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| Scope of Works | | Logo |
| Title: | IS4L Electrification of Heat Project | |
| Project: | CP2021009 | |
| Date: | 08 – 11 – 2021 | |
| Author: | Veekash Bhowruth | |
| Owner: | Anthony Clarke | |
| Client: | The Pirbright Institute | |
| Version No: | 1 | |

# Scope of Works History

## Document Location

N:\Capability Projects\Private\Operational Projects\CP2021009 – IS4L Electrification of Heat Project

Revision History

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| **Version** | **Date** | **Details** | **Author** |
| 1 | 08/11/2021 | First Draft | VB |

Changes from previous version are highlighted yellow.

## Approvals

This document requires the following approvals.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Title** | **Signature** | **Date** | **Version** |
| Anthony Clarke | Capability EMS Operational Projects Manager |  |  | 1 |

## Issue History

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

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Purpose** | **Date of Issue** | **Version** |
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# Introduction

## Document Purpose

The primary purpose of this version of the document is intended to:

* Give details of works required to potential suppliers so they can submit quotation and programme of works.
* Fulfil the client brief and pre-construction information aspects of construction design management (CDM) regulations 2015.

For comparison only, this version of the document could be aligned with Royal Institute of British Architecture (RIBA) Plan of work 2014 Stage 1 (Preparation & Brief).

As the project progresses, this document will be updated to contain more detailed information on the proposed design and delivery of the works.

Should changes to the scope occur, these will always be recorded in meeting notes and the scope document will be updated and re-issued if appropriate.

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.
* There are additional requirements needed.
* Envisaged requirements are required.

## Summary Description of works

The IS4L facility at The Pirbright Institute acts as a focus for the production, maintenance, analysis and genetic modification of mosquitoes with a view to controlling internationally important viruses of humans and livestock. This project is part of a strategy to improve resilience within the IS4L Building, whilst also working towards the Site’s Net Carbon Zero Strategy by reduction of fossil fuel use.

IS4L is currently heated using Low Temperature Hot Water (LTHW), which is generated by steam from a gas fired boiler. Humidification for the main AHUs is provided by injecting steam directly into the AHU air stream. The current LTHW system is reaching its end of life, has numerous maintenance issues and need replacing to ensure resilience for this critical building. This presented an opportunity to replace the system with technology that would result in a reduction of fossil fuel usage on site. Whilst the humidification lances to the main AHU have no issues at present, there is also a requirement to replace these with fossil fuel free heating technology.

The aim of this project is to improve the resilience of the IS4L building and work towards the Net Carbon Zero strategy for the site. The objectives are as follow:

* Remove and replace existing LTHW heating system with fossil fuel free heating technology
* Remove and replace existing Steam Humidifiers with fossil fuel free heating technology
* Upgrade of electrical supplies for new equipment
* Upgrade of BMS (Trend 963/IQ Vision) to support new installations

## Contact Details

Anthony Clarke

* Role: TPI Project Business Sponsor
* Anthony.clarke@pirbright.ac.uk
* 01483 231 062
* Normal working hours: 0800h to 1630h, Monday to Friday

## Location of Works

These works will take place at the following addresses:

The Pirbright Institute

Ash road,

Pirbright,

Woking,

GU24 0NF

# Site Information

This section contains information related to delivering these works at The Pirbright Site.

## 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.

R&A-COP-3: Approved Contractor Site handbook should be issued to principal contractors/designers by the project sponsor or project manager in advance of any works commencing. These should be issued to sub contractors/designers by the principal contractors/designers before any works commencing. These need to acknowledged as read and understood in any Risk Assessments & Method Statements (RAMS) received.

R&A-FORM-4: Pirbright Site Rules Overview is a summary of R&A-COP-3: Approved Contractor Site handbook and should be issued to all contractors / subcontractors when they arrive on site to do works.

EMS-SOP-101: Safe System of Work details the process of applying a safe system of work to all construction works taking place on site including Point of Work Risk Assessment, Permit to Work and Lock off Tag Out processes.

The above documents detail TPIs management of H&S for construction works, the following sections highlight aspects to be considered.

