

Estates Management Arrangements and Procedures EMAP 42 – Project Handover

Procedure Ref. QMUL/BES/E-map 42

Control Sheet

Application

These procedures apply to all QMUL premises on all campuses.

Purpose

The purpose of E-map 42 is to set out QMUL policy, procedures and requirements associated with the handover of the Building Engineering Services (BES) at QMUL premises.

Scope

All QMUL Premises.

These procedures shall apply to all activities undertaken and documents generated by design and project groups and by all external designers and contractors.

These procedures shall apply to all projects and must be used in conjunction with all other QMUL E-map procedures.

Issue

Issue No. 2

Date: 26th January 2017

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1 Introduction

The QMUL Handover Procedures form a process for ensuring that all the BES are properly commissioned, tested, inspected and are safe for operational use and maintenance.

The early involvement by I & M (Infrastructure & Maintenance) and FM (Facilities Management) teams are key to the successful handover of a project. The early involvement by all parties will assist in ensuring that:

- A common understanding and ownership of the project is created.
- A strategy is created which provides a smooth handover from construction, technical fit –out and occupation.
- The roles and responsibility of each team member are understood.
- The future maintenance requirements and associated costs are understood well before practical completion has occurred.

2 Compliance with Legislation

The QMUL Handover Procedures have been developed to ensure all BES projects are delivered in accordance with the legislative requirements of the Health and Safety at Work etc. Act 1974 and the associated UK regulations. This also includes compliance with the QMUL Health and Safety Management System.

3 Handover Process

The handover process consists of the following elements:

Project Appraisal

- Produce handover plan for project and arrange for this to be included in the tender documentation.
- Identify and define the roles and responsibilities for members of the project team with respect to handover.

During Design and Construction Phases

- Design review and validation.
- Site inspections.
- Review of handover plan during progress meetings.
- Inspection and testing.
- Requirements for asset registration.
- Commissioning.
- Documentation.
- Training and familiarisation.
- Identification of defective and outstanding work (snags).
- Develop procedure for addressing defects that are identified post practical completion and handover.
- Ensure Maintenance actions and responsibilities are in place for handover i.e. provision of fire extinguishers etc.
- Practical completion.
- Handover meeting.

Post Practical Completion / Handover

- Technical fit-out phase (if applicable).
- Resolution of defective and outstanding work (de-snag).
- Reassurance testing of BES prior to occupation date.
- Occupation.
- Monitoring of defects throughout the defects liability period.
- The updating of the O&M documentation to include any modifications to the BES that occurred during the technical fit-out phase.

4 Types of Handover Document

There are currently 2 types of Handover Document available for the BES projects:

- Minor BES Handover Document – See Appendix 8.1
- Major BES Handover Document – See Appendix 8.2

5 Which Handover Document?

Minor BES Handover Document

As the name implies, this handover document should be used for the minor projects. Examples of minor projects include:

- Plant upgrades.
- Plant replacement / Life cycle replacement.
- Fire alarm upgrade.
- Emergency lighting upgrade.
- Generator upgrade.
- Boiler replacement.
- Minor works below the value of £250k.

Major BES Handover Document

This type of handover document should be used for the larger and more complex projects. Typical projects where the Major BES Handover Document should be utilised include:

- New acquisitions.
- Building refurbishments.
- Major building alterations.
- Complex and extensive plant upgrades.

6 Requirements for Handover

It is essential that a completed handover document is prepared prior to handover process taking place or being agreed. The handover document itself forms a prompt for ensuring that all the required criteria has been identified. This document should have been prepared and tailored to suit the project during the project appraisal stage and all members of the project team, including the contractor, should be fully aware of the requirements within. Particular emphasis should be given to ensuring that:

- Inspection and Test certification has been provided and is fully complete. I & M and FM should be invited to attend inspection and testing to assist with their training and familiarisation of the BES and associated systems. All test certification must be fully completed and issued before handover can take place.
- Commissioning and setting to work of the plant and equipment has been fully completed and verified. BES commissioning is vital to ensure that the building services operate to specification and comply with all relevant regulations. The purpose of commissioning is to ascertain that the specified design has been achieved and that the major operational parameters specified by the designer, such as air delivery and water flow rates are achieved. I & M should be invited to attend commissioning to assist with their training and familiarisation of the BES and associated systems. Commissioning must be fully completed and documented before handover can take place.
- Documentation is adequate, appropriate and complete. Handover cannot be completed unless adequate information has been provided in the safe operation, inspection, testing and maintenance of the BES and associated systems.
- Training and Familiarisation is adequate, appropriate and complete. This is essential in order to enable the BES plant and equipment to be operated, tested and maintained. Employers have a duty under current legislation to provide information, instruction, training and supervision. Handover cannot take place unless adequate training and familiarisation has been provided to all personnel that will be required to operate and maintain the BES plant and equipment. A record of all the training and familiarisation provided must be listed within the handover document.

