



The University of
Nottingham

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POST OCCUPANCY EVALUATION REPORT

ROMAX TECHNOLOGY CENTRE



DECEMBER 2015



1. Introduction

QTC Projects were appointed to carry out the Post Occupancy Evaluation following the submission of a fee proposal for services dated 19 February 2015 to the Head of Capital Projects, University Estate Office.

2. Scope of the Review

Evaluation Technique

The evaluation was conducted at Project Review stage (1 – 2 years after handover) and has been undertaken in line with the criteria and guidance contained in the HEFCE/AUDE publication, 'Guide to Post Occupancy Evaluation'.

Analysis

Analysis broadly followed the University's brief for undertaking the evaluation and 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 (brief)
- Some aspects of the building procurement process
- Building user feedback
- Cost management and control
- Construction and project management
- Functional and technical performance
- Sustainability - Assessment against BREEAM criteria
 - Review of energy efficiency measures incorporated into the design

Questionnaires

Questionnaires were developed to obtain information and feedback from four specific groups:

- a) User Client – UNIP Operations Director
- b) Consultant Design Team
 - Architect
 - Project Manager/QS
 - Services Consultant
 - Structural Engineer
- c) Estate Office – Development/Operations & Facilities
- d) Main Contractor

Interviews

Interviews were held with the following:

- a) UNIP Operations Director – Bob Scott
- b) Estate Office
 - James Hale – Senior Capital Projects Officer
- c) William Saunders Architects – Karen Whysall
- d) Darnton B3 Services Consultants – Peter Daniels
- e) Turner & Townsend Project Management & Cost Consultants
 - Anthony Blackburn
 - Martyn Cooper

Workshop

A half day workshop was held on 7 December 2015 (a list of attendees is shown in Appendix 1.)

The format for the workshop was a presentation by QTC Projects acting as facilitator. 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	Romax Technology Centre
Size	2,950m ² (Gross Internal Area)
No of Storeys	3 storeys
Occupants	Romax Technology (Tenant)
Types of space	Open plan office areas Meeting rooms Social space Ancillary space
Construction Period	52 weeks
Start on site	22 April 2013
Contract Completion	17 April 2014
Practical Completion	23 April 2014

Net Construction Costs

At Start of Construction	£5,095,086
At Final Account stage	£5,208,000

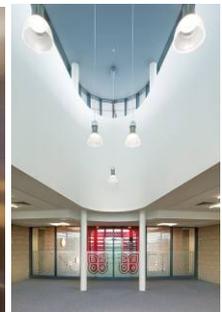
Funding University

Consultant Team

Project Manager	Turner & Townsend, Nottingham
Architects	William Saunders, Newark
Cost Managers/QS	Turner & Townsend, Nottingham
Services Engineer	Darnton B3 Consulting Engineers, Altrincham
Structural Engineers	Curtins Consulting, Nottingham

