Projects were appointed to carry out the Post Occupancy Evaluation following the submission of a proposal letter dated 18 October 2008 to the University of Nottingham Estate Office Development Director.

2. **Scope of the Review**

Evaluation Technique

The evaluation was conducted at strategic review stage for Phase 1 (2 – 4 years after handover).

Analysis

Analysis consisted of reviewing all written information received concerning the building together with information collated from the questionnaires and workshop. Particular areas reviewed were:

Purpose and scope of project
Some aspects of the building procurement process
Building user feedback
Stakeholder participation
Project management

Questionnaires

Questionnaires were developed to obtain information feedback from five specific groups:

a) Client
- Dean of SVMS
- Director of Academic Support & Administration
- Chair of Project Management Group
- Senior Research Technician

b) User
- a representative sample of 29 users of the building

c) Estate Office Staff
- Development Director
- Capital Projects Officer
- Operations & Facilities Director
- Senior Building Surveyor
- Chief Security Officer
- Senior Engineer
- Energy Manager
- BMS Engineer
- Maintenance General Manager
- Administration & Business Systems Manager
- Cleaning Services Manager
- Communications Engineer
- Mechanical Design Engineer

d) Consultant Design Teams for Academic & Clinical Buildings
- Architect
- Project Manager
- Services Consultant
- Structural Engineer
- QS

e) Building Contractor (Clinical Building)

Samples of the Questionnaires are shown in Appendix 1

Interviews

Interviews were held with the following:

Tim Brooksbank	Development Director
Barry Chadwick	Director of Operations & Facilities
Karen Braithwaite	Director of Academic Support & Administration

A meeting also took place with representatives from the Operations and Facilities Team.

Workshop

A half day workshop was held on 10 March 2009 (a list of attendees is shown in Appendix 2).

The format for the workshop was a brief presentation by QTC Projects acting as facilitator which included feedback from the user satisfaction questionnaires. The workshop helped to highlight the key issues that had been raised in the questionnaires and interviews which were then discussed and debated.

The information from the workshop provided important comment which has been incorporated into this report.

3. **Building Data**

Name	School of Veterinary Medicine and Science	
Size	Academic Building	5437m²
	Clinical Building (excluding stables/barns)	2854m²
No of storeys	Academic Building	3 storeys
	Clinical Building ` area	Single storey plus small 1st floor
Types of Space	Academic Building	Atrium Reception 350 seat Lecture Theatre Offices Seminar/Teaching Rooms Staff Common Room Research Laboratories
	Clinical Building	Clinical Teaching Laboratories Practical Teaching Surgery Dissection Laboratory Small Animal Rooms Offices
Start on site	Academic Building	16th May 2005
	Clinical Building	19th December 2005
Date Completed	Academic Building	5th September 2006
	Clinical Building	20th October 2006
Cost	Academic Building	£7.4m (build)
	Clinical Building	£3.14m (build)
Funding	Predominantly HEFCE funded	
Design Team	Master Plan Architects	Saunders Boston, Cambridge
	Project Manager	Hannah Reed, Cambridge
	Quantity Surveyors	WT Partnership, Nottingham
Academic Building	Architects	Pick Everard, Leicester
	Services Engineer	Pick Everard, Leicester
	Structural Engineer	Pick Everard, Leicester
Clinical Building	Architects	Saunders Boston, Cambridge
	Services Engineer	Silcock Dawson, Princes Risborough
	Structural Engineer	Hannah Reed, Cambridge
Type of Contract	Academic Building	NEC Develop & Construct
	Clinical Building	JCT 98 with Quantities

(Both contracts single stage. OJEU Notice on Academic Building only)

4. Project Background and Description

The aim of the project was to design and construct a new School of Veterinary Medicine and Science which would provide academic and clinical facilities to support 500 undergraduates and 100 postgraduates. There was to be a greater emphasis on shared faculty resources rather than rigid, departmental demarcation. This required the development of new types of flexible multipurpose spaces and buildings that can accommodate change over a long period.

