Grade 5

THESIS DOCUMENT

METHOD STATEMENTS

Issued by Anthony McMahon C.S.A Member 3165/IM

THESIS DOCUMENT-METHOD STATEMENTS

Document Index.

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THESIS DOCUMENT-METHOD STATEMENTS

Section One

Description of Thesis

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Section One

Document Description

This document is a thesis based on the subject of method statements.

Method statements are a form of documentation that informs the relevant parties of how a task is to be performed, and of any requirements that may be an issue to enable the works to be carried out correctly and in a safe manner.

This document deals with the requirements, importance, and types of method statements that are commonly used by various contractors.

Method statements are not new, they have been used for many years and this thesis identifies an early form of method statement that has been seen by millions of people around the world, in fact three people owe their lives to the method statement due to the direct impact of its content.

The document contains a pro's and con's section for production and issue of a method statement, the document also contains a conclusion and various appendices.

THESIS DOCUMENT-METHOD STATEMENTS

Section Two

Requirements and Importance of Method Statements

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Section Two

Requirements and Importance of Method Statements

Requirements

According to the Health and Safety Executive (HSE), British construction law does not require method statements to be provided, however, it is a recommendation that they are supplied in the project health and safety file. (Refer to appendices 'D')

In the event an incident occurs, whilst carrying out a task that results in a near miss, injury or death that the HSE are called out to investigate, one of the first things that they will require to see is the health and safety file, and the section containing risk assessments and method statements for the task related to the incident.

It is the employer's responsibility to issue a method statement on behalf of an employee, and the employee should read the document prior to carrying out the works.

When compiling a method statement the employer should take into account site-specific requirements to ensure the method statement is an accurate description of the proposed works.
It is simply not acceptable on most construction sites, to issue a method statement that has obviously been used on numerous sites as each site has differing requirements.

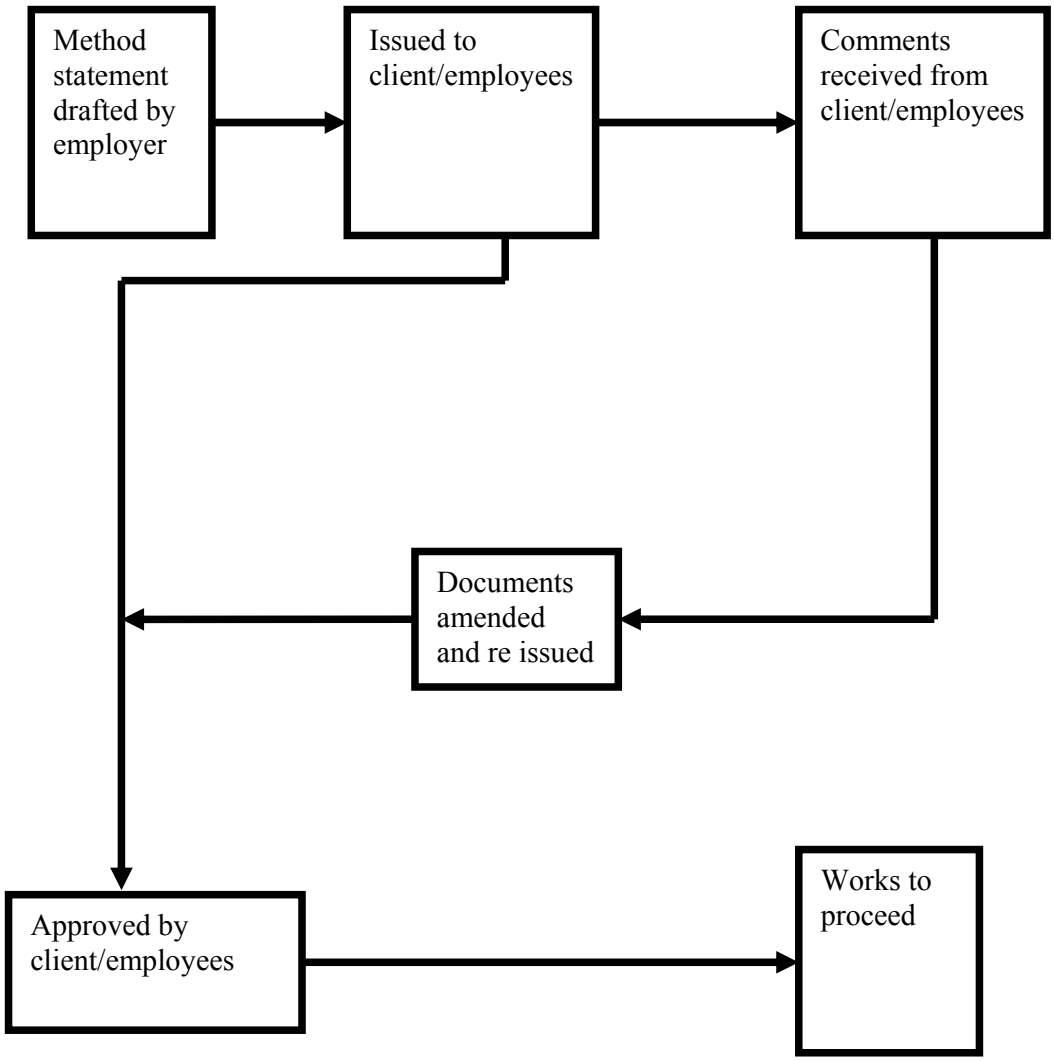
The construction industry has varying requirements for method statements ranging for instance, from full description of works and risks associated, to some sites that don't have an obvious requirement for one. Although on certain construction sites, a method statement may not be requested by the principle contractor it does not mean that one is not required, the method statement would be required should something go wrong and in that instance all parties would be at fault for either not requesting and or not issuing the method statement prior to the works taking place.