Contractor G F Tomlinson Building, Derby

Building Contract JCT Design & Build 2011



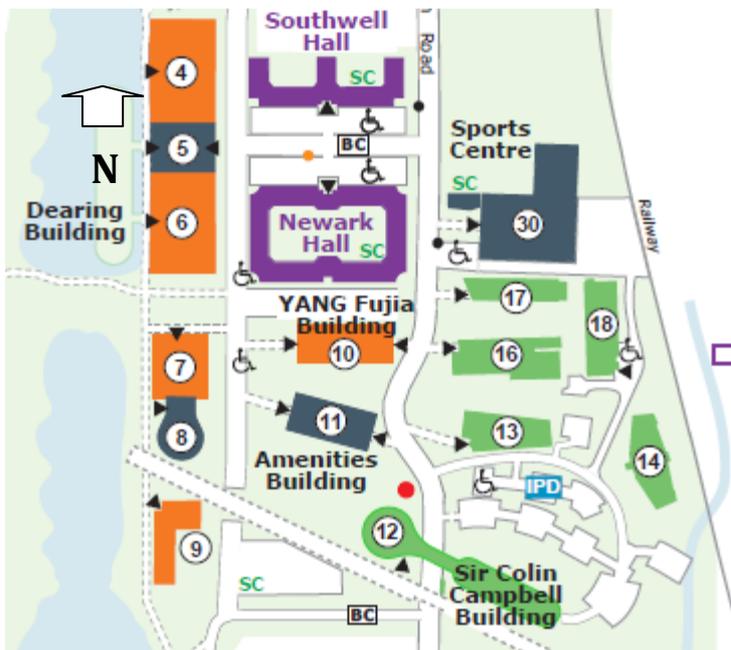
4. Project Background and Description

The building is located on the Jubilee campus and provides purpose-built accommodation for Romax Technology, a global leader in software and services for gearbox, bearings and driveline systems. The building is leased to Romax Technology, being owned by the University and managed through the University of Nottingham Innovation Park (UNIP).

The new 3,100m² facility incorporates offices, training suite and meeting areas and provides space for future expansion and development thus strengthening the links with the University.

The position of the building on the site (14) was mainly determined by the proximity of a disused mineshaft and a main sewer. It is located directly to the southeast of the Aerospace Technology Centre (18) along the eastern boundary of the Innovation Park.

As part of the design competition the University issued a design brief in January 2010 which identified the site for development which had to be in line with the University Campus Development Plan formally adopted by Nottingham City Council in December 2004 and updated in the Development Framework issued in February 2006.



The form of the building comprises three storey blocks either side of a central atrium and entrance area which also contains the staircase, lift and further accommodation on the upper floors. The flanking walls either side of the central area which are finished in polished 'Lignacite' blockwork accentuate the main entrance and frontage. Elements of materials used in the facades are complimentary to some of those used in the adjacent Aerospace Technology Centre and Geospatial Building (13).

The final design and finished building sits well within a mix of contemporary architecture which makes up the University Campus and it respects the original master planning principles. The main contract works commenced on site in April 2013 and were completed in April the following year. The project was completed within the overall approved budget and the end user occupied the building on the agreed date.

The building has achieved an 'Excellent' rating in line with the Building Research Establishment's environmental assessment methodology (BREEAM), incorporating a green roof, extensive solar shading and will eventually be heated and powered by the biofuel CHP unit in the adjacent Centre for Sustainable Chemistry currently under construction.

A full list of project milestones is shown in Table 1.

Table 1 Project Milestones

Design Brief issued	January 2010
Design Team appointment	27 May 2010
Planning application submitted	7 August 2012
Planning Approval	13 December 2012
Main contract tenders invited	October 2012
Main contract tenders returned	30 November 2012
Main contractor appointed	15 February 2013
Contract start date	22 April 2013
Contract completion date	17 April 2014
Actual completion date	23 April 2014
Final account agreed	9 May 2014

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:

- User Issues
- Design Issues
- Construction Issues
- Operations and Facilities
- Project Management
- Procurement and Cost Management
- Sustainability

5. User Issues

A number of user issues and comments were raised during the interviews and from the questionnaire returns which were discussed at the workshop.

Feedback from the Romax user representative at the workshop was generally very positive. Romax consider that the building creates the right image for the company and promotes their collaborative working culture. The offices, in particular, provide a good working environment and the recreational areas work well.



General office area



Central area open to main entrance below

The atrium provides an impressive central space but occupants of the central office area on the first floor, which is open to the atrium, suffer from noise disturbance from the floor below. In hindsight it would have been better to enclose this space from the atrium. This has been done on the floor above for fire protection purposes. A proposal is now in hand to incorporate a demountable partition in front of the balustrade to the atrium.

Staff who work at the reception desk in the ground floor main entrance have complained of feeling cold in winter despite the provision of a warm air curtain above the main entrance doors. This is considered to provide insufficient heat and further investigation is needed.



