

Scope of Works



Title: PM Incin Abatement Equipment Phase 2 & 3

Project Ref: EM042

Date: 06/12/16

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Owner: David Shadwell

Client: The Pirbright Institute

Version No: 3

1 Scope of Works History

1.1 Document Location

N:\Capability Projects\Private\Operational Projects\EM042 - PM Incin Abatement Equipment Phase 2\Scope of works document

1.2 Revision History

Version	Date	Details	Author
1-A	13/09/16	First Draft	IMP
1	15/9/16	First Issue	IMP
2	22/11/16	Updated with: <ul style="list-style-type: none">• Details of main plant items and supplier.• Design basis for Enabling works.• Design basis for control system works.	IMP
3	06/12/16	Work element 8 updated for quotation.	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			

1.4 Issue History

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

Name	Purpose	Date of Issue	Version
Potential suppliers of enabling works.	For quotation.		3

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3 Introduction

3.1 Document Purpose

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

- Incorporate agreed solution of main plant items.
- Allow potential suppliers of enabling works packages to provide concept designs with budgetary quotations.

This version of the document is intended to fulfil the client brief 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 and Brief).

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

Should changes to the scope occur, it will be re-issued to potential suppliers for re-quoting purposes.

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

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

3.2 Summary Description of works

The Pirbright site features an incinerator known as the "PM Incin", this is the single point of disposal for hazardous waste from the SAPO4 research facilities within the "ISO compound".

The condition of existing abatement equipment associated with this incinerator is poor and being replaced in phases.

Phase 1 was to replace the ID fans, this was completed in January 2015.

Phase 2 is to replace the bag filter before the end of March 2017.

Phase 3 is to replace the air cooled heat exchanger before the end of October 2017.

This scope of work document details the requirements for phases 2 & 3 of the PM Incin abatement equipment replacement project at The Pirbright Institute (TPI).

The works are summarised as follows:

- Phase 2 works:
 - Removal of existing bag filter and associated mechanical, electrical and control equipment.
 - Installation of new flue gas filter equipment and associated mechanical, electrical and Control equipment.
 - Installation of plant rooms for above equipment.
 - Utility connections and ground works for above equipment and phase 3 equipment.
 - Integration of above equipment with the existing incinerator controls system.
- Phase 3 works:
 - Removal of existing air cooled heat exchanger and associated mechanical, electrical and control equipment.
 - Installation of flue gas cooling equipment and associated mechanical, electrical and Control equipment.

- Utility connections and ground works for above equipment.
- Integration of above equipment with the existing incinerator controls system.

4 General requirements

This section describes the general requirements for delivering these works at The Pirbright Institute.

4.1 Site Contacts

TPI Project Leader, Project Manager and Client Representative is:

- Iain Paterson
- iain.paterson@pirbright.ac.uk
- 01483231469

The client representative's working hours are 0800h – 1630h Monday - 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 Site inductions

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

Note: on this project, only contractors performing works inside the incinerator hall will require an induction.

4.4 Site Rules for Contractors

The site rules for contractors are included in Appendix C and should be read by all contractors before coming to site.

A summary of these rules will be given to new contractors by security personnel at the gate house on their arrival.

Highlights and additional requirements are included in the following sections.

4.5 Contractor Capability

Relevant training records of all contractors, site managers and designers performing works associated with this scope should be provided to the site contact before works commence.

4.6 Supplier Capability

If appropriate, the suppliers of significant items may require a capability assessment by TPI personnel before works commence.

This may include:

- Visit to existing installation.

- Visit to proposed site of manufacture.
- Provision of quality control system details.
- Provision of insurance levels.

4.7 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 along with the contractor rules attached in appendix C give further relevant details for performing works at The Pirbright Institute.

4.8 RAMS

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 or attempt to cover the scope of works as a whole, but should be task specific and include the relevant dates of the works.

The risk assessment should feature a conventional scoring system with explanation.

The method statement should be of a step by step nature.

Further details are included in the contractor's site rules included in appendix C.

4.9 PPE

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

4.10 Tools & Equipment

Contractors are expected to provide all tools and equipment for both performing works and making the works safe unless specifically agreed with the client.

4.11 Lifting Equipment

Test certification for all lifting equipment should be issued to the client representative before works commence.

For Hi-Ab and crane lifting, a lift plan must be provided in addition to the RAMS 5 days in advance of the 1st day of the works.