- Defective and Outstanding Works have been identified and have been fully documented. It is essential that handover is not accepted if there are any outstanding items that create an unsafe condition with regard to the operation and maintenance of the BES plant and equipment. Any outstanding work should not have an adverse effect on the operation of the premises.
- Asset lists have been supplied to the Campus Maintenance manager for all plant installed and all items removed from service.

7 Roles and Responsibilities

The Project Manager is the owner of the document and is responsible for ensuring that:

- The handover plan is prepared and included at tender stage.
- The handover procedures are reviewed at project meetings.
- Sufficient resources are made available to ensure that the requirements of the handover plan are realised.

The Campus Maintenance Manager is responsible for:

- Arranging for appropriate QMUL staff attendance to be available for witness testing and training and familiarisation, as requested.
- Liaison with the 3rd party maintenance provider.
- Attending project control group meetings (typically from 6 months prior to handover).
- Ensuring that Maintenance actions and responsibilities are in place for handover i.e. provision of fire extinguishers etc. (See schedule within Major BES Handover Document for details).
- Ensuring that the Maintenance service is in place at handover.

The Senior Engineer will:

- Provide support and guidance throughout the life cycle of the project.
- Provide assistance in developing the handover plan.
- Randomly witness and audit the installation, the testing and the commissioning of the BES.
- Report any serious concerns to the Project Manager and Campus Maintenance Manager.
- Co-ordinate the requirements for I & M resource throughout the construction and handover phases.
- Review the O&M documentation for completeness.
- Arrange for these procedures to be reviewed annually or when the need arises.

8 Appendices

1. Minor BES Handover Document
2. Major BES Handover Document

3. Acceptance Form

QMUL Premises/Area		
Project Title		
Main Contractor		
Scheme/Project Ref		Date

Brief description of BES covered by this Handover Document
Enter Details Here

Description of Plant or Services	List of Compliance Requirements	Yes	No	N/A
Electrical	17 th Edition test certificates (BS7671).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Emergency lighting certificate (BS5266).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Earth bonding - Ductwork/Ceiling/Cable Tray (BS7671).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fire alarm completion certificate (BS5839).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fire alarm audibility test (BS5839).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fire alarm cause and effect (BS5839).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fire alarm - Witness all interfaces (BS5839).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Lightning protection (BS EN 62305).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Electrical installation operating satisfactorily.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Mechanical	Pipe work pressure test certificates & certificates of compliance with Water regulations issued by approved scheme member. L8 R.A. updated by incumbent company (See EMAP 35 Appendix 1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Cleanliness and chemical treatment certificates.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Plant commissioning certificates.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Conformity certificates for plant subject to Statutory Inspection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Schedule of refrigerant (F-gas).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fire dampers have been examined and tested.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Certificate of sterilisation for the water services.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Gas services have been fully tested and certified.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Mechanical installation operating satisfactorily.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controls and BMS	Test and commissioning certification.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Operating strategy (Point schedule and strategy drawings).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Provision of electronic backup copy of BMS database and graphics.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Passwords issued.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	BMS operating satisfactorily.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Security Installation (Continued overleaf)	Certification that the CCTV system is complete in all respects, fully tested and witnessed (BS7958 & NACP20).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Certification that the Access Control system is complete in all respects, fully tested and witnessed (NACP30).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Description of Plant or Services	List of Compliance Requirements	Yes	No	N/A
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Security Installation cont.	Certification that the Intruder Detection and PA systems are complete in all respects, fully tested and witnessed (BS4737). Certification of remote monitoring and response, including URN, for Intruder, Fire and PA Systems. Certification that motorised doors and gates are complete in all respects, fully tested and witnessed.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Lift Installations (See BES-26)	Certification that the Lift installation is complete in all respects, fully tested and witnessed.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>
General	Building Control / Local Authority Approval. Plant has Undergone Satisfactory Proving Period. Safe and adequate access available to all BES plant. Asset schedule provided. Key inventory is provided for all keys, including specialist BES panel keys. Certification that fire stopping is complete in all respects and witnessed and entered on main drawings. Confirmation that asbestos is recorded as per the QMUL Asbestos Management Plan. Certification that the Induction Loop installation is complete in all respects, fully tested and witnessed. Confirm that all contractors have been removed from the security systems at handover.	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Outstanding Minor Works or Defects					
Ref.	Location of o/s work or defect	Detail of work required	Action by	Date for completion	Date completed
		Enter Details Here			

