Scope of Works

Title: Steam Distribution Phase 2.

Project: EM039

Date: 21/06/16

Author: Iain Paterson

Owner: David Shadwell

Client: The Pirbright Institute

Version No: 1-A

1 Scope of Works History

1.1 Document Location

N:\E&M Dept\private\Iain Paterson\Projects\EM039\Scope of works

1.2 Revision History

Version	Date	Details	Author
1	23/06/16	First Issue.	IMP

Changes from previous version are highlighted yellow.

1.3 Approvals

This document requires the following approvals.

Name	Title	Signature	Issue Date	Version
David Shadwell	Senior site operations manager and deputy head of estates			
Paul Embleton	Site operations manger			

1.4 Issue History

In addition to the approvers, this document has been issued to:

Name	Purpose	Date of Issue	Version

2 Table of Contents

1 Scope of Works History 1
1.1 Document Location 1
1.2 Revision History 1
1.3 Approvals 1
1.4 Issue History 1
2 Table of Contents 2
3 Introduction 5
3.1 Document Purpose 5
3.2 Summary Description of works 5
4 General requirements 6
4.1 Contact details 6
4.2 Location of works 6
4.3 Health & Safety Requirements 6
4.3.1 Risk Assessments & Method Statements 6
4.3.2 Tools and Equipment 6
4.3.3 PPE 7
4.3.4 Barriers and Warning signs. 7
4.3.5 Scaffolding and access equipment 7
4.3.6 Equipment certification 7
4.3.7 Permits 7
4.3.8 Isolations & LOTO 7
4.3.9 Asbestos 7
4.3.10 Emergency Procedures 8
4.4 Security and Site Access Requirements 8
4.4.1 Site access 8
4.4.2 Site inductions 9
4.4.3 Site Rules for Contractors 9
4.4.4 Escort requirements 9
4.4.5 Vehicle movements 9
4.4.6 Welfare facilities 9
4.4.7 Working hours 9
4.5 Bio Safety Quarantine and Decontamination Requirements 9
4.6 Design Requirements 9
4.6.1 Design Responsibility 10
4.6.2 Standards and Specifications 10
4.6.3 Supports and steelwork 10
4.6.4 Documentation 10

4.7 Completion of works 10
4.7.1 Snagging surveys 10
4.7.2 Inspection, Testing and Commissioning 10
4.7.3 Documentation 10
4.7.4 Waste management 10
4.8 Project Management Requirements 11
4.8.1 Contractor Capability 11
4.8.2 Project meetings 11
4.8.3 Project Risk Register 11
4.8.4 Project Programme 11
4.8.5 Documentation storage 11
4.8.6 Project Co-Ordination 11
4.8.7 Project Organogram 1
4.8.8 Responsibilities 1
5 Particular Requirements 3
5.1 Work package 1 – Ash Building Hot Water Boilers 3
5.1.1 Work Element 1.1 – Hot Water Boiler Supply & Install 3
5.1.2 Work Element 1.2 – Service Connections 3
5.1.3 Work Element 1.3 – Ground Works 4
5.1.4 Work Element 1.4 – Fuel Tank Works 4
5.1.5 Work Element 1.5 - Principal Designer 5
5.1.6 Work Element 1.6 - Principal Contractor 5
5.2 Work Package 2 – Workshop Building Hot Water Boilers 5
5.2.1 Work Element 2.1 – Hot Water Boiler Supply & Install 6
5.2.2 Work Element 2.2 – Service Connections 6
5.2.3 Work Element 2.3 – Ground Works 7
5.2.4 Work Element 2.4 – Fuel Tank Works 7
5.2.5 Work Element 2.5 - Principal Designer 8
5.2.6 Work Element 2.6 - Principal Contractor 8
5.3 Work Package 3 - Steam Generation Plant 8
5.3.1 Work Element 3.1 – Steam Generation Plant Supply & Install 8
5.3.2 Work Element 3.2 – Service Connections 9
5.3.3 Work Element 3.3 – Ground Works 10
5.3.4 Work Element 3.4 – Fuel Tank Works 11
5.3.5 Work Element 3.5 – BMS works 11
5.3.6 Work Element 3.6 - Principal Designer 12
5.3.7 Work Element 3.7 - Principal Contractor 12
6 CDM requirements 13
6.1 Client Brief 13

6.2 Duty Holders 13
6.3 Pre-Construction Information 13
6.4 Management Arrangements 14
6.5 Notification to HSE 14
6.6 Construction Phase Plan 14
6.7 Health and Safety File 15
Appendix A – Drawings 16
Appendix B – Documents 16
Appendix C – Standards & Specifications 16

3 Introduction

3.1 Document Purpose

The primary purpose of this document is to provide information to potential suppliers to allow for budgetary quotation.

This document is to be considered “live” and will evolve to incorporate more detail as the project progresses, eventually containing full details for construction to begin.

This document details the envisaged requirements of the works but should not been seen as restrictive. All parties should advise if:

- Appropriate alternatives are available.
- Additional requirements are needed.
- Items or works are not required.

This document is also intended to fulfil the client brief and pre-construction information aspects of construction design management (CDM) regulations. Construction phase plans will be separate documents for various work elements as required.

3.2 Summary Description of works

This scope of work document details the requirements for the phase 2 of the steam distribution system redesign at The Pirbright Site.

The phase 1 works were completed in March 2016 and were to install steam and condensate pipework to enable the isolation of the aging main site boiler house and allow steam to be supplied to the whole of site from the EC1 boiler house.

Phase 2 works are to install the following plant:

- New steam generation plant to supply steam to BSU, Insectary and IS4L buildings.
- New hot water boiler plant to supply heating and hot water to the ash building.
- New hot water boiler plant to supply heating and hot water to the Workshop and MOD 2 buildings.

This will make the extensive above ground steam distribution pipework in the now redundant areas of site redundant. Therefore the pipework can be removed as part of the future demolition works planned as per the overall site development programme.

Sketches showing the proposed works are included in appendix A.

Drawings of the proposed locations of the works are included in appendix B.

4 General requirements

This section describes the general requirements related to delivering these works at The Pirbright Site.

4.1 Contact details

The PIR engineer overseeing the works is:

- Iain Paterson
- Iain.paterson@pirbright.ac.uk
- 01483 231 469
- Normal working hours: 0800h to 1630h, Monday to Thursday

4.2 Location of works

These works will take place at the following addresses:

The Pirbright Institute
Ash road,
Pirbright,
Woking,
GU24 0NF

4.3 Health & Safety Requirements

All works should be performed in line with site Health & Safety (H&S) rules and the health and safety at work act 1974.

The following sections highlight H&S aspects to be considered for the works and further details are included in the site rules for contractors document, included in appendix C.

4.3.1 Risk Assessments & Method Statements

Any works on the site must be preceded by a risk assessment and method statement (RAMS). These must be submitted to the site contact at least 5 days in advance of the 1st day of works.

RAMS must not be generic but specific to the task and date of the works and should take the form of a fully detailed step by step method.

RAMS should not try and cover the full scope of works, but should be written for the various work elements or construction steps as appropriate.

Although RAMS are never “approved” by PIR personnel, they will be reviewed by PIR personnel and feedback will be given. Works will not be allowed to take place if the RAMS are felt to be inappropriate.

Where possible, RAMS should be accompanied by drawings to help explain their context.

Further details are included in the contractor’s site rules included in appendix D.

4.3.2 Tools and Equipment

The contractor should provide all tools and equipment they require to complete their works.

Equipment used by contractors should be kept in good working order.

Electrical equipment should be PAT tested.

Were appropriate calibration, inspection and testing certificates of equipment being used should be issued to the site contact before being used. This is particularly important for safety equipment and lifting equipment.

4.3.3 PPE

Contractors should provide and use their own personal protective equipment (PPE). PPE used should be suitable for the works and should be detailed in the RAMS.

4.3.4 Barriers and Warning signs.

Area of works must be cordoned off with suitable barriers and warning signs to prevent unauthorised pedestrian access during work activities.

Contractors must provide their own barriers and warning signs.

4.3.5 Scaffolding and access equipment

Contractors can arrange their own scaffolding required to facilitate works or use the site preferred supplier (request details from site contact if required).

Contractors are expected to provide their own temporary access equipment such as ladders and mobile platforms. These should be class 1 (industrial) certification standard.

All scaffolding and access equipment should not be used without in date inspection and tagging.

4.3.6 Equipment certification

Where appropriate, inspection

4.3.7 Permits

Permits to work are issued by the site contact for the following work types:

- Hot works.
    - Includes power cutting tools such as drills, saws and grinders as well as welding etc.
    - Includes the requirement for fire watchers 30 mins & 60 mins (indoor works only) after hot works have been completed.
- Working at height.
    - Includes any works over 2m.
- Isolations.
    - Includes fore alarm isolations, which must be done on a daily basis.
- Excavations.
- Confined Space.

Permits will be issued on a daily or weekly basis as appropriate.

4.3.8 Isolations & LOTO

All electrical & mechanical Isolations will be performed under permit by PIR engineering staff and should be witnessed by the contractor performing the work.

These isolations should then be secured with padlocks on a lock off tag off (LOTO) basis where appropriate.

4.3.9 Asbestos

There are 2 instances of asbestos that may affect these works.

The first is a “blue gasket” associated with the calorifiers in the Ash building plant room that may be modified as part of this project.

The second is an asbestos containing gasket on the steam pipework associated with the plate heat exchanger skid being replaced by this project:

If required, the removal of these asbestos containing gaskets will be dealt with as part of this project by The Pirbright Institute in advance of any other contractor works in the area.

The full asbestos reports for the Ash building and the Workshop building are included in appendix C.

Asbestos is not expected to effect the external works associated with the installation of steam generation plant.

If any other suspected asbestos is identified during the works then works in the area should be stopped and it should be highlighted to the site contact, who will arrange sampling to take place.

4.3.10 Emergency Procedures

If an emergency event is discovered, such as a fire or medical emergency, the site gatehouse should be contacted for assistance on the emergency extension number 1000 or on radio channel 1.

On discovering a fire, the area should be evacuated and all personnel should go to the fire assembly point. If safe to do so, fire alarm call points should be activated on the way out of the area.

In the event of a fire alarm, works should cease and contractors should make their way to their fire assembly point (to be given by the site contact).

4.4 Security and Site Access Requirements

4.4.1 Site access

All personnel must have visitor forms raised for them by their site contact before arrival on site, therefore a full names and dates of all personnel attending site must be provided at least 24h in advance.

Contractors must report to the gatehouse and present photo ID each time they access site.

Contractors must also sign in and out of the E&M contractor's office each time they access site.

Contractors may be required to attend a construction site specific tool box talk at the beginning of the works and as required throughout the works to highlight particular hazards and activities associated with the works.

4.4.2 Site inductions

All personnel performing works on site must have completed a site induction within the last 12 months. Inductions take approximately an hour and can be arranged to take place on the 1st day of the works.

4.4.3 Site Rules for Contractors

The site rules for contractors are included in Appendix C.

Highlights and additional requirements are included in the following sections.

4.4.4 Escort requirements

Contractors must be fully escorted by Pirbright personnel unless there are approved contractors within the team. Therefore it is recommended that an appropriate number of contractors in each team should complete an institute security check (performed by Agenda). The cost of this is covered by the institute. This process can take up to 2 weeks to complete.

In order to do initiate this process, provide full names and an email address specific to the person to the site contact.

Even approved contractors may require an escort in certain restricted areas of site.

NOTE: none of the works in this scope is envisaged to be within restricted areas.

4.4.5 Vehicle movements

Vehicle movements on site are to be via on site roadways only. The site speed limit of 10 mph must be observed at all times and extra caution should be taken by drivers due to site pedestrians, bicycles and vehicles being present.

Vehicle access to the site is through the main entrance at the north boundary of the site.

4.4.6 Welfare facilities

The use of site welfare facilities will be available during the works. the site contact will give the locations of these.

The site canteen is located within The Plowright Building, in order to access this each contractor will be required to read additional SOPs and complete an online test (in addition to any site induction and security checks). If this is required then please forward an e-mail address for each contractor to the site contact.

4.4.7 Working hours

Contractors will be able to access site from 0800h – 1900h.

Consideration should be given to the use of temporary lighting requirements if working in poor light.

4.5 Bio Safety Quarantine and Decontamination Requirements

No personnel, vehicles or equipment will be subject to any quarantine restrictions or decontamination process as a result of these works.

4.6 Design Requirements

Detailed design for all mechanical, civil, electrical and control works should be performed.

4.6.1 Design Responsibility

Final design responsibility will always be with the principal designer as appointed by the client.

4.6.2 Standards and Specifications

All equipment should be manufactured, installed, tested and commissioned in accordance with all applicable national and international standards. These should be referenced in any quotation documentation.

Also, the installation works should be fully compliant with the following Pirbright standards:

- E&M-STD-004: Pipework Standard 001
- E&M-STD-005: Pipework Standard 002

4.6.3 Supports and steelwork

Contractor works includes the design, supply and install any necessary supports and steelwork associated with the works.

4.6.4 Documentation

The following documentation should be issued before works commence:

- Design Drawing.
- Data sheets.
- Design calculations, or statements confirming they are not required.
- Relevant safety certificates for equipment being used to perform the works.

4.7 Completion of works

4.7.1 Snagging surveys

On completion of the any installation works, the works must be visually inspected by an appropriate member of the institute engineering team and signed off as complete if acceptable. Any snags identified shall be listed on a project snagging schedule by the site contact and reviewed with the principal contractor before the works are deemed complete.

4.7.2 Inspection, Testing and Commissioning

Any records relating to the inspection, testing and commissioning of an installation should be provided to the site contact.

Were appropriate, witnessing of these by a member of the Pirbright engineering team may be required.

4.7.3 Documentation

The following documentation should be provided following the completion of installation and commissioning works:

- As installed drawings.
- Inspection, testing and commissioning documentation including any certificates.
- Critical spares list.
- Details of planned preventative maintenance requirements of installed equipment.

4.7.4 Waste management

Waste, including spoil created by the works must be removed from site by the contractor and disposed of in an appropriate manner.

Skips must be arranged by the contractor.

Waste transfer notes will be required from the institute for all waste leaving site.

4.8 Project Management Requirements

4.8.1 Contractor Capability

Contractor capability will be reviewed before works are awarded to suppliers.

This will potentially involve:

- Issuing relevant training records of all contractors and managers associated with the works.
- Issuing of relevant company certification (such as ISO 9001, safe contractor etc.). Where certification is not present, documentation showing a satisfactory alternative system is in place should be issued.
- Visits to the suppliers manufacturing facilities by Pirbright personnel.

4.8.2 Project meetings.

Regular project progress meetings will take place with the principal designers and contractors as appropriate.

4.8.3 Project Risk Register

A project risk register will be created by the site contact and will be reviewed at project management meetings.

The risk register should include design, H&S and operational risks and details of mitigation measures taken.

4.8.4 Project Programme

Contractors should give an indication of delivery and installation times associated with the work elements they are quoting for.

Once the project is underway, the site contact will maintain a project programme which will be reviewed at the project management meetings.

It is envisaged that these works will be completed before the end of 2016. However this is subject to successful finding application and detailed design stage.

4.8.5 Documentation storage

All project documentation will be stored by the site contact the works in the project file in the following location on the Pirbright server:

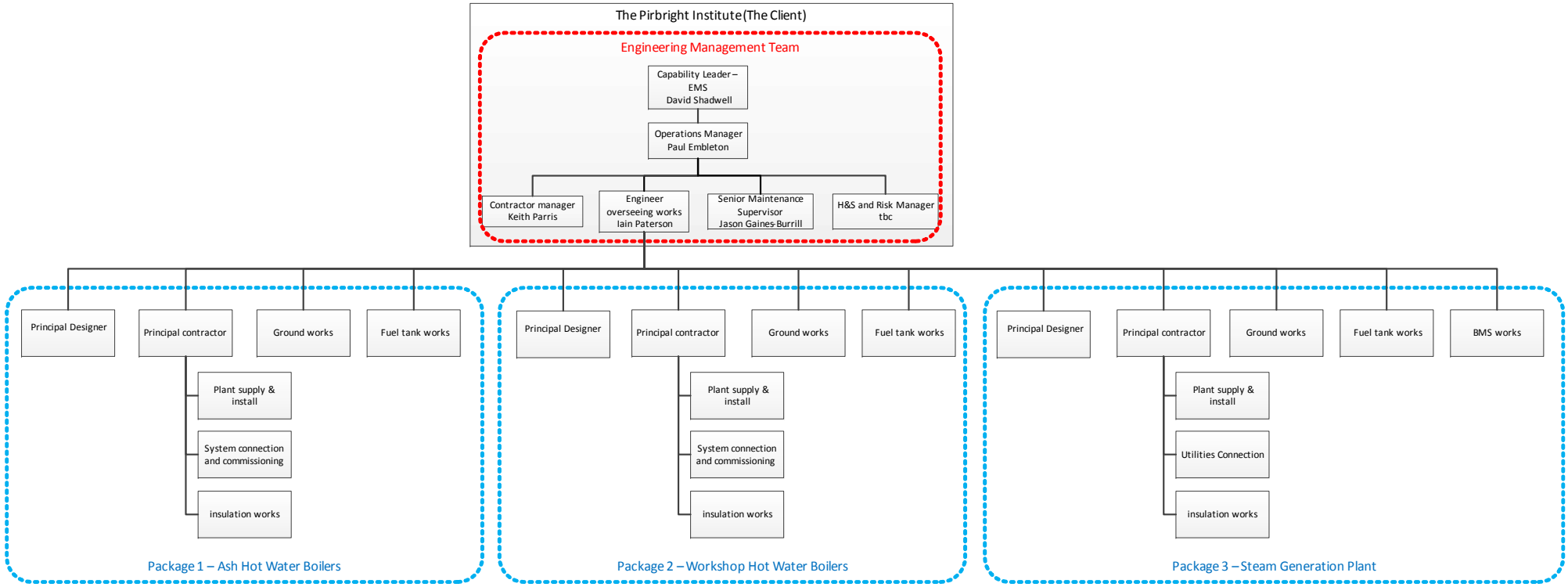
N:\E&M Dept\private\Iain Paterson\Projects\EM039 - Pirbright steam distribution phase 2

4.8.6 Project Co-Ordination

The following activities will ensure project co-ordination:

- Regular project management meetings, primarily between the Pirbright engineer overseeing the works and the principal contractor/designer.
- Regular site checks to see progress and ensure works are taking place in a safe manner.
- Toolbox talks principal contractor to all subcontractors as and when required to highlight any issues they need to be aware of.
- Regular updates from the Pirbright engineer overseeing the works to the Pirbright Engineering Management Team.

4.8.7 Project Organogram



4.8.8 Responsibilities

The responsibilities of each party for these works are as follows:

The Pirbright Institute engineer overseeing works:

- Act as site contact for contractors.
- Create, maintain and issue scope of works document.
- Create and maintain a project risk register.
- Raise purchase orders.
- Co-ordinate the contractor, designers and institute personnel to facilitate works.
- Managing project documentation and budget.
- Facilitate site access.
- Reviewing and agreeing detailed design before works commence.
- Arrange and chair project meetings.
- Responding to contractor queries.
- Arrangement of permits and isolations.
- Ensuring works are performed in a safe manner.
- CDM Client representative.
- Co-ordinating snagging surveys as required.
- Handover to Pirbright Engineering Management.
- Arranging training where appropriate.

Contractors and designers:

- Design responsibility for all installed items.
- Responsibility for installation activities.
- Management of all contractors performing works.
- Ensuring works are performed in a safe manner.
- Highlight H&S and design risks to the engineer overseeing works.
- Supplying all required documentation and information to the institute.
- Ensuring the scope of works is met in full.
- CDM principal Contractor and Principal Designer responsibilities were appropriate.
- Providing Training where appropriate.

Institute personnel:

- Provide information as required.
- Reviewing designer and contractor information as required.
- Reviewing RAMS as required.
- Facilitate works as required.
- Perform isolations required.

- Ensuring works are performed in a safe manner.
- Highlight H&S and design risks to the engineer overseeing works.
- Completing snagging surveys as required.
- Providing escort as required.

5 Particular Requirements

This section describes the particular requirements of each works package of the scope of works.

This is not restrictive or fully detailed and the contractor should provide additional detail where required and suggest alternatives if appropriate.