### 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 project manager 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.

RAMS are never “approved” by TPI 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.

Personnel performing works and their relevant training records should be included with RAMS.

### Tools and Equipment

Contractors should provide all tools and equipment they require to complete their works. TPI will not issue equipment to contractors.

Equipment used by contractors should be in good working order and comply with all relevant legislation.

Electrical equipment should be PAT tested.

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

### PPE

Contractors should provide their own personal protective equipment (PPE). PPE used should be suitable for the works and specific type/specification of PPE should be detailed in the RAMS.

### 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.

### Scaffolding and Access Equipment

Contractors should arrange scaffolding required to facilitate their works, TPI preferred suppliers can be utilised. Contractors should ensure that scaffolding is inspected and tagged on a weekly basis once erected.

Contractors should provide all temporary access equipment such as ladders and mobile platforms. These should be class 1 (industrial) certification standard. TPI will not issue access equipment to contractors.

All access equipment should be in good working order (visual check before use) and have been inspected in the last 6 months.

### Equipment Certification

Where appropriate, evidence of inspection / testing / commissioning of equipment supplied or used for installation works should be provided.

### Permits

All construction works performed by contractors require a permit to work.

See EMS-SOP-101: Safe System of Work and EMS-WI-079: Permit to work for further details.

Note: The application of the safe system of work and permits to the construction works with relevant members of Capability EMS as advised by the project sponsor in advance of works commencing.

### Isolations

Isolations of TPI site energy sources must be performed under permit by TPI maintenance technicians and should be witnessed by the contractor performing the work.

These isolations should then be secured with padlocks of contractors working downstream of the isolation.

See EMS-SOP-101: Safe System of Work and EMS-WI-82: EMS Lockout/Tagout Work Instruction for further details.

### Asbestos

There is no asbestos risk associated with this construction work, the site asbestos register is available on request.

If any 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.

### 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 project manager).

## Security and Site Access Requirements

R&A-COP-4: Contractor Management Process details site access requirements.

The following sections highlight aspects to be considered.

### Photos

Photos can only be taken with prior agreement from the project manager. Any photos taken should not include any faces or vehicle number plates.

### Site Access

To gain access to site, all contractors must have visitor forms raised for them by their site host 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.

### Site Inductions

There are no works within restricted area, therefore no site induction over and above the contractor handbook is required for these works.

Construction site specific inductions should be created and delivered to all personnel visiting or working within the construction site.

### Approved Contractors and 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.

As a rule of thumb, 1 approved contractor can escort up to 3 unapproved contractors.

Even approved contractors may require an escort in certain restricted areas of site, however none of the works are envisaged to take place within restricted areas.

### Vehicle Movements

Vehicle movements on site roads is subject to a speed limit of 10 mph which must be observed at all times extra caution should be taken by drivers on site roads due to shared use of roads by pedestrians, bicycles and vehicles.

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

### Welfare Facilities

Welfare facilities will be provided close to the construction site.

### Working Hours

Contractors will be able to access site from 0700h – 2000h Mon - Fri. Works outside of these hours need to be arranged with the project manager.

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

### Construction site management

The construction of this project will be managed via the Safe Systems of Work at Pirbright. The works will be carried out under the TPI permit procedures and contractors are required to adhere to these procedures. The TPI Project manager will provide assistance to ensure all documentation is in place prior to works starting.

Note: the contractor is expected to arrange any equipment required for construction area management such as track way, barriers, site vehicles etc. as part of their works.

Access to the construction area should only be to people who have completed the necessary site induction and Bio-safety inductions. This can be arranged through the TPI Project Manager.

## Bio Safety Quarantine and Decontamination Requirements

Personnel and equipment working within Biocontainment areas will be subject to a quarantine period (mustn’t visit zoos, farms, safari parks or other locations likely to house susceptible cloven hoofed animals).

The IS4L Building does not fall under these restrictions and there are no envisaged works within Biocontainment areas. It must be highlighted that one of the rooms in IS4L is a CL2 lab and therefore no unescorted access is allowed. All works are planned to be carried out in the IS4L plantrooms, so there won’t be a need to enter this room. However, if there are any changes to this during the project, then the project manager will inform the contractors of this.