List of Drawings, Operating Instructions and Maintenance Manuals	Set No.1 Received	Set No.2 Received	Set No.3 Received	Electronic Copy Received
Health and Safety File	Yes <input type="checkbox"/> No <input type="checkbox"/>			
Building Energy Log Book	<input type="checkbox"/> <input type="checkbox"/>			
List all Mechanical and Electrical O&M Manuals here	<input type="checkbox"/> <input type="checkbox"/>			
O&M Manual Set No.1 issued to:				
O&M Manual Set No.2 issued to:				
O&M Manual Set No.3 issued to:				
Electronic Copy No.1 issued to:				
Electronic Copy No.2 issued to:				
Electronic Copy No.3 issued to:				

List of Recommended Maintenance Contracts and Insurance Items
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Enter Details Here

Provision of Training and Familiarisation

Enter Details Here

Additional Comments

Enter Details Here

Accepted as Complete and Safe for Operation and Maintenance

Signed by the Project Manager

Name : Date

Signed by the Designer

Name : Date

Signed by the Senior Engineer

Name : Date

Signed by the Campus Maintenance Manager

Name : Date

Defects Liability on the above works shall be 12 months from the date of Practical completion, i.e.

Appendix (2) Major BES Handover Document

Introduction

Management of health and safety of the Building Engineering Services (BES) requires the responsibilities to be defined and to facilitate this requirement a clearly defined hand-over procedure has to be established.

The Assistant Director of Estates and Facilities is responsible for the safe and effective operation of all premises and the BES at all QMUL premises. The duties associated with the hand-over procedures have been delegated to the QMUL Senior Engineer who shall work in liaison with the QMUL Compliance Manager.

Hand-over of the Building Engineering Services for QMUL premises will be from the Project Manager to the Campus Maintenance Manager.

The Assistant Director of Estates (I & M) based on guidance from the QMUL Senior Engineer will ensure that adequate resources are available for the effective hand-over of the Building Engineering Services and that any persons employed to manage, inspect, witness and operate equipment and systems are competent to undertake such duties.

Whilst the preparation for the completion and hand-over of the project will be managed and monitored by the Project Manager with both the Design and Construction teams, close liaison with the Campus Maintenance Manager and Senior Engineer will assist in the hand-over process. This document sets out how liaison between the Project Manager and the QMUL Engineer*, Compliance Manager* and Campus Maintenance Manager* will be integrated into the final phases of the construction phase of a project.

The QMUL Senior Engineer will confirm the policy that shall apply for the operation, planned preventive and reactive maintenance for each of the installations. This needs to be established at an early phase of the project so that the appropriate persons can be provided with training and familiarisation.

Design verification

The Project Manager shall obtain from the designer(s) and issue in writing to the QMUL Senior Engineer* confirmation of the design parameters that the equipment and systems are required to operate. These shall include standards as detailed on the Room Data Sheets or schedules. Furthermore the designers shall provide confirmation that the plant and systems comply with all current safety legislation including Workplace Regulations, PUWER, LOLER & DSE. A residual risk assessment based on design shall be supplied. These shall be inspected and approved by the QMUL Compliance Manager*.

Inspection and test

Inspection and testing shall be as defined in the Contract documentation. Records of all inspections and tests will be taken by the Design/ Construction team and shall form part of the record documentation. The Campus Maintenance Manager and or the plant operators / maintenance personnel/3rd party maintainer should be invited to witness inspection and tests as part of their training and familiarisation.

Commissioning the works

Following inspection and testing all equipment and systems shall be commissioned and set to work as detailed in the Contract documentation. The Campus Maintenance Manager and or the plant operators / maintenance personnel/3rd party maintainer should be invited to witness commissioning and setting to work as part of their training and familiarisation.

Documentation

Hand-over cannot be completed without adequate information being provided in the safe operation, inspection, testing and maintenance of the equipment and systems. The documentation required is set out in the contract documentation and to assist a draft check schedule is provided for use by the QMUL Senior Engineer*, Compliance Manager* and Campus Maintenance Manager*. This check schedule should not be considered a definitive list or relieve the Contractor of his responsibilities to provide all information under the terms of the Contract. Where in the opinion of the QMUL Senior Engineer*, Compliance Manager* or Campus Maintenance Manager*, documentation provided is inadequate the Project Manager shall arrange for further documentation to be provided.

Draft check lists are schedule HO11

Training and familiarisation.

Adequate training shall be provided to enable the BES equipment and systems to be operated, tested and maintained. This provision shall be in accordance with the contract documentation. Training and familiarisation may in part be undertaken as part of the inspection, testing, commissioning and setting to work procedures. Formal training shall be provided to all management, supervisor and operative levels required to operate and maintain the equipment and systems. Where in the opinion of the QMUL Senior Engineer*, Compliance Manager* or Campus Maintenance Manager*, training provided is inadequate the Project Manager shall arrange for further training to be provided. Training provision is to be recorded on HO 10

Defective and outstanding works

Prior to any equipment and systems being offered for hand-over the works should be substantially complete. Substantially complete shall be mean: -

- Safe in all respects regarding the operation and maintenance of the equipment and systems.
- All documentation as set out in the Contract is handed over; a summary of these documents is provided in schedules HO 03 & 04.
- Project Manager confirms that the design criteria of building engineering services has been achieved.
- Project Manager provides a detailed schedule of all outstanding works together with dates when these items will be completed by.
- Any outstanding works will not have any adverse effect on the operations of the premises.