4.12 Scaffolding and access equipment

Contractors are expected to arrange any scaffolding required to facilitate works, a preferred supplier of the institute can be used if required, arrange with engineer overseeing works as required.

Contractors are expected to provide their own temporary access equipment such as mobile platforms.

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

4.13 Asbestos

Asbestos has not been identified in the area of the works.

Access to the sites asbestos register is available upon request.

4.14 Control Transfer Documents & Permits

On the 1st day of any contractor works, the contractors must report to the engineering office to be issued with a “control transfer document” (CTD), this is effectively a “permission to work form”, which gives visibility to what works are occurring where to site personnel.

This will be completed with your host and signed by the host, the lead contractor and the contractor manager.

In addition to the CTD, permits will be 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.).
- Working at height.
- Isolations.
- Excavations.
- Confined Space.

4.15 Construction Site Tool Box Talks

On the 1st day of any contractor works, the contractor will be given a tool box talk by either the site host or the principal contractor for the project. This will highlight the context of the works and any known hazards associated with the works.

4.16 Isolations & LOTO

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

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

4.17 Security requirements

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

All contractors will require photo ID to gain access to the site.

There are various classifications of site areas that effect the level of restrictions to contractor access. These are summarised below:

- Restricted areas:
 - Restricted areas refer to those within the “bio-containment” barriers and systems.
 - All contractors must be fully escorted by a member of Pirbright personnel within restricted areas.
- Non-restricted areas:
 - Non-restricted areas refers to all areas that are not “restricted areas”
 - Security cleared contractors can freely access non-restricted areas on the understanding that they will follow all site rules.
 - Contractors that are not security cleared may access non-restricted areas only if escorted by a member of Pirbright personnel or a security cleared contractor.
- NOTE: None of the works in this scope are within restricted areas.

To assist completion of the works on time, at least one member of each contractor team should complete an institute security check (performed by Agenda). This could take up to 2 weeks to complete. In order to do this the contractor should supply the names and contact details of personnel to be security checked to the client representative (an e-mail address specific to the individual is required).

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.

4.18 Quarantine requirements

The quarantine requirements associated with this scope of works are as follows:

Personnel, tools and equipment that enter the PM Incin incinerator hall or ISO compound plant rooms will be subject to a 3 day quarantine period.

During the quarantine period locations (such as farms, zoos and safari parks) potentially housing vulnerable species (such as cattle, pigs, sheep, goats and deer) cannot be visited.

Further details of the quarantine rules will be given during the site induction.

4.19 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.

4.20 Vehicle wash-downs

There are no wash-down requirements for these works.

4.21 Design Responsibility

Final design responsibility will always be with the principal designer or contractor project manager (where CDM does not apply or does not require a principal designer and/or principal contractor).

Detailed design for all mechanical, civil, electrical and controls works should be performed. This includes any stress and thermal expansion analysis if required, or a statement to confirm if not required.

All relevant drawings and calculations should be issued to the client representative for review before works commence.

As built drawings should be issued before the project can be deemed complete.

4.22 Standards and Specifications

All equipment should be manufactured, installed, tested and commissioned in accordance with all applicable national and international standards. These should be listed for the institute in relevant documentation.

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

- No standards at this time.

See Appendix C for standards.

4.23 Supports and steelwork

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

4.24 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.

4.25 Inspection, Testing and Commissioning

Any records relating to the inspection, testing and commissioning of an installation should be provided to the client representative as part of the commissioning process.

4.26 Required documentation

The following documentation should be provided before any mechanical, electrical and commissioning works commence:

- Drawings.
- Data sheets.
- RAMS.
- Relevant training Records of all contractors.
- Relevant safety certificates for equipment being used to perform the works.
- Programme of works detailing specific activities and timescales.

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

- As installed drawings.
- Relevant calculations or statements to confirm that they are not required.
- Inspection, testing and commissioning documentation including any certificates.
- Critical spares list.
- Details of planned preventative maintenance requirements of installed equipment.

4.27 Waste

Disposal of the existing abatement equipment needs to be discussed with the client representative. Waste transfer notes will be required before this waste is removed from site.

Waste generated by the installation works should be cleared and removed from site for appropriate disposal by the contractors performing the works.

4.28 Contractor Working hours

Normal working hours for contractors will be able to access site from 0700h – 1900h.

