Scope of Works

Title:	ISO 11 CHP LTHW Heat Recovery (Project Management and Detailed Design)
Project:	BC24-004
Date:	08/04/24
Author:	Anthony Clarke
Owner:	David Shadwell
Client:	The Pirbright Institute
Version No:	1

1 Scope of Works History

1.1 Document Location

N:\Capability Projects\Private\Operational Projects\BC22-002 ISO 11 Chiller Replacement\Procurement\Tender documents\ITT

1.2 Revision History

Version	Date	Details	Author
1	08/04/2024	First Issue.	AC

1.3 Approvals

This document requires the following approvals.

Name	Title	Signature	Date	Version
Anthony Clarke	Capability Operations Projects Manager		08/04/24	1

1.4 Issue History

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

Name	Purpose	Date of Issue	Version
Potential Suppliers	For Tender	09/04/24	1

2 Table of Contents

3 Introduction

3.1 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.

3.2 Summary Description of works

A significant energy project, commissioned August 2022, was the Combined Heat and Power (CHP) plant. This currently produces circa 90% of the site's power and 25% of steam load, saving an estimated £1m pa at current (October 2023) energy prices. The CHP has available a further 828kW of Engine Heat via LTHW, and the objective of this business case is to utilise this currently wasted heat from the CHP to both heat Plowright and to provide DHW, saving circa 5,000,000kWh of Gas per year. (£415k pa at current energy prices, 1.7 years payback time). The project would start in April 2024, with benefits realisation starting September 2025.

The contract is for a single supplier to provide Project Management and a Detailed Design to the CHP LTHW Heat Recovery project.

The project objectives are as follows:

- Greater financial sustainability through substantial energy savings via system rationalisation and utilisation of free waste heat available from CHP.
- To realise reduced carbon emissions of circa 12%

A feasibility study and concept design has been undertaken (attached in Appendix E1 A). This includes the recommended concept design and layout of a proposed CHP LTHW Heat Recovery system, along with system drawings.

The Scope of Works for this contract is as follows:

- Review feasibility study and propose any changes necessary to progress to detailed design
- Evaluate system performance using building data, the technical options proposed within the existing feasibility study. Following the review, prepare mechanical, electrical and controls detailed design to rationalise Plowright LTHW and DHW systems where appropriate, and to connect to circa 828 kW LTHW free heat available from the CHP, sufficient to tender for an installation contractor.
- Particular focus is to be given to rationalisation of existing plant to enable maximum maintenance savings, while maintaining “outbreak scenario” capacity. Existing steam fed equipment would be maintained as backup.
- Project Management to include
- Principal Designer and contractor responsibility for project
- Handover of all documentation in line with Pirbright Project Information File (PIF) structure. A Sample PIF is attached in Appendix E1B.

3.3 Contact Details

John Nixon

- Role: Procurement Buyer
- John.Nixon@pirbright.ac.uk
- 01483 232441
- Normal working hours: 08:30h to 17:00h, Monday to Friday

Anthony Clarke:

- Role: The Pirbright Institute Project Business Sponsor
- anthony.clarke@pirbright.ac.uk
- 01483 231 062
- Normal working hours: 0830h to 1730h, Monday to Thursday.

3.4 Location of Works

These works will take place at the following addresses:

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

4 Site Information

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

4.1 Health & Safety Requirements

All works related to this specification should be performed in line with site Health & Safety (H&S) rules and the Health and Safety at Work Act 1974.

The following documents are attached in Appendix E1 C and detail the site rules to be considered when tendering and when works are performed on site:

- RISK-SOP-7: Management of Contractors
- R&A-COP-3: Contractor Site Handbook
- R&A-FORM-4: Pirbright Site Rules Overview
- EMS-WI-085: Permit to work
- EMS-FORM-100: Point of Work Risk Assessment (POWRA)
- EMS-FORM-098: Permit to Work Part A, Part B & Part C
- EMS-WI-82: EMS Lockout/Tagout Work Instruction
- EMS-FORM-126 RAMS for Planned Work on Bio Containment Systems (PWBCS)

If required, further training on the procedures detailed in the above documents can be given on site.