5.1 Work package 1 – Ash Building Hot Water Boilers

Work package 1 is to replace the steam fed calorifiers in the Ash building with an LPG fed hot water boiler system.

5.1.1 Work Element 1.1 – Hot Water Boiler Supply & Install

Inclusions

- Detailed design work.
- The supply, delivery, offload, positioning, testing and commissioning of a hot water boiler system.
- Additional testing and commissioning of the system when fully connected to the sites utility systems, in co-ordination with the principal designer.
- Documentation for the above plant.
- Project management of above works.
- CDM requirements associated with above works.

Design Basis

The buildings hot water, heating and ventilation systems are supplied by steam fed heat exchangers and calorifiers. The existing kit is rated as follows:

- 2 x 246 kW heat exchanger sets.
- 2 x 355 kW calorifiers.

However these were sized on historic building use and are now oversized. Data from the recently installed steam meter to the building show that the average steam demand is only 10 kW, but peaks at approximately 260 kW.

It is envisaged that the existing heat exchangers and calorifiers will be removed and replaced by hot water boilers and tanks piped directly to the existing distribution pipework.

The photo below shows the existing equipment:

See the appendices for further details including drawings and photographs.

5.1.2 Work Element 1.2 – Service Connections

Inclusions

- Detailed design work.
- Removal of redundant plant and pipework and preparation of existing pipework for new connections.
- Design, sizing, supply, installation, testing and commissioning of the following pipework including all fittings and ancillary items:
    - Hot water supply and return pipework from the hot water boiler to any new tanks and existing hot water distribution system.
    - Raw water supply pipework from existing site system to hot water boiler plant.
    - Condensate pipework to existing site drain.

- Insulation of the above supply and return pipework.
- Design, sizing, supply and installation of any required steelwork and supports for the above pipework.
- Design, sizing, supply, installation, testing and commissioning of electrical supply cabling including all bonding and ancillary items from existing site distribution system to hot water boiler plant.
- Design, sizing, supply and installation of any required tray / containment and supports for the above cabling.
- Design, sizing, supply and installation of external lighting as required around the new fuel tanks.
- Any scaffolding requirements for above works.
- Removal of all waste associated with above works.
- Documentation for the above plant.
- Project management of above works.
- CDM requirements associated with above works.

Design basis:

See section 5.1.1.

See the appendices for further details including drawings and photographs.

5.1.3 Work Element 1.3 – Ground Works

Inclusions

- Detailed design work.
- Scanning of the area to identify buried services before works commence.
- Design, sizing, supply and installation of concrete hard standing to facilitate the new containerised steam generation plant and associated fuel tanks.
- Design, sizing, supply and installation of fencing to create a secure compound around the fuel tanks.
- Design, sizing, supply and installation of trench works associated with the LPG pipework from the fuel tanks to the building.
- Diversion of existing footpath to facilitate new hard standing.
- Removal of all spoil of the above works from site.
- Documentation for the above plant.
- Project management of above works.
- CDM requirements associated with above works.

Design Basis

It is envisaged that the hard standing will need to accommodate 2 x 2,000 ltr LPG tanks.

The LPG tank compound fence should incorporate 1 x double gate for access and fuel deliveries and 1 x pedestrian gate for emergency escape.

See the appendices for further details including drawings and photographs.

5.1.4 Work Element 1.4 – Fuel Tank Works

Inclusions

This work package includes:

- Detailed design work.
- Design, sizing, supply, installation and commissioning of fuel tanks and associated fixtures and ancillaries to supply the hot water boiler supplied by work element 1.1.
- Design, sizing, supply, installation and commissioning of pipework to connect the above fuel tanks to the hot water boiler tie in point (TP).
- Design, sizing, supply, installation and commissioning of steelwork and supports associated with the above fuel tanks and pipework.
- Documentation for the above plant.
- Project management of above works.
- CDM requirements associated with above works.

Design Basis

The fuel type is envisaged to be LPG.

It is envisaged that the hot water boiler plant will have an installed peak load of approx. 260 kW thermal. However average demand is only likely to be 10 kW.

Number and size of fuel tanks should be sized to ensure deliveries are required no more than monthly.

Equipment should be incorporated to ensure that deliveries are triggered automatically.

See the appendices for further details including drawings and photographs.

5.1.5 Work Element 1.5 - Principal Designer

The Principal designer will take overall responsibility of ensuring that the different work elements of this work package work correctly when linked.

Main responsibilities are:

- Manage all sub-designers.
- Maintain and issue the health and safety file.
- Overall commissioning of the installed system.
- Provide pre-construction information as required.
- Fulfil obligations required by CDM regulations.

5.1.6 Work Element 1.6 - Principal Contractor

The Principal designer will take overall responsibility of ensuring that the various construction works associated with this work package are co-ordinated and performed safely.

Main responsibilities are:

- Manage all sub-contractors.
- Maintain and issue the construction phase plan.
- Provide pre-construction information as required.
- Deliver tool box talks to all contractors as required.
- Fulfil obligations required by CDM regulations.

5.2 Work Package 2 – Workshop Building Hot Water Boilers

Work package 1 is to replace the steam fed plate heat exchanger in the Workshop Building with an LPG fed hot water boiler system.

5.2.1 Work Element 2.1 – Hot Water Boiler Supply & Install

Inclusions

- Detailed design work.
- The supply, delivery, offload, positioning, testing and commissioning of a hot water boiler system.
- Additional testing and commissioning of the system when fully connected to the sites utility systems, in co-ordination with the principal designer.
- New heating controls within the MOD 2 building to improve energy and comfort levels.
- Documentation for the above plant.
- Project management of above works.
- CDM requirements associated with above works.

Design Basis

The Workshop building currently incorporates a 50 kW steam fed plate heat exchanger system that provides heating to the Workshop building and MOD 2 building via air blowers and radiator circuits.

It is envisaged that this heat exchanger would be replaced with a 50 kW hot water boiler system.

See the appendices for further details including drawings and photographs.

5.2.2 Work Element 2.2 – Service Connections

Inclusions

- Detailed design work.
- Removal of redundant plant and pipework and preparation of existing pipework for new connections.
- Design, sizing, supply, installation, testing and commissioning of the following pipework including all fittings and ancillary items:
    - Hot water supply and return pipework from the hot water boiler to any new tanks and existing hot water distribution system.
    - Raw water supply pipework from existing site system to hot water boiler plant.
    - Condensate pipework to existing site drain.
- Insulation of the above supply and return pipework.
- Design, sizing, supply and installation of any required steelwork and supports for the above pipework.
- Design, sizing, supply, installation, testing and commissioning of electrical supply cabling including all bonding and ancillary items from existing site distribution system to hot water boiler plant.
- Design, sizing, supply and installation of any required tray / containment and supports for the above cabling.
- Design, sizing, supply and installation of external lighting as required around the new fuel tanks.
- Any scaffolding requirements for above works.
- Removal of all waste associated with above works.
- Documentation for the above plant.
- Project management of above works.
- CDM requirements associated with above works.

Design basis:

See section 5.2.1.

See the appendices for further details including drawings and photographs.

5.2.3 Work Element 2.3 – Ground Works

Inclusions

- Detailed design work.
- Scanning of the area to identify buried services before works commence.
- Design, sizing, supply and installation of concrete hard standing to facilitate new fuel tanks.
- Design, sizing, supply and installation of fencing to create a secure compound around the fuel tanks.
- Design, sizing, supply and installation of trench works associated with the LPG pipework from the fuel tanks to the building.
- Diversion of existing footpath to facilitate new hard standing.
- Removal of all spoil of the above works from site.
- Documentation for the above plant.
- Project management of above works.
- CDM requirements associated with above works.

Design Basis

It is envisaged that the hard standing will need to accommodate 1 x 2,000 ltr LPG tanks.

The LPG tank compound fence should incorporate 1 x double gate for access and fuel deliveries and 1 x pedestrian gate for emergency escape.

See the appendices for further details including drawings and photographs.

5.2.4 Work Element 2.4 – Fuel Tank Works

Inclusions

This work package includes:

- Detailed design work.
- Design, sizing, supply, installation and commissioning of fuel tanks and associated fixtures and ancillaries to supply the hot water boiler supplied by work element 2.1.
- Design, sizing, supply, installation and commissioning of pipework to connect the above fuel tanks to the hot water boiler tie in point (TP).
- Design, sizing, supply, installation and commissioning of steelwork and supports associated with the above fuel tanks and pipework.
- Documentation for the above plant.
- Project management of above works.
- CDM requirements associated with above works.

Design Basis

The fuel type is envisaged to be LPG.

It is envisaged that the hot water boiler plant will have an installed peak load of approx. 50 kW thermal.

Number and size of fuel tanks should be sized to ensure deliveries are required no more than monthly.

Equipment should be incorporated to ensure that deliveries are triggered automatically.

5.2.5 Work Element 2.5 - Principal Designer

The Principal designer will take overall responsibility of ensuring that the different work elements of this work package work correctly when linked.

Main responsibilities are:

- Manage all sub-designers.
- Maintain and issue the health and safety file.
- Overall commissioning of the installed system.
- Provide pre-construction information as required.
- Fulfil obligations required by CDM regulations.

5.2.6 Work Element 2.6 - Principal Contractor

The Principal designer will take overall responsibility of ensuring that the various construction works associated with this work package are co-ordinated and performed safely.

Main responsibilities are:

- Manage all sub-contractors.
- Maintain and issue the construction phase plan.
- Provide pre-construction information as required.
- Deliver tool box talks to all contractors as required.
- Fulfil obligations required by CDM regulations.

5.3 Work Package 3 - Steam Generation Plant

Work package 3 is to install a new steam generation plant to supply steam to the Insectary, BSU and IS4L buildings.

5.3.1 Work Element 3.1 – Steam Generation Plant Supply & Install

Inclusions

- Detailed design work.
- The supply, delivery, offload, positioning, testing and commissioning of a containerised steam generation plant.
- Additional testing and commissioning of the system when fully connected to the sites utility systems, in co-ordination with the principal designer.
- Documentation for the above plant.
- Training package for up to 6 x operators/maintenance engineers on the above plant.
- Service agreement for the above plant, separate quotation to be provided.
- Project management of above works.
- CDM requirements associated with above works.

Design Basis

The estimated loads of the existing buildings that the new steam generation plant is expected to support is summarised on the table below:

This data is to be verified by the principal designer as part of the detailed design phase of the project.

Building	Average load kg/h	Max load kg/h

IS4L	50	650
BSU	50	1270
Insectary	20	30
Total	**150**	**1,950**

The required generation pressure is 5.5 bar(g).

It is envisaged that the plant would consist of 3 x units capable of operating on a duty/standby/unavailable and duty/duty/standby basis.

It is envisaged that the steam generation plant is incorporated in to a standard shipping container incorporating all the necessary ancillaries to enable its use as a plant room such as lighting, heating/cooling arrangements, small power, fire alarms etc.

There is no natural gas supply local to the proposed location of the steam generation plant. Therefore it is envisaged that the steam generators will be LPG fuelled, though light fuel oil will also be considered and an option quotation for this should be provided.

It is preferred that the steam generation plant should as far as reasonably practicable, incorporate features to maximise its automation and minimise attendance by engineering personnel. These items should be shown as optional extras on the quotation.

It is preferred that the steam generation plant should as far as reasonably practicable, incorporate features to maximise its energy efficiency and minimise operational costs. These items should be shown as optional extras on the quotation.

The containerised steam generation plant should incorporate the following utility meters:

- Steam supply meter (Endress and Hauser (E&H) Prowirl F with 4 – 20 mA output).
- Raw Water meter (E&H prefered – type to be confirmed)
- Fuel meter (E&H preferred – type to be confirmed)
- Power meter (Schneider PM750)

See the appendices for further details including drawings and photographs.

5.3.2 Work Element 3.2 – Service Connections

Inclusions

- Detailed design work.
- Design, sizing, supply, installation, testing and commissioning of the following pipework including all fittings and ancillary items:
    - Steam pipework from containerised steam generation plant package tie in point (TP) to existing site steam distribution.
    - Condensate return pipework from existing site pipework to containerised steam generation plant package TP.
    - Raw water supply pipework from existing site distribution system to containerised steam generation plant package TP.
    - LPG supply pipework from fuel tank package TP to containerised steam generation plant package TP.
    - Drainage pipework from containerised steam generation plant package TP to existing site drainage system.
    - Double Isolation valve set to isolate the “remaining” distribution system from the “redundant” steam distribution system.

- Insulation of the above steam and condensate pipework.
- Design, sizing, supply and installation of any required steelwork and supports for the above pipework and meters.
- Design, sizing, supply, installation, testing and commissioning of electrical supply cabling including all bonding and ancillary items from existing site distribution system to containerised steam generation plant package TP.
- Design, sizing, supply and installation of any required tray / containment and supports for the above pipework.
- Design, sizing, supply and installation of external lighting as required around the new steam generation plant container and fuel tanks.
- Any scaffolding requirements for above works.
- Removal of all waste associated with above works.
- Documentation for the above plant.
- Project management of above works.
- CDM requirements associated with above works.

Design Basis

The relevant loads for the enabling works will be verified by the principal designer, however for budgetary quotation purposes, the following design basis should be assumed:

- Steam/Condensate demand: See section 5.1.3.
- Raw water supply pressure: min: 2 bar, max: 6 bar.
- Electrical supply: 415V / 3 phase / 50 Hz / 40 kW connected load.

See the appendices for further details including drawings and photographs.

5.3.3 Work Element 3.3 – Ground Works

Inclusions

- Detailed design work.
- Design, sizing, supply and installation of concrete hard standing incorporating plinths and trenches to facilitate the new containerised steam generation plant and associated fuel tanks.
- Scanning of the area to identify buried services before works commence.
- Design, sizing, supply and installation of fencing to create a secure compound around the fuel tanks.
- Design, sizing, supply and installation of trench works associated with the electrical supply cable to the containerised steam boiler plant.
- Design, sizing, supply and installation of drains associated with the containerised steam boiler plant.
- Removal of all spoil of the above works from site.
- Documentation for the above plant.
- Project management of above works.
- CDM requirements associated with above works.

Design Basis

The new concreted area is to incorporate natural falls to meet the level of adjacent concrete road areas.

The steam generation plant will be contained in a standard 40ft shipping container. It is envisaged that this container will sit on 2 plinths with a recess between to facilitate drain pipework from the steam generation plant. The depth of the recess is to be 300mm.

The operational weight of the steam generation plant is expected to be approx. 15 te.

The LPG tanks are not expected to be on plinths, but a level surface should be provided for them to sit on.

There may be up to 6 x 2,000 Ltr LPG tanks associated with the steam generation plant.

The LPG tank compound fence should incorporate 1 x double gate for access and fuel deliveries and 1 x pedestrian gate for emergency escape.

See the appendices for further details including drawings and photographs.

5.3.4 Work Element 3.4 – Fuel Tank Works

Inclusions

This work package includes:

- Detailed design work.
- Design, sizing, supply, installation and commissioning of fuel tanks and associated fixtures and ancillaries to supply the containerised steam generation plant supplied by work element 3.1.
- Design, sizing, supply, installation and commissioning of pipework to connect the above fuel tanks to the steam generation package tie in point (TP).
- Design, sizing, supply, installation and commissioning of steelwork and supports associated with the above fuel tanks.
- Documentation for the above plant.
- Project management of above works.
- CDM requirements associated with above works.

Design Basis

The fuel type is envisaged to be LPG.

It is envisaged that the steam generation plant will have an installed peak load of approx. 1700 kW thermal. However average demand is only likely to be 150 kW.

Number and size of fuel tanks should be sized to ensure deliveries are required no more than monthly.

Equipment should be incorporated to ensure that deliveries are triggered automatically.

5.3.5 Work Element 3.5 – BMS works

Inclusions

This work package includes:

- Detailed design work.
- Design, sizing, supply, installation and commissioning of all cabling, hardware and software required to connect the interface modem from the containerised steam generation plant to the sites BMS system.
- Design and configuration of status and alarm monitoring screens for the containerised steam generation plant on the site central BMS system.
- Design, sizing, supply, installation and commissioning of all cabling, hardware and software required to connect the steam, fuel and power meters from the steam generation enabling works package to the sites metering interface panel in the BSU building.
- Configuration of the containerised steam generation plant steam, fuel and power meters on the site central metering system.
- Documentation for the above plant.

- Project management of above works.
- CDM requirements associated with above works.

Design Basis

See the appendices for further details including drawings and photographs.

5.3.6 Work Element 3.6 - Principal Designer

The Principal designer will take overall responsibility of ensuring that the different work elements of this work package work correctly when linked.

Main responsibilities are:

- Manage all sub-designers.
- Maintain and issue the health and safety file.
- Overall commissioning of the installed system.
- Provide pre-construction information as required.
- Fulfil obligations required by CDM regulations.

5.3.7 Work Element 3.7 - Principal Contractor

The Principal designer will take overall responsibility of ensuring that the various construction works associated with this work package are co-ordinated and performed safely.

Main responsibilities are:

- Manage all sub-contractors.
- Maintain and issue the construction phase plan.
- Provide pre-construction information as required.
- Deliver tool box talks to all contractors as required.
- Fulfil obligations required by CDM regulations.

6 CDM requirements

This section outlines the CDM specific requirements of each party.

6.1 Client Brief

This scope document forms the client brief.

6.2 Duty Holders

Client

The client is The Pirbright Institute; represented by Iain Paterson and as such will:

- Appoint the principal contractor and designer in writing.
- Take reasonable steps to satisfy themselves that appointees have H&S skills, knowledge and experience.
- Complete HSE notification if required and display the notification at a location all contractors can see it.
- Update HSE notification if required.
- Provide Pre-Construction information as required.
- Ensure a construction phase plan is drawn up before works commence and ensure it is updated throughout the project.
- Ensure a health and safety file is drawn up before works commence and ensure it is updated throughout the project.
- Take reasonable steps to ensure the principal contractor and designer are fulfilling their responsibilities.

Principal Designer

The Principal Designer for each work package is to be confirmed.

The principal designers will:

- Manage all sub-designers.
- Produce a health and safety file and update it throughout the project.
- Provide pre-construction information as required.

Principal Contractor

The Principal Contractor for each work package is to be confirmed.

The Principal contractors will:

- Manage all sub-contractors.
- Produce a construction phase plan and update it throughout the project.
- Provide pre-construction information as required.

6.3 Pre-Construction Information

This scope of works forms the pre-construction information and will be updated and re-issued as appropriate.

6.4 Management Arrangements

Section 4.11 outlines the management arrangements for the project.

6.5 Notification to HSE

If applicable, HSE notification will be done by the client representative.

6.6 Construction Phase Plan

Separate construction phase plans for each work package will be written and issued by the relevant principal contractor. This must be reviewed with the client before any works can begin.

The construction phase plan should include the following sections (relevant sections of this document are also referenced):

- The health and safety aims for the project:
  - See section 4.6 and contractor rules in appendix C.
- The site rules:
  - See section 4.7, 4.8 and contractor rules in appendix D.
- Arrangements to ensure co-operation between project team members:
  - See section 4.11.
- Co-ordination of their work, such as regular site meetings:
  - See section 4.11.
- Arrangements for involving workers
  - See section 4.11.
- Site induction.
  - See section 4.3.
- Welfare facilities.
  - See section 4.7
- Emergency procedures, such as fire and first aid.
  - See section 4.6.
- The control of any of the specific site risks relevant to the.

6.7 Health and Safety File

Each work package should have a health and safety file maintained by the relevant principal designer throughout the project and issued to the client as a standalone document on the completion of works.

It should include the following information:

- Brief Description of the works being carried out.
- Project Risk Assessment.
- Key structural principals.
- Hazardous materials used.
- Information on the future removal of installed plant.
- H&S information about equipment provided for cleaning or maintaining installed plant.
- The nature, location and markings of significant services.
- Information and as built drawings of buildings, plant and equipment.