(* or their nominated representative)

Works during the defects period

Prior to hand over of the building engineering services the Project Manager, Campus Maintenance Manager and Compliance Manager shall agree and record how any work is carried out on any Building Engineering Services following hand-over. These will include: -

- A work permit procedure will be required for most works these procedures will be established by the Campus Maintenance Manager.
- Access to plant rooms, service voids, and roof areas, will be controlled and the Campus Maintenance Manager will establish and manage control procedures post hand over.
- A log record book shall be provided and retained on site to record all changes/ modifications/ works undertaken/ inspections carried out/ tests made/ maintenance undertaken during the defects liability period. The Project Manager will ensure that all Contractors are aware of the requirements to maintain these records. The Campus Maintenance Manager will audit the logbook at least monthly and will advise the Project Manager where records are inadequate.
- The Project Manager shall set out in writing the procedures that must be followed if any building engineering equipment or services fail or defects are identified during the defect liability period.
Refer to schedule HO 09

Hand over meeting

A formal hand-over meeting shall be arranged so that the Campus Maintenance Manager can accept Building Engineering Equipment and Services.

Acceptance forms are attached for: -

- Occupation of the accommodation
- Maintenance of the Building Engineering equipment and services.

Practical completion

Practical completion of the Contract will be determined by the Contract Supervisor / Contract Administrator and is the point at which the possession of the Building Engineering Services transfer from the Contractor to the Employer. The QMUL Senior Engineer or the Campus Maintenance Manager are not party to the Practical Completion, however the CS/CA should seek the QMUL Senior Engineer, Compliance Manager and Campus Maintenance Manager's views on the completeness so far as responsibilities for the safe and efficient operation of the Building Engineering Services are concerned.

**Schedule HO 01
Summary Document**

Part A

Brief description of the project and BES covered by this Handover Document: -

Part B

Confirmation of the completeness of the Building Engineering Services, other than outstanding works and defects as recorded on HO 02.

Provision of the Health and Safety file, including all Building Engineering Services record drawings, operating and maintenance manuals, risk assessments (including L8) and identified residual risks. Confirmation that the document has been checked for completeness, and where any item is not included these are scheduled with dates for issue. See HO 06 and HO 07.

Certification of Hand-over for Occupation, see HO 03

Certification of Hand-over for Maintenance, see HO 04

Confirmation of the design criteria, see HO 05 and HO 08

Issue of procedures to be adopted regarding work post hand-over, see HO 09

Confirmation that adequate training and familiarisation has been provided, see HO 10

Signed
Project Manager

Date.....

Part C

Acceptance of the Building Engineering Services for operation and maintenance by the Campus Maintenance Manager.

Signed
Campus Maintenance Manager

Date.....

Schedule HO 02
Outstanding works and defects

Date of issue.....
Sheet 1 of

Ref.	Location of o/s work or defect	Detail of work required	Action by	Date for completion	Date completed

Description of Equipment or Service	List of Safety Compliance Requirements	Indicate by a tick in box below		
		Yes	No	N/A
Mechanical Services	Set of Drawings, O & M manuals and building energy log book.			
	Confirmation of operating criteria.			
	Confirmation that design criteria has been achieved and is operating satisfactorily.			
	Fire dampers have been examined and tested.			
	Controls / BMS is fully operational.			
	L8 Risk Assessment has been updated by incumbent company (See EMAP35 Appendix 1).			
	Certificates of compliance with Water Supply (Water Fittings) Regulations 1999 issued by approved scheme member.			
	Pipe work and plant pressure tested.			
	Sanitary pipe work, soil pipes, and plumbing pipe work pressure tested.			
	Gas services have been installed, inspected and tested as Gas Safety Regulations 1998.			
	Electrical Services	Set of Drawings, O & M manuals and building energy log book.		
Electrical Installation certificate(s) as BS7671. To include all MCC's and field wiring.				
All extraneous metal work has been electrically bonded to earth (to include raised floors, ceilings, tray, basket etc.).				
Certification that the Fire detection / alarm system is complete in all respects, fully tested and witnessed by QMUL Fire Officers.				
Certification that the Emergency lighting system is complete in all respects, fully tested and witnessed.				
Confirmation that a Lightning Protection risk assessment has been carried out.				