The above documents detail Pirbright's management of H&S for construction works, the following sections highlight aspects requiring particular attention.

4.1.1 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 Pirbright responsible person at least 5 days in advance of the works.

RAMS must be specific to the task and date of the works and should include a detailed step by step method.

RAMS are never "approved" but will be "reviewed" by Pirbright personnel, and feedback will be given. A permit to work will not be issued if the RAMS are deemed to be inappropriate.

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

Details of the competent person performing works and their relevant training records should be included and/or referenced in the RAMS.

4.1.2 Tools and Equipment

Contractors should always provide their own tools and equipment they require to complete their works. Pirbright will not issue equipment to contractors.

Equipment which must be supplied by the contractor is as follows. The equipment must be suitable for fumigation or can be disposed of. All items of test equipment must have a current calibration certificate.

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

Electrical equipment should be PAT tested.

Equipment brought into Pirbright's restricted areas will need to be suitable for fumigation or disposal.

Where appropriate calibration, inspection and testing certificates of equipment being used should be issued to the responsible person before works commence.

4.1.3 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.

4.1.4 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.

4.1.5 Scaffolding and Access Equipment

Contractors should arrange scaffolding required to facilitate their works, Pirbright 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. Pirbright 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.

4.1.6 Equipment Certification

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

4.1.7 Permits

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

See EMS-WI-085: Permit to work (Appendix E1 C) 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.

4.1.8 Isolations

Isolations of Pirbright site energy sources must be performed under permit by Pirbright 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-WI-87: EMS Lockout/Tagout Work Instruction (Appendix E1 C) for further details.

4.1.9 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.

4.1.10 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 project manager).

4.2 Security and Site Access Requirements

RISK-COP-3 and RISK-FORM-4 (Appendix E1 C) details site access requirements.

The following sections highlight aspects to be considered.

4.2.1 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.

4.2.2 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.

4.2.3 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.

4.2.4 Approved Contractors and Escort Requirements

Contractors must be fully escorted by Pirbright personnel unless there are approved contractors within the team.

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.

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.

4.2.5 Vehicle Movements

Vehicle movements on site roads is subject to a speed limit of 10 mph, which must be always obeyed. 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.

4.2.6 Welfare Facilities

Welfare facilities are available will be provided within the abatement building local to the construction site and the Plowright building Canteen.

4.2.7 Working Hours

Contractors will be able to access site from 0700h – 1900h 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.

4.2.8 Construction site management

The construction site should be prepared and managed by the principal contractor delivering the ISO 11 Chilled Water system project. This construction site should be separated from the wider Pirbright site via barriers as required.

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

4.3 Bio Safety Quarantine and Decontamination Requirements

There aren't expected to be any such requirements, however further details will be given on site if this changes.

4.4 Design Requirements

4.4.1 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 principal designer as appointed by the client.

4.4.2 Standards and Specifications

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

4.4.3 Design Review

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

The Principal Designer and any appropriate sub designers must provide any information requested in advance.

4.4.4 Documentation

The following documentation should be issued before works commence:

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

4.5 Completion of works

The following sections details what constitutes completion of the works.

4.5.1 Inspection and Testing

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

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

4.5.2 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.

4.5.3 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.

4.5.4 Snagging Surveys

All works, they must be visually inspected by an appropriate member of the Pirbright 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.

4.5.5 Project Information File (PIF)

Final handover to the Pirbright 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 E1 B.

All project documentation is to be handed overusing Pirbright's document naming convention

A full list of assets disinvested and new assets will be provided in accordance with Pirbright's asset naming convention

4.5.6 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 Operations Projects Manager
- Appropriate Capability EMS Specialist Equipment Owners
- Capability EMS BMS Owner
- EMS Technical Coordinator
- Maintenance Supervisor(s)
- Science Users (if applicable)
- IT representatives (if applicable)
- HSBS representatives (if applicable).

All project and Handover documentation will be accessed on "Procore", the cloud-based system which Pirbright use for their document and drawing management.

All documentation for review will be uploaded to Procore and will be organised according to Pirbright's stated document naming convention.

4.5.7 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.

4.5.8 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.