Works outside of these hours should be agreed with the client representative.

4.29 Site Access

Contractors must report to the gatehouse and present photo ID when entering and exiting site on every day the works.

All contractors must report to the engineering office to receive a CTD by their site host on the 1st day of their works as highlighted in section 4.14

All contractors must attend a construction site specific tool box talk on the 1st day of the works as highlighted in section 4.15.

4.30 Welfare facilities

Contractors will have access to existing site to welfare facilities during the works.

4.31 Emergency Procedures

In the event of an emergency such as a fire or medical emergency, the site gatehouse should be contacted on the emergency extension number 1000 or on radio channel 1.

In the event of a fire or fire alarm, the area should be evacuated and all personnel should go to the fire assembly point for the area they are working in. These are shown in appendix D.

If safe to do so, fire alarm call points should be activated on the way out of the area.

5 Particular Requirements

This section provides details of the envisaged work elements to be included in the scope of works and supporting information.

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

5.1 Work Element 1 – Phase 2: Bag Filter and Dosing System Decommissioning

Inclusions:

- Isolation, decommissioning and removal of the existing bag filter, dosing system and associated ductwork, steelwork and ancillary items to facilitate the installation of replacement equipment.
- Remedial works associated with above decommissioning.
- Removal of these items from site as per conditions agreed with the client representative.
- Project & site/contractor management of above works.

The principal designer / contractor delivering this work element is Lührfilter Ltd.

5.2 Work Element 2

This work element has been superseded by work element 12.

5.3 Work Element 3 – Phase 2: Replacement Flue Gas Filter and Additive Dosing System.

Inclusions:

- Ensuring that the existing air cooled heat exchanger is fit for purpose to sufficiently cool the flue gasses to a temperature suitable for the replacement flue gas filter for the period between installation phases.
- Design, Supply, Delivery and Mechanical/Electrical Installation of the replacement flue gas bag filter, additive reaction chamber, additive dosing/re-circ /disposal system and all associated ancillary systems including ductwork, pipework, supports, platforms, insulation, instrumentation and mechanical/electrical/instrumentation ancillaries.
- Design, Supply and mechanical/electrical/network installation of all cabling for above equipment, including cable tray and containment where required.
- Design, Supply, Delivery and Installation of control system associated with above equipment.
- Relocation and reconnection of ID fan control panels from shipping container to new “plant building” (see work element 5 for further details).
- Extension of all power and signal cables associated with the ID fans due to relocation of control panels.
- Design, Supply and mechanical/electrical installation of all compressed air pipework and associated ancillary items from tie in point on existing ring main to above equipment, including support tray where required.
- Enabling works associated with installation of above equipment.
- Testing and commissioning of above items.
- Documentation for above items.
- Operation & Maintenance training for above items.

- Critical Spares for above equipment.
- Project, site and contractor management of above works.
- Principal designer and principal contractor responsibilities associated with above works.

The principal designer / contractor delivering this work element is Luhrfilter Ltd.

Design Basis:

The abatement equipment should be designed based upon the following data relating to the operation of the existing incinerator:

The abatement equipment should be designed based on the following technical data:

- Waste Gas from INCINERATOR: 7,550 Nm³/hr (Max)
- Max. Temperature into FGT Plant: 800 °C
- Max. Temperature into Filter Plant: 180 °C
- Actual Gas Volume @ Filter: 24,300 Am³/hr @ 180 °C
- Dust composition: Ash Residue + Additive reagents
- Dust particle size: 60% > 100 μm; 30% > 60 μm; 5% < 30 μm (estimated)
- Dust burden: estimated 1.0 g/Nm³
- SO₂ Concentration: max 1,200 mg/Nm³
- HCl Concentration: max 800 mg/Nm³
- HF Concentration: max 20 mg/Nm³
- Hg Concentration: max 0.75 mg/Nm³
- PCDD /PCDF Concentration: TBC
- O₂ Content: 16.5%
- Operating Hours (Expected): 500 hours/year
- Operating Hours (Max. Permitted): 5,000 hours/year
- Emission Limits Warranty:-
 - Particulate: < 10 mg/Nm³
 - SO₂ Concentration: < 50 mg/Nm³
 - HCl Concentration: < 10 mg/Nm³
 - HF Concentration: < 2 mg/Nm³
 - Hg Concentration: < 0.02 mg/Nm³
 - PCDD /PCDF Concentration: < 0.1 ng/Nm³

Phase 2 items should be designed to enable successful operation with both the existing heat exchanger and the future Phase 3 flue gas cooling equipment.