The facility was to be available for the student intake in September 2006. The site chosen for the school was a greenfield site which lies in the south east quarter of the Sutton Bonington campus.

An overall master plan was prepared for the site which allowed for design and construction to be carried out under two separate construction contracts to provide an academic building and clinical support building. The layout and configuration of the Academic building allows for further expansion in the future.

The assessment of required useable areas was initially established by the Master Plan Architects due to their past experience of similar facilities with further veterinary input from Professors Boyd and Monaghan from University College Dublin School of Veterinary Science. Both the Academic and Clinical buildings did not have a detailed user brief at RIBA Stage C and consequently various assumptions had to be made regarding teaching practices and research requirements.

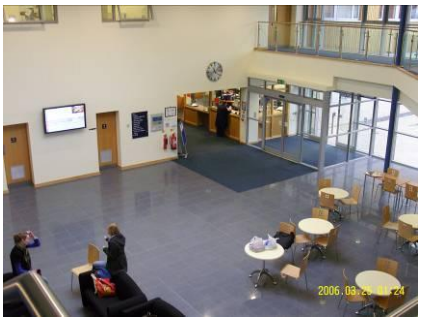
On the Academic building the internal layouts were merely indicative although the external envelope, elevations, stair and toilet cores were considered in some detail.

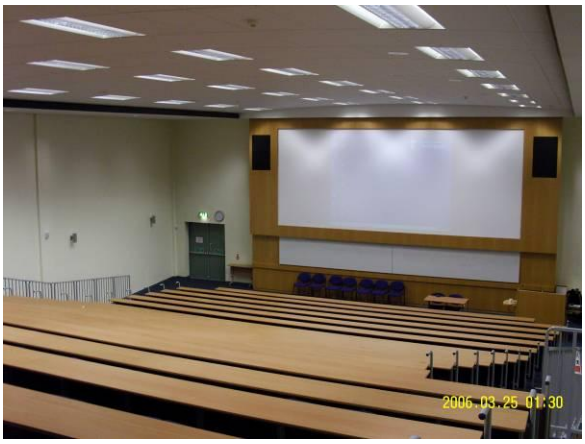
Similarly on the Clinical building the final layout plans were dependant on the final structure of the curriculum which still required consideration and debate by the Project Management Group.

Originally the Clinical building included accommodation which provided a small veterinary hospital open to the public on a predominantly referral basis. This facility was later taken out when the user brief became more clearly defined and it became apparent that the local case load was insufficient. The space released was subsequently designated for clinical teaching and office space.

In designing the Academic building, the Architects have taken account of the rural nature of the site and the external materials used are intended to give an agricultural feel to the building.

The main entrance is accentuated by the juxtaposition of the 350 seat lecture theatre at a 45º angle to the south wing creating a funnelled approach to the glazed entrance. The central atrium acts as a welcoming and meeting area for both students and staff and gives a great sense of space.





Off the Atrium is a well equipped 350 seat lecture theatre available for use by all students on the Sutton Bonington Campus.

Externally, the building is clad at the upper level in treated European Redwood vertical boarding with exposed glue laminated circular timber columns. Masonry walls at the lower level comprise split faced Lignacite blockwork which provides a stone texture and contrast with the vertical cladding above.

Brise Soleil/Solar Shading is provided on all the South East and South West elevations. Leading out of the Atrium is a well proportioned link corridor which gives access to the Clinical building located on the North East side of the Academic building.

The Clinical building accommodation is provided within a single storey courtyard building which maximises the use of natural daylight and ventilation. The simple pitched roof form is stepped and staggered in certain areas to create a clerestorey which provides natural daylight to the central corridor.

Externally the masonry walls comprise splitfaced blockwork to match the Academic building with aluminium double glazed windows and aluminium sheet roofing.

Hard and soft landscaping has been provided around the buildings creating attractive outdoor spaces in some areas. A small car park is provided on the west side of the Academic Building off the main campus south entrance from Landcroft Lane.