Schedule HO 03
Hand-over for Occupation

Date of issue.....
Sheet 2 of 3

Description of Equipment or Service	List of Safety Compliance Requirements	Indicate by a tick in box below		
		Yes	No	N/A
Electrical Services continued	If a Lightning Protection system has been installed, confirm that it is certified, installed and tested to BS6651.			
Asbestos	Confirmation that Asbestos is recorded as per the QMUL Asbestos Management Plan. Confirm that any recommendations contained within the survey report have been addressed.			
Fire Stopping	Certification that fire stopping is complete in all respects, fully tested and witnessed.			
Lift Services (See BES-26)	Certification that the Lift installation is complete in all respects, fully tested and witnessed.			
Induction Loop	Certification that the Induction Loop installation is complete in all respects, fully tested and witnessed.			
Security Services	Certification that the CCTV system is complete in all respects, fully tested and witnessed.			
	Certification that the Access Control system is complete in all respects, fully tested and witnessed.			
	Certification that the Intruder Detection and PA systems are complete in all respects, fully tested and witnessed.			
	Certification of remote monitoring and response, including URN, for Intruder, Fire and PA Systems.			
	Certification that motorised doors and gates are complete in all respects, fully tested, witnessed and users trained in their operation.			

**Schedule BES / HO 03
Hand-over for Occupation**

Date of issue.....
Sheet 3 of 3

Description of Equipment or Service	List of Safety Compliance Requirements	Indicate by a tick in box below		
		Yes	No	N/A
Keys	A key inventory is provided for all keys, including specialist BES panel keys that are issued at handover.			

Any outstanding works including documents or defects shall be recorded on schedule **BES / HO 02**

Accepted as complete and safe for Occupation

Part A

Signed
Project Manager

Date.....

Part B

Signed
Campus Maintenance Manager

Date.....

Part C

Signed
Fire Officer

Date.....

Part D

Signed
Compliance Manager

Date.....

**Schedule HO 04
Hand-over for Maintenance**

Date of issue.....
Sheet 1 of 1

Description of Equipment or Service	List of Drawings, Operating and Maintenance manuals	Indicate by a tick in box below		
		Yes	No	N/A
Building Energy Log Book				
Mechanical Services				
Electrical Services				

Any outstanding works including documents or defects shall be recorded on schedule HO 02

Accepted as complete and safe for Maintenance

Part A

Signed
Project Manager

Date.....

Part B

Signed
Campus Maintenance Manager

Date.....

Part C

Signed
Energy Manager

Date.....

**Schedule HO 06/02
Mechanical Services documentation**

**Date of issue.....
Sheet 2 of 2**

Provision of O&M Manuals and safety files

Doc Ref	O&M Manual	Familiarisation issue		Pre-approval issue		Final approved issue		Comments
	Heating							
	Cooling							
	Air conditioning							
	Ventilation							
	Ventilation (L.E.V.)							
	Controls / BMS							
	Water treatment							
	Water services EMAP 35 for L8							
	Gas service							
	PH & Drainage							

This schedule is issued as a check / monitoring list. The final documents may be combined into various folders. The content of each shall be as the Contract documentation.

**Schedule HO 07/02
Electrical Services documentation**

**Date of issue.....
Sheet 2 of 2**

Provision of O&M Manuals and safety files

Doc Ref	O&M Manual	Familiarisation issue		Pre-approval issue		Final approved issue		Comments
	Mains & sub distribution							
	Lighting							
	General power installation							
	Fire alarm Installation							
	Standby Generator							
	UPS Installation							
	Earthing installation							
	Lightning Protection							
	Disabled alarm							
	Emergency lighting							
	Electrical services to mechanical plant							

This schedule is issued as a check / monitoring list. The final documents may be combined into various folders. The content of each shall be as the Contract documentation.

**Schedule HO 08
Confirmation of the design criteria**

**Date of issue.....
Sheet 1 of 1**

Confirmation that I & M have inspected, witnessed tests and monitored that each of the installations to ensure that they have been installed, tested and commissioned in accordance with the Contract documents.

Each item of plant and system is in full working order to meet the criteria set out in HO 05
Any items that are incomplete or defective have been recorded on schedule HO 02

Signed
Project Manager

Date.....

Signed
Senior Engineer

Date.....

Signed
Campus Maintenance Manager

Date.....

Schedule HO 09

Procedures to be adopted regarding post hand-over works

Date of issue.....

Sheet 1 of 1

	Yes	No	Comments
Control of Contractors	<input type="checkbox"/>	<input type="checkbox"/>	_____
Access to the premises	<input type="checkbox"/>	<input type="checkbox"/>	_____
Work Permits	<input type="checkbox"/>	<input type="checkbox"/>	_____
Checking / monitoring post hand-over works	<input type="checkbox"/>	<input type="checkbox"/>	_____
Log book for the recording of changes etc.	<input type="checkbox"/>	<input type="checkbox"/>	_____
Access to plant rooms, service voids and roof areas	<input type="checkbox"/>	<input type="checkbox"/>	_____
Defective works and equipment faults.	<input type="checkbox"/>	<input type="checkbox"/>	_____

Schedule to be completed following the appropriate risk assessments and discussions regarding responsibilities and duties with PM, QMUL Senior Engineer, QMUL Compliance Manager, CMM and FM Security Manager and Fire Officer.