Appendix A – Drawings

Reference	Title	Version
EM039_DRG_001	Project construction sketch – Existing	1_A
EM039_DRG_002	Project construction sketch – Proposed.	1_A
EM039_DRG_003	Steam Distribution Phase 2 Locations	1_A
EM039_DRG_004	Steam Generation Plant Locations	1_A
EM039_DRG_005	Ash Hot Water Boiler Locations	1_A
EM039_DRG_006	Workshop Hot Water Boiler Locations	1_A
C9749/M09	Ash Building Ventilation Schematic	-
C9749/M10	Ash Building Piped Services	-

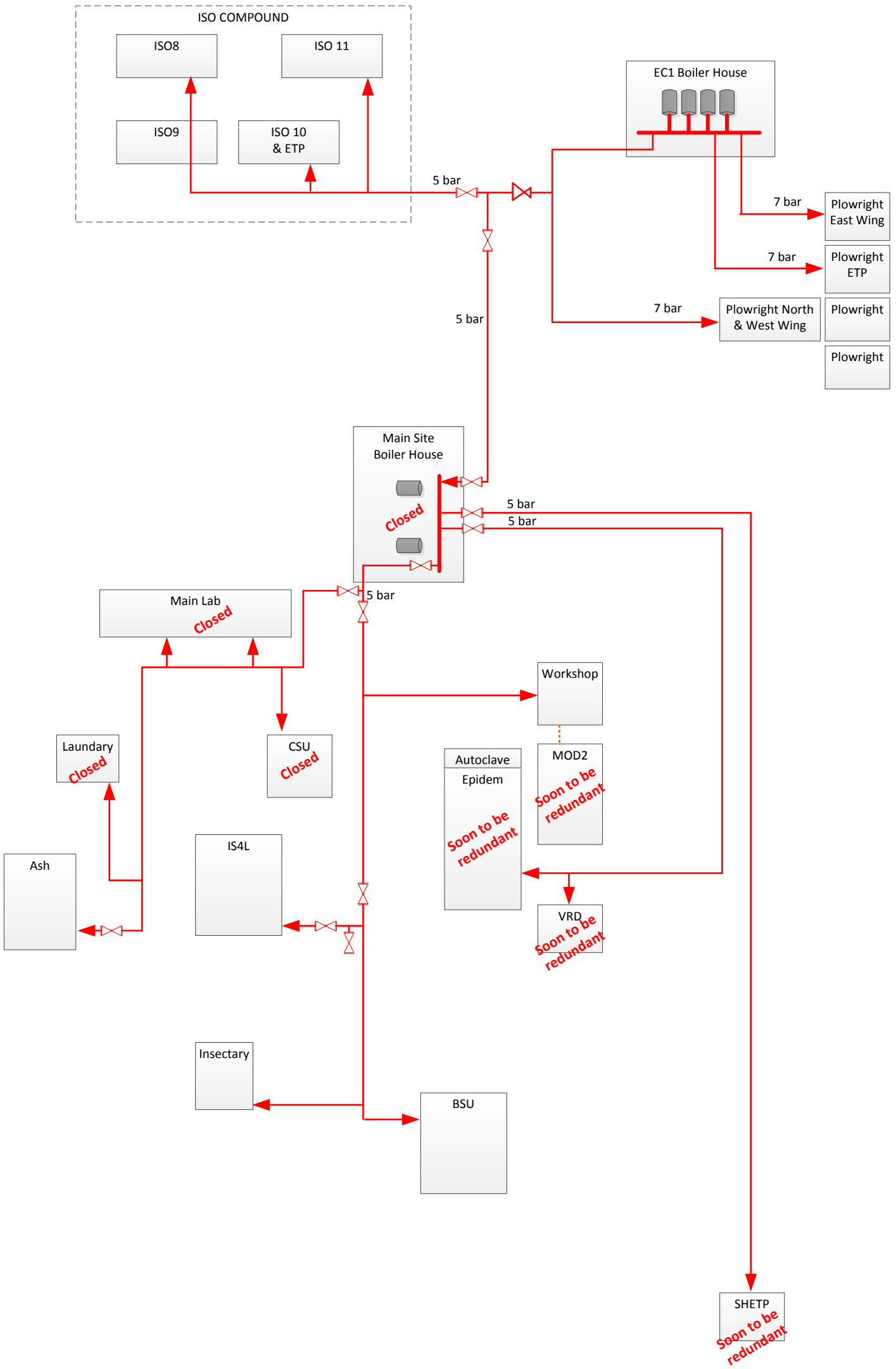
Appendix B – Documents

Reference	Title	Version
E&M-GUIDE-052	Pirbright Institute Contractor Site Rules	2-B
	Location Photos	
	P001 Ash Building Asbestos Report	
	P057 Workshop (formerly CWI) Asbestos report	

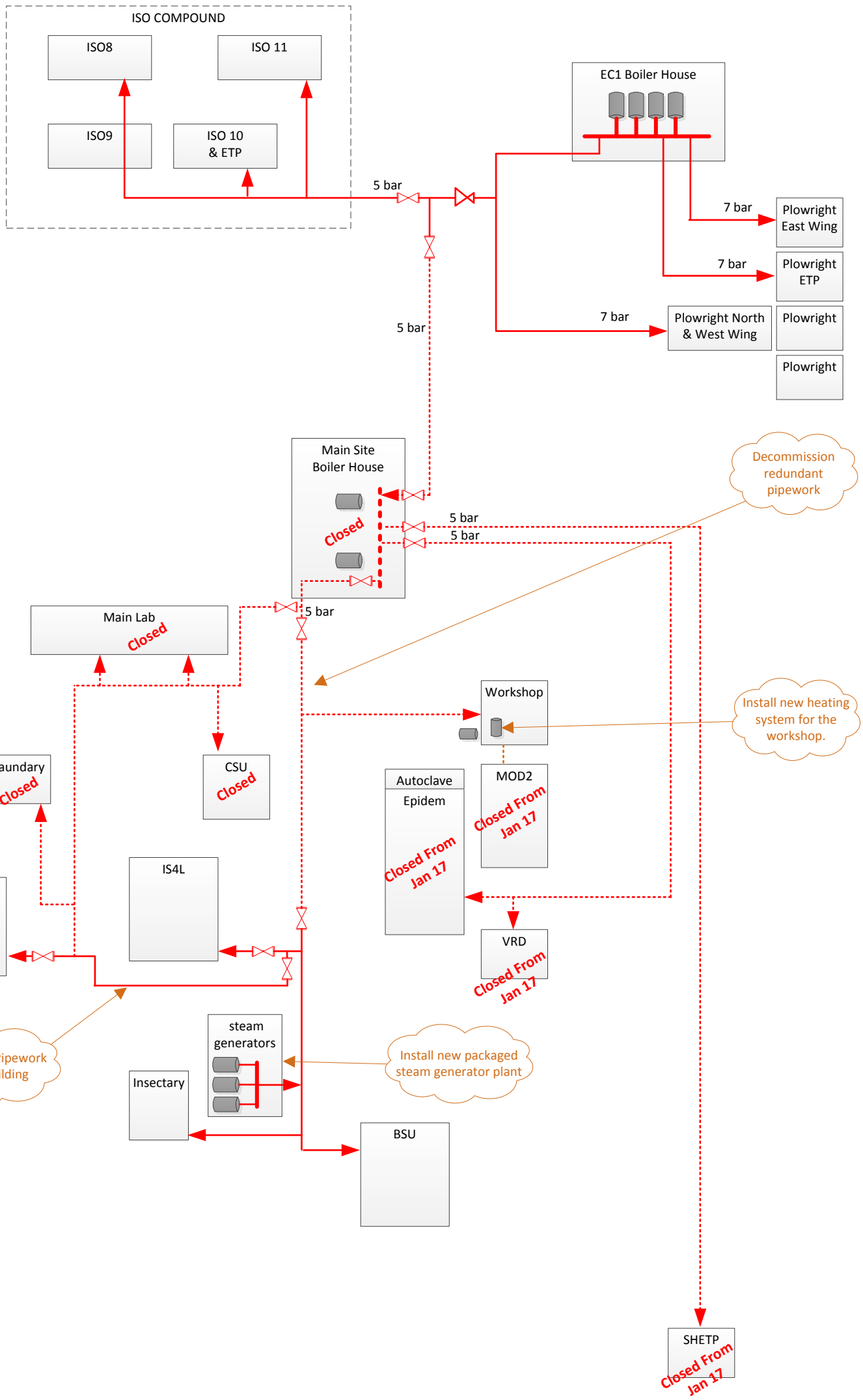
Appendix C – Standards & Specifications

Reference	Title	Version
E&M-STD-004	Pipework Standard 001	2
E&M-STD-005	Pipework Standard 002	1 – A

EM039_DRG_001_1_A_Project Construction Sketch - Existing



EM039_DRG_002_1_A_Project Construction Sketch - Proposed



A+B BLOCK

HV INTAKE

T7

MERIAL LABORATORY

CANTEEN

ASH BLDG

LAUNDRY

MAIN LAB

NEW HOT WATER
BOILER SYSTEM FOR ASH

INSECTARY

IS4L BLDG

CSU

NEW STEAM
GENERATION PLANT

NEW VALVE SET TO DISCONNECT
FROM REDUNDANT STEAM SYSTEM

MAIN SITE
BOILER HOUSE

EPIDEM

BSU

BSU

TIE IN POINT TO EXISTING
STEAM DISTRIBUTION

VRD

MOD 2

WORKSHOP

BMS

SHETP

NEW HOT WATER BOILER SYSTEM
FOR WORKSHOP

Plowright Building

0 5 10 15 20 25 30 35 40 45 50

SCALE (Metres)

NOTES

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LEGEND

- EXISTING STEAM DISTRIBUTION
- SITE BUILDINGS
- NEW PIPEWORK
- STEAM GENERATOR
- DEMOLITION ZONE

revision	description	initials	date
1A	FIRST DRAFT, PHASE 1 SCOPE OF WORKS	IMP	23/06/16

THE Pirbright INSTITUTE

Director:
PROFESSOR JOHN FAZAKERLEY
BSc, MBA, PhD, FSB, FRCPath.

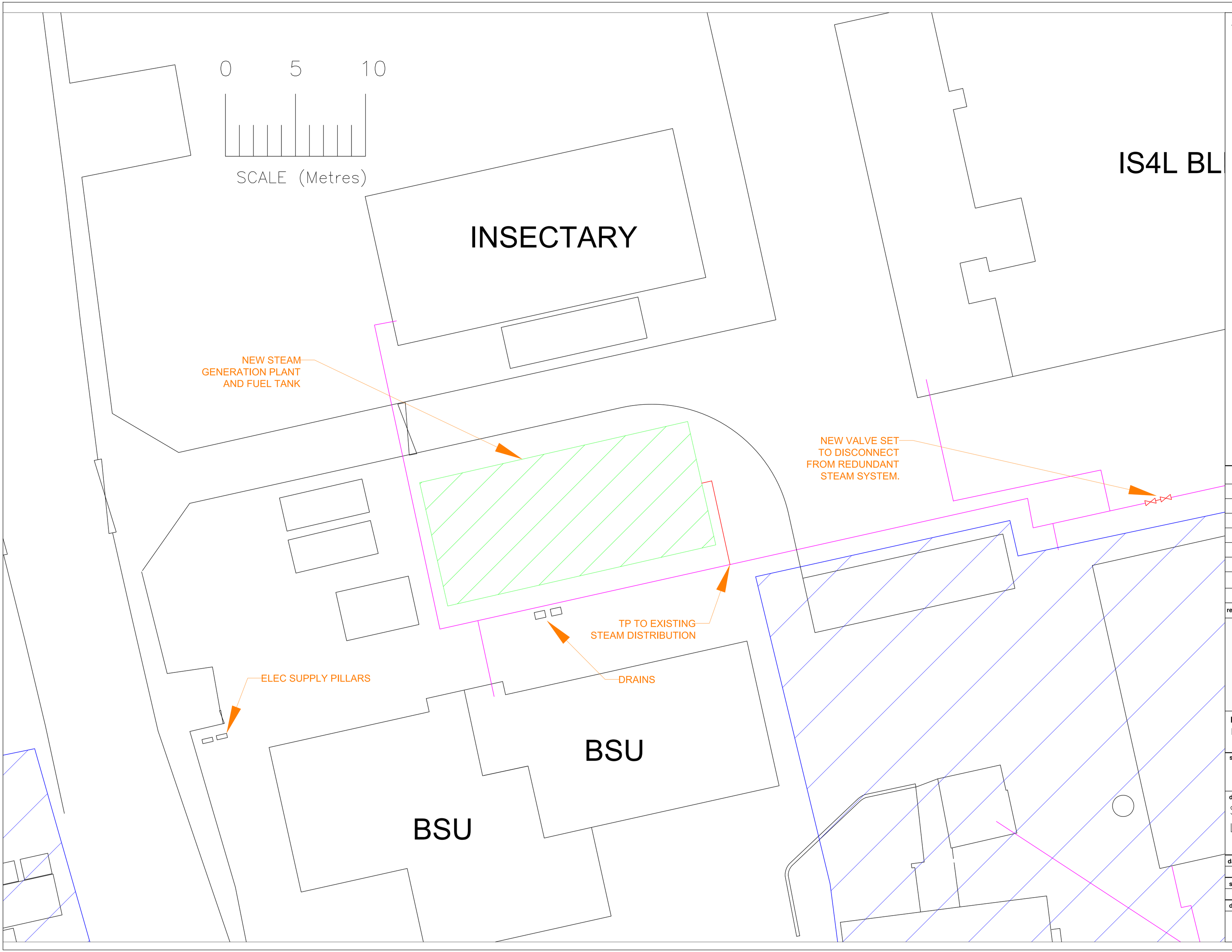
site

THE PIRBRIGHT INSTITUTE

drawing title

STEAM DISTRIBUTION PHASE 2 LOCATIONS

date	drawn
23/06/16	IAIN PATERSON
scale	**checked**
1 : 500	
drawing no	**Version**
EM039_DRG_003	1-A



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LEGEND

- EXISTING STEAM DISTRIBUTION
- SITE BUILDINGS
- NEW PIPEWORK
- STEAM GENERATOR
- DEMOLITION ZONE

revision	description	initials	date
1A	FIRST DRAFT.	IMP	23/06/16

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Project
EM039 - Steam Distribution Phase 2

site
THE PIRBRIGHT INSTITUTE

drawing title
STEAM GENERATION PLANT LOCATIONS

date	drawn
23/06/16	IAIN PATERSON
scale	**checked**
1 : 500	

drawing no	Version
EM039_DRG_004	1-A

ASH BLDG

LAUNDRY

IS4L BL

INSECTARY

APPROX LOCATION OF
NEW FUEL TANKS

NEW HOT WATER BOILER LOCATION
1ST FLOOR PLANT ROOM

0 5 10

SCALE (Metres)

NOTES

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LEGEND

- EXISTING STEAM DISTRIBUTION
- SITE BUILDINGS
- NEW PIPEWORK
- STEAM GENERATOR
- DEMOLITION ZONE

revision	description	initials	date
1A	FIRST DRAFT.	IMP	23/06/16

THE Pirbright INSTITUTE

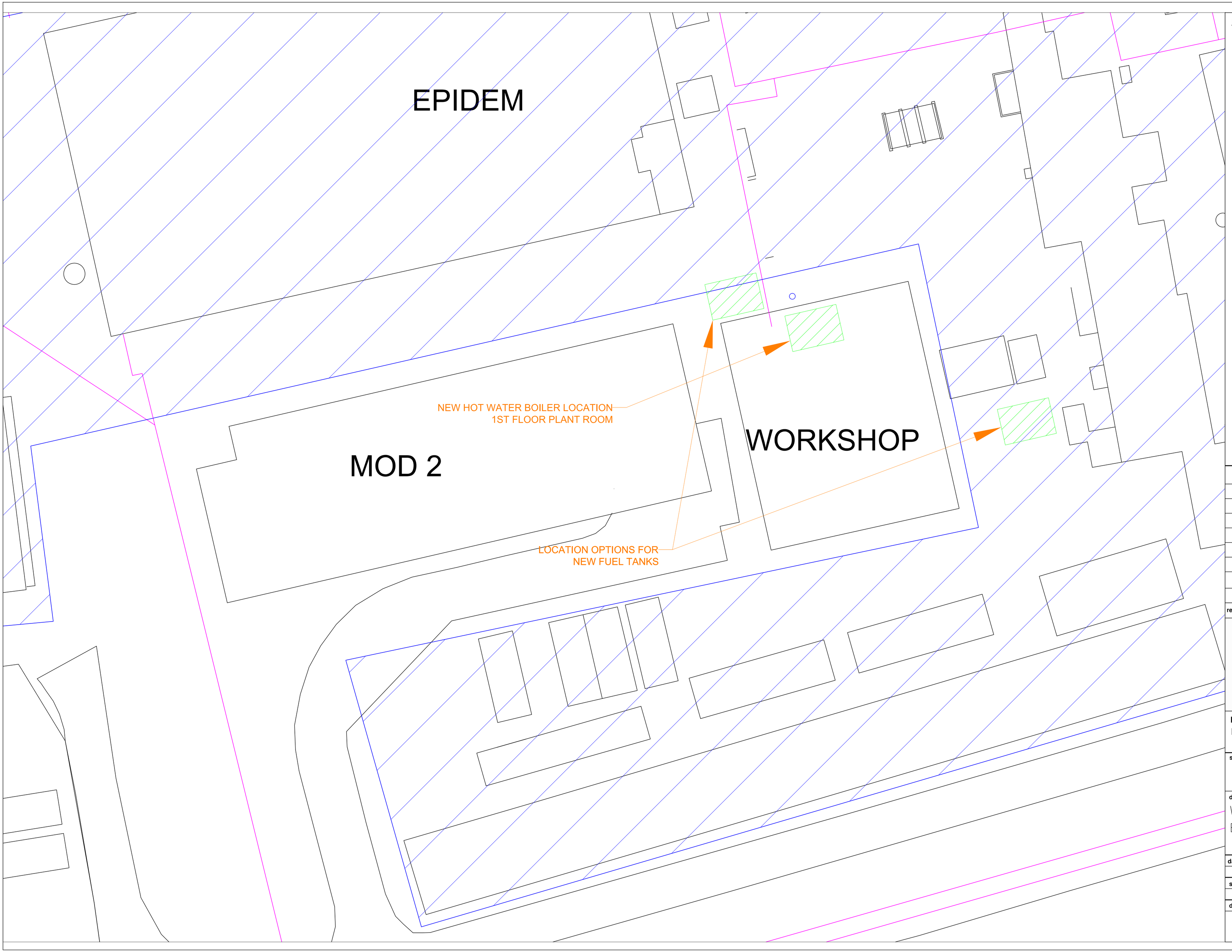
Project
EM039 - Steam Distribution Phase 2