The University established a Building Project Management Group and followed the in house capital procedures to ensure good management throughout the various stages of the project. The Building Project Management Group reported to the University's Finance Committee. The Development Director reported to the Group.

5. User Satisfaction

Building user satisfaction has been evaluated from the responses to the questionnaires received. Appendix 3 shows a range of bar charts covering the following areas:

- Satisfaction with specific room types, ie laboratory, office, lecture room, administrative area, social space and overall impact of the building
- Security
- Accessibility
- Cleanliness
- Air Quality
- Internal Room Temperature
- Distraction from noise
- Lighting conditions, natural and artificial
- Data connectivity at the workspace
- AV equipment in teaching/lecture rooms

The responses from the staff and students that returned the questionnaires show a high level of satisfaction, with a range of 92% - 100% satisfaction with the room types. A high proportion of respondents rated the facilities good to excellent.

The exception to this was the provision of social space which dropped to 75%.

Generally respondents considered security in the building satisfactory with a large number regarding the building as very safe. Accessibility within the building, however, proved to be less satisfactory due to the use of keypads for the internal door entry system.

The responses to cleanliness showed students to be very satisfied but some issues raised concerning the contract cleaners reduced the satisfaction rate amongst staff.

Air quality achieved a 96% satisfaction rating but room temperatures attracted a lot of criticism. Analysis of the questionnaires showed that 36% were too cold in winter and 58% too hot in summer.

Respondents considered that the balance of natural and artificial light had been achieved successfully. However, distraction from noise is a problem for some students and staff.

79% of users who responded to the questionnaires thought the AV equipment worked well. On data connectivity at the workspace some high satisfaction levels were achieved (41%) but some less so (21% below the satisfaction baseline).

Resulting from the questionnaire responses, interviews and various discussions, a number of issues have been highlighted and were presented at the POE workshop for further discussion/debate. The issues have been grouped under the following headings and considered in more detail in this report.

- Design Issues
- Heating and Cooling Issues
- Budget and Cost Management
- Construction Issues
- Sustainability
- Operations and Facilities Issues
- User Comments

6. **Design Issues**

End users not known during Design Stage

The University established a Project Group in January 2003 and commissioned a feasibility study and master plan from architects, Saunders Boston. In looking at the building requirements for a new Veterinary School, the Architects had to make some assumptions about the curriculum that would form the basis of the new course since none of the academic staff that would deliver this had been appointed. Saunders Boston had therefore to use not only their direct experience of working at the University of Cambridge Veterinary School but also specific research through interviews and visits to Cambridge and the new School of Veterinary Medicine at University College Dublin.

This building project was therefore unusual in that there was not an end user until the design was complete and construction started. Since the input from the end user was not available or not sufficiently knowledgeable a fair proportion of the building spaces had to be left for later fit out when more details were known. This resulted in having large PC sums and potential for delays in agreeing final layouts.

However, considering the lack of key user input at the early stage, there is still a high level of satisfaction, as shown in the completed questionnaires.

Recommendations

It is accepted that the decision by the University to develop a Veterinary School was made very quickly with an urgency to complete the buildings and facilities for the new intake of students in September 2006.

On future projects, if possible the client or end user should be clearly defined with that person being sufficiently knowledgeable to assist in the development of the design brief at a very early stage.

Lack of clearly defined user brief

The lack of a clearly defined user brief was a direct result of the late appointment of academic staff who had the detailed knowledge and expertise to develop the plans and usage. Hence 10% of the internal space plans were merely indicative of what could be achieved. Alternative proposals for the laboratory areas that were included as provisional or PC sums did have an impact on the contractor as the decision on requirements for these areas was made later than stated in the contract. The PC sum element of works was considered as a separate budget and an additional contractor could have been brought in to carry out this work. In the end, The University decided to give this package of work to the main contractor. There was also an impact on the Design Team who produced a number of alternative fit out requirements to meet different needs which were then not implemented.

