What’s this document about?

This document sets out the MEICA specification to be followed by all Environment Agency staff and Suppliers for documentation, drawings, as built record information and operation and maintenance O&M manuals. Any variation to this standard must be applied for through the [concession process](https://defra.sharepoint.com/sites/def-contentcloud/_layouts/15/DocIdRedir.aspx?ID=CONTENTCLOUD-190616497-13897).

This specification does not cover any special documentation requirements that is equipment, component or project specific.

! Users must read [MEICA – Specification - General](https://defra.sharepoint.com/sites/def-contentcloud/_layouts/15/DocIdRedir.aspx?ID=CONTENTCLOUD-190616497-16038)  prior to using MEICA any Specifications

Who does this apply to?

This specification applies to:

1. Environment Agency Staff;
2. External Suppliers working on Environment Agency projects.

Contact for queries and feedback

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Please give anonymous feedback for this document via email.

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**General**

General requirements

It is essential that the Environment Agency holds and maintains an accurate set of documentation and drawings for all its systems and equipment.

This specification gives the general requirements for MEICA documentation; it must be read in conjunction with the project specification and scope. This document does not cover any special project requirements that may be specified or other standard specifications.

The Contractor must produce and provide all project and site documentation - for review. The Contractor must produce or update documentation and drawings to enable the safe operation, maintenance and decommissioning of all equipment.

The Contractor shall comply with the [Environment Agency BIM policy](http://ams.ea.gov/ams_root/2015/501_550/516_15.doc) as set out in the contract scope document.

Existing site records

Existing site records that are issued to the Contractor for use or reference must be updated to reflect all changes made before returning to the Environment Agency in scaled PDF format. Modifications carried out to existing systems and equipment must be recorded by:

* amendment of existing drawings, or production of new drawings;
* updating site specific operation and maintenance (O&M) manuals

Ownership

The ownership and copyright of all reports, calculations, computer software, data or other documentation produced as part of a contract with the Environment Agency must be vested in the Environment Agency.

Submission of documentation

Submissions

The Contractor must submit drawings, calculations, samples, patterns, models and operating and maintenance manuals, in electronic format. Where there is a requirement for supplementary paper copies these will be specified in the project specification.

Supporting information

Drawings submitted for review must be supported by the Contractor’s design calculations, performance curves and other additional information deemed necessary to enable the Environment Agency to have a clear and precise understanding of the equipment, its operation and its layout.

The additional information may include, but not be limited to, standard literature or drawings of minor items of equipment; small-scale detail layouts of equipment sub-assemblies which due to scale are unclear in the general layout drawing; subcontractor’s detail drawings that give further information to enable the Environment Agency project team to be satisfied that the equipment complies with the Specification.

Supporting calculations

Calculations must be submitted to the Environment Agency to review and comment on. They must be in sufficient detail to enable the Environment Agency to check that the size, rating and design of the various items of Equipment comply with the Specification.

Document control

During the development of a project involving MEICA systems and equipment, the design and associated documentation and drawings are likely to evolve. Rigorous document control is therefore essential from the outset.

Drawings and documentation must be clearly marked with current revision and status. Current status must be recorded as defined in the BIM protocol.

Note: ‘as built’ status must only be applied to drawings once the Environment Agency has confirmed with the manufacturer/installer that they are an acceptable and accurate record of the work undertaken.

Acceptance of documentation

Bespoke equipment

The manufacture of any bespoke equipment shown on a drawing must not start until that drawing has been reviewed and accepted by the Environment Agency.

Content of submissions

The Contractor is responsible for the content of all submissions to the Environment Agency irrespective of the source or origin of information contained in such submissions. Acceptance by the Environment Agency of these submissions by the Contractor or of inspected equipment and tests must mean approval in principle in order to allow work to proceed. Approval by the Environment Agency does not imply that the drawing has been checked, particularly as far as dimensions are concerned. Such acceptance by the Environment Agency does not relieve the Contractor of their responsibilities under the Contract.

Final acceptance

Inspection and review of drawings will not include a dimensional check or check of electrical circuitry by the Environment Agency. In this respect, whether approval has been given or not, final acceptance of the Equipment will only be given once the Equipment has been installed and the commissioning satisfactorily completed.

Operation and maintenance manuals

General

The O&M manual must define the requirements and procedures for the effective operation, maintenance and decommissioning of the equipment. The operating and maintenance manual includes details of the construction works, maintenance history and instructions for its operation and maintenance. Any guarantees and warranties must include details of how to decommission the equipment. The Contractor must prepare the O&M manual in accordance with BS EN IEC/IEEE 82079-1 and the requirements of The Supply of Machinery (Safety) Regulations 2008 (as amended). The O&M manual must be submitted in electronic format. Further paper copies may be provided as required in the project specification.