Access for maintenance should be taken in to account not only for new equipment to be installed but also for existing equipment.

The proposed control philosophy of the abatement equipment is shown on the "PID Phase 2" & "PID Phase 3" drawings in appendix A.

5.4 Work Element 4 – Phase 2: Plant Building, Control Room & Welfare Facilities

Inclusions:

- Design, Supply, Delivery and Mechanical/Electrical Installation of new “plant building” to house:
 - Bag filter and additive reaction chamber, additive dosing recirc and loading systems
 - Water pump room,
 - Office for use as control room.
 - Mess room
 - W/C and shower room.
- The following should be incorporated in to the above:
 - Fire system throughout (to be intergrated with the PM incin building).
 - Small power throughout (IMP to confirm No of sockets etc. required).
 - Lighting throughout.
 - Boarded “Office” finish to walls & ceilings of office, mess and w/c areas.
 - “plant room” finish to walls, floor and ceilings of other areas.
 - Smooth finish to floor of welfare mess and w/c areas.
 - Carpet tile finish to the office area.
 - 1 x window in the office area.
 - 1 x window in the mess room area.
 - Extract fan for the w/c area.
 - Wash basin, electric shower and toilet in w/c area.
 - Kitchen sink, sideboard, drawers and cupboards in the mess area.
 - Point of use electric water heater in mess area.
 - All pipework and cabling associated with above.
 - Heating / cooling for the office & mess area.
 - Heating / cooling for the plant areas if required.
- Disconnection and relocation of existing shipping container containing ID fan control panels.
- Disconnection and relocation of existing supply panel and distribution board from shipping container to new plant building electrical plant room.
- Enabling works associated with installation of above equipment
- Testing and commissioning of above items.
- Documentation for above items.
- Project, site and contractor management of above works.
- Principal designer and principal contractor responsibilities associated with above works.

Exclusions:

- Network points and associated cabling.
- Office & mess area furniture.
- Office IT equipment.
- Kitchen white goods.

- Provision of water supply from site water supply to the building envelope.
- Provision of drains from building envelope to site drains.

A proposed layout and foundation drawings of this building is shown in appendix A.

The principal designer / contractor delivering this work element is Luhrfilter Ltd.

5.5 Work Element 5 – Phase 2: Emissions monitoring PC.

Inclusions:

- Specification of PC hardware to host emissions monitoring software.
- Design, supply, installation and commissioning of emissions monitoring software on PC hardware above.
- Design, supply, installation and commissioning of cabling from ABB emissions monitoring panel in the incinerator hall to the new emissions monitoring PC in the plant building control room.
- Connection of above PC to site IT network.
- Design, supply, installation and commissioning of cabling from ABB emissions monitoring panel in the incinerator hall to the new incinerator SCADA PC in the plant building control room (see work element 6).

This work element excludes:

- Purchase of PC hardware (to be free issued).
- Installation of site IT network points.

5.6 Work Element 6 – Phase 2: Control System Upgrade

Inclusions:

- Mechanical/electrical/network installation and configuration of replacement HMI in the incinerator loading hall to match that in the incinerator hall.
- Specification of PC featuring SCADA software for use as control station for incinerator and abatement equipment.
- Mechanical/electrical/network connection and configuration of above “SCADA PC”.
- Configuration of SCADA software on above SCADA PC.
- Signal / network connections of the above SCADA PC to:
 - The ABB emissions monitoring control panel in the incinerator hall.
 - Incinerator control panel
 - ID fan control panel.
 - Any new control panels associated with the bag filter equipment installed as part of work element 3.
 - The site IT network.
 - The site BMS network.
- Design and modification of incinerator control software to integrate the control system associated with the bag filter equipment installed as part of work element 3 with the existing incinerator control system.
- Installation of required network points within the plant building detailed in work element 4.

- Design, Supply and mechanical/electrical/network installation of all cabling required to facilitate for above works, including cable tray and containment where required.
- Testing and commissioning of above items.
- Documentation for above items.
- Operation & Maintenance training for above items.
- Project, site and contractor management of above works.