site
THE PIRBRIGHT INSTITUTE

drawing title
ASH HOT WATER BOILER LOCATIONS

date	drawn
23/06/16	IAIN PATERSON
scale	**checked**
1 : 500	

drawing no	Version
EM039_DRG_005	1-A



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LEGEND

- EXISTING STEAM DISTRIBUTION
- SITE BUILDINGS
- NEW PIPEWORK
- STEAM GENERATOR
- DEMOLITION ZONE

revision	description	initials	date
1A	FIRST DRAFT.	IMP	23/06/16

THE Pirbright INSTITUTE

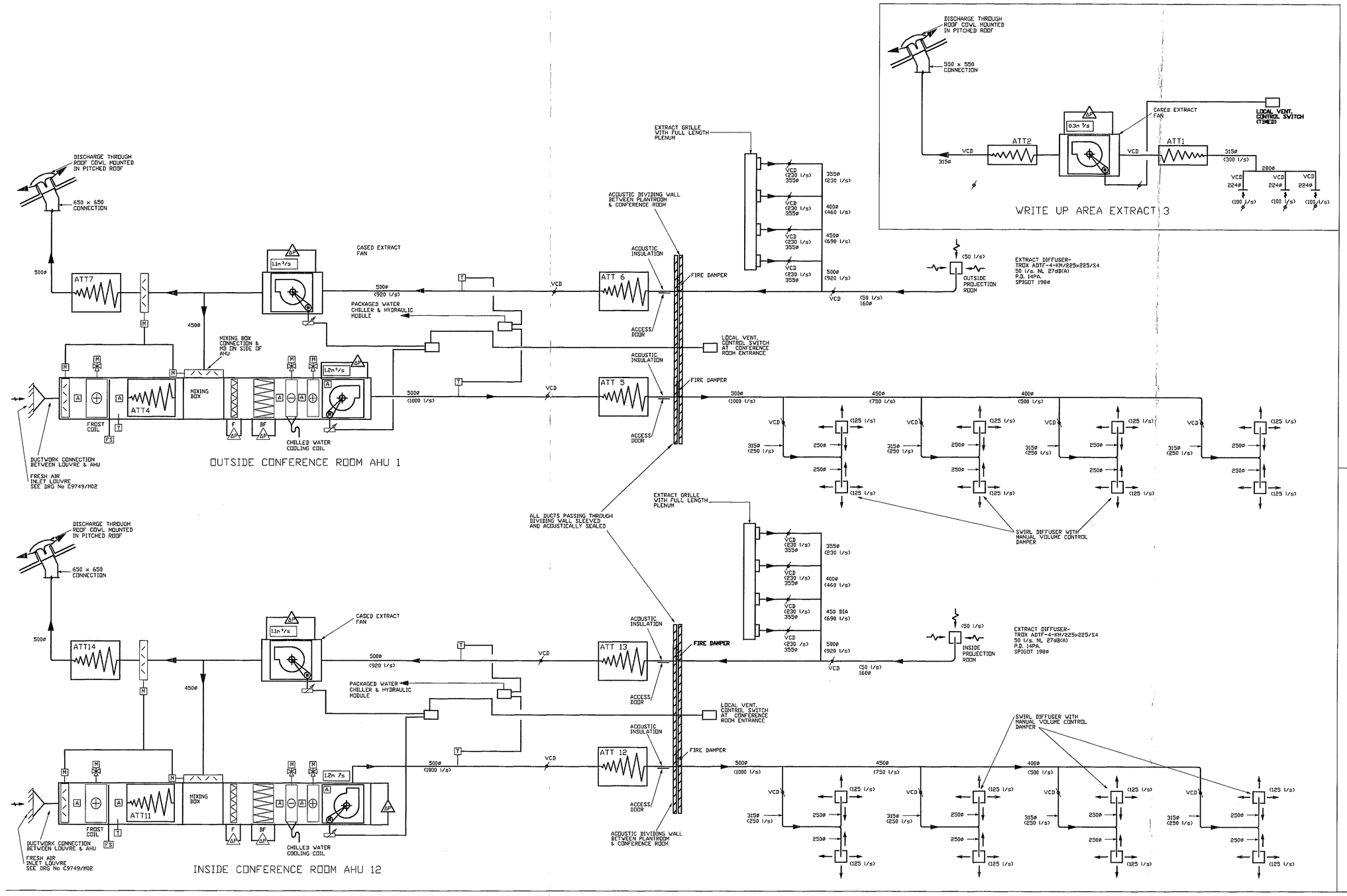
Project
EM039 - Steam Distribution Phase 2

site
THE PIRBRIGHT INSTITUTE

drawing title
WORKSHOP HOT WATER BOILER LOCATIONS

date	drawn
23/06/16	IAIN PATERSON
scale	**checked**
1 : 500	

drawing no	Version
EM039_DRG_006	1-A



SPEED CONTROLLER (INVERTER)
VCD VOLUME CONTROL DAMPER
DIFFERENTIAL PRESSURE SENSOR
M MOTORISED DAMPER/VALVE
T TEMPERATURE SENSOR
FS FROST SENSOR
F PRE-FILTER
BF BAG FILTER
A ACCESS
FD/AP FIRE DAMPER & ACCESS PANEL
DVP DUCT VELOCITY PROBE
CONDENSE DRAINS

NOTES:

ALL FLOW RATES GIVEN ARE DESIGN FIGURES. FOR ACTUAL FROW RATES PLEASE REFER TO COMMISSIONING FIGURES.

ALL FIRE DAMPERS ARE COMPLETE WITH ACCESS PANEL ADJACENT.

Rev	Date	Revisions

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Job Title
INSTITUTE FOR ANIMAL HEALTH
PHASE - 4
PIRBRIGHT, WOKING

Drawing Title
VENTILATION SCHEMATIC

SCALE	DRAWN BY
N.T.S.	CAD JC
DATE	CHECKED
JUNE 98	

Drg No. C9749/M09

RECORD DRAWING

AMBIENT SENSOR INBUILT INTO CHILLER PACKAGE. SET AT 8°C TO ACTIVATE ANTI-FROST HEATER IN THE HYDRAULIC MODULE BUFFER VESSEL TO AVOID FREEZING DOWN TO -9°C

415V/50Hz/3PHASE ELECTRICAL SUPPLY
BMS INTERFACE
INTERLOCK FROM PRESSURISATION UNIT
ELECTRICAL PANEL
FLEXIBLE CONNECTION
PACKAGED CENTRIFUGAL FAN AIR COOLED WATER CHILLER
DESIGN COOLING CAPACITY 642 kW
DESIGN AMBIENT TEMP 38°c
CHILLER ENT/LEAV TEMPS 12/6 C
CHILLER FLOW RATE 256 l/sec
FLEXIBLE CONNECTION
EVAPORATOR
4No ANTI-VIBRATION PADS BY CHILLER MANUFACTURER
CORE CABLE
500LITRE BUFFER VESSEL
VENT
SEPARATOR
54F
54 FLOW
42 FLOW AND RETURN
INSIDE CONFERENCE ROOM AHU COOLING COIL
42 FLOW AND RETURN
OUTSIDE CONFERENCE ROOM AHU COOLING COIL
54 RETURN
PACKAGED HYDAULIC MODULE
3 BAR SAFETY VESSEL
25 LITRES EXPANSION VESSEL
300 LITRES WATER STORAGE TANK
3.5 LITRES DOSING POT
ELECTRIC ANTI-FREEZE HEATER
CIRCULATING PUMP
SV DRAIN TO DISCHARGE OVER NEAREST FLOOR GULLEY
15mm DRAIN TO DISCHARGE OVER NEAREST FLOOR GULLEY
15CF FROM PRESS UNIT

CHILLED WATER SCHEMATIC

(ALL CHILLED WATER PIPEWORK TO BE COPPER)

CHILLED WATER SYSTEM PRESSURISATION UNIT
15 MWS
EXP. VESSEL
DCVA
QUICK FILL CONN.

TYPICAL COOLING COIL PIPING ARRANGEMENT.

ALL HEATER BATTERIES TO HAVE FOLLOWING TYPICAL 3 WAY VALVE ARRANGEMENT.

TYPICAL TRAP SET (TS)
STEAM
CONDENSATE
IV NRV
SC ST

67 HWS OPEN VENTS RISE TO ABOVE FLOOD LEVEL OF TANKS & DISCHARGE INTO COLLECTION CISTERN
TANK OVERFLOW/HWS OPEN VENT COLLECTION CISTERN
50mm DELAYED ACTION BALL VALVES
100 OVER FLOW
25 WARNING PIPE
DRAIN VALVE
100 DISCHARGE PIPE TO LL OUTSIDE GROUND LEVEL
COLD WATER STORAGE TANK 24,000 LITRES CAPACITY 4,000mm H x 3900mm W x 3300mm D WITH CENTRAL DIVISION PLATE TO FORM TWO COMPARTMENTS EACH 3900mm L x 2000mm W x 2000mm D.
67 CF
67 CWDS

REHEAT
40 HTG F&R
INSIDE CONFERENCE ROOM AHU
FROST
25 HTG F&R
50 HTG F&R
65 HTG F&R
80 HTG F
80 HTG R
OUTSIDE CONFERENCE ROOM AHU
CHANGING ROOM/ SHOWER AHU

LTHW HEATING PRESSURISATION UNIT
15 MWS
EXP. VESSEL
DCVA
QUICK FILL CONN.

100 F
80 F
80 CONST TEMP HTG F
CT HTG. PUMP SET
PRIMARY HEATING CIRCULATING PUMPS
SEPARATOR/ DEACRATOR LOCATED AT HIGH POINT OF PIPEWORK
HEATING CHEMICAL DOSING POT
TO DRAIN
OUTSIDE SENSOR
CONTROLLER
COMP. HTG PUMP SET
50 F
50 COMP. HTG F
50 COMP. HTG R
BY-PASS
OFFICES COMPENSTED HEATING RADIATOR SYSTEM
LPHW PERIMETER HEATING TO OFFICE AREA. ALL HEAT EMITTERS TO HAVE LOCAL THERMOSTATIC CONTROL VALVES
AUTOMATIC PRESSURE DIFFERENTIAL REGULATION VALVE (REF A3)
COMP. HTG PUMP SET (24 HOURS)
40 COMP HTG F
40 COMP. HTG R
CHANGING AREA COMPENSTED HEATING RADIATOR SYSTEM (24 HOURS)
AUTOMATIC PRESSURE DIFFERENTIAL REGULATION VALVE (REF E3)
80 CONST.TEMP HTG R
67 OPEN VENT
67 DV
67 HWS CF
67 HWS F
42 HWS R
42 HWS F
NRV
HWS SEC PUMP
SPARE PUMP ON LOCAL BRACKET
67 CWBS
SHOWER AREA
OFFICE AREA
15 MWS TO LTHW & CHW PRESSURISATION UNITS
15 TO TEA POINT FIRST FLOOR
WATER CONDITIONER (67 CONN.)
HOT & COLD WATER SUPPLY TO CHANGING/ SHOWER AREAS & GROUND & 1st FLOOR TOILET AREAS
WATER METER (76)
76 HWS FROM SITE RING MAIN
15 TO FIRST AID ROOM (TRACE HEATED EXTERNALLY)

CAPILLARY TUBE
50 STEAM
100 HTG F
HTG CALORIFIER NO1 355kW
32 SV
CONDENSATE COOLER NO1
42 COND R
100% DUTY /STANDBY (EACH)
100 STEAM
100 FLOW HEADER
100 RETURN HEADER
100 HTG R
(7.71) CVS
HTG CALORIFIER NO2 355kW
CONDENSATE COOLER NO2
65 STEAM
100 MAIN HEADER
80 R
40 R
CVS (1.56)
CVS (4.93)
CVS (0.94)
50 CAPPED 1V AT LOW POINT FOR FILLING, FLUSHING DRAINAGE ETC

CONDITIONING UNIT
100 S
EXISTING PACKAGE CONDENSATE RECEIVER & PUMPING UNIT LOCATED EXTERNAL TO THE BUILDING
54 COND R
GRAVITY CONDENSATE FROM ADMIN BUILDING
EXISTING 67 PUMPED CONDENSATE FROM RHONE MERIEUX
VENT
DRAIN
LOCAL VALKVAY GRAVITY CONDENSATE RETURN (EXISTING)
D/F
CONDR
NEW 100 STEAM FROM VALKVAY MAINS
EXISTING STEAM & PUMPED CONDENSATE TO & FROM SITE RING MAINS
EXISTING 1V ON VALKVAY MAIN
VALKVAY MAINS

50 STEAM
42 CONDENSATE
65 STEAM
35 C
END OF LINE TRAP SET WITH BALANCE PRESSURE AIR VENT
STEAM TRAP MONITOR

HWS CALORIFIER NO1 (24 hrs)
HWS CALORIFIER NO2 (24 hrs)
SHUNT PUMP & LOOP IS PART OF CALORIFIER PACKAGE
50% DUTY (EACH)

LEGEND

AV	AIR VENT
SC	STOP COCK
IV	ISOLATING VALVE
DRV	DOUBLE REGULATING VALVE
CVS	COMMISSIONING VALVE STN
NRV	NON RETURN VALVE
DCVA	DOUBLE CHECK VALVE
ST	STRAINER
(P)	PRESSURE GAUGE WITH IV
P	PRESSURE SENSOR
(T)	TEMPERATURE GAUGE
T	TEMPERATURE SENSOR
TP	TEST POINT (BINDER)
	3 PORT MIXING VALVE
	2 PORT MOTORISED VALVE
FS	FLOW SWITCH
	SENSING CHAMBER
TRS	STEAM TRAP
	PRESSURE DIFFERENTIAL SWITCH WITH IV
MV	MOTORISED VALVE
VB	VACUUM BREAKER
SV	SAFETY VALVE
DDC	DRAIN OFF CONNECTION
M	FLOW METER
S	STEAM SEPARATOR
	STEAM P.R.V
SV	SOLENOID VALVE
TS	TRAP SET
CF	COLD FEED
CWDS	COLD WATER DOWN SERVICE
DW	DRINKING WATER
	PRESSURE REGULATING VALVE
(5.0)	FLOW RATE IN kg/s

PLEASE NOTE ALL FLOW FIGURES GIVEN ARE DESIGN FIGURES. PLEASE REFER TO COMMISSIONING REPORTS FOR ACTUAL FIGURES.

Rev	Date	Revisions
A	AUG 98	ZBP COMMENTS INCORPORATED

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Job Title
INSTITUTE FOR ANIMAL HEALTH
PHASE - 4
PIRBRIGHT, WOKING

Drawing Title
PIPED SERVICES SCHEMATIC

SCALE	DRAWN BY
N.T.S.	CAD JC
DATE	CHECKED
JUNE 98	

Dwg No. C9749/M10

RECORD DRAWING

Site Rules for Contractors

Introduction and Definitions

Introductory Statement

The Pirbright Institute has a statutory and moral duty to ensure, so far as is reasonably practicable, the health and safety at work of all its staff and to ensure that activities undertaken by the Institute and those it employs, do not endanger others.

The Pirbright Institute's Estates and Facilities Department recognises these duties and also that specific arrangements will have to be made from time to time to cater for special risks, either of a permanent or temporary nature. In view of the many and varied activities carried out by Contractors on the Institute premises, these site rules have been introduced to ensure the safety of the staff, students, Contractors and any other visitors on site.

The Pirbright Institute will as far is as reasonably practicable ensure that all Contractors engaged to carry out work are competent and will encourage good safety practices. The Institute will plan, co-ordinate, control and monitor the activities of Contractors to minimise the risks presented to staff, students, Contractors, and other persons on site.

All Contractors are required to observe the procedures laid down in these site rules and to ensure that their supervisors and employees on site are familiar with its contents. In addition, Contractors are required to sign a declaration to say they have read the document and agree to abide by this requirement and return it to the Estates and Facilities Department (or their Contractor Host) before any work commences.

Purpose of the Site Rules

These rules have been prepared to assist Contractors and their employees to work safely and to prevent accidents and injuries to them and to Pirbright Institute staff, students and visitors to site. It also aims at assisting Contractors in complying with the Health and Safety at Work Act 1974 and any subsidiary regulations and other statutory provisions.

All Contractors working on Institute premises must conform to the provisions of these site rules. The site rules do not in any way relieve the Contractors of their legal or contractual obligations. All Contractors and their employees should be conversant with the Safety and Biosecurity Rules of the Department or Area in which they are working and the Contractor's senior on-site representative is responsible for ensuring that this is so.

In any case of doubt regarding the application of the site rules, or in any way circumstances affecting safe working not covered by the site rules, advice should be sought from the Contractor's Contractor Host, from whom additional copies of the site rules may be obtained and clarification given.

Definitions and Abbreviations

'Institute' The Pirbright Institute, Pirbright Laboratory, Ash Road, Pirbright & The Pirbright Institute Compton Laboratory, Compton.

The 'Contractor Host' is any nominated person within the Pirbright Institute acting on its behalf, who has arranged for the Contractor(s) to attend site to carry out activities; is responsible for the coordination of their activities whilst on site.

The 'Contractor' where used in this document, should be taken to include the Contractor's employees and those of any engaged sub-contractor.

'Normal working hours – Monday to Thursday, 8.30am – 5.00pm Friday 8.30am – 4.30pm

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Registered Office: Pirbright, Surrey GU24 0NF. Charity Commission Reference Number 228824

Appointment and Insurance

Appointment of Contractors

The Contractor **must** inform the Pirbright Institute of the intention to use sub-contracted staff prior to work being undertaken.

The Contractor **must** ensure any sub-contracted staff comply with the requirements set out in this document and all other Institute Policies and SOPs that are relevant to the work being undertaken.

It is the Contractor's responsibility to ensure that any individual employed to work on their behalf fully understands and adheres to the standards set out in this document. The Contractor must ensure that any such individuals are aware of the nature and scope of the work and that they are competent to undertake such work.

Institute Policies and Procedures

The Institute has a number of policies and procedures that must be adhered to when working on Institute premises, the following is not an exhaustive list of procedures which may apply:

- BSEC-REG-02: Pirbright Institute Biorisk Overview.
- BSEC-REG-04: Access Control at the Pirbright Institute Laboratory
- BSEC-Reg-06: Procedure for the transfer of equipment, tools and effects into and out of the Restricted Area with special Reference to visiting Equipment Engineers.
- BSEC-Reg-10: Quarantine rules following entry to the Pirbright site.

The Contractor must ensure any sub-contracted staff comply with the requirements set out in these documents and any other Institute Policies and SOPs that are relevant to the work being undertaken, if you are unsure as to which may apply speak to your Contractor Host.

Insurance Requirements

It is the policy of the Pirbright Institute to maintain a high standard of health and safety in all of its undertakings; Part of these procedures we require all Contractors carrying out work on our premises to comply with both statutory requirements and the Code of Practice contained herein.

The Pirbright Institute insist that Contractors working on any of our premises must have the following insurance in place as a minimum requirement:

- Employers Liability (minimum limit of £5 million is required by law)
- Public/Products Liability (with a minimum limit of £5 million)
- Contractors All Risks Insurance (where applicable)

Copies of insurance certificates are required by the Estates and Facilities Department Office before Contractors are allowed to work on site.

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Planning and Risk Management

Planning

The scope of work to be undertaken by the Contractor should be clearly defined. Should there be any doubt as to the scope of work clarification should be sought from your Contractor Host prior to starting work.

The Contractor is required to conduct & provide relevant risk assessments and method statements for all jobs to be undertaken, these to be submitted to their Contractor Host at least 5 working days prior to commencement of the job. A Safe System of Work is also required for activities which present a significant hazard and a more detailed assessment is required. It is the Contractor's responsibility to ensure that a Safe System of Work is followed at all times.

If the Contractor considers, at any stage, that any work is necessary out of normal working hours then sufficient notice of this must be provided to their Contractor Host for agreement of the arrangements.

The following activities need authorisation, which may be in the form of a formal permit to work, issued to the Contractor from their Contractor Host:-

- Work at height;
- Entry into any confined space;
- Hot work i.e. work involving the potential of fire e.g. welding, cutting, grinding etc;
- The Erection and striking of scaffolds of scaffolds, fixed or Mobile;
- Work involving any excavation or creation of opening; A proven and suitable method of scanning the ground for services must be undertaken prior to digging taking place and excavations must be shored if the ground is considered unstable. The excavation must be risk assessed on a continuous basis.
- Work involving the use of highly flammable liquids or gases or the use of gas cylinders;
- Work involving the use of any toxic or carcinogenic substance, any biological agent or larger volumes of any substance hazardous to health or where there is significant risk to health;
- Live electrical work;
- Work involving the removal of any safeguarding system from any machine or work equipment;
- Work involving or likely to involve the disturbance of asbestos;
- Work likely to involve high noise levels;
- Work involving mechanical lifting equipment or
- Work in any laboratory or laboratory area
- Work in any restricted area
- Work on any bio-containment system

No live working on electrical system permitted, the exception to this will be fault finding by those who have received suitable training and are qualified to do this. No single person working on live system.

If the Contractor is in any doubt as to whether any of the above are applicable this must be discussed with their Contractor Host.

Risk Management

The Contractor must ensure there are effective arrangements for safeguarding staff, students, sub-contractors, suppliers and visitors. This will include carrying out a suitable and sufficient risk assessment and if significant, a copy given to the Contractor Host.

A sub-contractor must not sub-contract anything out without informing the original Contractor.

Dust

The Contractor must take all reasonable precautions to limit and contain dust when working inside buildings.

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Asbestos

The Pirbright Institute has taken a number of steps to ensure that Contractors will not encounter asbestos this includes:
The labelling of Asbestos Containing Materials in certain areas.

An Asbestos Register available in electronic and hard copy format.

A signing procedure indicating the Asbestos register has been checked.

However the possibility may arise where Contractors unexpectedly encounter material they suspect to be asbestos: they should stop work immediately and inform their Contractor Host for further guidance before work can continue.
Prior to any construction work being undertaken and if the building is on the Asbestos register then a pre-construction survey will be undertaken.

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Statutory Duties & Services

Statutory Duties

All Contractors must carry out their works in accordance with the appropriate legislation.