Issue of draft O&M manuals

The Environment Agency must be provided with a draft PDF O&M manual for approval **not less** than two weeks before the Environment Agency is asked to attend the Factory Acceptance Test (FAT), or if FAT not witnessed the Site Acceptance Test (SAT), of any equipment (as discussed in LIT UNASSIGNED MEICA Project Delivery).

A further paper copy is to be provided by the Contractor at the factory test or site, as applicable, for use during testing and commissioning. Any changes and adjustments to the system, during testing and commissioning must be recorded on the paper copy.

The changes must be integrated into the final version by the Contractor. On completion of the amendments, the final versions will be sent to the Environment Agency.

Issue of interim O&M manuals

The O&M manual will evolve as the works progress. It is a requirement that site-specific and detailed written operating and maintenance instructions are provided to Environment Agency operating and maintenance staff when these operating and maintenance duties are handed to the Environment Agency. No form of beneficial usage can be claimed until this met.

Any interim O&M instructions must be reviewed by the Environment Agency. If this approach is used, interim O&M documentation must identify clearly the extent of the operation and maintenance works being handed to the Environment Agency and include details of who is responsible for other issues on the site that are not yet handed to the Environment Agency.

Issue of final O&M manuals

On completion of the works, the Contractor is to provide a PDF version of the complete O&M manual. In addition to a PDF version, each design drawing is to be provided in an electronic editable drawing file such as dwg.

The final version of the manual incorporating any additions and modifications must be completed within four weeks of the works being taken over. Three copies of the final version must be provided.

The Contractor must also provide paper copy O&M manuals if required in the project specification.

O&M manual electronic format

The O&M manual must be provided in PDF electronic format with each Section (shown in the table below) provided as a separate PDF file. Each Section must be indexed to the sub sections for easy reference. The manual should be formatted to include hyperlinks to section headers from the table of contents. The manual must be provided via the current Environment Agency document control system, as specified in the project Contract. Where a section file size becomes too large it may be split into parts.

The submission must also, include all drawings in electronic DWF/DWG (or other programme as specified in the project Contract) version stored in a dedicated ‘drawings’ folder. Programmable Logic Controller (PLC) programmes must also be included in a dedicated PLC folder.

The manual must be prepared specifically for the site, equipment and process operation. Every effort must be made to condense and focus the information. Any marketing information that is not relevant will be rejected. For detailed technical information on spare parts, only the information for that part must be included, generalised stock lists containing information on irrelevant parts will be rejected.

O&M manual paper format

Paper versions should only be supplied on request. They must be A4 size and in loose-leaf 4 ring binders. The binder must be marked clearly with the name of the installation and the number of the contract. The front cover must carry the Environment Agency and Contractor’s logos. Large manuals should be supplied in several volumes, with separate binders for each section as detailed in this document.

In the case of large manuals supplied in several volumes, each binder must carry this information, and must also identify the volume number.

Section 0

* Issue History
* Confidentiality, Contractual and Legal Information
* Table of contents
* How to use guide
* Emergency information
* Description of the site and its purpose and operation
* Location plan and details of access
* Health and Safety requirements
* Details of all the equipment and equipment on site, including equipment that has not been supplied as part of the works
* Cross-references to existing drawings and existing operation, maintenance and service information relating to equipment on site that has not been supplied as part of the works
* System operating instructions for Environment Agency staff (may be cross-referenced to other sections of the O&M manuals)
* System maintenance instructions for Environment Agency staff (may be cross-referenced to other sections of the O&M manuals)
* Safe systems of work relevant to the operation and maintenance activities described in this section
* List of system-adjustable control parameters in the form of a table with columns allowing recording of future changes
* Index of the contents of other sections of the manual including a schedule of manuals, drawings, and other records.

Section 1

* A description of the site and the equipment covered by the manual, including a brief description of how the equipment described in the manual fits into the overall operation of the site
* Detailed description of the installed equipment, including overall performance data for the equipment
* Method of operation of the equipment and equipment including any original ‘as installed’ parameters and/or constraints
* As installed’ prints of all drawings produced
* Technical data sheets listing each component with its serial number, type number and the name of the supplier
* Exploded views of all items of equipment with each component cross-referenced to the technical data sheets
* ‘As Built’ digital photographs of the Works

Section 2

* Safety isolation procedures
* A description of all controls (both manual and automatic), including a copy of any functional design specification (FDS) and program coding for programmable logic controllers
* Pre-start and post-operation checklists
* Fault finding/troubleshooting guide
* Emergency procedures
* Copies of all as installed computer software for protection relays and PLCs

Section 3

* Guidance to relevant legislation
* Risk assessments
* Lubrication requirements, lubricant specification and intervals
* Detailed safety instructions including Control of Substances Hazardous to Health (COSHH) assessments, design information, risk assessments and method statements for operation and maintenance tasks
* Disposal information
* Design parameters and asset data including structural, electrical, hydraulic and pneumatic design calculations
* Maintenance task matrix detailing maintenance routines and intervals, together with safe methods of working
* Equipment schedules and asset register
* Recommended spares lists and part numbers.
* Manufacturers’ contact details
* Manufacturers’ literature
* All certification for the Works

Errors and amendments

If any errors are discovered in the final version of the manual, or if it is necessary to make any modifications to the equipment during the maintenance period, the manual must be amended accordingly. Where a paper copy of the O&M Manual has been specified, a replacement set of each of the pages and drawings concerned must be provided within two weeks of the modifications being completed.