Schedule HO 10
Provision of training and familiarisation

Date of issue.....
 Sheet 1 of 1

Equipment and system familiarisation records

Equipment / System	Training provided by	Training given to	Date of training	Comments
Heating installation.				
Gas appliances.				
Cooling installation.				
Water chillers.				
Air conditioning installation(s).				
Ventilation installations.				
Local extract ventilation (including fume cupboard installations).				
Controls / BMS.				
Water treatment.				
Water services.				
Gas service.				
PH / Drainage.				
Electrical distribution.				
Standby Generator plant.				
UPS Installation.				
Lightning Protection.				
Disabled alarm system.				
Fire detection and alarm system.				
Gas suppression system.				
Emergency Lighting installation.				
Motorised access gates and doors.				
Passenger/goods Lifts.				
Security Systems.				

This listing is based on preliminary information and other equipment and systems should be added to suit the project. Names of persons that attended training to be recorded.

Schedule HO 11
Check list of Building Engineering Certificates

Date of issue.....
 Sheet 1 of 2

Item	Action by	Target date	Achieved date	Comments
Ductwork air leakage tests data.				
AHU air leakage test data.				
Fire damper inspection and test records.				
Ductwork cleanliness records.				
Air volume flow rates.				
Water chiller(s) test certificates inc. pressure vessel test data.				
Chilled water circulating pumps inc. pump / system curves.				
Chilled water pressure set certificates.				
Chilled water pipe work pressure test certificates.				
Chilled water pipe work / systems flushing / cleaning certificates.				
Heating water circulating pumps inc. pump / system curves.				
Heating water pressure set certificates.				
Heating water pipe work pressure test certificates.				
Heating water pipe work / systems flushing / cleaning certificates.				
Gas pipeline pressure test certificates.				
Certificate that the Gas installation has been examined as required by Gas Regs.				
Records that the Gas isolation solenoid valve has been tested.				
Gas boiler test certificates.				
Gas suppression installation.				
Fume extract plant records.				
Water services pipe work pressure test certificates.				
Water services certificate of chlorination.				
Water sample analysis records.				
Water treatment records including chemical used.				

Schedule HO 11
Check list of Building Engineering Certificates

Date of issue.....
 Sheet 2 of 2

Item	Action by	Target date	Achieved date	Comments
Sanitary plumbing test certificates.				
Controls and BES test and commissioning data including all set points.				
Fire man's control to Mech Plant certificates.				
Gas detection system test certificates.				
Water Supply (Water Fittings) Regulations 1999 compliance certificates.				
Refrigerant inventory inc volumes in each system. F-gas compliance certificates.				
Safety valve certificates.				
Heat Load test certificate for critical areas.				
Provision of CE conformity certificates for chillers and expansion vessels.				
Electrical services test records as BS 7671 for complete installation (To include MCC's and all field wiring).				
Emergency Lighting test certificates as BS 5266.				
Fire Alarm / detection test certificates, as BS 5839.				
Lightning protection test certificate.				
Standby generator test certificates.				
Fuel Storage Control of Pollution Regulations 2001 compliance certificate.				
UPS test certificates.				

Schedule HO 12

Typical 'count down' to BES operating to serve the University

Pre hand-over, hand-over, and post hand-over.

Date of issue.....

Sheet 1 of 7

Item	Action by	Target date	Achieved date	Comments
AD to ensure that adequate resources are available to achieve safe handover of building engineering services.	AD	HO-8W		HO-4W = 4 weeks before hand-over
Obtain a copy of the Contractors BES commissioning, testing and training programme.	PM	HO-8W		
Establish and record all H&S responsibilities pre handover.	CMM /CM	HO-4W		
Establish maintenance policy and appoint contractors / in house staff.	CMM	HO-4W		
Assess the competency of the persons appointed to operate and or maintain the BES. Establish any further training requirement	CMM	HO-4W		
Agree hand over procedure with Project Manager.	PM / CMM / HOM	HO-4W		
Review draft BES hand over procedure and revise accordingly to suit project.	PM / CMM / SE	HO-4W		
Check and update the record drawing schedules.	PM	HO-4W		
Obtain briefing from Contractor on hazards prior to undertaking inspections etc.	ALL	Prior to each visit.		
Ensure that PPE is available and used prior to any site inspection etc.	ALL	Prior to each visit.		
Carry our risk assessment re access to construction works.	ALL	Prior to each visit.		
Establish procedures to be adopted regarding post hand-over works see BES /HO 09.	CMM	HO-4W		
Obtain draft record drawing for familiarisation of mechanical equipment and systems.	PM	HO-4W		
Obtain draft record drawing for familiarisation of electrical equipment and systems.	PM	HO-4W		
Obtain confirmation that generator fuel storage facility satisfies the requirements of the Control of Pollution Regulations 2001.	PM / CMM / SE	HO-4W		
Witness the operation of the generator off load.	PM / CMM / SE	HO-3W		
Witness the operation of the generator on load (dummy load).	PM / CMM / SE	HO-3W		
Produce a comprehensive asset schedule.	PM	HO-3W		

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Typical 'count down' to BES operating to serve the University

Pre hand-over, hand-over, and post hand-over.