## Design Requirements

### Design Responsibility

Detailed design work for all mechanical, electrical, civils and controls works should be carried out for all works.

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

### Standards and Specifications

All equipment supplied an installed should be manufactured, installed, tested and commissioned in accordance with all applicable national and international standards, manufacturer’s instructions. These should be referenced in any quotation documentation and RAMS documents.

### Design Review & SWIFT Analysis

The proposed design should be reviewed with appropriate Capability EMS personnel.

The designer and any appropriate sub designers must attend and provide any information requested in advance.

A SWIFT study has not been planned for this project.

### Documentation

The following documentation should be issued before works commence:

* Design Drawings
* Control Philosophy
* Design calculations, or statements confirming they are not required.
* Relevant safety certificates for equipment being used to perform the works.

## Completion of works

The following sections details what constitutes completion of the works.

### Inspection and Testing

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

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

### Commissioning

Commissioning of equipment must take place to prove that requirements as detailed by this scope of works have been successfully met.

Commissioning requirements must be drafted during the Design development phase of the project and finalised during the detailed design phase of the project.

### End Users Training

Appropriate end users training must have taken place to a level that the end user feels they can successfully operate and maintain any equipment.

### Snagging Surveys

All works, they must be visually inspected by an appropriate member of the institute engineering team.. Any snags identified shall be listed on a project snagging schedule by the project manager and reviewed with the principal contractor and project sponsor to agree where responsibility for remedial works lies.

Performance and documentation defects/deficiencies can also be recorded and traced on this schedule.

### Project Information File (PIF)

Final handover to the TPI operations team includes the completion of a Project Information File (PIF).

This includes information from the contractors.

Details of what is to be included in the PIF are shown in the PIF check sheet included in Appendix A.

### Operations Handover Workshops

Operational handover workshops should take place between once the activities in the sections above have been completed, this should be facilitated by the project manager and should involve the following people:

* Capability EMS Leader Operations and Maintenance
* Capability EMS Leader Projects and Process
* Appropriate Capability EMS Specialist Equipment Owners
* Capability EMS BMS Owner
* Capability EMS Systems Administrator
* Maintenance Supervisor (Reactive & Planned)
* Science Users (if applicable)

### Project Completion Sign Off

Once all the activities in the above sections have been completed, then a project completion sign off sheet should be signed by those that attended the handover workshops.

This marks the completion of the project and any new equipment installed is now managed by Capability EMS Operations and Maintenance.

### Waste Management

A project will not be signed off if waste from the works remains on site, contractors must dispose of waste from the works via appropriate means.

TPI waste streams must not be used without prior agreement.

It is envisaged that no TPI waste streams will be used for the delivery of these works.

All waste spoil created by the works must be removed from site by the contractor and disposed of in an appropriate manner. However, this must be confirmed in writing with the TPI Biosafety team as spoil from some areas of site must be stored and/or sampled on site before disposal.

Any waste skips/bins/collections must be arranged by the contractor.

## Commercial Requirements

The work will be procured following the Pirbright’s procurement policy. Works will only be undertaken by specialist contractors who are approved by the equipment manufacturer, or in-house resources.

Due to the pre-existing equipment and proprietary technology it is expected that most elements will have to be sourced from those existing suppliers as they may be from a single vendor option, or from an approved framework.

This project will be procured in line with public sector procurement rules. In summary:

* < £10,000 (NET): 1 quotation required.
* £10,000 - £25,000 (NET): 3 quotes required.
* £25,000 – FTS Level: Competitive tender via FTS
* FTS

Quotations will be gathered by the project manager.

Orders can only be placed with approval from the project business sponsor (as budget holder).

Raising POs and co-ordination of any competitive tender process will be by the TPI Commercial Officer.

Contractor capability should be reviewed before works are awarded.