The following is not an exhaustive list of the legislation which may apply:

- Health and Safety at Work Act 1974
- Electricity at Work Regulations 1989 (and IEE Code of Practice)
- Workplace, (Health, Safety and Welfare) Regulations 1992
- Provision and Use of Work Equipment Regulations 1998
- Lifting Operations and Lifting Equipment Regulations 1998
- Control of Substances Hazardous to Health Regulations 2002 (COSHH)
- Working at Height Regulations 2005
- Control of Asbestos Regulations 2012
- Management of Health and Safety at Work regulation 1999 (amended 2006)

Services

Services such as electrical systems, compressed air systems, water, drainage, industrial gasses, air or ventilation systems, air conditioning, BMS, fire alarm, air pressure alarm systems, access control systems must not be interrupted without the prior permission of the Contractor Host.

All work must be carried out to a programme agreed by the Estates and Facilities Department trained and authorised personnel.

Appropriate Regulations and Codes of Practice (especially for gas and electricity) must be followed.

Use of live Institute services shall be allowed by the Contractor only by prior written agreement from their Contractor Host.

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Tools & Equipment

Tools and Equipment

All tools and equipment necessary for the contract will be provided by the Contractor. No Institute plant, equipment, or apparatus shall be borrowed by the Contractor unless there is written approval from their Contractor Host.

The Contractor's tools and equipment must be in good condition and appropriate for the job.

It shall be the Contractor's responsibility to ensure that all personnel who use any tools or equipment are adequately trained and competent.

The Contractor's tools and equipment must be kept secure at all times and not loaned to any Institute employees or students.

The Institute accepts no responsibility for the safe keeping of or the loan or damage to, any tools or equipment of the Contractor.

Ladders and other Access Equipment

All such work must comply with standards laid down in the Working at Height Regulations 2005 and any current HSE Guidance Notes. Unsecured ladders should only be used for inspection purposes and footed at all times.

All gangways and working platforms must be properly protected.

The Contractor should ensure that their ladders and stepladders are regularly inspected, properly secured / footed when in use and be Industrial Class 1 (Heavy Duty Type).

Electrical Equipment and Working

Use of live Institute services shall be allowed by the Contractor only by prior written agreement from their Contractor Host

All electrical work to be undertaken by the Contractor will be carried out by qualified Electricians in accordance with the IEE and Statutory Regulations.

It is a requirement that portable electrical hand tools to be used by the Contractor shall be rated at 110 volts or below, and supplied from a transformer which will have a centre tap to earth.

All electrical cables and equipment must be in good condition, and must be inspected regularly by the Contractor to ensure that defective or damaged equipment is repaired or replaced.

The Contractor should ensure that cables are protected from accidental damage, especially when they extend beyond the immediate work site, and must not present a hazard to pedestrians or vehicles.

The Contractor should ensure that all lights are switched off whenever the area is vacated unless health and safety is compromised.

Any other electrical equipment that is used by the Contractor must be switched off if possible whenever the area is vacated.

Electrical equipment brought to site for use must be supported by the relevant certification.

Test certification shall be provided for all electrical installations.

UNCONTROLLED IF PRINTED

Approved by: Paul Embleton
(See Q Pulse record for full Approval List)

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PPE & Site Housekeeping

Personal Protective Equipment (PPE)

The Contractor is responsible for providing its own employees with personal protective equipment (PPE) as may be required for the work in hand, for example, eye protection, head protection, respirators and breathing apparatus, etc.

The Contractor must also ensure that if a type of PPE is described as a control measure in any risk assessment that the person/s undertaking the work wear the PPE at all times.

The Institute will provide any specialist equipment that may be required when working in specific areas, for example, lab coats, disposable gloves when working in a laboratory area.

All Contractors will be required to wear high visibility jackets whilst working on Institute sites or suitable high visibility equipment for the working location.

Site Housekeeping

If any goods are to be delivered to the Institute for the Contractor's use, then prior warning must be given to the Contractor's Contractor Host. Goods should state the Institute contract order number, the Contractor's name and their Contractor Host.

It is the Contractors sole responsibility to ensure that materials and equipment are safely, securely, and neatly stored while on site. In no cases must they block gangways, roadways or exits.

All equipment and materials used at the Institute must conform to the relevant British Standard and be installed according to the manufacturer's instructions.

Breakages of glass e.g. windows or light bulbs/fluorescent tubes must be reported promptly to their Contractor Host.

Building work: Prior to commencement of any work which generates building dust, and or liquid waste, an assessment must be carried out by the Contractor, their Contractor Host and area user representative or member of the Health and Safety Department, to determine the potential contamination risk and suitable working practices agreed with the Contractor in writing.

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Site Housekeeping, Waste & Pollution Prevention

Waste and Pollution Prevention

No harmful or polluting substances may be discharged into the drains or unsurfaced ground. In the event that contamination does occur, the Contractor's Contractor Host and the Institute Environmental Advisor must be informed immediately.

Where a project or activity presents a risk of pollution, the Contractor must show that risk has been mitigated via a risk assessment. If liquids for example paints, oils or petrol are being used spill kits must be provided and a means of safe disposal identified.

Plant such as generators or pumps which are fuel driven must be bunded or have a built in bund system.

Disposal of waste is the responsibility of the Contractor. The Contractor is not permitted to use any Institute bins or skips for the disposal of waste associated with the project or activity, unless written authorisation is received from the Contractor's Contractor Host.

If working in containment then the waste generated must be clearly segregated and bagged accordingly, the Institute will arrange the necessary treatment of this waste once the work is completed or during the works if the project is extensive.

It is the Contractor's responsibility, under the Environmental Protection Act 1990, to ensure that your waste is:

- handed to a licensed waste carrier;
- accompanied by a waste transfer note
- disposed of at a licensed or exempt recycling/transfer facility or landfill.

Where a project or activity produces Hazardous Waste as defined by the Hazardous Waste Regulations, 2005 it is the responsibility of the Contractor to dispose of the waste. The Contractor will identify the appropriate SIC code as producer and request the Institute premise code from the Environmental Advisor prior to disposal. A hazardous waste consignment note must be completed when handing waste to a carrier. Copies of all waste handling paperwork to be given to TPI host on completion for audit records.

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Facilities, Hygiene and Conduct

Site Facilities

Welfare facilities may be available for Contractor use. The Contractors Contractor Host will inform the Contractor of their location. These facilities must be respected at all times; no dirty clothing to be worn at any time! Further to this, the facilities must be left in a clean condition after use.

Temporary or portable buildings for use by the Contractor will only be allowed by prior written agreement with their Contractor Host. Mains services will not normally be provided.

The Contractor must at all times comply with Institute notices and statutory signage.

Personal Hygiene

The Contractor must follow Institute procedures with regards to hygiene; in particular when working in laboratory areas, hands must be washed prior to leaving the area.

Smoking is not permitted on the Institute Premises except in specially designated areas.

Food and drink must never be taken into work areas, and must only be consumed in the canteen area or site welfare cabins.

No alcoholic drinks are to be consumed or brought onto the Institute premises.

Conduct

The Contractor must ensure that their employees behave in a courteous manner when working on Institute premises. Bad language, unnecessarily raised voices and language or behaviour that could be offensive on the grounds of age, physical appearance, gender, sexuality, disability, ethnicity or religion are all forbidden.

Care should be taken to ensure that access routes, **for example dropped kerb, needed for disabled access and egress are not blocked by vehicles, skips, plant or materials.**

Radios or other media devices are not permitted on site.

Examples of unacceptable conduct are:

- verbal abuse, or insulting behaviour
- sexist jokes, racist jokes, jokes about an individual's sexual orientation or jokes about disability
- unwanted physical contact ranging from touching to serious assault
- display or circulation of sexually suggestive or racially abusive material
- bullying, coercive or menacing behaviour
- ridicule or exclusion of an individual for cultural or religious differences
- obscene slogans on T-shirts

Any Contractor who causes offence by his/her actions or creates an unsafe situation may be prohibited from the Institute estate and may be required to leave immediately when instructed by the Contractor Host or a member of the Estates and Facilities Department.

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Incidents, Accidents & Vehicles on Site

Incidents and Accidents

The Contractor must ensure all accidents, however minor, are reported to their Contractor Host immediately. Further to this if the accident is serious it must be reported to the Institute Security staff located at the Security Gatehouse at each site; either by radio, telephoning 1000 from an Institute telephone or 01483 231200 from a mobile phone, if on the Pirbright Laboratory Site; or if on the Compton Laboratory Site either by radio, telephoning 2600 from an Institute telephone or 01635 579375 from a mobile phone; as per the Institute Emergency procedures.

This report does not, however, remove the Contractor's legal obligations to report relevant accidents or incidents to the Enforcing Authorities, as required by the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013

First Aid boxes are available in a number of locations for emergency use. A number of personnel with a current First Aid certificate have access to the First Aid Boxes - their names are displayed in prominent locations.

However, where work is carried out on a site, it is the Contractor's responsibility to provide First Aid boxes and where applicable suitably trained personnel as identified by the Contractor's First Aid Assessment.

Vehicles on Site

Driving of any vehicles by the Contractor on Institute premises shall be undertaken with due care and attention and within the speed limits as indicated, following all direction signs. The Contractor shall be considerate to other road users, and particular care should be taken with regards to pedestrians on site who should be given priority at all times and in particular at marked crossing points.

Vehicles belonging to the Contractor shall be parked in the designated parking bays, exceptions shall be for loading/unloading and arranged with your Contractor Host. No vehicle shall be left unattended whilst unloading/loading.

The Contractor must ensure that fire exits are kept clear at all times!

When reversing, the Contractor must ensure all large goods vehicles and plant are watched by and under the control of a banksman.

It is not permitted to use a mobile phone whilst driving a vehicle on Institute premises.

Any incidents involving damage by the Contractor to property or causing injury no matter how minor must be reported to the Institute Security Staff and their Contractor Host as soon as practicable after the event.

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Fire and Fire Alarm System

Fire and Fire Alarm System

The Contractor must make themselves fully aware of and adhere to, the fire and evacuation procedures in operation within the Institute.

It is the Contractor's responsibility to satisfy themselves that their work creates no fire or explosion risk.

Fire doors and smoke stop doors may only be propped or wedged open by the Contractor for the immediate passage of plant and materials and with personnel in attendance to close if necessary. Under no circumstances are fire doors to be permanently wedged open.

Where it is intended to carry out any work on any exit route, the Contractor must inform their Contractor Host in advance, and gain approval before commencement.

Where Contractor's work requires breaking fire separation, particularly in occupied buildings, this must be kept to a minimum and the breach made good as soon as is practical. Where permanent reinstatement is not practical in the short term, temporary means must be used such as the use of intumescent pillows, temporary fire screening, etc.

Heat detectors, smoke detectors and portable extinguishers are installed in most areas throughout the site.

Prior to the start of any works, the Contractor shall liaise with their Contractor Host and the Estates and Facilities Department, Health and Safety/Risk Supervisor to ensure that the works do not affect the system functionality or in any way reduce the effectiveness of the system. Any alteration or amendments to the fire alarm system shall be recorded in the Institute fire logbook. Any additions to the fire alarm system are to be provided on the Contractor's Operating and Maintenance Manuals.

The Contractor carrying out work in these areas must be agreed in advance with their Contractor Host. An isolation permit must be issued if the fire alarm is to be isolated for any reason. The permit must be closed at the end of the working day or alternative means put in place for adequate building protection

Any cable/equipment damage or false alarms caused by the Contractor's failure to comply with this requirement shall result in the Institute seeking costs for such damages or business disruption as it deems appropriate.

Where there is a dust explosion risk, any work by the Contractor to be carried out in these areas must be agreed in advance with their Contractor Host.

Procedure in the Event of Fire

Raise the alarm immediately in the event of a fire, by hitting the nearest fire alarm call point or calling the emergency number.

On hearing the fire alarm the Contractor must stop work immediately and follow the fire evacuation procedure leaving the building by the nearest safe exit route and then proceed to the closest fire assembly point. Once at the fire assembly you must wait for further instructions from a member of The Pirbright Institute's staff.

The Contractor must close all doors behind themselves and Must Not use lifts.

The Contractor is not to return to work or re-enter any building until instructed it is safe to do so by the Fire Warden in attendance.

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Security and Access

Security

The Institute runs an 'Approved Contractor' scheme whereby all Contractors working on the Institute premises must undergo a security screening prior to gaining authorised access to the Institute; all individuals must consent to, and subsequently complete the screening process to work at the Institute.

In addition to the screening process mentioned above all individuals must successfully complete an induction/training programme to gain access to Restricted Areas or areas subject to quarantine restrictions.

The Contractor must provide photographic identification to gain access to the Pirbright Institute site; this will be checked at the security gatehouse upon arrival at site; all individuals that are not an 'Approved Contractor' will be issued with a temporary visitor pass, this pass and any 'Approved Contractor' pass must be worn visibly at all times whilst on site.

All Contractors must at all times sign in at the Contractor Office once they have been granted access through the gatehouse, and also sign out prior to leaving site.

The Institute reserves the right to search any vehicle, person or property entering, leaving or present on Institute premises, the Contractor will be deemed to have consented to this requirement prior to arrival at The Pirbright Institute.

No photographs can be taken of any part of the site, or any equipment on the site, without written permission from the Head of Security.

Contractors are not authorised to be in any other part of site apart from that area they have been authorised to work in.

Upon any reasonable request, the Contractor must comply with any instruction given by the Institute Security Department.

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Acceptance Form

This form must be completed and signed by every Contractor prior to undertaking any construction, maintenance or other similar works on The Pirbright Institute estate.
The completed form should be sent to:

The Pirbright Institute
Estates and Facilities Department
Ash Road
Woking Surrey
GU24 0NF

I/we have received a copy of the Institute's Site Rules for Contractors undertaking work on the Institute estate.

I/we have read and understood the Rules referred to above and briefed our employees of the requirements and contents.
I/we agree to comply with all current legislation governing construction works and associated activities and the specific rules and procedures detailed in the Institute's Site Rules.
I/we understand that any contravention/breach of relevant health and safety legislation and the specific rules and procedures detailed in the Institute's Site Rules may lead to termination of the contract and removal from the Institute's approved list of Contractors.

Signed:

……

Designation:

……

On behalf of:

……

Dated:

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Steam Distribution Phase 2 – Location Photos

Workshop Steam Heat Exchanger:

Location option for workshop heating fuel tank:

Steam Generation Plant Location:

Ash Hot Water Boiler Fuel Tank Location:

Ash Building Steam Calorifiers:

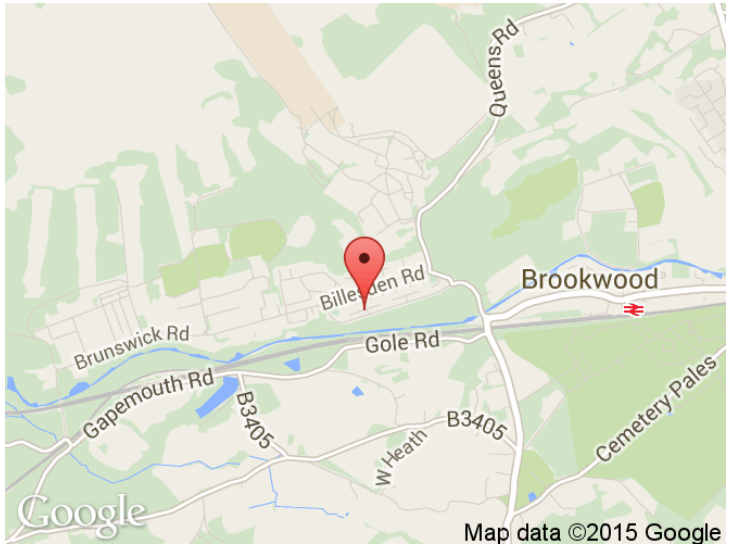
Lucion Environmental Limited
Registered in England + Wales 6495874
VAT Registration Number 208156326

Asbestos Reinspection Report

Job Ref No: ***78913****, Account Ref No:* ***449****, Contract Ref No:* ***8003***

P001 Ash Building, IHH Pirbright Institute, Ash Road, Surrey, GU24 0NS

Title*: IAH Pirbright Reinspection Surveys - May 2015,* ***Including****: All of property*



latlng: 51.303669,-0.657010

on site photo

Total Records	Analysed Records	No Asbestos Detected	R3	R2	R1
2	2	0	2	0	0

Head Office
7 Halifax Court, Dunston,
Gateshead, NE11 9JT
E: *enquiries@lucion.co.uk*
T: *0191 461 8999*

UKAS INSPECTION
0263

Report Summary

This certificate is for the attention of	**Graham Dandridge** **The Pirbright Institute** c/o RCUK SSC, Finance Department, Polaris House, North Star Avenue, Swindon, SN2 1UH
Contract Title	Re-inspection Surveys to all buildings on Pirbright Site
Survey Type	Survey, Reinspection
Site Address	P001 Ash Building, IHH Pirbright Institute, Ash Road, Surrey, GU24 0NS
Buildings Surveyed	P001 Ash Building
Surveyor(s)	Todd Pankhurst
Surveyor signature(s)	
Survey Date	Monday, 11th May, 2015
Approved signatory	Peter Henshall
Approved signature	
Approval date	Saturday, 30th May, 2015
Report Rendered on	Mon 8 Jun 2015 @ 15:13:25

Report Contents

Asbestos Register and Executive Summary 4
Buildings Included in Inspection Scope 5
Site Data 6
Inspection Methodology 7
Initial Risk Level Assessment 7
Recommendations 9
Cited References and Further Reading 11
Management Recommendation Detail 12
Areas Excluded & Not Fully Accessed During Inspection 12
Survey Inspection Detail, Sample Test Report and Risk Level Assessment Report 12
Annotated Plans and Other Additional Documents 14
Post Inspection Support 15

Asbestos Register and Executive Summary

Summary of Asbestos Containing Materials

Ordered By Building, Level and Location

Building	Level	Location	Item / Product Examined	Material Description	Risk Level (Material Score)	Initial Control Recommendation
P001 Ash Building	1	001/Plant Room	blue gaskets	Asbestos-containing gasket	R3 (3)	Reinspect Periodically
P001 Ash Building	9	999/externals	undercloaking	Asbestos-containing cement	R3 (4)	Reinspect Periodically

Summary of Areas Excluded & Not Fully Accessed During Survey

Building	Level	Location	Item / Product Examined	Accessibility	Access Comments
Nothing to report					

Buildings Included in Inspection Scope

Site Address: **P001 Ash Building, IHH Pirbright Institute, Ash Road, Surrey, GU24 0NS**

Surveyed Buildings: **P001 Ash Building**

Every effort has been made to identify all asbestos materials so far as was reasonably practical to do so within the scope of the survey and the attached report. Methods used to carry out the survey were agreed with the client prior to any works being commenced by way of acceptance of our contract / quotation.

This survey was conducted in accordance with Health and Safety Guidance - Publication "Asbestos: The Survey Guide (HSG 264)". Lucion Environmental Ltd cannot accept any liability for loss, injury, damage or penalty issues that arise for reasons of survey scope limitations. Lucion Environmental Ltd cannot be held responsible for any damage caused as part of this survey carried out on your behalf. Due to the nature and necessity of sampling for asbestos some damage is unavoidable and will be limited to that necessary for taking of the samples.

The scope of this survey relates only to building or area(s) inspected and does not include any form of investigation of the land on which the building is situated.

The purpose of the current inspection is to assertain the condition of Asbestos containing materials. This inspection may follow an earlier management inspection (as described in HSG 264) that has where possible (refer specific management survey report limitations) identified the presence of such materials.

The current inspection must not be used as an exhaustive account of Asbestos within the property and does not constitute an Asbestos register, survey report or similar account of investigative findings. Lucion Environmental Ltd accepts no responsibility for any mis-reporting or shortcomings of previous inspections upon which the current may be based.

Site Data

Site ID	34953
Address	P001 Ash Building, IHH Pirbright Institute, Ash Road, Surrey, GU24 0NS

Inspection Methodology

The inspeciton findings detailed in this report were gathered during a "walkthrough" inspection of the structural asbestos containing materials (as previously identified and as suspected by virtue of the surveyors forgoing knowledge of asbestos use in buildings of this type).

Initial Risk Level Assessment

The initial risk level assessments made within this report for those items strongly presumed, or positively proven by sampling and subsequent analysis, to contain asbestos have been made on the basis of the Material Assessment Algorithm detailed within the publications HSG 264 and HSG 227.