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Item	Action by	Target date	Achieved date	Comments
Based on asset schedule produce inspection, testing and maintenance regimes.	CMM	HO-3W		
Undertake an assessment of plant that will require statutory inspection by Zurich.	CMM	HO-4W		
Instruct Zurich to undertake inspection for LOLER & PUWER.	CMM	HO-3W		
Obtain from the Project Manager details of BES equipment and systems that need to be maintained by specific installers / suppliers to satisfy warranties etc.	CMM / SE	HO-4W		
Obtain design criteria for building engineering service.	PM	HO-4W		
Obtain details from Project Manager of required fire extinguishers.	CMM	HO-4W		
Order fire extinguishers.	CMM	HO-4W		
Add/remove assets to maintenance contract with 3 rd party maintainer.	CMM	HO-4W		
Review and report on access to duct mounted plant equipment.	PM / CMM / SE	HO-4W		
Inspect and report on the safe and adequate access to all BES equipment and systems for routine maintenance.	PM / CMM / SE	HO-4W		
Produce and introduce, based on risk assessments, control procedures for access to all BES plant rooms, voids and areas.	CMM / CM	HO-4W		
Establish dates when post hand over chiller testing is to be undertaken as Contract Spec under load conditions.	PM	HO-4W		
Establish when the post hand-over water treatment tests will be carried out.	PM	HO-4W		
Establish dates when BES post contract checks are to be carried out.	PM	HO-4W		
Obtain draft copy of O&M manuals for mechanical equipment and systems familiarisation.	PM	HO-4W		
Obtain draft copy of O&M manuals for electrical equipment and systems familiarisation.	PM	HO-4W		

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Typical 'count down' to BES operating to serve the University

Pre hand-over, hand-over, and post hand-over.

Date of issue.....

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Item	Action by	Target date	Achieved date	Comments
Obtain pre-approved record drawings of mechanical plant.	PM	HO-4W		
Review access to all controls equipment for maintenance requirements.	PM / CMM / SE	HO-4W		
Obtain confirmation that all fire dampers have been inspected and tested.	PM / CMM / SE / CM	HO-4W		
Emergency lighting installation. Witness the testing of installation.	PM / CMM / SE / CM	HO-3W		
Fire detection / alarm installation Witness the testing of installation including audibility tests.	PM / CMM / SE / FO / CM	HO-3W		
Witness the heat load and environmental testing in critical areas.	PM / CMM / SE	HO-3W		
Obtain training in the safe operation of all mechanical equipment and systems.	CMM / CM	HO-3W		
Obtain training in the safe operation of all electrical equipment and systems.	CMM / CM	HO-3W		
Confirm that training has been provided and is adequate.	CMM / CM	HO-2W		
Reassess the competency of the persons required to operate and or maintain the BES.	CMM	HO-2W		
Carry out risk assessment and obtain safety signs to all BES equipment / systems, plant rooms etc.	CMM / CM	HO-2W		
Undertake COSHH assessment and set up inspection, maintenance regimes for LEV plant.	CMM / CM	HO-2W		
Establish and record all H&S responsibilities post hand-over and during fit out phase.	CMM / CM	HO-2W		
Obtain pre-approved record drawings of electrical plant.	PM	HO-4W		
Ensure that both gas and electricity services are being supplied on contract.	CMM / Energy Team	HO-4W		

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Typical 'count down' to BES operating to serve the University

Pre hand-over, hand-over, and post hand-over.

Date of issue.....