Main reception desk



Main entrance doors with warm air curtain above

The UNIP Operations Director is very satisfied with the building and experienced no major problems at handover. However some operational issues occurred later which caused some difficulties in maintaining business continuity. A flood in the basement resulted in the building losing power and heavy rainfall five months after handover caused rainwater to penetrate the building at roof level.

The main contractor, working with the Estate Office, responded well in resolving these issues at the time in order to mitigate loss of business.

Recommendations

- i) Complete the work to improve sound insulation at first floor level*
- ii) Investigate the heating to the ground floor entrance and improve performance of the warm air curtain if possible*

6. Design Issues

A number of comments relating to design were raised during the interviews and from the questionnaire returns which were discussed at the workshop. These are listed as follows and commentary given:

Design Brief

The University issued a design brief at the competition stage. This was adequately detailed and provided sufficient information on which to prepare preliminary designs. There was a separate brief prepared for the interior design of the building. The Design Team considered there was good communication through the University's Estate Office via the Senior Capital Projects Officer.

Design Co-ordination

Design co-ordination worked well on this project. The Architects selected the Building Services and Structural Engineers as part of their team having worked together on previous schemes. The Architects would have preferred a longer period for detailed design but the protracted negotiations with Romax over the lease agreement prevented this. The subsequent delay between the Design Team's initial appointment and developing the final design also required some re-design due to some changes in the scope of works.

Planning Stage

It was noted at the workshop that there were no issues with obtaining the necessary planning approvals.

The siting of the project was in line with the approved Masterplan and Development Framework and sympathetic to adjacent buildings. There were no particular constraints from a planning point of view except the Planning Officer's specific requirement for the colour of the brise soleil sails and the internal lift wall.

Strategy for Heating Cooling and Ventilation

The original design intention for the heating, cooling and ventilation was to incorporate the hollow concrete floor Termodeck system which provides voids in the thickness of the floor distributing warm air in winter and cool air in summer.

During the tender evaluation stage it became apparent that the Termodeck solution was being withdrawn from the UK market. A conventional heating and cooling design solution was subsequently incorporated.

Basement Plant Room

A basement plant room was included in the design which was originally intended to house the Biomass boiler. This proposal was later abandoned in favour of an alternative renewable energy option but the basement room remained in the design and became the main plantroom for the building.

After handover, subsequent problems occurred due to a faulty ball-cock on the cold water supply tank in the plant room which caused the tank to overflow. This affected the electrical control panels in the plant room resulting in loss of power. There was a submersible pump installed in the plant room to prevent flooding but it was discovered that it was not connected to an electrical supply.

The submersible pump has now been connected and a new ball-cock fitted which has a fail-safe device fitted. It is further recommended that a water leak detection alarm is installed linked to the University's building management system.

Recommendations

- i) Consideration should be given to installing a water leak detection alarm linked to the University's building management system*
- ii) Avoid installation of water storage tanks at basement level where possible*

7. Construction Issues

Contractor Performance

The general view both from the design team and the Estate Office is that the contractor performed well on this project and responded promptly in dealing with defects. However the contractor felt let down by subcontractors employed on this project and have since reviewed their selection for future projects.

Programme

The main contractor felt that the programme was comfortable but timescales for completion became very tight due to the lease negotiations with Romax and the need to adhere to the agreed occupation date by the tenant.

Quality

The quality of the finishes both internally and externally are good and to a standard expected by the University. There were some issues with workmanship already mentioned but most of these have now been addressed.

Commissioning/Handover

There were no major issues with commissioning apart from the need to ensure that adequate time is built into the main programme

Aftercare Service

The main contractor's response to issues that arose following practical completion was considered very good. However the response from subcontractors was less satisfactory.

Outstanding Defects

Cladding Panels

The envelope subcontractor's performance was poor which has led to a number of cladding panels needing to be replaced. This issue is still outstanding but the contractor expects this to be resolved in the next two weeks.