Design Basis

The proposed control philosophy of the abatement equipment is shown on the “PID Phase 2” & “PID Phase 3” drawings in appendix A.

5.7 Work Element 7

Work element incorporated in to work element 8

5.8 Work Element 8 – Phase 2 Enabling works

Inclusions:

This work package includes the design, supply and installation of the following enabling works:

- **Ground works, including:**
 - Extension of the existing concrete slab on to adjacent grassed area.
 - Raising / lowering of service covers as required.
 - Removal of existing concrete pad currently supporting existing fuel oil tank.
 - Trenching, installation of pipework and making good for water pipework from local fire hydrant to point local to water pump room of new plant building. To include access chambers at each end. This excludes sizing, final connections and pressure testing (by others).
 - Trenching, installation of ducts and making good for power, signal, IT and fire system cables from exterior of Incinerator hall to exterior of new plant building. to include duct pits at each end.
 - Removal and making good of existing road hump and local kerb stones.
 - Removal of existing fencing.
 - Installation of foundation pads and associated bolt sets/cages as per layout drawings provided by Luhrfilter Ltd.
 - The requirements of new surface water drains if required.
 - See drawing EM042_DRG_007_PM Incin Abatement Equipment Ground Works for further details.
- **Electrical works, including:**
 - Discrimination survey of existing electrical distribution system vs proposed equipment.
 - Survey of load carrying capacity of the existing buried cable between substation C & ISO 8/9 feeder pillar.
 - Extension of supply cable from exterior wall of incinerator hall to repositioned supply panel position in new plant building.
 - Review of supply panel specification and upgrade of equipment as required.
- **Water pipe works, including:**

- Sizing, supply, final connection and pressure testing of water pipework from fire hydrant to connection pit local to water pump room.
- Fuel tank works, including:
 - Repositioning of existing fuel oil tank including draining and refilling oil to enable lifting.
 - Design, Supply and mechanical installation of new oil pipework from newly positioned oil tank to oil feed pumps inlet pipework in the incinerator hall.
 - Relocation and reconnection of existing storage containers and additive/ash skip.
 - Installation of new instrumentation cables associated with relocated fuel tank.
- Decommissioning, removal from site of the existing portacabin control room and associated items.
- Design, supply and mechanical/electrical/network installation of fire systems within plant building detailed in work element 4.
- All final connections of above to agreed site services tie in point (connection to luhfilter equipment to be by luhfilter).
- Testing and commissioning of above items.
- Documentation for above items.
- Project, site and contractor management of above works.
- Principal designer and principal contractor responsibilities associated with above works.

Design Basis:

- Ground works:
 - The ground works should be designed taking in to account the loadings and positions provided by Luhfilter for their equipment.
 - See drawing 128-101B in appendix A for further details.
- Water pipework:
 - The water pipework needs to be sized for the maximum water consumption of the future quench tower, and water use of the welfare facilities.
 - The max consumption of the quench tower is: 2,930 kg/h, 2.6 bar (@ 20 °C).
 - Isolation valves should be provided to both the quench tower and the welfare facilities.
 - The fire hydrant function should not be affected. An isolation valve should be included to allow quench tower / welfare facilities supply to be isolated in the event of a fire.
 - An isolation valve to the welfare facilities should be provided at the building envelope.
- Power cables and ancillary items (breakers etc):
 - The power requirements for the abatement equipment and plant building are as follows:
 - Fan Panel # 1: 415 V / 3 phase + Neutral, 120 A
 - Fan Panel # 2: 415 V / 3 phase + Neutral, 120 A
 - Bag Filter Panel: 415 V / 3 phase + Neutral, 120 A
 - Trace Heating: 440 V AC, 63 A
 - Electric Hoist: 415 V / 3 Phase + Neutral, Amps TBC.
 - Plant building lighting: 240 V AC, Amos TBC.
 - Plant building small power: TBC.
 - Quench Tower Trace Heating: 240 V AC, 32 A

- Fuel tank pipework
 - To match existing design.

See the relevant drawings in Appendix A for more information.

5.9 Work Element 9 – Phase 3: Heat Exchanger Decommissioning

Inclusions:

- Isolation, decommissioning and removal of the existing air cooled heat exchanger filter and associated ductwork, steelwork and ancillary items to facilitate the installation of replacement equipment.
- Remedial works associated with above decommissioning.
- Removal of these items from site as per conditions agreed with the client representative.
- Project & site/contractor management of above works.