Pirbright waste streams must not be used without prior agreement.

It is envisaged that no Pirbright 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 Pirbright 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.

4.6 Commercial Requirements

Quotations for other Work Packages (CHP LTHW Heat Recovery works) below £25K may be gathered by the contract Projects Manager. Liaison with TPI Procurement Team will be necessary for all Procurements related to this project to discuss and determine the Procurement Strategy and process to be followed. Orders can only be placed with approval from the Project Sponsor (as budget holder).

Raising POs and co-ordination of any competitive Request for a Quote process will be by EMS Administration.

Contractor capability should be reviewed before works are awarded. This may involve but is not limited to:

- Completion of Supplier Pre-Qualification Questionnaire
- Assessment of the quality of Request for a Quote 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 Pirbright personnel to supplier manufacturing facilities or reference sites
- Issuing relevant training records of all contractors and managers associated with the works Were appropriate, contracts will be administered under an NEC standard form of contract.

4.7 Project Management Requirements

4.7.1 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.

4.7.2 Project Risk Register

A project risk register is included in Appendix E1 D.

4.7.3 Project Programme

An envisaged project delivery schedule is as follows:

- Project Manager appointment: June 2024
- Procurement of CHP LTHW heat recovery detailed design: Jul 24 – Aug 24
- CHP LTHW Mechanical and controls design: Sep 24 – Nov 24
- CHP LTHW connection to Plowright procurement: Feb 25 – April 25
- CHP LTHW Heat Recovery connection to Plowright (installation): Jul 25 – Sep 25.

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.

4.7.4 Documentation Storage

Pirbright's document management system is the cloud-based "Procore" system and this will be used for the sharing of all design information, handover, etc to ensure traceability.

The Following documents apply:

EMS-WI-230 - Technical Library Principles of Use

- Appendix 1 - EMS Document Naming Convention
- Appendix 2 - Procore Disciplines

EMS-WI-403 - Procore User Guide

- Appendix 1 - Procore Superuser Guide

EMS-WI-329 – EMS Asset Convention

- Appendix 1 - EMS Asset Naming Convention
- Appendix 2 - TOPdesk Asset Import Template

4.7.5 Project Co-Ordination

The following activities will ensure project co-ordination:

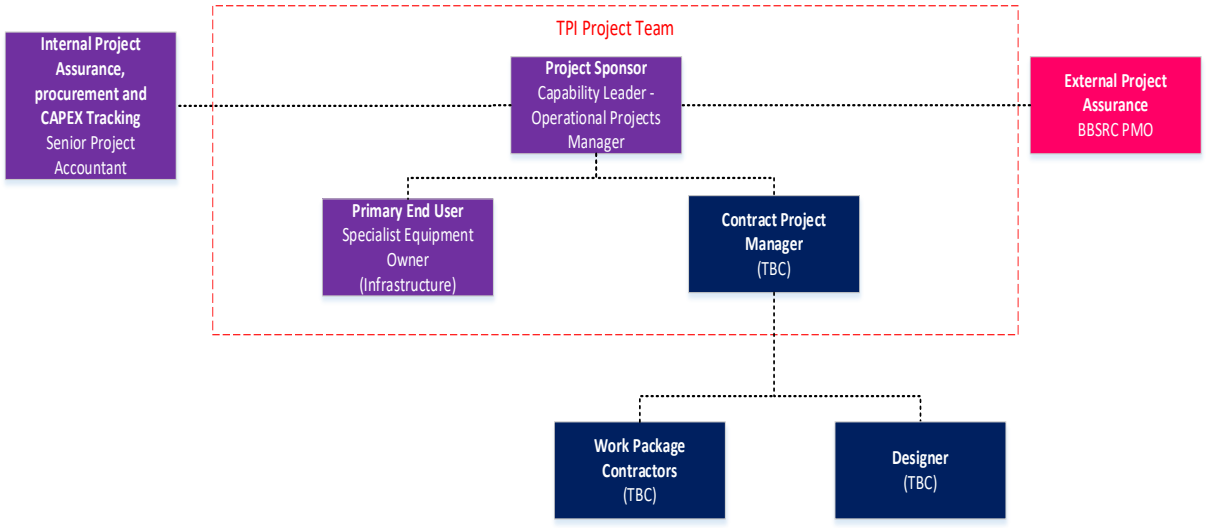
- Regular project management meetings, primarily between the Pirbright client representative and the principal contractor/designer.
- Regular site checks to see progress and ensure works are taking place in a safe manner.
- Regular updates from the Pirbright engineer overseeing the works to the Pirbright Capability EMS Team.