Brise Soleil

The brise soleil on the main elevation of the building are in the form of fabric 'sails' anchored to a steel frame. The sails vibrate in the wind and the fabric expands and contracts despite adaptations already made to counteract rotational forces. The contractor is currently looking into options to resolve this.

Doors to WC's

Replacement doors are currently on order but expected to be fitted by mid December.

Health and Safety

There were no health and safety issues raised, the contractor conducting site operations in a satisfactory manner.

Recommendations

i) Ensure all outstanding defects are rectified as soon as possible

8. Operations and Facilities Issues

Involvement of Maintenance Team

On this project, maintenance staff were involved in the project to some extent and, overall, liaison has improved.

Building Materials/Services Specification

There were no major issues concerning the specification of building materials and mechanical and electrical services. The maintenance of the brise soleil is an issue at present due to the cost but it is expected this will be resolved once the contractor's proposed modifications have been agreed and carried out.

Fault Reporting

There were no issues regarding fault reporting through the Estate Office helpdesk. Building users understood the process and the internal arrangements (tenant/landlord) work well.

Operations & Maintenance Manuals

The Operations and Maintenance manuals were produced by consultants who have produced sets of documents for a number of University capital projects and there is now a consistency in their production and content. However there were comments made at the workshop regarding their content. The documents could be made more relevant rather than inclusion of standard corporate literature and services drawings need to be amalgamated with the University's services records.

Cleaning

Cleanliness in the building was considered to be a good standard. There were some comments made regarding the ability to adequately clean the floor tiles in the toilet areas. The specification of floor tiles to toilet areas should therefore be reviewed. Alternative cleaning equipment is now being considered in order to tackle this problem.

Security

There were no major security issues raised except for the theft of two bikes from the bike store. It is understood security improvements are now in progress in this area. Some adaptations have been made to the swipe card access system and a separate system installed for the Comms room.

Recommendations

- i) Review the Operations and Maintenance Manuals to ensure the services drawings have been amalgamated with the University's services records*
- ii) Review the specification of floor tiles in toilet areas to ensure they can be adequately cleaned with standard equipment*
- iii) Complete the security improvements to the bike store*

9. Project Management

Communication worked reasonably well on this project. The consultant design team, Quantity Surveyor and main contractor all had positive comments to make regarding the Estate Office and the accessibility of the University's Senior Project Officer.

As with all University capital projects, this project was overseen and monitored by a Project Management Group (PMG) which included representation from Romax Technology. The senior management team of Romax Technology was also involved in the design development and were consulted at the various stages. Once the final scheme was selected by the University, the project was delivered successfully through the normal PMG process.

There were very few client changes on this project (only 26 variations) with changes being dealt with through a well-structured change control process. The main change was the omission of the double height space at ground floor level.

The consultant Project Manager produced a detailed Project Execution Plan which sets out clearly the scope and broad objectives for the project, communication protocol and change control procedures.

Risk management was a key part of the project monitoring process and was handled well with a risk register being produced at an early stage and monitored by the PMG.

10. Procurement and Cost Management

Procurement

The Architects on this project acted as lead design consultant, being appointed following the outcome of a design competition. This has proved to be a worthwhile and beneficial process as it enables the client to consider a range of design initiatives and different approaches to interpretation of the brief. The Architect also selected the Structural and Building Services Engineers to make up the overall design team. The consultant Project Manager and Quantity Surveyor were separate appointments.

The Architects and Structural Engineers were novated to the contractor at stage D+ with the Building Services Engineers being retained on the client side to provide a monitoring role and quality control service. It is considered that stage D+ or stage E is the most appropriate point in the design process at which to novate as more design certainty has been achieved by this stage.

The main contractor appointment followed standard University procedures. Following a call for expressions of interest and a pre-qualification exercise, five contractors were invited to tender for the proposed works and submitted compliant tenders.

The two lowest tendering contractors were asked to submit a revised tender based on a more conventional heating and ventilation solution once it was known that the Termodeck system was being withdrawn from the UK market.