5.10 Work Element 10 – Phase 3: Quench tower Installation

Inclusions:

- Design, supply, delivery and mechanical/electrical installation of the replacement flue gas cooling equipment and all associated ancillary systems including ductwork, pipework, supports, platforms, insulation, instrumentation and mechanical/electrical/instrumentation ancillaries.
- Design, Supply and mechanical/electrical/network installation of all cabling for above equipment, including cable tray and containment where required.
- Design, Supply, Delivery and Installation of control system associated with above equipment.
- Enabling works associated with installation of above equipment.
- Testing and commissioning of above items.
- Documentation for above items.
- Operation & Maintenance training for above items.
- Critical Spares for above equipment.
- Service Agreement for above equipment.
- Project, site and contractor management of above works.

The principal designer / contractor delivering this work element is Luhrfilter Ltd.

Design Basis:

See work element 3 for the design basis.

5.11 Work Element 11 – Phase 3: Control System Integration

Inclusions:

- Design and modification of incinerator control software to integrate the control system associated with the flue gas cooling equipment installed as part of work element 10 with the existing incinerator control system.
- Testing and commissioning of above items.

- Documentation for above items.
- Operation & Maintenance training for above items.
- Project, site and contractor management of above works.

5.12 Work Element 12 – Phase 3: Emergency Vent Stack Decommissioning

Inclusions:

- Isolation, decommissioning and removal of the existing emergency vent stack and associated ductwork, steelwork and ancillary items.
- Remedial works associated with above decommissioning.
- Removal of these items from site as per conditions agreed with the client representative.
- Project, site and contractor management of above works.

5.13 Drawings

Relevant drawings to accompany the work element descriptions are included in Appendix A.

These drawings are intended to help clarify the scope only, and are not in any way design drawings.

5.14 Free Issue Equipment

The following items will be free issued to contractors:

- PC for “emissions monitoring PC”.
- PC for “Incinerator SCADA PC”.

5.15 Site Set up and Mobilisation

The following site works are required to facilitate works outlined above:

- Electrical isolations of the incinerator.
- Positioning of road plates to protect service covers/chambers on grounds to be used for crane lifts.
- Positioning of crowd barriers to ensure underground tank is not damaged by vehicle movements.
- Notification to site personnel of works.
- Barrier off road / pedestrian access to work area.

5.16 Works Performed by Others

The following works will be performed by institute personnel:

- Isolations of all site services.
- Positioning of road plates and crowd barriers.

6 Project Management

6.1 Project Co-Ordination

The following activities will take place to ensure project co-ordination:

- Regular project management meetings, primarily between the client representative and the principal contractors/designers. These will take place as and when required but should be no more than 2 weeks apart once site works have begun.
- Regular construction site inspections by Pirbright personnel to check progress. These will take part at least weekly once site works have begun.
- Regular updates from the client representative to the Pirbright engineering management team. These will take place as and when required, but at least weekly once the site works have begun.

6.2 Project organogram

The project team organogram is included in Appendix B.

6.3 Responsibilities

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

The Pirbright Institute client representative:

- Write and update scope of works (includes client brief and pre-construction information).
- Create and maintain a project risk register.
- Raise orders.
- Co-ordinate the contractor and institute personnel to facilitate works.
- Managing project documentation and budget.
- Facilitate site access.
- Reviewing and agreeing detailed design before works commence.
- Arrangement of project meetings.
- Responding to contractor queries.
- Issue of permits and arrangement of isolations.
- Arrange Institute engineering works required to facilitate works.
- Ensuring works are performed in a safe manner.
- Client representative for CDM responsibilities.
- Co-ordinating snagging surveys as required.
- Produce the Project Information File for handover to engineering management team.
- Arranging training where appropriate.

Pirbright Project Team members:

- Provide information as required.
- Comment on designer and contractor information as required.
- Facilitate works as required.

- Ensuring works are performed in a safe manner.
- Highlight H&S and design risks for inclusion on the project risk register.
- Completing snagging surveys as required.
- Process commercial aspects of project.

Principal contractor, principal designer and project manager for contractor/designer works:

- Full design responsibility for all installed items.
- Full responsibility for all installation works.
- Management of all contractors performing works.
- Ensuring works are performed in a safe manner.
- Highlight H&S and design risks for inclusion on the project risk register.
- Supplying all required documentation and information to the institute.
- Ensuring the scope of works is met in full.
- Fulfilling CDM responsibilities.
- Providing Training where appropriate.