Drawings

General

All drawings provided must print to standard sizes (A1 or smaller). Drawing symbols must be to the relevant British standard. Dimensions must be metric. The use of multiple A4 drawings will be rejected when in the opinion of the Environment Agency, a larger drawing would aid understanding.

Drawing checking

The Contractor must provide drawings in accordance with the subsequent clauses and must check each of their drawings and those of their subcontractors before submitting them to the Environment Agency. The Contractor must sign each drawing to certify that it has been checked. The Environment Agency will not examine any drawing which has not been certified. All drawings must be clearly and fully cross-referenced to the Specification and the Drawings as relevant.

Drawing format

As a minimum, all drawings submitted must carry the Contractor’s name and a title block with the Contract title, drawing title, Environment Agency’s name and a reference number forming part of a sequential numbering system for all drawings, plus safety, health and environment (SHE) boxes for significant residual risks associated with Construction, Operation & Maintenance, Cleaning and Demolition.

Where drawings are revised, the revision letter or number must be incorporated in the title block. Revisions must be clearly indicated on the drawing with the revision letter or number shown in an adjacent triangle.

All drawings must be prepared on a computer-aided design (CAD) system. The file type must be specified and files supplied electronically. The Contractor must produce drawings in accordance with the current issue of the Environment Agency BIM Protocol.

Supporting calculations

Electronic copies of all related design calculations must be provided with the drawings.

Working drawings

The Contractor must prepare working drawings that remain with the work and are amended and updated as modifications are made.

Working drawings will be provided for:

* General arrangement drawing or drawings of the layout of the equipment
* Drawings or diagrams showing the installation of the equipment, the required access for installation, the headroom and lifting facilities required, and the equipment loads (both static and dynamic)
* Piping and instrumentation diagrams (P&IDs)
* Single line diagrams and block cable diagrams
* Foundation drawings showing all fixing and holding down bolt details, details of pipes and other items to be built in, and all information necessary to enable the civil works design to proceed
* Duct and cabling layouts
* Schematics drawings and control circuit designs
* Electrical enclosure manufacture (when no standard enclosures are being made)

The location, level and description of all statutory services (i.e. gas, water, telecom, cable TV, electricity, etc.) encountered during the excavation works. These must also show all permanent and temporary diversions made during the Works.

Updating working drawings

The Contractor must ensure that electronic up-to-date working drawings are available on-site at the start of erection. These records must be kept up to date.

Site mark-ups

The Contractor must make two copies of all reviewed drawings available on-site at the start of erection. These must be marked up with any modifications made during erection, commissioning and testing. Both copies must be passed to the Environment Agency at the time of taking over.

As built drawings

Prior to commencing as-built record drawings, the Contractor must consult the Environment Agency to agree the drawing/file reference names for each drawing, to facilitate easy loading of the drawings into the Environment Agency’s BIM Protocol. All as-built record drawings must be submitted in an agreed format and must be completed in accordance with the Environment Agency’s BIM Protocol. Copies of all drawings must also be supplied in pdf format.

Take over

Within four weeks of the works being taken over, the Contractor must provide all as-built drawings, amended as necessary to show the equipment installed. Drawings must be numbered as directed by the Environment Agency using the BIM protocol.

Revisions during maintenance period

If it is necessary to make any modifications to equipment during the maintenance period, the relevant drawings must be amended accordingly. A replacement set of each of the drawings concerned must be provided.

As-built asset data

General

The Contractor must agree the requirements of recording the Environment Agency asset data for both removed and newly installed equipment.

Equipment removed schedule

The Contractor must supply a schedule of each item of equipment removed, including instruments, comprising a brief description, original supplier, supplier's reference, and Environment Agency asset reference.

Equipment installed schedule

The Contractor will be issued with a spreadsheet, which will be the latest version of the Environment Agency’s equipment sheet. The Contractor must populate this spreadsheet with details of each item of installed equipment. This must include all its sub-components such as gearboxes, valves, motors, starters, switchgear, instruments etc.

A fully populated spreadsheet must be provided at least 3 months prior to Takeover.

Related Documents

BS EN series

BS EN IEC/IEEE 82079-1 Preparation of information for use (instructions for use) of products. Principles and general requirements.

Standard specifications

All MEICA specifications are listed in:

* [MEICA - Specification - General](https://defra.sharepoint.com/sites/def-contentcloud/_layouts/15/DocIdRedir.aspx?ID=CONTENTCLOUD-190616497-16038)