This assessment aims to elucidate the potential for a particular material to release hazardous fibres and expose those within the specific area to asbestos dust. The following table gives the scoring strategy for the initial risk level assessment and indicates the scoring degree of those points that are considered, namely product type, condition, surface treatment and asbestos fibre type present.

	Score	Score Category
Product Type An assessment of the inherent risk a product may pose (Product debris is assessed on the product type from which it originates)	1	**Asbestos reinforced composites** - Plastics / resins / mastics / felts / vinyl tiling / semi rigid paints / decorative finishes / asbestos cement and other such similar bound materials.
	2	**Materials of a medium asbestos content including** - Asbestos insulating board / millboard / low density insulation board / textiles / gaskets / ropes / papers / debris from asbestos containing composite material and cement.
	3	**Materials of a high asbestos content including** - Thermal insulation / sprayed asbestos / loose asbestos / packing / filled padding / all other debris.
Material Condition An assessment of the damage or deterioration in condition of product	0	**Undamaged** - No visible signs of damage
	1	**Minor damage** - Light material surface abrasion / abrasion to edges
	2	**Medium damage** - Evidence of loose asbestos fibre protruding from material / poor condition of material is notable
	3	**Major damage** - Significant damage to materials often resulting in the short-term production of asbestos containing debris / delamination of sprays and thermal insulation / asbestos debris

table continued from previous page...

	Score	Score Category
Surface Treatment An assessment of the level of fibre retention the surface of a material may be capable of	0	**Composite materials** - Plastics / resins / mastics / felts / vinyl tiling / semi rigid paints / decorative finishes
	1	**Sealed and enclosed materials** - Painted asbestos insulating board (with exposed face painted or encapsulated) / enclosed asbestos lagging and sprayed asbestos (as originally installed) / unsealed asbestos cement products
	2	**Unsealed and encapsulated materials** - Unsealed asbestos insulating board / asbestos lagging, sprayed asbestos and woven material encapsulated (remedially)
	3	**Unsealed friable materials** - Unsealed asbestos lagging and sprayed asbestos
Asbestos Fibre Type An assessment of asbestos fibre types propensity to cause asbestos related diseases	1	**Serpentine Asbestos** - Chrysotile
	2	**Amphibole Asbestos** - Amosite / Anthophyllite / Tremolite / Actinolite
	3	**Amphibole Asbestos** - Crocidolite

Material / Accessibility Score

Following the rating of a material using the above criteria, the resulting aggregated additive material score may be assessed in terms of accessibility to derive an assessment of initial risk level as follows:

	Very Low Risk (2-4)	Low Risk (5-6)	Medium Risk (7-9)	High Risk (10-12)
Inaccessible (1)	R3	R3	R3	R2
Periodically Accessed (2)	R3	R3	R2	R1
Frequently Accessed (3)	R3	R2	R1	R1

General Interpretation of Risk Assessment Level

Risk Assessment Level	Interpretation of the Recommended Control Action [1]
R1	immediate implementation
R2	as soon as practicable - *in interim period material should be regularly inspected and its management planned for*
R3	not immediately necessary - *material should be regularly inspected and its management planned for*

Recommendations

In addition to the risk assessment level assigned to strongly presumed and identified asbestos containing material, a management control action recommendation is also made. It must be realised that this/these management recommendations are made on the basis of prevailing material conditions and access at the time of the reinspection and as such are intended solely as a guide to assist in the effective control of the materials concerned. Where doubt may be raised about the action that should be taken regarding an asbestos containing material, measures should be implemented to a degree that reflect either those of a higher risk or a more in depth risk assessment should be carried out. This risk assessment may account for greater knowledge of the material's location (i.e. greater than that of the surveyor at the time of reinspection) or knowledge (current or future) of activities or works surrounding or concerning the material.

1. The risk level assessment is determined on the basis of information collated during the course of the reinspection. The risk assessment level needs to be reviewed periodically, (normally in line with a frequency defined in an asbestos management plan) to verify its validity and prior to any refurbishment work within the building/ site.

The current recommendations conventionally made by Lucion Environmental Limited may include the following:

Recommendation	Description	Notes
Air Monitoring	Sampling of air for asbestos fibre concentration. Necessary where a risk of fibre exposure is present and assessment of such exposure presence or absence is prudent.	UKAS accredited analytical laboratory should perform reassurance air testing.
Access Restriction	Restriction of access to area / location only to personnel wearing appropriate PPE / RPE.	Suitability of RPE / PPE must be carefully assessed and procedure invoked to ensure these control measures are adhered to.
Access Prohibition	Prohibition of access to area / location to all personnel.	Area should be marked clearly as being prohibited to all personnel, possibly in conjunction with asbestos warning stickers.
Environmental Clean	A cleaning process used to prevent the spread of asbestos containing contaminants.	Services of a licensed asbestos removal contractor should be engaged and all works carried out under appropriate controlled conditions. Works should also be accompanied by an appropriate air test performed by a UKAS accredited laboratory.
Material Repair	Repair of the material in such a manner as to minimise the release of asbestos fibre.	Repair of materials is recommended by the Health and Safety Executive as an alternative to removal, where reasonably safe to so.
Material Encapsulation	Encapsulation of the material in a manner that ensures the complete enclosure of any remaining asbestos fibres.	Encapsulation of materials is a possible alternative to their removal, where reasonably safe to do so. Works should also be accompanied by appropriate air test performed by a UKAS accredited laboratory.
Material Removal	Removal of the material in instances where it is remaining in situ would lead to a high residual risk level. Or removal may be necessary to permit work within the location. Removal of materials may also be carried out on a preventive basis.	Removal works should be carried out in accordance with the relevant ACOP (approved code of practice), L143
Any recommendations made within this report are made on the basis of findings collated at the time of inspection. *Recommendations should undergo careful client evaluation prior to a final management decision being made.* *Lucion Environmental Ltd does not accept any responsibility for any works carried out as a result of recommendations made within this report.*		

At this point it is pertinent to return to the legislation behind this report and outline the next steps that may need to be carried out in managing asbestos.

- Review all recommendations and risk level ratings given within this report (CAR 2012 Regulation 4, 10)
- Prepare a plan aimed at managing asbestos containing materials and works that may affect them (CAR 2012 Regulation 4, 8)
- Ensure a procedure is in place to prevent work being carried out without the asbestos register being consulted (CAR 2012 Regulation 4, 9)
- Arrange a program of asbestos containing material re-inspection (CAR 2012 Regulation 4, 10)

If any remedial works need to be carried out, decide whether or not they need to be carried out by a licensed contractor. If you are unsure about this Lucion can offer advice as to what you should do.

Cited References and Further Reading

1. Control of Asbestos Regulations (2012) ~ The Stationery Office. **ISBN 978-0111521083**
2. Construction (Design and Management) Regulations (2007) ~ The Stationery Office. **ISBN 011043845-0**
3. The Hazardous Waste (England and Wales) Regulations (2005) ~ The Stationery Office. **ISBN 011072685-5**
4. Managing and working with asbestos Control of Asbestos Regulations 2012. Approved Code of Practice & guidance L143 (second edition, 2013) ~ HSE Books. **ISBN 978-0717666188**
5. A Comprehensive Guide to Managing Asbestos in Premises (2002) ~ HSE Books. **ISBN 978-0717623815**
6. Asbestos Essentials: A task manual for building, maintenance and allied trades of non-licensed asbestos work (third edition, 2012) ~ HSE Books. **ISBN 978-0717665037**
7. Asbestos Essentials Task Sheets [http://www.hse.gov.uk/asbestos/essentials/] ~ HSE. *electronic downloadable version of the above*
8. Asbestos: The licensed contractors' guide HSG247 (2006) ~ HSE Books. **ISBN 978-0717628742**
9. Asbestos: The analysts' guide for sampling, analysis and clearance procedures HSG248 (2005) ~ HSE Books. **ISBN 978-0717628759**
10. Asbestos: The Survey Guide HSG 264 (second edition, 2012) ~ HSE Books. **ISBN 978-0717665020**
11. The Management of Health and Safety at Work Regulations (1999) ~ The Stationery Office. **ISBN 011085625-2**
12. The Health & Safety at Work etc. Act (1974) ~ The Stationery Office.

Management Recommendation Detail

Building	Level	Location	Item / Product Examined	Sample No.	Material Description	Fibre Type	Material Score	Extent	Risk Level Assessment	Initial Control Recommendation	Photograph
P001 Ash Building	1	001/Plant Room	blue gaskets		Asbestos-containing gasket	Strongly Presume Chrysotile	3	4 No.	R3	Reinspect Periodically	
P001 Ash Building	9	999/ externals	undercloaking		Asbestos-containing cement	Strongly Presume Chrysotile	4	Not Quantifiable	R3	Reinspect Periodically	

Areas Excluded & Not Fully Accessed During Inspection

Asbestos should be presumed to be present within Locations and Items not accessed until a further assessment can be performed.

Additional surveyor comments.

Building	Level	Location	Item / Product Examined	Accessibility	Access Comments	Photograph
Nothing to report						

Survey Inspection Detail, Sample Test Report and Risk Level Assessment Report

Asbestos should be presumed to be present within Locations and Items not accessed until a further assessment can be performed.

Additional surveyor comments.

Building: P001 Ash Building **Level: 1** **Location: 001/Plant Room**

Item / Product Examined	Material Description	Sampling Strategy	Sample No.	Extent	Product Score	Material Condition	Surface Treatment	Fibre Id.	Material Score	Accessibility Score	Risk Level Assessment
blue gaskets	Asbestos-containing gasket	Strongly Presume		4 No.	1	1	0	Strongly Presume Chrysotile	3	2	R3

Building: P001 Ash Building **Level: 9** **Location: 999/externals**

Item / Product Examined	Material Description	Sampling Strategy	Sample No.	Extent	Product Score	Material Condition	Surface Treatment	Fibre Id.	Material Score	Accessibility Score	Risk Level Assessment
undercloaking	Asbestos-containing cement	Strongly Presume		Not Quantifiable	1	1	1	Strongly Presume Chrysotile	4	2	R3

Annotated Plans and Other Additional Documents

The following documents accompany this report and should be regarded as an integral part of this report.

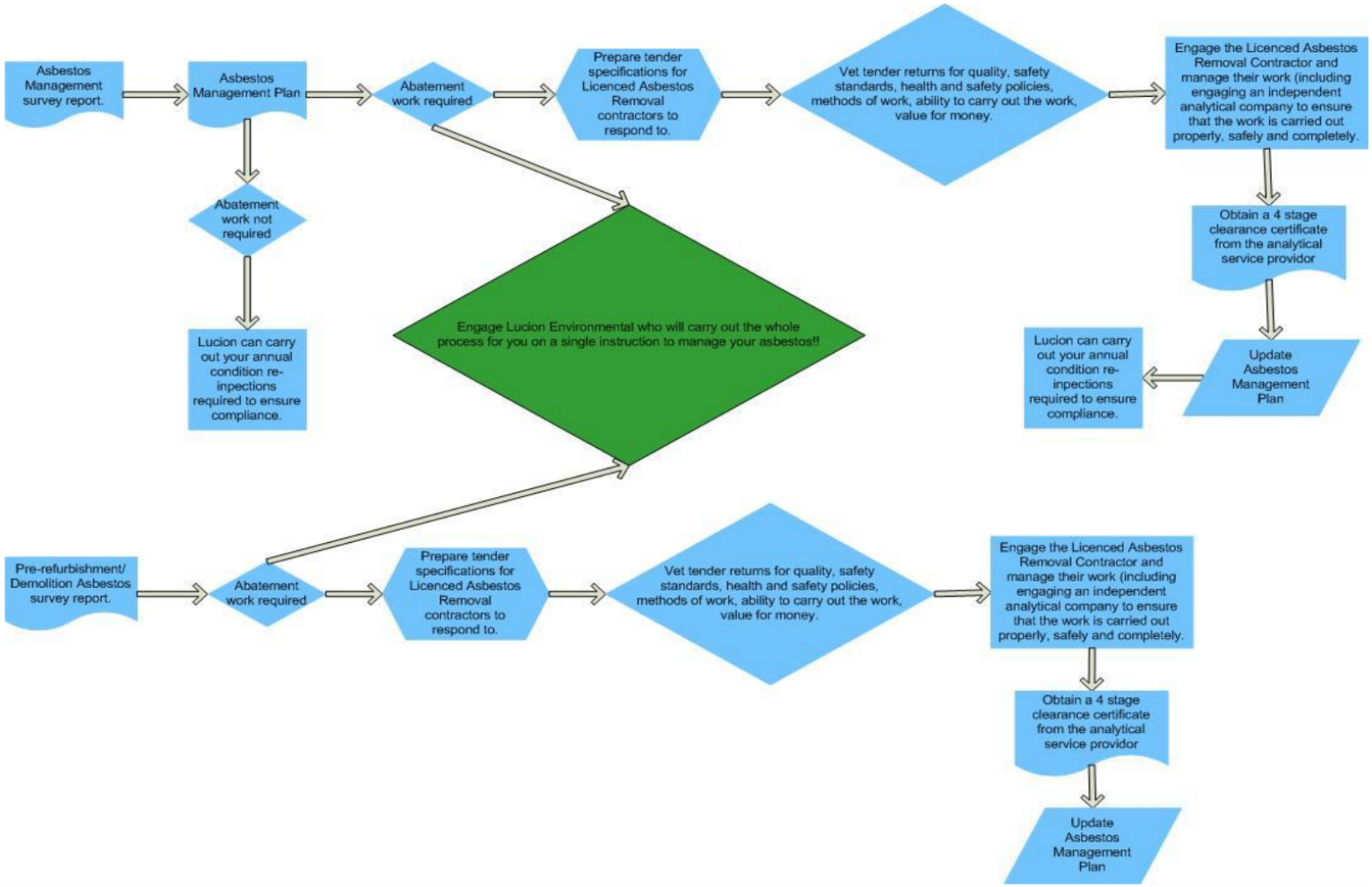
They can be downloaded from http://web.lucion.co.uk/reports/78913/attachments.

- Method Statement [http://web.lucion.co.uk/method_statements/78913?s=ac2c70ef6d87ffdd0c3d36f12cbedb93]
- Risk Assessment [http://web.lucion.co.uk/risk_assessment/78913?s=0f66e5a79df0117beab2eb4dfeb53f66]

Post Inspection Support

The ultimate aim of any management plan must be the prevention of exposure to personnel working on your premises. You should therefore make this register available for consultation and keep it regularly updated. Publications relating to the Control of Asbestos Regulations (2012) suggest an annual reinspection as minimum (more frequently for higher risk materials) by a competent person.

Remember, an asbestos survey is the first step in asbestos management. Effective asbestos management often needs specialist advice; have a look at the diagram below which shows the basic steps in formulating a typical asbestos management plan. Lucion realise that you may need some assistance in drafting your management plan; please give us a call on **0191 4618999** or send an email to enquiries@lucion.co.uk or visit the lucion website [http://lucion.co.uk] for advice on any of the steps shown below:



Lucion Environmental
Delivering Trusted Hazard Management to the Built Environment.

Lucion Environmental Ltd
Registered in England + Wales 6495874
VAT Registration Number 208156326

Asbestos Reinspection Report

Job Ref No: ***40599****, Account Ref No:* ***449****, Contract Ref No:* ***4527***

P057 E&M Worksop (Former Clinical Waste Incinerator), IAH Pirbright Institute, Ash Road, Surrey, GU24 0NS

Title*: Reinspection Surveys January 2014,* ***Including****: All of property*

latlng: 51.303669,-0.657010

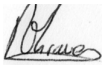
on site photo

Total Records	Analysed Records	No Asbestos Detected	R3	R2	R1
1	1	0	0	1	0

Head Office
7 Halifax Court, Dunston,
Gateshead, NE11 9JT
E: *enquiries@lucion.co.uk*
T: *0191 461 8999*

UKAS INSPECTION
0263

Report Summary

This certificate is for the attention of	**Graham Dandridge** **IAH - The Pirbright Institute** Finance Department, The Pirbright Institute, Ash Road, Pirbright, Woking, Surrey, GU24 0NF
Contract Title	Re-inspection Surveys to all buildings on Pirbright Site
Survey Type	Survey, Reinspection
Site Address	P057 E&M Worksop (Former Clinical Waste Incinerator), IAH Pirbright Institute, Ash Road, Surrey, GU24 0NS
Buildings Surveyed	P057 Clinical Waste Incinerator
Surveyor(s)	Jack Pye
Surveyor signature(s)	
Survey Date	Monday, 6th January, 2014
Approved signatory	Richard Graves
Approved signature	
Approval date	Tuesday, 18th February, 2014
Report Rendered on	Thu 7 Apr 2016 @ 15:40:56

Report Contents

Asbestos Register and Executive Summary 5
Buildings Included in Inspection Scope 6
Site Data 7
Inspection Methodology 8
Initial Risk Level Assessment 8
Recommendations 11
Cited References and Further Reading 14
Management Recommendation Detail 15
Areas Excluded & Not Fully Accessed During Inspection 15
Survey Inspection Detail, Sample Test Report and Risk Level Assessment Report 15
Annotated Plans and Other Additional Documents 17
Post Inspection Support 18

Asbestos Register and Executive Summary

Summary of Asbestos Containing Materials

Ordered By Building, Level and Location

Building	Level	Location	Item / Product Examined	Material Description	Risk Level (Material Score)	Initial Control Recommendation
P057 Clinical Waste Incinerator	0	001/Incinerator Room - Mezzanine Floor	pipework	Asbestos-containing Asbestos containing gaskets	R2 (7)	Remove

Summary of Areas Excluded & Not Fully Accessed During Survey

Building	Level	Location	Item / Product Examined	Accessibility	Access Comments
Nothing to report					

Buildings Included in Inspection Scope

Site Address: **P057 E&M Worksop (Former Clinical Waste Incinerator), IAH Pirbright Institute, Ash Road, Surrey, GU24 0NS**

Surveyed Buildings: **P057 Clinical Waste Incinerator**

Every effort has been made to identify all asbestos materials so far as was reasonably practical to do so within the scope of the inspection and the attached report. Methods used to carry out the inspection were agreed with the client prior to any works being commenced by way of acceptance of our contract / quotation.

This inspection was conducted in accordance with an in house procedure detailed in TOP01.01 Asbestos Surveying. Lucion Environmental Ltd cannot accept any liability for loss, injury, damage or penalty issues that arise for reasons of inspection scope limitations. Lucion Environmental Ltd cannot be held responsible for any damage caused as part of this reinspection carried out on your behalf. Due to the nature and necessity of sampling for asbestos some damage is unavoidable and will be limited to that necessary for taking of the samples.

The scope of this inspection relates only to building or area(s) inspected and does not include any form of investigation of the land on which the building is situated unless specifically stated in the agreed scope of works.

The purpose of the current inspection is to assertain the condition of Asbestos containing materials. This inspection may follow an earlier management inspection (as described in HSG 264) that has where possible (refer specific management survey report limitations) identified the presence of such materials.

The current inspection must not be used as an exhaustive account of Asbestos within the property and does not constitute an Asbestos register, survey report or similar account of investigative findings. Lucion Environmental Ltd accepts no responsibility for any mis-reporting or shortcomings of previous inspections upon which the current may be based.

Site Data

Site ID	34962
Address	P057 E&M Worksop (Former Clinical Waste Incinerator), IAH Pirbright Institute, Ash Road, Surrey, GU24 0NS
Property Type	Agricultural
Property Build Date	Unknown
Property Number of buildings	1
Property Number of rooms	5-20
Property Number of Levels	1
Property Construction type	Traditional
Roof Type	Pitched
Property access notes	Access arranged with site manager - site induction required
Property access restrictions	None
Property unusual features	None
Property in Conservation area?	NO
Listed Building?	NO
Property Alterations	None
Property Plant or equipment installed?	YES

Inspection Methodology

The inspection findings detailed in this report were gathered during a "walkthrough" inspection of the structural asbestos containing materials (as previously identified and as suspected by virtue of the surveyors forgoing knowledge of asbestos use in buildings of this type).

When a reinspection is reliant on bulk analysis from a laboratory other than Lucion, the data shall refer to fibre type as a 'Strongly Presume' rather than a definitive analysis.