6.4 Project Programme

The Phase 2 works are due to be completed by the 12th March 2017.

The phase 2 site installation and commissioning works are to take place during the planned ISO compound shutdown scheduled for 28th January 2017 – 12th March 2017.

These dates are not flexible and if required additional resource must be provided to ensure the shutdown dates are not affected.

The Phase 3 works are due to be completed by end of 6th November 2017.

The phase 3 site installation and commissioning works are to take place during the planned ISO compound shutdown scheduled for 25th September 2017 – 6th November 2017.

These dates are not flexible and if required additional resource must be provided to ensure the shutdown dates are not affected.

The project programme is included in Appendix B.

6.5 Project Risk Register

A project risk assessment will be created by the site contact and maintained by all parties.

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

This should be regularly reviewed and updated at project meetings through all stages of the project and should be included in the H&S file at the end of the project.

6.6 Documentation storage

All project documentation will be stored by the client representative in the following location on the Pirbright server:

N:\Capability Projects\Private\Operational Projects\EM042 - PM Incin Abatement Equipment Phase 2

7 CDM requirements

This section outlines the CDM specific requirements of each party.

7.1 Application of CDM Regulations

The project will be split in to 4 distinct packages, CDM regulations will be applied to each part as summarised below:

1 – Phase 2 & 3 Abatement equipment packages

Includes: Work Elements 1, 3, 4, 7, 9 & 10.

This work requires the appointment of a principal contractor and principal designer due to multiple contractors involved in the construction works.

This work is estimated to require more than 100 person days of construction time, therefore the works are notifiable to the HSE by the client representative.

2 – Phase 2 & 3 Enabling Works:

Includes: Work Element 8.

This work requires the appointment of a principal contractor and principal designer due to multiple contractors involved in the construction works.

This work is estimated to require more than 100 person days of construction time, therefore the works are notifiable to the HSE by the client representative.

3 – Phase 2 & 3 Control System Upgrades:

Includes: Work Element 5 & 6

Software aspects of this work are exempt from CDM regulations 2015.

Construction aspects of this work are being performed by a single contractor, therefore appointment of principal designer and contractor is not required.

This work will require less than 100 person days of construction time, therefore the works will not be notifiable to the HSE.

7.2 Client Brief

This scope document forms the client brief.

7.3 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

Appointed 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

Appointed principal contractors will:

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

7.4 Pre-Construction Information

This document forms the pre-construction information.

7.5 Management Arrangements

Section 6 outlines the management arrangements for the project.

7.6 Construction Phase Plan

The construction phase plan should be issued by the principal contractor and agreed by the client representative before works begin.

The document should cover the following items as a minimum:

- 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 works.

This document and the project risk register will contain details required by the construction phase plan; these should be re-iterated in the construction phase plan.

7.7 Health and Safety File

The health and safety file should be issued to the client representative by the principal designer as a standalone document. The works are not deemed complete until the client representative has acknowledged that it has been received and its content is appropriate.

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
EM042_DRG_001	Existing Locations	1_A
EM042_DRG_002	Existing Schematic	
EM042_DRG_003	Phase 2 Decommissioning Schematic	1_A
EM042_DRG_004	Phase 2 Installation Schematic	1_A
EM042_DRG_005	Phase 3 Decommissioning Schematic	1_A
EM042_DRG_006	Phase 3 Installation Schematic	1_A
EM042_DRG_007	Ground Works Scope	1_A
128-100	General Arrangement (PROVISIONAL ONLY)	
128.102.Stage 2	PID Stage 2	
128.102.Stage 3	PID Stage 3	
128-500	Proposed Service Building Layout	
128-101B	Foundation Layout (CERTIFIED FINAL)	B
128-2000b	Proposed Ducting Layout (PROVISIONAL ONLY)	B

Appendix B – Project Documents

Reference	Title	Version
EM042_ORG	Project Organogram	1_A
EM042_PRO	Project Programme	1_A

Appendix C – Pirbright Documents

Reference	Title	Version
E&M-GUIDE-052	Pirbright Institute Contractor Site Rules	2-B
PI/PSP/001/FAP/FH/TP2	Fire assembly points.	T