The appointment of the preferred contractor took place following the inclusion of further value engineering options in order to bring the tenders within budget. The process and recommendations were then set out in a detailed tender report approved by PMG.

The form of contract used was the JCT Design and Build contract 2011. This form of contract works well particularly since the contract clauses remain unamended and thus requiring less negotiation. In this form it is considered to provide good value in balancing cost and quality.

Cost Management

Costs were managed well on this project. Regular cost plans and cost checks were prepared prior to construction and estimated costs were aligned to the approved budget through undertaking value engineering exercises.

Once construction commenced, regular cost reports were produced. PMG was kept regularly informed through the monthly cost reports and was able to monitor expenditure effectively and direct as required.

The final account has been agreed and issued and figures confirm that the final total cost comes within the overall approved budget.

11. Sustainability

The design brief for this project stipulated a BREEAM target of 'Excellent' which conforms to the requirement of the University's Carbon Management Plan and this has been achieved.

It is a requirement of the Nottingham City Council Planning Guidelines that 10% of all energy used (interpreted through CO₂ emissions) in new developments over 1000m² be obtained from low carbon emission or renewable energy sources. The design intent was that following an appraisal of possible options this would be achieved through the provision of heating via a biomass boiler installation.

However during the concept design stage, the opportunity was taken to use the waste heat from the biofuel CHP unit being built as part of the adjacent Sustainable Chemistry Building and the biomass option was abandoned. It was calculated that by using the waste heat from the CHP unit this would achieve 23.4% CO₂ savings. Delays in the completion of the Chemistry Building have meant no carbon emissions have been achieved through renewable energy sources, the building's heat source being delivered by standby gas fired boilers in the basement plant room.

Energy consumption figures should continue to be recorded so that once the CHP is operational and connected, actual energy consumption can be compared to design targets and the percentage CO₂ emissions from renewable sources verified.

A number of energy efficiency and sustainability measures have been incorporated into the building, namely:

- Use of waste heat from adjacent biofuel CHP unit
- Green roof
- Solar shading
- Natural ventilation controls
- High efficiency lighting and controls
- Air handling units which incorporate heat exchangers
- High efficiency gas fired boilers

Recommendations

i) Continue to record energy consumption and compare with design targets for the building once the CHP unit is operational

12. Conclusion

This building has successfully delivered on the design brief and produced a quality building. Outstanding issues are being addressed and overall, the building’s fitness for purpose is good with positive feedback from the Romax user representative.

The building was awarded “Sustainable project of the year” at the East Midlands Property Dinner 2014 and was “highly commended” in the RICS Regional Awards 2015 (Commercial Sector).

13. Summary of Recommendations

Action

User Issues

- | | |
|---|---------------------------|
| i) <i>Complete the work to improve sound insulation at first floor level</i> | Development |
| ii) <i>Investigate the heating to the ground floor entrance and improve performance of the warm air curtain if possible</i> | Operations and Facilities |

Design Issues

- | | |
|--|---------------------------|
| i) <i>Consideration should be given to installing a water leak detection alarm linked to the University’s building management system</i> | Operations and Facilities |
| ii) <i>Avoid installation of water storage tanks at basement level where possible</i> | <i>Development</i> |

Construction Issues

- | | |
|--|--------------------|
| i) <i>Ensure all outstanding defects are rectified as soon as possible</i> | <i>Development</i> |
|--|--------------------|

Operations and Facilities Issues

Action

i) *Review the Operations and Maintenance Manuals to ensure the services drawings have been amalgamated with the University's services records*

Development
Operations and Facilities

ii) *Review the specification of floor tiles in toilet areas to ensure they can be adequately cleaned with standard equipment*

Development
Operations and Facilities

iii) *Complete the security improvements to the bike store*

Operations and Facilities

Sustainability

i) *Continue to record energy consumption and compare with design targets for the building once the CHP unit is operational*

Sustainability

Appendix 1
ROMAX TECHNOLOGY CENTRE
Post Occupancy Evaluation Workshop
Held on Monday 7 December 2015