Initial Risk Level Assessment

The initial risk level assessments made within this report for those items strongly presumed, or positively proven by sampling and subsequent analysis, to contain asbestos have been made on the basis of the Material Assessment Algorithm detailed within the publications HSG 264 and HSG 227.

This assessment aims to elucidate the potential for a particular material to release hazardous fibres and expose those within the specific area to asbestos dust. The following table gives the scoring strategy for the initial risk level assessment and indicates the scoring degree of those points that are considered, namely product type, condition, surface treatment and asbestos fibre type present.

	Score	Score Category
Product Type An assessment of the inherent risk a product may pose (Product debris is assessed on the product type from which it originates)	1	**Asbestos reinforced composites** - Plastics / resins / mastics / felts / vinyl tiling / semi rigid paints / decorative finishes / asbestos cement and other such similar bound materials.
	2	**Materials of a medium asbestos content including** - Asbestos insulating board / millboard / low density insulation board / textiles / gaskets / ropes / papers / debris from asbestos containing composite material and cement.
	3	**Materials of a high asbestos content including** - Thermal insulation / sprayed asbestos / loose asbestos / packing / filled padding / all other debris.
Material Condition An assessment of the damage or deterioration in condition of product	0	**Undamaged** - No visible signs of damage
	1	**Minor damage** - Light material surface abrasion / abrasion to edges
	2	**Medium damage** - Evidence of loose asbestos fibre protruding from material / poor condition of material is notable
	3	**Major damage** - Significant damage to materials often resulting in the short-term production of asbestos containing debris / delamination of sprays and thermal insulation / asbestos debris

table continued from previous page...

	Score	Score Category
Surface Treatment An assessment of the level of fibre retention the surface of a material may be capable of	0	**Composite materials** - Plastics / resins / mastics / felts / vinyl tiling / semi rigid paints / decorative finishes
	1	**Sealed and enclosed materials** - Painted asbestos insulating board (with exposed face painted or encapsulated) / enclosed asbestos lagging and sprayed asbestos (as originally installed) / unsealed asbestos cement products
	2	**Unsealed and encapsulated materials** - Unsealed asbestos insulating board / asbestos lagging, sprayed asbestos and woven material encapsulated (remedially)
	3	**Unsealed friable materials** - Unsealed asbestos lagging and sprayed asbestos
Asbestos Fibre Type An assessment of asbestos fibre types propensity to cause asbestos related diseases	1	**Serpentine Asbestos** - Chrysotile
	2	**Amphibole Asbestos** - Amosite / Anthophyllite / Tremolite / Actinolite
	3	**Amphibole Asbestos** - Crocidolite

Material / Accessibility Score

Following the rating of a material using the above criteria, the resulting aggregated additive material score may be assessed in terms of accessibility to derive an assessment of initial risk level as follows:

	Very Low Risk (2-4)	Low Risk (5-6)	Medium Risk (7-9)	High Risk (10-12)
Normally Inaccessible (1)	R3	R3	R3	R2
Periodically Accessed (2)	R3	R3	R2	R1
Frequently Accessed (3)	R3	R2	R1	R1

The level of access to the ACM determines how easily the product can be reached by the building occupants which could result in a disturbance that causes fibre release, it relates purely to access and does not consider product type.

The above is defined by the following:

1. Normally inaccessible or occasionally accessed:

   The ACM will not be accessed or is unlikely to be disturbed.

2. Periodically accessed:

   The ACM is likely to be disturbed occasionally.

3. Frequently accessed:

   The ACM is routinely and easily disturbed.

General Interpretation of Risk Assessment Level

Risk Assessment Level	Interpretation of the Recommended Control Action [1]
R1	immediate implementation
R2	as soon as practicable - *in interim period material should be regularly inspected and its management planned for*
R3	not immediately necessary - *material should be regularly inspected and its management planned for*

Recommendations

In addition to the risk assessment level assigned to strongly presumed and identified asbestos containing material, a management control action recommendation is also made. It must be realised that this/these management recommendations are made on the basis of prevailing material conditions and access at the time of the reinspection and as such are intended solely as a guide to assist in the effective control of the materials concerned. Where doubt may be raised about the action that should be taken regarding an asbestos containing material, measures should be implemented to a degree that reflect either those of a higher risk or a more in depth risk assessment should be carried out. This risk assessment may account for greater knowledge of the material's location (i.e. greater than that of the surveyor at the time of reinspection) or knowledge (current or future) of activities or works surrounding or concerning the material.

1. The risk level assessment is determined on the basis of information collated during the course of the reinspection. The risk assessment level needs to be reviewed periodically, (normally in line with a frequency defined in an asbestos management plan) to verify its validity and prior to any refurbishment work within the building/ site.

The current recommendations conventionally made by Lucion Environmental Limited may include the following:

Recommendation	Description	Notes
Air Monitoring	Sampling of air for asbestos fibre concentration. Necessary where a risk of fibre exposure is present and assessment of such exposure presence or absence is prudent.	UKAS accredited analytical laboratory should perform reassurance air testing.
Access Restriction	Restriction of access to area / location only to personnel wearing appropriate PPE / RPE.	Suitability of RPE / PPE must be carefully assessed and procedure invoked to ensure these control measures are adhered to.
Access Prohibition	Prohibition of access to area / location to all personnel.	Area should be marked clearly as being prohibited to all personnel, possibly in conjunction with asbestos warning stickers.
Environmental Clean	A cleanup of areas following disturbance of asbestos or discovery of loose asbestos dust/debris/material.	The work is not removal (ie requiring physical force) and consists of vacuuming, wiping, picking up and bagging of debris. The work can be either licensed or unlicensed depending on the product and whether exposure is likely to exceed the 4 hour control limit or sporadic and low intensity limit. For licensed work a 4-stage clearance by a UKAS accredited laboratory is required, whilst for non-licensed work appropriate air tests are recommended.
Material Repair	Repair of the material in such a manner as to minimise the release of asbestos fibre.	Repair of materials is recommended by the Health and Safety Executive as an alternative to removal, where reasonably safe to so.
Material Encapsulation	Encapsulation of the material in a manner that ensures the complete enclosure of any remaining asbestos fibres.	Encapsulation of materials is a possible alternative to their removal, where reasonably safe to do so. Works should also be accompanied by appropriate air test performed by a UKAS accredited laboratory.
Material Removal	Removal of the material in instances where it is remaining in situ would lead to a high residual risk level. Or removal may be necessary to permit work within the location. Removal of materials may also be carried out on a preventive basis.	Removal works should be carried out in accordance with the relevant ACOP (approved code of practice), L143
Any recommendations made within this report are made on the basis of findings collated at the time of inspection. *Recommendations should undergo careful client evaluation prior to a final management decision being made.* *Lucion Environmental Ltd does not accept any responsibility for any works carried out as a result of recommendations made within this report.*		

At this point it is pertinent to return to the legislation behind this report and outline the next steps that may need to be carried out in managing asbestos. Particular reference should be made to HSE publication L143 Managing and working with asbestos, Control of Asbestos Regulations 2012.

- Review all recommendations and risk level ratings given within this report
- Prepare a plan aimed at managing asbestos containing materials and works that may affect them
- Ensure a procedure is in place to prevent work being carried out without the asbestos register being consulted
- Arrange a program of asbestos containing material re-inspection

If any remedial works need to be carried out, decide whether or not they need to be carried out by a licensed contractor. If you are unsure about this Lucion can offer advice as to what you should do.

Cited References and Further Reading

1. Control of Asbestos Regulations (2012) ~ The Stationery Office. **ISBN 978-0111521083**
2. Construction (Design and Management) Regulations (2015) ~ The Stationery Office. **ISBN 9780717666263**
3. The Hazardous Waste (England and Wales) Regulations (2005) ~ The Stationery Office. **ISBN 011072685-5**
4. Managing and working with asbestos Control of Asbestos Regulations 2012. Approved Code of Practice & guidance L143 (second edition, 2013) ~ HSE Books. **ISBN 978-0717666188**
5. A Comprehensive Guide to Managing Asbestos in Premises (2002) ~ HSE Books. **ISBN 978-0717623815**
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8. Asbestos: The licensed contractors' guide HSG247 (2006) ~ HSE Books. **ISBN 978-0717628742**
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12. The Health & Safety at Work etc. Act (1974) ~ The Stationery Office.

Management Recommendation Detail

Building	Level	Location	Item / Product Examined	Sample No.	Material Description	Fibre Type	Material Score	Extent	Risk Level Assessment	Initial Control Recommendation	Photograph
P057 Clinical Waste Incinerator	0	001/Incinerator Room - Mezzanine Floor	pipework		Asbestos-containing Asbestos containing gaskets	Strongly Presume Chrysotile	7	Not Quantifiable	R2	Remove	

Areas Excluded & Not Fully Accessed During Inspection

Asbestos should be presumed to be present within Locations and Items not accessed until a further assessment can be performed.

Additional surveyor comments.

Building	Level	Location	Item / Product Examined	Accessibility	Access Comments	Photograph
Nothing to report						

Survey Inspection Detail, Sample Test Report and Risk Level Assessment Report

Asbestos should be presumed to be present within Locations and Items not accessed until a further assessment can be performed.

Additional surveyor comments.

Building: P057 Clinical Waste Incinerator **Level: 0** **Location: 001/Incinerator Room - Mezzanine Floor**

Item / Product Examined	Material Description	Sampling Strategy	Sample No.	Extent	Product Score	Material Condition	Surface Treatment	Fibre Id.	Material Score	Accessibility Score	Risk Level Assessment
pipework	Asbestos-containing Asbestos containing gaskets	Strongly Presume		Not Quantifiable	2	2	2	Strongly Presume Chrysotile	7	2	R2
		19995138-001 - condition improved majorly damaged gaskets have been removed.									

Annotated Plans and Other Additional Documents

The following documents accompany this report and should be regarded as an integral part of this report.

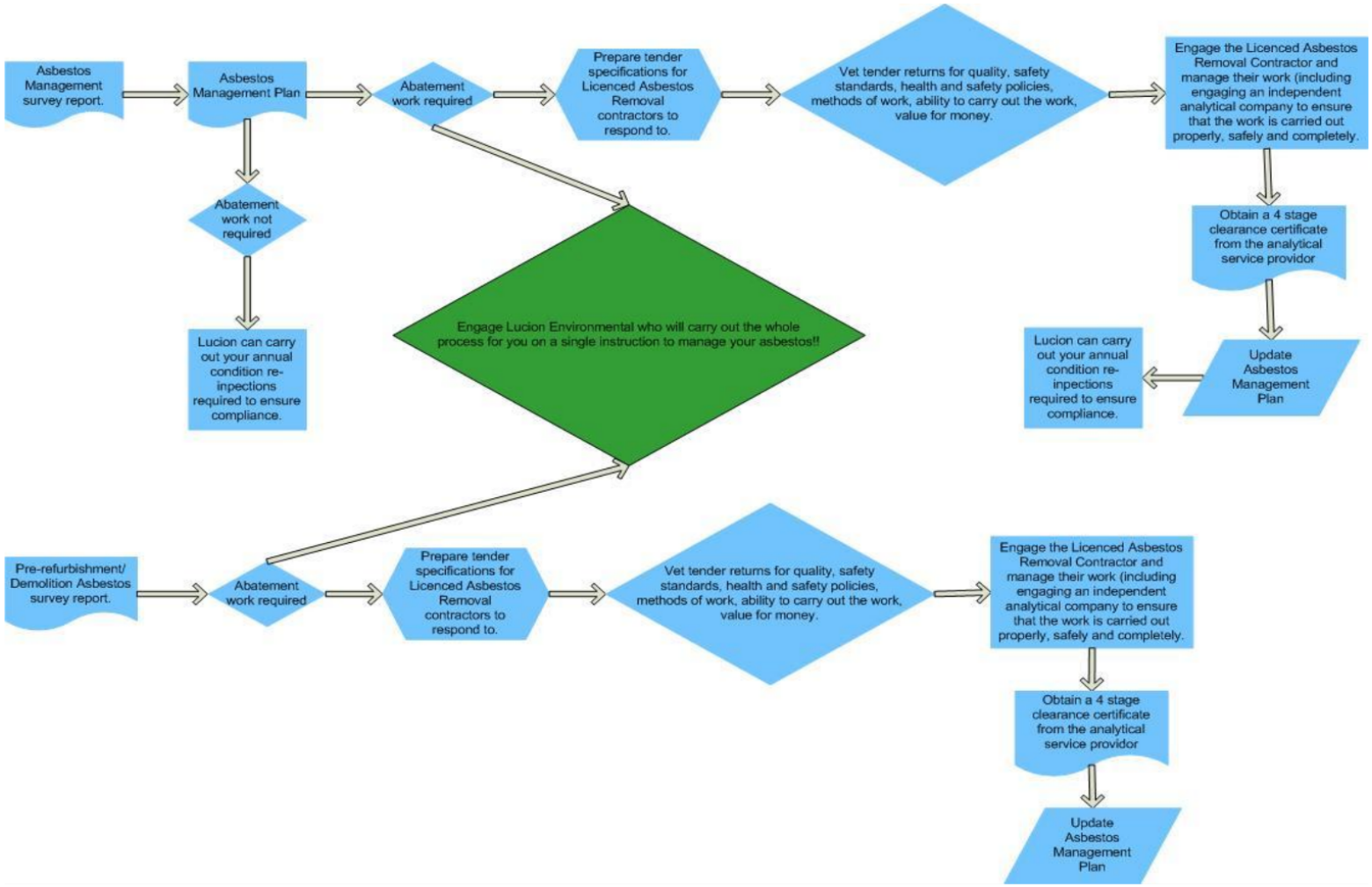
They can be downloaded from http://web.lucion.co.uk/reports/40599/attachments.

- Method Statement [http://web.lucion.co.uk/method_statements/40599?s=6482f0add6cbefa1a774bba5391a2254]
- Risk Assessment [http://web.lucion.co.uk/risk_assessment/40599?s=80a4b51a33f3de30b5d7ae7677c20919]

Post Inspection Support

The ultimate aim of any management plan must be the prevention of exposure to personnel working on your premises. You should therefore make this register available for consultation and keep it regularly updated. Publications relating to the Control of Asbestos Regulations (2012) suggest an annual reinspection as minimum (more frequently for higher risk materials) by a competent person.

Remember, an asbestos survey is the first step in asbestos management. Effective asbestos management often needs specialist advice; have a look at the diagram below which shows the basic steps in formulating a typical asbestos management plan. Lucion realise that you may need some assistance in drafting your management plan; please give us a call on **0191 4618999** or send an email to enquiries@lucion.co.uk or visit the lucion website [http://lucion.co.uk] for advice on any of the steps shown below:



STANDARD
Pipework Standard 001

Suitable pipework contents:

Pipework contents	Notes
Saturated Steam < 10 bar(g)	Above ground. Non-flameproof area.
Condensate pressurized <10 bar(g)	Pipework between steam trap and condensate return vessel

Relevant Standards:

Pipework: ASME B31.3 – 2002 – Process Piping
Pressure Equipment Directive 97/23/EC
Testing: BS EN13480 – Metallic Industrial Piping
Welding: Welders used for manufacturing or installation must have completed and passed a test in accordance with BS EN 287.

Pipework, valves and fittings:

Item	Size range	Description	Notes
Pipe	½" – 2" DN15 – DN50	Carbon steel API 5L GR B seamless XS (schedule 80 pipe)	
	2 ½" – 24" DN65 – DN600	Carbon steel API 5L GR B seamless Std. Wt. (schedule 40 pipe)	
Fittings	½" – 24" DN15 – DN600	Butt weld, wrought carbon steel ASTM A234 GR WPB seamless. Dimensions to ASME B16.9. Thickness to match pipe.	Use pulled bends (Rad 5D) for 2" NB and below. Where dimensions are limited, butt weld fittings shall be used. Screwed may be used up to 2" NB when agreed with the site engineer.
Flanges	½" – 24" DN15 – DN600	Weldneck, ASME B16.5 class 150# RF. Carbon steel ASTM A105N.	Other flange standards e.g. BS10, PN16, BS1560 FF etc. Installed only where required by mating equipment and when agreed with site engineer.
	½" – 24" DN15 – DN600	Blind, ASME B16.5 class 150# RF. Carbon steel ASTM A105N.	Other flange standards e.g. BS10, PN16, BS1560 FF etc. Installed only where required by mating equipment and when agreed with site engineer.
Gaskets	½" – 24" DN15 – DN600	Class 150#, inside bolt circle (ring type). Graphite laminated with tanged stainless steel sheet reinforcement, flat ring type inside bolt circle, 1.5mm thick, dimensions to ASME B16.21	
Bolting	½" – 24" DN15 – DN600	Alloy steel heavy hexagon head machine bolt. Zinc plated. Threaded full length with one zinc plated heavy hexagon series threaded nut. ISO metric coarse thread. ASTM A193 GR B7 bolt with ASTM A194 GR 7 nut.	Washer of compatible material to be placed under nut.
Ball valves	½" – 1 ½" DN15 – DN40	3-piece, antistatic Carbon Steel body & end connectors. 316L Stainless Steel ball. TFM self-relieving seats & seals, graphite gland packing (not on 3-way valves). Butt weld to suit pipe.	
	2" – 8" DN50 – DN200	1-piece body. Firesafe & antistatic. Carbon steel body ASTM A351 CF8M. 316L stainless steel ball & trim. TFM self-relieving seats & seals, graphite gland packing (not on 3-way valves). Flanged ends to ASME B16.5 150# RF.	
Gate valve	2" – 12" DN50 – DN300	Bolted bonnet. Carbon steel body ASTM A216 WCB, 13 chrome trim. Solid wedge. Graphite gland packing. 150# flanged ends to ASME B16.5 RF.	
Globe valve	2" – 6" DN50 – DN150	Bolted bonnet. Carbon steel body ASTM A216 WCB, 13 chrome trim. Stellited seat and disc. Renewable disc. Graphite gland packing. 150# flanged ends to ASME B16.5 RF.	
Parallel slide	1" – 1 ½" DN25 – DN40	Bolted bonnet. Cast carbon steel body and bonnet ASTM A216 WCB, stainless steel stem. Nickel alloy trim. Graphite gland packing. 300# flanged ends to ASME B16.5 RF.	
	2" – 12" DN50 – DN300	Bolted bonnet. Cast carbon steel body and bonnet ASTM A216 WCB, stainless steel stem. Nickel alloy trim. Graphite gland packing. 150# flanged ends to ASME B16.5 RF.	
Needle valve	½" DN15	Needle valve for isolation, calibrating and venting with stainless steel 316 S16 body, spindle and handwheel. Hard seat. PTFE seal. BSP taper female ends.	For instrument isolation, calibration and venting only. Combine with ball valve if necessary.
Check	2" – 6"	Swing type check valve. Bolted cover. Carbon steel body, disc	

swing	DN50 – DN150	and cover ASTM A216 WCB. 13 chrome trim. 150# flanged ends to ANSI B16.5 RF.	
Check spring	½" – 4" DN15 – DN100	Wafer spring loaded "disc" type check valve. AISI 316 stainless steel body, internals and spring.	

Branch table:

	HEADER																
BRANCH	**NPS**	**24**	**20**	**18**	**16**	**14**	**12**	**10**	**8**	**6**	**4**	**3**	**2**	**1 ½**	**1**	**¾**	**½**
	½	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT	BWT	BWT
	¾	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT	BWT	
	1	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT		
	1 ½	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT			
	2	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT				
	3	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT					
	4	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT						
	6	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT							
	8	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT								
	10	SOB	SOB	SOB	SOB	SOB	SOB	BWT									
	12	SOB	SOB	SOB	SOB	SOB	BWT										
	14	SOB	SOB	SOB	SOB	BWT											
	16	SOB	SOB	SOB	BWT												
	18	SOB	SOB	BWT													
	20	SOB	BWT														
	24	BWT															

NPS: Nominal Pipe Size in Inches.
SOB: Set On Branch.
BWT: Butt Welding Tee.

Thermal insulation:

	Pipe size (NB)											Flat surfaces & vessels
	½"	**¾"**	**1"**	**1 ½"**	**2"**	**3"**	**4"**	**6"**	**8"**	**10"**	**12"**	
	Thickness (mm)											
0 to + 185 C Rockwool	40	40	50	60	60	70	70	80	90	90	100	60
Aluminum cladding	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.6
Stainless steel cladding	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.5

A minimum clearance of 25 mm must be left all around a completed insulated pipe.

