

## A Guide to Operation & Maintenance (O&M) Manuals

**This is a short article explaining how to produce Operation and Maintenance Manuals, including the different options available and good and bad practices.**

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## What are Operation and Maintenance Manuals and how do they fit in with other handover documentation?

All construction works that are subject to CDM Regs will require a Health and Safety File (H&S File). Part of the H&S File requires information about H&S aspects relating to equipment provided for cleaning or maintaining the structure.

There's no legal requirement for an Operation and Maintenance (O&M) Manual but realistically, equipment and materials will usually have some manufacturer's information relating to its use and maintenance. It stands to reason that this information should be handed over to the client. So, there is usually some stipulation in the job spec that relates to what is required O&M-wise for handover.

### When are they required?

Whenever job spec or the client state that they are required.

### What should go into O&M Manuals?

This is really simple. The information required is whatever is stipulated in the job spec. The more complicated the works and building, the more detailed the O&M Manuals are likely to be. The danger here is that the O&M Manual specification may have been copied from a much more complicated job and be much too complicated or conversely be inadequate for the job in question (although the latter is rare).

In the absence of a layout for the manuals in the job spec, here is some advice on contents. However, it's always good to clear the proposed manuals with the client prior to starting to compile them.

Although strictly speaking the O&M Manuals need only contain operation and maintenance information, realistically the minimum information that should be included for each maintainable item of equipment is:

- Description of the works.
- Details of each installed item including Manufacturer, model number and any sub-type information such as colour.
- Details of where the item is installed. Either refer to drawings that have this information or include a textual description.
- A textual description of the operation information or reference to manufacturers' literature where this information can be found.
- Textural maintenance information or reference to manufacturers' literature that has this information
- Any relevant drawings
- Any relevant Test and Commissioning information.
- Manufacturers Operation and Maintenance information, product data sheets, safety data sheets or drawings.

In reality clients often request more detailed information. Typically, this may be:

- Manufacturer and supplier contact details
- Guarantee / Warranty information
- A maintenance matrix. This is a tabular representation of all maintenance required compiled into one place and not listed by item.

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Then occasionally, further information may be requested that does not have a direct bearing on the operation and maintenance such as:

- Asset register with financial information included
- Product life expectancy which is very hard to state and most manufacturers will say that it depends upon usage.

## What do they cost

This is inevitably the main thing that a main or subcontractor will be concerned with but it's not a simple matter to price for them.

The O&M Manuals for bigger jobs will tend to be proportionately cheaper than smaller ones but because every job is different you really need to assess each independently.

Costs need to be evaluated using the following criteria:

- Scope of works. The more things that need mentioning in the manuals the more work is involved.
- The number of subcontractors. The more people have to supply information, the more work is involved in chasing them and compiling their submissions.
- Type of job. The more complex the type of job, the more in depth information is required in the O&M Manuals.
- The O&M Manual layout. Some clients require much more complex manuals than others.
- The complexity of the system used to compile the manuals. There are a number of database systems that clients may use. Some of these can be pretty complicated and time consuming to satisfy.
- The time period allowed for their compilation. Obviously the more notice the better.
- The format of the manuals. Electronic, Printed, uploaded to a Database etc.
- Phased handovers that have O&M requirements. One job can be split into many phases, each requiring a separate O&M Manual. This adds to costs.

Specialist authoring companies such as ourselves can further complicate matters by offering different levels of service. Ours are as follows starting with the most expensive and reducing in cost as you go down:

1. We take as much work as possible off our client by writing the manuals from the job spec and other information.
2. Our client and any subcontractors are issued templates by ourselves. They complete and return these and we write the manuals from this information. (This our 'standard' service and is recommended for most jobs).
3. As for 2, but our client issues and retrieves the templates. We only deal with our client.
4. Our client writes the manual on a master template supplied by us. We then take the finished documentation, tidy it up and burn it to disc ready for issue.

## Timing – planning the work

We're often asked 'When do you like to get involved in the project?'. My answer is as early as possible. Even at tender stage. Even if the bulk of the manual cannot be started until later, the all-important building of a foundation can be done right at the start of the job.

From our point of view, the later it's left for us to get going on the O&M Manuals, the more trouble they're going to be and therefore the more we'll charge for doing them.

Too early and nothing's certain. Too late and people won't give info or there's too much to assimilate in the time allowed.