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Item	Action by	Target date	Achieved date	Comments
Ensure that all Fire exits are operational.	CMM /CM / FO	HO-2W		
Ensure that all emergency procedures are in place and training provided for fit out phase.	CMM / CM / FO	HO-2W		
Ensure that first aid facilities are provided for tech fit out phase.	CMM	HO-2W		
Confirm that drinking water provision has been made in the contract.	PM	HO-2W		
Obtain confirmation that all known hazards including Asbestos are recorded in the H&S file.	PM / CM	HO-2W		
Establish formal hand over meeting for the building engineering services.	PM / CMM / SE	HO-2W		
Read and record gas, water and electricity meter readings at practical completion of the contract.	CMM / Energy Team	HO		
Ensure that Electrical safety signs including resuscitation data is provided in all electrical switch rooms.	CMM / CM	HO-1W		
Ensure that Gas service line drawing have been provided and installed as Gas Regs.	PM / CM	HO-1W		
Witness the testing of the fireman's switch control for the mechanical plant.	PM / SE / CM / FO	HO-1W		
Witness the gas detection installation.	PM / SE / CM / FO	HO-1W		
Witness water leakage detection installation.	PM / CMM / HOM	HO-1W		
Obtain confirmation that BES plant has run trouble free etc for two weeks.	PM	HO-1W		
Ensure that all labelling is complete.	PM	HO-1W		
Obtain copy of Fire Certificate.	CMM / CM / FO	HO-1W		
Install fire extinguishers.	CMM / FO	HO-1W		

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Typical 'count down' to BES operating to serve the University

Pre hand-over, hand-over, and post hand-over.

Date of issue.....

Sheet 5 of 7

Item	Action by	Target date	Achieved date	Comments
Arrange for QMUL Fire Officer to carry out fire risk assessment pre hand-over.	CM	HO-1W		
Advise QMUL Insurance prior to when the building is handed over.	PM	HO-1W		
Ensure that plant rooms and equipment are thoroughly clean prior to hand-over.	PM	HO-1W		
Obtain approved record drawings of mechanical plant.	PM	HO-1W		
Obtain approved record drawings of electrical plant.	PM	HO-1W		
Obtain approved copy of O&M manuals for mechanical equipment and systems.	PM	HO-1W		
Obtain approved copy of O&M manuals for electrical equipment and systems.	PM	HO-1W		
Obtain approved / checked H&S files for the Contract.	PM	HO-1W		
Confirm that all items for practical completion are in place re BES.	PM	HO-1W		
HANDOVER				
Fix/ install safety signs to all BES equipment / systems, plant rooms etc.	CMM			
Ensure that training / instruction in fire safety is given to all staff, visitors and contractors during tech fit-out period.	CMM / CM / FO			
Ensure that Occupants have been provided with copy of Fire Certificate and is aware of fire safety duties/ responsibilities.	CM /FO			
Obtain a copy of Employer's Liability Insurance certificate and post in common area.	CMM			
Obtain and post a copy of the H&S Law poster 'what you should know'.	CMM / CM			
Establish and record all H&S responsibilities during normal occupation of premises.	CMM / CM			

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Typical 'count down' to BES operating to serve the University

Pre hand-over, hand-over, and post hand-over.

Date of issue.....

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Item	Action by	Target date	Achieved date	Comments
Fire detection / alarm installation witness the testing of installation including audibility / visual alarm tests when tech equip has been commissioned.	CMM / CM / FO			
Witness the testing of the UPS full load test when all tech equipment is connected.	CMM or SE			
Fire detection / alarm installation witness the testing of installation including audibility tests when premises are occupied.	CMM / CM / FO			
Witness the operation of the generator on load (actual equipment load).	CMM or SE			
Carry out risk assessment regarding safe evacuation of disabled persons, to include, wheel chair evacuation, blind persons, persons with hearing difficulties etc. Put control measures in place.	CMM / CM / FO			
Ensure training and procedures are in place for reception assistance alarms.	CMM / CM / SM			
Ensure that all emergency procedures are in place and training provided for normal occupancy of premises.	CMM / CM / SM / FO			
Ensure that training / instruction in fire safety is given to all staff, visitors and contractors. Following occupation of building for normal use.	CMM / CM / FO			
Ensure training and procedures are in place for disabled person assistance alarms.	CMM / CM / SM			
Arrange for QMUL Fire Officer to carry out fire risk assessment during normal occupancy.	CMM / CM / FO			
Ensure that first aid training and facilities are provided for normal occupancy of premises.	CMM / CM / SM			
Produce / update the Building Manual for the premises.	CMM			
Produce / update the Emergency Procedure Manual for the premises.	CMM / CM / SM /FO			

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Item	Action by	Target date	Achieved date	Comments
Arrange for Occ Health to carry out Occupational Health risk assessment.	CMM			
Arrange for a Water Services risk assessment to be carried out.	PM / CMM / CM	HO		
Arrange for a Security risk assessment to be carried out.	CMM / SM			
Confirm that all contractors have been removed from the security systems at handover.	CMM / SM			

EMAP 42 – Project Handover

Appendix (3) – EMAP 42 Acceptance Form

QUEEN MARY, UNIVERSITY of LONDON

Acceptance of EMAP-42 Project Handover

I confirm by signature below that I have received a copy of QMUL's EMAP-42

This document will be forwarded to colleagues within the company/department as appropriate.

I will take all necessary precautions to ensure full compliance with the requirements noted within this EMAP.

Signed _____

Name (Print) _____

Company/Department _____

Date _____