4.7.6 Client Representative

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

4.7.7 Project Organogram

The envisaged project organogram is shown below:



4.7.8 Responsibilities

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

Pirbright 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
- Review and amending of Project Highlight reports.
- Advising the Project Manager on the application of site processes and what personnel should be consulted for project queries.

Pirbright Project Manager & CDM Client Representative.

- Drive day to day activities to delivery of the scope of works
- Preparation of Project Highlight Reports
- 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

5 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 principal contractors / designers should provide additional detail where required and suggest alternatives if appropriate.

5.1 Work Package 1: Project Management and CDM representative

This work package is for the project management of the delivery of all works outlined in Section 3.2 and fulfilment of CDM client representative requirements for the project. Responsibilities of the role are out lined in section 4.7.8 and further details are provided below.

- Drive day to day activities to deliver the scope of works
- Act as site host for principal contractors / designers
    - The Project Manager(s) are expected to be on site proactively as and when needed to be a site host
- Create and agree with principal contractors the content of the construction site induction, Construction Phase Plan and other documents required to ensure safe working (CDM Works)
- Create and maintain scope of works document
- Create and maintain a project risk register
- Create and maintain project programme
- Create and maintain project resource plan, with an emphasis on any Pirbright staff support requirements.
- Attendance to project boards as per project governance structure and production of Project Highlight Reports with monthly cashflows.
- Managing project documentation
- Raise purchase orders
- Co-ordinate the contractor, designers and institute personnel to facilitate works
    - As part of the work, the Project Manager will be the central point of contact for all involved parties.
- Facilitate site access
- Reviewing and agreeing detailed design before works commence
    - A requirement for these works is that the Project Manager/their company has the relevant technical expertise and qualifications to provide technical oversight for all parts of the project
- 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 ensuring all information required by the PIF is available for the Pirbright Institute

5.2 Work Package 2: Detailed Design

Overview:

This work package is for a single Designer to take design responsibility for all aspects of the CHP LTHW Heat Recovery system and provide information required for a tender of a contractor to Install and commission effectively.

Inclusions:

To perform the following for all Mechanical, electrical, civils, IT and controls aspects of the CHP LTHW Heat Recovery system works:

- Review of previously completed feasibility study and concept design work and update taking in to account site changes, utility price changes and technology available
- Carry out detailed design work to sufficient detail (e.g. RIBA stage 4), to allow:
    - Project budgetary costings to be updated and refined
    - Tender process to take place
    - Potential contractors to submit accurate quotes during tender process
- Carry out any site surveys required to inform any aspect of the design
- Contribute to any technical risk assessments (SWIFT/HAZOP) associated with the works
- Define quality and acceptance criteria for all aspects of installation (CVV process)
- Regularly review installation is as per design, quality and acceptance criteria
- Be present to witness key commissioning
- Be present to identify snags and defects
- Sub designer management associated with the above works
- Documentation associated with all above works
- CDM requirements associated with above works
- Following all site processes as summarised in the site information (section 4).

Design Basis

- See previously completed feasibility and concept design notes and schematics in Appendix E1 A.

6 CDM requirements

This section outlines the CDM specific requirements for the project.

6.1 Client Brief

This scope document forms the client brief.

6.2 Duty Holders

Client

The client is The Pirbright Institute; represented by the Pirbright 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

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 will:

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

6.3 Management Arrangements

Section 4 outlines the management arrangements for the project.

6.4 Notification to HSE

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

6.5 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:
- 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.

6.6 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.

6.7 Application of CDM to this project

It is envisaged that CDM will be applied to these works as follows:

Work Package 1 – Project Manager & CDM Representative.

The Project Manager appointed by Pirbright will act as CDM client representative throughout the project.