This may involve but is not limited to:

* Completion of pre-Qualification Questionnaire
* Assessment of the quality of tender submission via a scoring matrix
* 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 by TPI personnel to suppliers manufacturing facilities or reference sites
* Issuing relevant training records of all contractors and managers associated with the works

Where appropriate, contracts will be administered under an NEC standard form of contract

## Project Management Requirements

### Project Meetings.

Regular project progress meetings between the project manager will take place with the principal designers / contractors and any other relevant personnel required regularly.

During construction this needs to be weekly.

### Project Risk Register

A project risk register will be created and will be reviewed at project management meetings.

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

### Project Programme

A live project programme will be agreed in the detailed design phase and then further agreed once contractors are procured.

Contractors should provide a delivery and installation programme associated with any works they are quoting for.

The project manager should own and maintain the overarching project programme and principal contractors/designers should provide information on their elements of works as required.

### 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:\Capability Projects\Private\Operational Projects\ CP2021009 – IS4L Electrification of Heat Project

### Project Co-Ordination

The following activities will ensure project co-ordination:

* Regular project management meetings, primarily between the Pirbright client representative 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 Capability EMS Team.

### Client Representative

TPI Project Manager will be acting as the Client Representative in terms of CDM responsibilities.

### Project Organogram

The envisaged project organogram is shown below:

Diagram, Teams

Description automatically generated

### Responsibilities

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

TPI Project Sponsor.

* Business Case Author
* Budget Control
* Benefit realisation
* Escalation of issue to senior management when required
* Halting project if required
* Approving changes to project scope
* Reviewing and agreeing detailed design before works commence
* Responding to contractor queries
* Ensuring works are performed in a safe manner
* Advising the TPI project manager on the application of site processes and what personnel should be consulted for project queries

TPI Project Manager & CDM Client Representative:

* Drive day to day activities to delivery of the scope of works
* Act as site host for principal contractors / designers
* Create and agree with principal contractors the content of the construction site induction
* Create and maintain scope of works document
* Create and maintain a project risk register
* Create and maintain project programme
* Managing project documentation
* Raise purchase orders
* Co-ordinate the contractor, designers and institute personnel to facilitate works
* Facilitate site access
* Reviewing and agreeing detailed design before works commence
* Arrange and chair project meetings and issuing notes of meeting
* Responding to contractor queries
* Arrangement of permits and isolations
* Ensuring works are performed in a safe manner
* Fulfil CDM Client Responsibilities including appointing principal contractors/designers and submission of F10 forms for notifiable projects
* Co-ordinating snagging surveys as required
* Handover to Pirbright Engineering Management
* Arranging training where appropriate

Designers:

* Design responsibility for all installed items in their scope
* Management of all sub designers
* Act as site host for sub designers
* Ensuring works are performed in a safe manner
* Highlight H&S and design risks to the project manager
* Supplying all required documentation and information to the institute
* Ensuring the scope of works is met in full
* Providing a Health and Safety File in accordance with CDM Regulations
* Providing Training where appropriate

Contractors:

* Install items as per designers specification
* Management of all sub-contractors
* Act as site host for sub-contractors
* Ensuring works are performed in a safe manner
* Highlight H&S and design risks to the project manager
* Supplying all required documentation and information to the institute
* Ensuring the scope of works is met in full
* Fulfilling Contractor responsibilities to adhere to The Pirbright Institute Safe Systems of Work
* Providing Training where appropriate

Sub-Designers:

* Design responsibility for all installed items in their scope
* Ensuring works are performed in a safe manner
* Highlight H&S and design risks to the principal designer
* Supplying all required documentation and information to the principal designer.
* Ensuring the scope of works is met in full
* Fulfilling CDM Sub-Designer responsibilities
* Providing Training where appropriate

Sub-Contractors

* Install items as per designer specification
* Responsibility for installation activities within their scope
* Management of all contractors performing works within their scope
* Ensuring works are performed in a safe manner
* Highlight H&S and design risks to the principal contractor
* Supplying all required documentation and information to the principal contractor
* Ensuring the scope of works is met in full
* Fulfilling CDM Sub Contractor responsibilities
* Providing Training where appropriate

Institute personnel:

* Provide information requested by principal designer / contractor
* 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 project manager
* Completing snagging surveys as required
* Take part in project meetings / handover workshops as required

# Works Information

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

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

## Work Package 1 – Design, Supply and Installation of LTHW System for IS4L Building and AHU Humidification

Overview:

The aim of this work is to replace the LTHW System and AHU Humidification with technology which reduces/eliminates the use of fossil fuels for heating. The deliverable of this project is to design, supply and install a new LTHW system for the IS4L Building and new humidification systems for the main AHU.