The brief therefore became a compromise between known and anticipated usage with generic systems being installed to cover the majority of fit out situations. The Design Team considered that the assistance received from the Estate Office, who effectively acted as the Client, was very good and the brief obtained from them helped during this difficult design stage.

Recommendations

Ideally this detailed design brief should be available during the feasibility stages (RIBA Stages A, B) on future capital projects. The University understands and is comfortable accepting risks in design associated with no fully defined users at the outset when the development of the University requires. This is considered to be a preferable option to delaying delivery of capital programme.

Laboratories and similar areas should be designed with maximum flexibility to avoid the need for later fit out and large provisional/PC sums.

Continue to ensure full consultation is carried out with in house technical and academic staff to avoid potential post occupancy problems.

Academic/Clinical Design Teams

Apart from the architect for the Master Plan/Feasibility Report, Project Manager and Quantity Surveyor, separate design teams were appointed for the Academic and Clinical buildings.

The appointment of two separate design teams for two buildings designed and constructed more or less in parallel for a single school was raised at the workshop. In taking this procurement route there was potential for conflict and delays resulting in claims from the contractors.

The workshop members representing the Estate Office and Design Team were unanimous in their view that this did not have a detrimental affect on the delivery of the projects. In fact this procurement route may have assisted the programme due to the avoidance of the need to comply with EU tendering rules for the Clinical building design team appointments.

Recommendations

The appointment of design teams should be considered on a project by project basis so that the appropriate design teams are appointed to match the complexities of individual projects.

7. Heating and Cooling

In reviewing the feedback in the completed questionnaires received from building users a number of comments refer to the level of heating and cooling in the laboratories, computer room and large teaching spaces which operate by supply air ventilation systems. A number of comments relate to end user lack of control of heating and cooling which is controlled remotely by the Building Management System and monitored at the University Park Campus. Users have to ring the Estate Office at University Park to request controls to be altered so that temperatures can be adjusted up or down. Users say this is taking far too long. Over use of the air conditioning is also mentioned.

The calls to the Estate Office help desk to report faults have been analysed for 2007 and 2008. In 2007 there were 168 calls in total of which 9 refer to heating faults. In 2008 there were 212 calls of which 17 refer to heating faults. Overall the level of calls is not excessive for this type of building.

Recommendations

The Estate Office should review the level of monitoring of the BMS to ensure temperatures are maintained at optimum level.

The Estate Office should review response times relating to requests for heating/cooling changes and consider whether current arrangements can be improved.

8. **Budget and Cost Management**

Form of Contract

Separate forms of building contract were used for the Academic and Clinical buildings. (NEC Develop and Construct and JCT 98 with Quantities respectively).

On the Academic building the architects were appointed following an OJEU based architectural competition. The contract for the Architectural, Civil and Structural Engineering Services,all provided by Pick Everard, were subsequently novated to the main contractor once appointed.

On the Clinical building contract, Saunders Boston, Hannah Reed and Silcock Dawson were selected to provide an integrated design service. In view of Saunders Boston's experience and with expected fees for other members of the team below the EU procurement threshold, these appointments were agreed on a negotiated basis.

Generally the choice of building contract did not adversely affect the projects' outcome and the contracts were selected on the advice of the Project Manager and Quantity Surveyor, as being the most appropriate for the scope and complexity of building work.

There were however comments raised at the workshop relating to the Develop and Construct contract with views expressed that traditional procurement rather than 'design and build' would have given better build quality on the Academic building. Also that more involvement from the novated design team during the construction phase would have helped.

Recommendations

The University should continue its policy of selecting the form of contract to match the scale and complexity of the building operations and engineering services content.

Ensure novation agreements are sufficiently robust to allow novated consultants to discharge their duties appropriately.

Value Engineering

There is a general consensus that a clearer definition and fixing of the users brief would have reduced the potential for re-design, delay and costs during construction stage.

At tender stage it was known that the tenders were likely to be over budget and consequently a value engineering exercise had to be undertaken at post tender stage. This resulted in some of the design requirements identified by the Master Plan architects having to be omitted as part of the cost reductions.