All insulated pipework must be supported on insulated blocks the same size as the required insulation thickness. Supports or brackets must be no closer than 30mm to the outside edge of the insulating block.

Supporting Spans:

The maximum pipe span in metres for standard wall carbon steel pipe should be as follows:

Pipe size (NB)	½"	1"	1 ½"	2"	3"	4"	6"
Max pipe span (m)	2	3	3	3.3	4.8	5.7	7.6

Supports should be designed to allow adequate movement for thermal expansion of pipework.

Hydrostatic Testing:

All pipework subject to operating pressures in excess of 0.5 barg should be hydrostatically tested to 1.5 times the design pressure of the system unless it is impractical or undesirable for process/safety reasons to do so.

The design pressure of the system is the maximum possible pressure due to a protective device (e.g. relief valve set pressure) or the maximum service pressure x 1.1 (whichever is lower).

For modifications and repairs to existing pipework that has already been proven to be adequately strong either by previous testing or by an appropriate period of satisfactory service, either:

- The whole installed system should be hydraulically tested in situ.
  Or
- The modified section should be strength tested in the workshop and then assembled. Further strength testing is not required if the connections are flanged. If the final connections are welded then the system should be hydraulically tested in situ. This may be waivered on the written permission of the Site Engineering Operations Manager following at least a visual inspection and proof of NDT certification.

Strength testing should be carried out in accordance with the requirements of BS EN 13480. Steam & Condensate services over 9 barg & 290 °C and all boiler pipework should be pressure tested should be conducted in accordance with BS 806.

Before testing begins, all components in the system must be checked to ensure they can withstand the test pressure (isolating or removing as appropriate if acceptable to do so).

Certification of strength testing should be provided by the supplier.

Testing should not be performed below 7 °C ambient temperature.

Water is the preferred testing medium, if not practical then another fluid can be used.

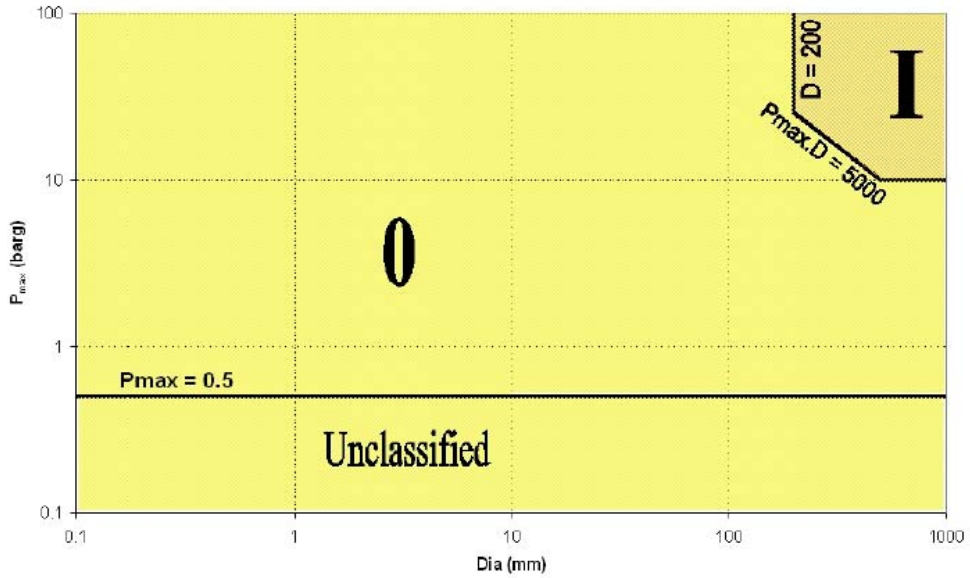
The test pressure should be raised incrementally in steps of not more than 10% of final test pressure or 1 barg (whichever is the lower increment) and the system checked for pressure loss over a specified period of no less than 5 mins at each increment. When the final test pressure is reached it should be held for at least 30 minutes. Testing should be witnessed by PIR or the PIR representative and their signature should be included on the test certificate.

Nondestructive testing:

The standard for testing of completed metallic pipework sections is BS EN 13480 and aligns with the Pressure Equipment Directive in terms of categories and definitions.

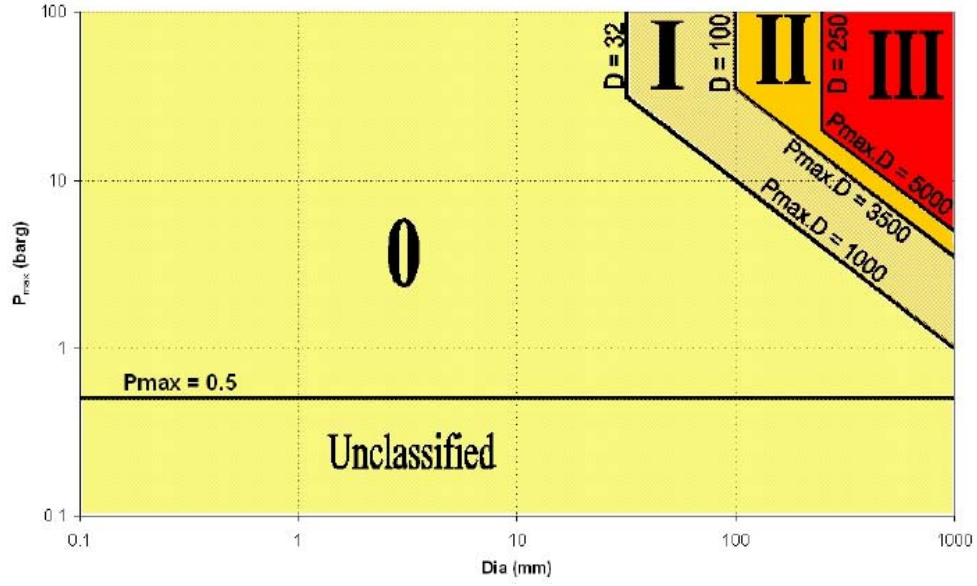
Steam & Condensate up to 0.5 barg is considered a group 2 liquid.

The classification for this pipework can be found from the following table:



Steam & Condensate above 0.5 barg is considered a group 2 gas.

The classification for this pipework can be found from the following table:



Note for the above graphs:

The Pmax is the maximum possible pressure due to a protective device (e.g. relief valve set pressure) or the maximum service pressure x 1.1 (whichever is lower).

In that the pipe size vs Pmax coincides with a division between two classes, then the lower class applies.

The classification of the pipework defines what NDT is required as per the following table:

Pipe Class	Visual examination	Butt Welds	Branch Welds >100mm		Socket/Fillet Welds Seal Welds	
		RT/UT	MT	RT/UT	MT	RT/UT
Unclassified/0	100%	0%	0%	0%	0%	0%
I	100%	5%	0%	0%	0%	0%
II Steam/Condensate	100%	25%	0%	25%	0%	10%
III Steam/Condensate	100%	100%	10%	100%	10%	10%

RT = Radiographic Testing:

Class III welds: carried out in accordance with EN 1435:1997 Class B.
Class I or II welds: carried out in accordance with EN 1435:1997 Class A.
All welds for testing should be numbered and marked on pipework in indelible pen.
The acceptance criteria are defined in EN 12517:1998 acceptance level 2 and additional requirements of EN 13480-5:2002 table 8.4-3.
Testing should be carried out by persons qualified to at least EN 473:2000 Level 1, supervised by persons qualified to level 2 or 3 who are responsible for the evaluation of the results.

UT = Ultrasonic Testing (for carbon steel 15mm wall thickness or greater):

Ultrasonic testing is preferred on carbon steel where the material thickness is greater than 15 mm.
Class III welds: carried out in accordance with EN 1714:1998 Class B.
Class I or II welds: carried out in accordance with EN 1714:1998 Class A.
The acceptance criteria are defined in EN 1712:1997 acceptance level 2.
Testing should be carried out by persons qualified to at least EN 473:2000 Level 1, supervised by persons qualified to level 2 or 3 who are responsible for the evaluation of the results.

MT = Magnetic Particle Testing:

The examination shall be carried out in accordance with EN 571-1.
The acceptance criteria are defined in EN 1298:1998 acceptance level 1.
Testing should be carried out by persons qualified to at least EN 473:2000 Level 1, supervised by persons qualified to level 2 or 3 who are responsible for the evaluation of the results.

If a weld is rejected, two more welds of the same type by the same welder must be examined. If these are acceptable then the initial weld can be repaired and re-examined. If either of the additional welds examined is unacceptable then all of the welds in the group must be examined and repaired and re-examined as required.

All welds should be visually examined externally and internally for defects and irregularities.

STANDARD
Pipework Standard 002

Suitable pipework contents:

Pipework contents	Notes
Pumped Condensate	Pipework from condensate return vessel pump outlet.

Relevant Standards:

Pipework: ASME B31.3 – 2002 – Process Piping
Pressure Equipment Directive 97/23/EC
Testing: BS EN13480 – Metallic Industrial Piping
Welding: Welders used for manufacturing or installation must have completed and passed a test in accordance with BS EN 287.

Pipework, valves and fittings:

Item	Size range	Description	Notes
Pipe	1" – ¾"" DN15 – DN20	Stainless Steel, ASTM A312 TP316L Seamless Sch 40S, plain ends	
	1" - 12" DN50 – DN300	Stainless steel, ASTM A312 TP316L seamless Sch 10S, plan ends. For 4" and larger longitudinally welded at site engineers discretion.	Welded pipe and fittings shall be 100% radiographed by the manufacturer
	½" – 2" DN15 – DN50	Stainless steel, ASTM A312 TP 316L seamless, for straight pipe nipples Sche 40S, threaded ends BSP taper.	If a screwed connection is to be made to process equipment, use a schedule 40S nipple and break flanges to specification required. Not to be used for hygienic applications. Not to be used for sterile fluid applications. Use PTFE tape to BS 7786 for pipe thread sealing.
Fittings	½" – 12" DN15 – DN300	Butt weld, wrought stainless steel ASTM A403 WP316L seamless. Dimensions to ASME B16.9. Wall thickness to match pipe.	Use pulled bends (Rad 5D) for 1" NB and below. Where dimensions are limited, butt weld elbow may be used for ¾" NB and above.
	¼" – 1"	Threaded half coupling. Forged stainless steel ASTM A182 F316L. Dimensions to ASME B16.11 class 300#. Threaded BSP taper.	For instrumentation only. Not to be used for sterile fluid applications. Use PTFE tape to BS 7786 for pipe thread sealing.
Flanges	½" – 12" DN15 – DN300	Slip on, ASME B16.5 class 150# RF. Stainless steel ASTM A182 F316L.	Other flange standards e.g. BS10, PN16 etc. Installed only where required by mating equipment and when agreed with site engineer. Not to be used for hygienic applications. Shall be double welded.
Gaskets	½" – 24" DN15 – DN600	Class 150#, inside bolt circle (ring type). Graphite laminated with tanged stainless steel sheet reinforcement, flat ring type inside bolt circle, 1.5mm thick, dimensions to ASME B16.21	For use with weld slip on flanges.
Bolting	½" – 12" DN15 – DN300	Stainless steel heavy hexagon head machine bolt. Threaded full length with one heavy series threaded nut. ISO metric coarse thread. ASTM A193 GR B8 class 2 bolt with ASTM A194 GR 8 nut.	Washer of compatible material to be placed under nut.
Ball valves	½" – 1 ½" DN15 – DN40	3-piece, antistatic Stainless Steel body & end connectors. 316L Stainless Steel ball. TFM self-relieving seats (not on 3-way valves). & seals, graphite gland packing. Butt weld ends to suit pipe.	
	2" – 8" DN50 – DN200	150# flanged ball valve. 1-piece body. Firesafe & antistatic. 316SS body ASTM A351 CF8M. 316L stainless steel ball & trim. TFM self-relieving seats (not on 3-way valves) & seals, graphite gland packing. Flanged ends to ASME B16.5 150# RF.	
Needle valve	½" DN15	Needle valve for isolation, calibrating and venting with stainless steel 316 S16 body, spindle and handwheel. Hard seat. PTFE seal valve. BSP taper female ends.	For instrument isolation, calibration and venting only. Use PTFE tape to BS7786 for pipe thread sealing.
Check swing	½" – 12" DN15 – DN300	150# Swing type check valve. Bolted cover. 316 SS body, disc and cover ASTM A351 CF8M 316 SS trim. flanged ends to ANSI B16.5 RF.	

Branch table:

		HEADER															
BRANCH	**NPS**	**24**	**20**	**18**	**16**	**14**	**12**	**10**	**8**	**6**	**4**	**3**	**2**	**1 ½**	**1**	**¾**	**½**
	½	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT	BWT	BWT
	¾	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT	BWT	
	1	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT		
	1 ½	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT			
	2	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT				
	3	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT					
	4	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT						
	6	SOB	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT							
	8	SOB	SOB	SOB	SOB	SOB	SOB	SOB	BWT								
	10	SOB	SOB	SOB	SOB	SOB	SOB	BWT									
	12	SOB	SOB	SOB	SOB	SOB	BWT										
	14	SOB	SOB	SOB	SOB	BWT											
	16	SOB	SOB	SOB	BWT												
	18	SOB	SOB	BWT													
	20	SOB	BWT														
	24	BWT															

NPS: Nominal Pipe Size in Inches.
SOB: Set On Branch.
BWT: Butt Welding Tee.

Thermal insulation:

	Pipe size (NB)											**Flat surfaces & vessels**
	½"	**¾"**	**1"**	**1 ½"**	**2"**	**3"**	**4"**	**6"**	**8"**	**10"**	**12"**	
	Thickness (mm)											
0 to + 185 C Rockwool	40	40	50	60	60	70	70	80	90	90	100	60
Aluminum cladding	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.8	0.6
Stainless steel cladding	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.8	0.5

A minimum clearance of 25 mm must be left all around a completed insulated pipe.

All insulated pipework must be supported on insulated blocks the same size as the required insulation thickness. Supports or brackets must be no closer than 30mm to the outside edge of the insulating block.

Supporting Spans:

The maximum pipe span in meters for 10s stainless steel pipe should be as follows:

Pipe size (NB)	**½”**	**1”**	**1 ½”**	**2”**	**3”**	**4”**	**6”**
Max pipe span (m)	1.5	2	2.3	2,7	3.4	3.8	4.4

Note: The preferred span for schedule 10s pipework, 25 NB and above, on gantries and intermediate supports is 2.5 meters.

Supports should be designed to allow adequate movement for thermal expansion of pipework.

Hydrostatic Testing:

All pipework subject to operating pressures in excess of 0.5 barg should be hydrostatically tested to 1.5 times the design pressure of the system unless it is impractical or undesirable for process/safety reasons to do so.

The design pressure of the system is the maximum possible pressure due to a protective device (e.g. relief valve set pressure) or the maximum service pressure x 1.1 (whichever is lower).

For modifications and repairs to existing pipework that has already been proven to be adequately strong either by previous testing or by an appropriate period of satisfactory service, either:

- The whole installed system should be hydraulically tested in situ.
  Or
- The modified section should be strength tested in the workshop and then assembled. Further strength testing is not required if the connections are flanged. If the final connections are welded then the system should be hydraulically tested in situ. This may be waivered on the written permission of the Site Engineering Operations Manager following at least a visual inspection and proof of NDT certification.

Before testing begins, all components in the system must be checked to ensure they can withstand the test pressure (isolating or removing as appropriate if acceptable to do so).

Certification of strength testing should be provided by the supplier.

Testing should not be performed below 7 °C ambient temperature.

Water is the preferred testing medium, if not practical then another fluid can be used.

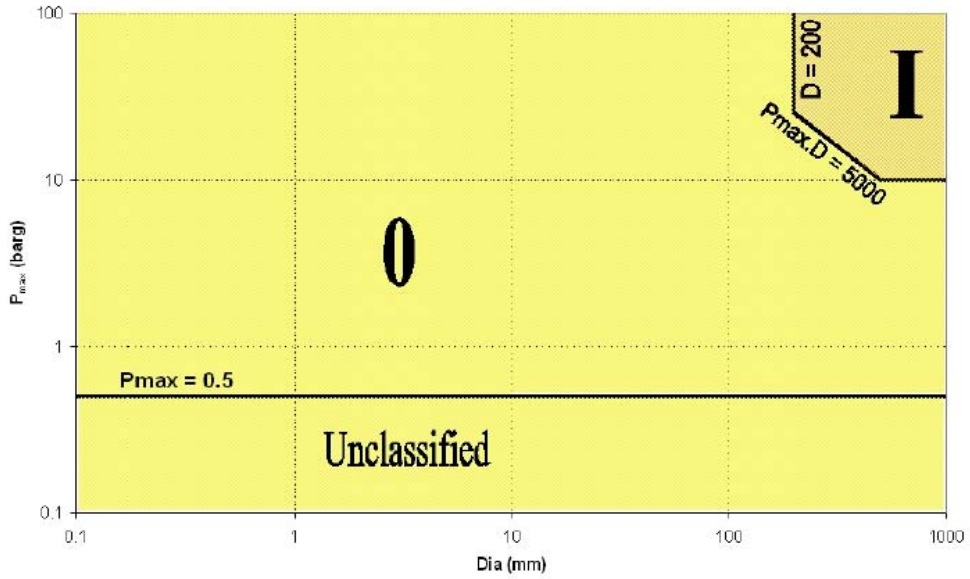
The test pressure should be raised incrementally in steps of not more than 10% of final test pressure or 1 barg (whichever is the lower increment) and the system checked for pressure loss over a specified period of no less than 5 mins at each increment. When the final test pressure is reached it should be held for at least 30 minutes. Testing should be witnessed by PIR or the PIR representative and their signature should be included on the test certificate.

Nondestructive testing:

The standard for testing of completed metallic pipework sections is BS EN 13480 and aligns with the Pressure Equipment Directive in terms of categories and definitions.

Atmospheric Condensate is considered a group 2 liquid.

The classification for this pipework can be found from the following table:



Note for the above graphs:

The Pmax is the maximum possible pressure due to a protective device (e.g. relief valve set pressure) or the maximum service pressure x 1.1 (whichever is lower).

In that the pipe size vs Pmax coincides with a division between two classes, then the lower class applies.

The classification of the pipework defines what NDT is required as per the following table:

Pipe Class	Visual examination	Butt Welds	Branch Welds >100mm		Socket/Fillet Welds Seal Welds	
		RT/UT	MT	RT/UT	MT	RT/UT
Unclassified/0	100%	0%	0%	0%	0%	0%
I	100%	5%	0%	0%	0%	0%

RT = Radiographic Testing:

Class III welds: carried out in accordance with EN 1435:1997 Class B.
Class I or II welds: carried out in accordance with EN 1435:1997 Class A.
All welds for testing should be numbered and marked on pipework in indelible pen.
The acceptance criteria are defined in EN 12517:1998 acceptance level 2 and additional requirements of EN 13480-5:2002 table 8.4-3.
Testing should be carried out by persons qualified to at least EN 473:2000 Level 1, supervised by persons qualified to level 2 or 3 who are responsible for the evaluation of the results.

UT = Ultrasonic Testing (for carbon steel 15mm wall thickness or greater):

Ultrasonic testing is preferred on carbon steel where the material thickness is greater than 15 mm.
Class III welds: carried out in accordance with EN 1714:1998 Class B.
Class I or II welds: carried out in accordance with EN 1714:1998 Class A.
The acceptance criteria are defined in EN 1712:1997 acceptance level 2.
Testing should be carried out by persons qualified to at least EN 473:2000 Level 1, supervised by persons qualified to level 2 or 3 who are responsible for the evaluation of the results.

MT = Magnetic Particle Testing:

The examination shall be carried out in accordance with EN 571-1.
The acceptance criteria are defined in EN 1298:1998 acceptance level 1.
Testing should be carried out by persons qualified to at least EN 473:2000 Level 1, supervised by persons qualified to level 2 or 3 who are responsible for the evaluation of the results.

If a weld is rejected, two more welds of the same type by the same welder must be examined. If these are acceptable then the initial weld can be repaired and re-examined. If either of the additional welds examined is unacceptable then all of the welds in the group must be examined and repaired and re-examined as required.

All welds should be visually examined externally and internally for defects and irregularities.