Scope of Works:

* Design and specify equipment, pipework, electrical and BMS services for this project and prepare relevant documentation (datasheets, drawings, calculations) required for technical review.
* Provide Risk Assessments and Method Statements prior to carrying out works. This should be submitted at least one week before the start date.
* On delivery to site, the contractor will be responsible for the Installation and Commissioning of the system.
* A commissioning protocol is to be develop by the contractor and submitted to TPI for review.
* Commissioning, Testing, Certification of new installation
* Provide on-site training to the TPI teams.
* Be present to witness key commissioning.
* Be present to identify snags and defects.
* Disposal of waste
* Documentation associated with all above works (see example PIF in appendices)
* Following all site processes as summarised in the site information (section 4)

Design Basis

* The existing LTHW pump has a max flowrate of 4.24l/s shown on the plate and the ∆T of the LTHW is assumed to be 11°C
* The outlet conditions of the AHU is 19 - 22°C and 50 – 60%RH. (Measurements to be taken as part of design)
* Drawings are included with this document and show the following:
  + AHU schematic showing proposed air flowrates. There is currently a project in place to optimise the building HVAC, so discussions with the designers for this work will confirm the final flowrates.
  + Existing LTHW and Heat Recovery Schematic
  + Existing Steam Pipework Schematic

# CDM requirements

This section outlines the CDM specific requirements for the project.

## Client Brief

This scope document forms the client brief.

## Duty Holders

**Client**

The client is The Pirbright Institute; represented by the TPI project manager (TBC) 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 – This role will not be formally appointed to the contractor, but work will be carried out in accordance with The Pirbright Safe Systems of Work**

The Designer for each work package is to be confirmed.

The 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 – This role will not be formally appointed to the contractor, but work will be carried out in accordance with The Pirbright Safe Systems of Work**

The Contractor for each work package is to be confirmed.

The contractors will:

* Manage all sub-contractors.
* Ensure that all parties working on the construction adhere to The Pirbright Institute Safe Systems of Work.
* Provide pre-construction information as required.

## Pre-Construction Information

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

## Management Arrangements

Section 4 outlines the management arrangements for the project.

## Notification to HSE

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

## Construction Phase Plan

As part of this project, a Construction Phase Plan will not be required as the work will be carried out in accordance with TPIs Safe Systems of Work. However, it is the responsibility of the contractor to ensure the following is defined for the works. This information can be contained in RAMS submitted for the works.

* The health and safety aims for the project
* The site rules
* Arrangements to ensure co-operation between project team members
* Co-ordination of their work, such as regular site meetings
* Arrangements for involving workers
* Site induction
* Welfare facilities
* Emergency procedures, such as fire and first aid
* The control of any of the specific site risks relevant to the project

## Health and Safety File

It is a requirement for each work package to have a health and safety file maintained by the relevant contractor 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.

## Application of CDM to this project

Due to the nature and sequencing of the works, it is not expected that a full CDM site will be set up for the works. It is envisaged at this stage that works will be permitted through the site Permit system.

#### Appendix– Documents

|  |  |  |
| --- | --- | --- |
| **Reference** | **Title** | **Version** |
| 30420-BS-DR-5007 | HVAC PLANT SCHEMATIC AHS01 / GEX01 (PROPOSED) | B1 |
| 109186-05M7799-111 | BUILDING 77 LTW01/02 HEATING AND HEAT RECOVERY SYSTEM SCHEMATIC |  |
| 109186-05M7799-101 | BUILDING 77 FST01/FSC01 FACTORY STEAM & CONDENSATE PIPEWORK SCHEMATIC |  |
|  |  |  |
|  |  |  |