During the measurement for the Bill of Quantities the building cladding element was not taken off the Architects drawing and therefore not included in the Contractors' tenders. This lack of co-ordination resulted in the need to make further cost savings.

However despite the need to cut costs, overall value for money has been achieved in the completed buildings.

Recommendations

Where value engineering has to be applied to a project due to the estimated costs exceeding the approved budget, then careful consideration needs to be given to where those cost savings can be made. It is recommended that cost savings are prioritised and graded to ensure design compromises are kept to a minimum.

Consultants appointed on future projects should have robust quality control and design co-ordination and checking procedures. Sufficient time should be given to allow correct interpretation of the Architects drawings.

Provisional/PC Sums

Due to the lack of a clearly defined user brief for the buildings' activities large areas had to be left fallow and layouts only agreed at a late stage when academic staff had been appointed. This resulted in large provisional/PC sums being included in the Employers Requirements.

The alternative proposals for the laboratories that were included as provisional sums affected the contractor as the decision on requirements for these areas was made later than stated in the contract.

On the Clinical Building, proposals for the area that was left fallow did impact on the design team due to a succession of alternative fit out requirements to meet different needs being produced but not implemented.

Recommendations

Ensure that a detailed user brief is available at an early stage to allow detailed layouts to be prepared.

Consider an alternative approach to laboratory areas to allow fitting out as standard, flexible laboratory units.

Keep provisional/PC sums to a limited amount.

9. **Construction Issues**

Separate contractors were appointed for the Academic and Clinical buildings with both construction contracts operating in parallel on site. There appeared to be no conflicts or operational difficulties that could not be resolved during this period.

The late agreement of layouts due to absence of academic staff gave the contractor an excuse for delay. This may have been legitimate as the decision on requirements for these areas was made later than stated in the contract. However this had been allowed for in the contract.

The relationship between the design team and contractors was considered good. The only comment referred to members of the design team on the Academic building which were novated to the contractor and could have been more 'visible' during the construction phase.

The scope of design development available to the contractor within the remit of the contract for the Academic building was not clearly understood. The contractor considered that he was unable to bring many design changes to the project which he understood may have helped with programme and quality and benefited the project and contractor in cost terms. However, it is understood that these would have been rejected on grounds of maintenance

and sustainability issues.

It has been acknowledged that on the Academic building the contractor started well and with good site set up and operations. However towards the end of the contract the completion of the fit out proved difficult and slow with the Project Manager chasing progress from the contractor on a daily basis. Consequently handover was poor as the contractor had many snagging issues which took far too long to deal with.

The decline in the contractor's performance at the end of the contract can be attributed to the fact that the Site Manager left eight weeks before the end of the project. The contractor accepts that this 'derailed' the project at a busy time and struggled to find a replacement. The contractor has stated that in hindsight the Site Manager should have been kept on the project to maintain continuity.

Recommendations

Ensure that the design brief and layouts are signed off in good time to align with building contract timescales.

Work to obtain an agreement with the contractor on the level of site attendance by the novated consultants.

Ensure there is a clear understanding of the scope of design development available to the contractor within the remit of the contract.

Establish agreement with the contractor to allow continuity of site staff throughout the construction period.

10. **Sustainability**

No formal BREEAM assessment was undertaken for either building although it is understood that the buildings were designed to achieve the 'very good' standard.

A number of energy saving measures have been incorporated into the Mechanical and Electrical Services design. These include grey water system, movement sensors to operate lighting in toilets and wind capture system to offices.

The University now has recently been successful in obtaining funding from Hefce's Revolving Green Fund as a contribution to the cost of energy saving initiatives.

In order to improve procedures for establishing a building project's 'green' credentials a report is now submitted to the University's Environment Committee for each capital project.

Recommendations

In line with Hefce's strategy for reducing the HE Sector's carbon footprint, continue to work to achieve a BREEAM 'very good' rating as a minimum standard and consider whether a more formal assessment should be applied..