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## The Process - Getting the information

This is generally done either from the job specification or by issuing templates / RFIs (requests for information) to the subcontractors. Both these methods are far from straight forward and will need constant communication and good organisation if the manuals are to be done in time.

### **Getting information from the Job Specification.**

The job spec can be dissected and reformed to give a good idea of what is / was involved in the job. However, in all our years of compiling O&M Manuals, not one job has ever followed the job spec exactly. This means that there needs to be regular questioning of those responsible for the installation to find out where things have varied from the original spec.

This method also relies on detailed schedules of all equipment being present as part of the spec. In the absence of these schedules, information of installed equipment and materials need to be obtained by other means, most typically by asking whoever has done the installation.

### **Getting information from subcontractors and installers using templates**

Firstly, the templates that are to be issued to the subcontractors need to be customised to reflect the O&M requirements for the job in question as laid out in the job spec or as agreed with the client.

Once the various parties who are to supply the information have been issued with the templates, the fun really begins. Some will complete the template perfectly and send it back with all the associated drawings, test and commissioning info and manufacturers literature but the majority will need to be chased and their returned information checked thoroughly.

## The Process - Checking the information

Once the information has been gathered the job is still far from complete. Now the process of checking what has been supplied starts. Common issues that will almost certainly be picked up by the client, CA or CDMC are:

**Incomplete scope of works.** Typically a subcontractor may simply forget about certain items or materials used.

**Drawings are not marked up 'As Built' or 'Record'.** This is a very common problem. All drawings in the O&M Manuals should be final issue and marked up as such.

**Test and commissioning sheets not signed or missing.** As above, the client, CA or CDMC will almost always check that test / commissioning sheets are signed, scanned versions and not the pre-signed ones.

**Manufacturer's literature is not relevant.** The manufacturer's literature needs to be applicable to operation, maintenance and health and safety. Hundreds of pages of sales literature are a waste of space and are often put in purely to 'pad out' the O&Ms. The Client, CA or CDMC will not be pleased if they have to trawl through this.

A good O&M Manual compiler will be able to identify missing bits and prompt the subcontractors / installer to supply this. In addition, it's always worth going back and checking with them that there's nothing else to go in.

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## The Process - The draft manual

Usually, the client will want to view a draft version of the O&M Manual at some point. When they require the draft will dictate how much information can be included.

A switched on client will request the draft at a point whereby they can expect to have a pretty much complete scope of works but will understand that final AB (as built) drawings and test certification will not be available. There will also have to be enough time allowed to make all required changes after comments have been received back.

For the draft manual, once all the available information has been compiled it should be issued to the client with notes of what is missing.

The client should then issue it out to the various parties who have an interest for checking and comments. Ideally, this should be done one at a time to avoid everyone picking up the same mistake and wasting time.

Ideally, all comments should be compiled into one set and sent back to be actioned.

A common problem at this stage is where a number of different people are all commenting on one manual without talking to each other. Also, if more than one draft has been requested, it's very common for people to end up commenting on an old version, often picking up errors that may have already been sorted out.

In the same way that subcontractors and others would have been chased for information earlier, the client should be chased for their comments at this stage. The scenario whereby a lot of comments come rolling in a day before the final manual is due is one that needs to be avoided if at all possible.

## The Process - The final manual

Once comments from the draft manual have been received and actioned and all the remaining As Built drawings and scanned, signed test and commissioning sheets have been included the final manual should be ready for issue.

At this point the electronic and printed manuals need to be separated from each other and sent their different ways. Printable electronic versions to the printers and the full electronic version burnt to disc or uploaded.

Sometimes, if there are still items outstanding items (typically, last minute test results) these can be manually inserted into the printed version on site and added to the electronic version when they are available. Obviously, this means that the electronic final manuals will be issued later.

## Summary

Unfortunately there is no easy across-the-board answer to the O&M Manual question. But, one thing is certain; they're not going to get easier and they're not going away.

Whether you intend to attempt them yourself or employ people such as ourselves to do them for you, some things will always make them easier:

- Get them moving as soon as possible. Late notice O&M Manuals will always be problematic and costly.
- Allocate time and financial resources to the job. Don't expect an overstressed site manager to do the O&M Manuals unless he/she has the time.
- Talk with the client. Make sure you're producing what they want to see.

Please read the other articles on the <http://www.oandmit.co.uk> website for more information.