List of Attendees

User Representatives

Hilary Rapinet	Romax Technology
Bob Scott	UNIP Operations Director

Estate Office

James Hale	Senior Capital Projects Officer
Chris Dickinson	General Manager Maintenance
Tim Wilson	Senior Building Surveyor
Mark Bonsall	Senior Engineer

Design Team

Karen Whysall	William Saunders – Architects
David Spurrell	Curtins Consulting – Structural Engineers
Anthony Blackburn	Turner & Townsend – Project Manager
Martyn Cooper	Turner & Townsend – QS

Contractor

Ian Dalby	G F Tomlinson Building
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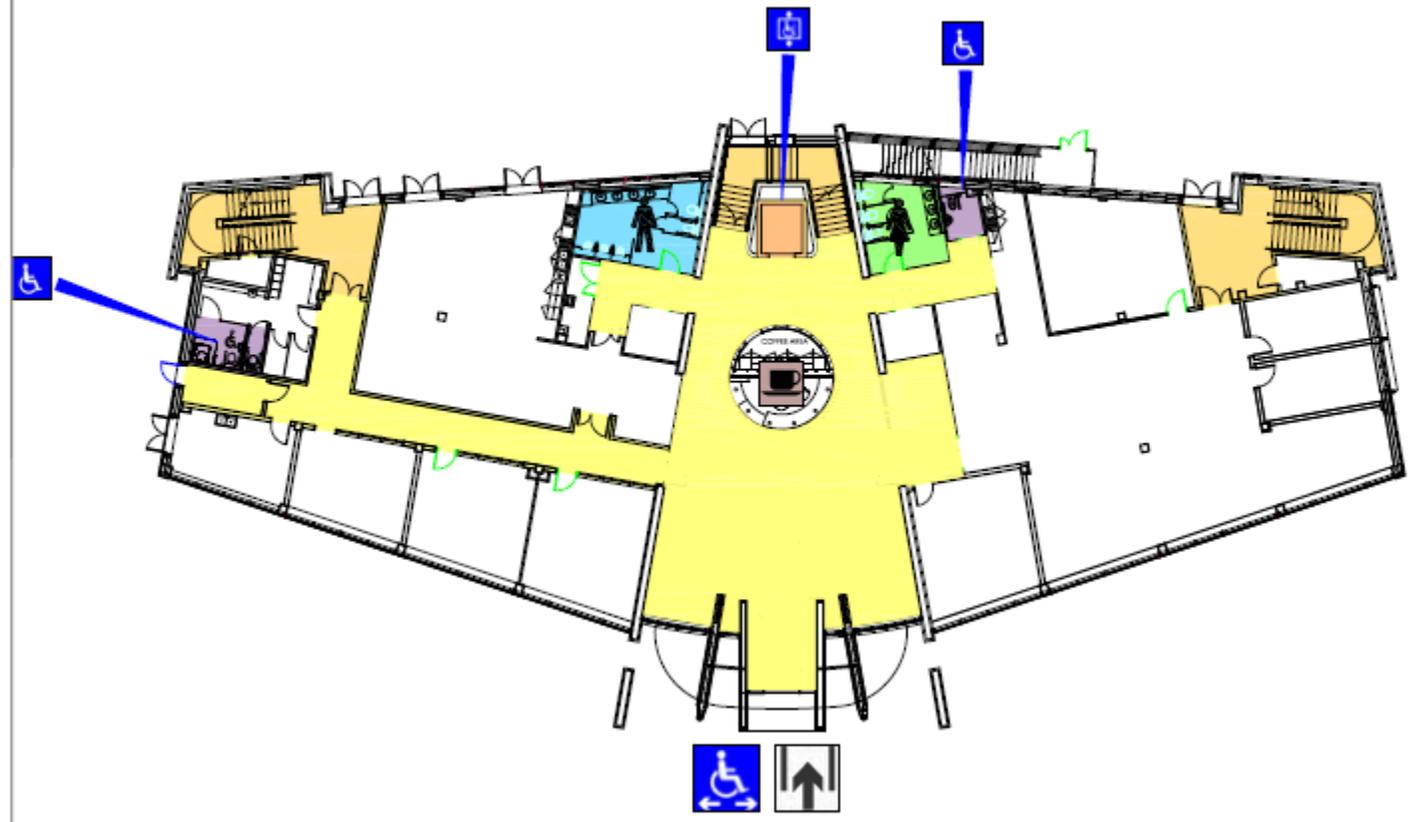
Apologies