Ensure the University's Environment Committee continues to play a role in the vetting of future capital projects.

In promoting energy efficiency in the design of new buildings consider the introduction of a design compliance checklist to assist in the development of the design brief.

11. **Operations and Facilities Issues**

The need for early involvement of the Operations and Facilities team was a key theme in the pre workshop discussions with the group. On this project appropriate dialogue did take place with the incumbent Senior Engineer who had responsibility for the operation of the building after handover but continuity needs to be maintained when staff changes take place as happened in this case.

Such involvement would provide an opportunity to influence the design and maintenance of the systems once installed. Having a detailed knowledge of the technologies installed would help the Operations and Facilities Team provide a better service to the building occupants.

The Consultant Services Engineer also confirmed that there is a need for closer liaison between the designers and Estate Office Staff operating the Building Management System both at design stage and during the latter part of construction which would have provided a much smoother handover.

In following capital project procedures, the Operations and Facilities Team were keen to stress the need to adhere to established processes and protocols. It was noted that the Project Communication Framework (Appendix 5) established by the Estate Office had not been followed.

There were some issues raised relating to keys and the quality of locks and doors. There were no clear management arrangements for the issue of keys at handover which were issued prior to them being received by the Security Department.

The building user feed back identified a number of complaints about the internal door entry systems and the level of call outs to repair doors/locks. Generally the keypad operated locks in the Academic Building are not liked and swipe cards are preferred.

In checking the level of call outs to repair locks and doors over 2007 and 2008, these amounted to 17 calls to help desk in 2007 and 30 calls in 2008. This would appear to be excessive in a relatively new building.

It was reported there were ongoing problems with the high velocity from AHU Nº 6. This is causing noise problems to the occupants below (Clinical building).

Recommendations

Re launch the Project Communication Framework and ensure it is followed on future building projects.

The 'Standard Design and Elemental Requirements' document (last updated February 2009) should continue to be followed and is incorporated into Consultants' Schedule of Services.

The Design Team should early on in the design process liaise with security staff to ensure an adequate level of consultation and input is achieved. Procedures should be reviewed for appropriate handover of keys.

Consideration should be given to replacing the Digilocks with a swipe or proximity card system.

Further investigate the excessive noise from AHU Nº 6.

12. **User Comments**

A number of comments from building users were raised through the returned questionnaires and at the workshop.

Student Locker Area

Some students have commented that there is insufficient locker space to store their belongings (bags, coats etc) except for personal protective equipment.

The original design intent was to have an additional locker room in the Academic building but this was omitted. However a room is now being considered for conversion for this purpose. School equipment issue.

Hose down/disinfectant area/boot wash

There is a lack of a good boot wash where 100 students can clean their boots quickly and efficiently after a practical. Also a hosepipe/disinfectant point is requested at the external entrance to the locker room.

Covered Bike Stores

Covered bike stores are preferred to give some protection from the weather
University policy does not provide as a local business provision.

Social Space

The social space is considered inadequate since the atrium area is stretched beyond capacity at many times. Also a café area would be preferred rather than vending machines. This was discussed at the workshop and it was concluded that the design intent was never to provide social space of a capacity to cater for all students. There are other catered facilities on campus which are available.
Comments not consistent with University space guidelines.

Lecture Theatre Seating

The built in desks to the seating are considered too small and at the wrong height for comfortable use. To see the screen comfortably, one student has commented that you have to sit half way up the lecture theatre to benefit from the rake in the seating. This is probably due to the shallower rake to the first few rows of seats.

Shape and Location of Offices

There are a few offices in the Academic building where a curved wall has been introduced to improve the corridor space outside the rooms. This limits the office layouts to these rooms. Some of the offices are also poorly laid out which is probably as a result of the eventual occupants changing the desk layout etc from the original design. Early consultation with users on preferred layout may have prevented this. (It is accepted that this was difficult to achieve on this project due to the late arrival of academic staff).
Offices sizes comply with University guidelines.