Peter Daniels	Darnton B3 – Building Services Engineers
Adrian Mawdsley	Estate Office Space Planning Manager

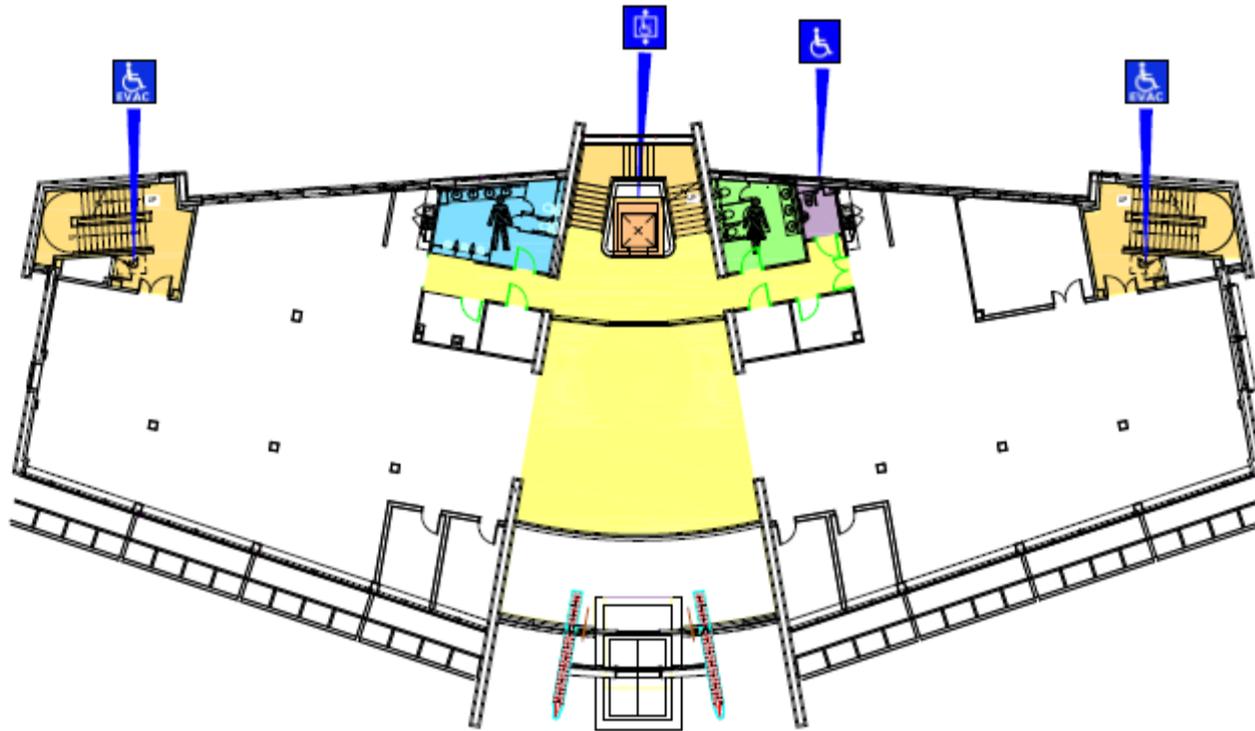
APPENDIX 2

Floor Plans

7390 Romax Technology Centre - A Floor Plan



7390 Romax Technology Centre - B Floor Plan



7390 Romax Technology Centre - C Floor Plan