Having offices in the Clinical building is not ideal as they are remotely sited from the main academic offices in the Academic building.

Atrium Floor

There are ongoing problems with the polished tiled floor in the atrium area. Firstly, the tiles were poorly treated when laid and sealed by the tiling subcontractor. Subsequently the process to try and rectify the problem has resulted in a poor finish.

Secondly, users have found the floor to be very slippery when wet. Slip tests carried out on the floor surface have confirmed that there is a slip hazard. Leaving the underfloor heating switched off (because the space gets too warm) is increasing the slip hazard in wet weather. It is suggested that the barrier matting is extended a short length further into the atrium area.

13. ***Summary of Recommendations***

On future projects, where possible the client or end user should be clearly defined with that person being sufficiently knowledgeable to inform the design brief at a very early stage.

Laboratories and similar areas should be designed with maximum flexibility to avoid the need for later fit out and large provisional/PC sums.

Continue to ensure full consultation is carried out with in house technical and academic staff to avoid potential post occupancy problems.

The appointment of design teams should be considered on a project by project basis so that the appropriate design teams are appointed to match the complexities of individual projects.

The Estate Office should review response times relating to requests for heating/cooling changes and consider whether current arrangements can be improved.

The University should continue its policy of selecting the form of contract to match the scale and complexity of the building operations and engineering services content.

Ensure novation agreements are sufficiently robust to allow novated consultants to discharge their duties appropriately.

Where value engineering has to be applied to a project due to the estimated costs exceeding the approved budget, then careful consideration needs to be given to where those cost savings have to be made. It is recommended that cost savings are prioritised and graded to ensure design compromises are kept to a minimum.

Consultants appointed on future projects should have robust quality control and design co-ordination/checking procedures. Sufficient time should be given to allow correct interpretation of the Architects' drawings.

Ensure that a detailed user brief is available at an early stage to allow detailed layouts to be prepared.

Consider an alternative approach to laboratory areas to allow fitting out as standard, flexible laboratory units.

Keep provisional/PC sums to a limited amount.

Ensure that the design brief and layouts are signed off in good time to align with building

contract timescales.

Work to obtain an agreement with the contractor on the level of site attendance by the novated consultants.

Ensure there is a clear understanding of the scope of design development available to the contractor within the remit of the contract.

Establish agreement with the contractor to allow continuity of site staff throughout the construction period.

In line with Hefce's strategy for reducing the HE Sector's carbon footprint, continue to work to achieving a BREEAM 'very good' rating as a minimum standard and consider whether a more formal assessment should be applied..

Continue the University's Environment Committee's involvement in the vetting of future capital projects.

In promoting energy efficiency in the design of new buildings consider the introduction of a design compliance checklist to assist in the development of the design brief.

Relaunch the Project Communication Framework and ensure it is followed on future building projects.

The 'Standard Design and Elemental Requirements' document (last updated February 2009) should continue to be followed and is incorporated into Consultants' Schedule of Services.

The Design Team should early on in the design process liaise with security staff to ensure an adequate level of consultation and input is achieved. Procedures should be reviewed for appropriate handover of keys.

Consideration should be given to replacing the Digilocks with a swipe or proximity card system.

Further investigate the excessive noise from AHU Nº 6.

Consider washdown facility and disinfecting area at the external entrance to the locker room.

Consider extending the barrier matting in the atrium area to lessen the slip hazard during wet conditions.

14. **Positive Aspects of the Project**

The POE workshop concluded with a discussion on the positive aspects of the project. A number of points were raised as being examples of good practice and these can be summarised as follows:

- Good interaction between user client, Estate Office and Design Team in relation to development of the design.
- Produced attractive buildings which are wearing well.
- Strong leadership from the Development Director and Director of Estates.
- Value for money was achieved.
- There is a high level of user satisfaction.
- From a construction point of view there have been no latent defects.
- The School was a new innovative design with no comparable models.
- The buildings have been good PR for the School and University.
- There is good access for maintenance.
- Amicable and early agreement of final accounts.