Section Two (continued)

Requirements and Importance of Method Statements

Requirements

To summarise the requirements of the method statement flowchart, in an ideal world would be as follows:



Section Two (continued)

Requirements and Importance of Method Statements

Requirements

In practice, events on a site may overtake the method statement procedure and the programme may be affected if certain works are not completed. It is therefore essential that method statements are issued to the relevant parties within an agreed timetable and are compiled after taking on board site-specific requirements.

I have shown as listed below, an example of a method statement index:

1. Scope of Works.

2. Site-specific Details.

3. Method of Working.

4. Assessment of Significant Risks.

    4.1. Access Requirements.
    4.2. Authorised and Unauthorised Access.
    4.3. Working at Heights.
    4.4. Control of Substances Hazardous to Health.
    4.5. Noise.
    4.6. Manual Handling.
    4.7. Working in a Hazardous Area.

5. Resources.

6. Control Measures.

7. Personnel Protective Equipment.

8. Emergency Arrangements.

9. Risk Assessment.

10. Information Issued To.

11. Monitoring and Compliance.

Section Two (continued)

Requirements

Each section would have various sub-sections as required, as shown previously, certain sub-sections may not be applicable and in this instance it would shown as Not Applicable".

Importance

The importance of a properly prepared method statement is crucial to the acceptance procedure, if little or no effort has been put into the document it will normally be returned as not acceptable or with so many comments that it would require to be re-written anyway.

When compiling a method statement, an employer should take into account all the facts regarding the workplace; this often will require a visit to the workplace to ensure the method statement is as specific as practically possible. If an employer has concerns regarding the content of the method statement it would be beneficial to arrange a meeting with all relevant parties to discuss and agree a format and the content requirements.

The operative who is supervising and/or the operative who is scheduled to carry out the work must be in possession of the method statement. The method statement should have been issued prior to attendance to the place of work, as this will allow the operatives to digest the contents of the documents, it will also allow the operatives to comment to the employer and revise the method statement if required.

A method statement will be included in the project Health and Safety file and this would be referred to, in the event of an incident occurring that requires an investigation. In this instance, should a method statement not be present, the employer and employee could be held accountable by any investigating body.

Listed below are points of importance for compiling a specific method statement.

- They identify the scope of works.
- They identify potential hazards.
- They let the employee understand the scope of works.
- They let the employee understand the specific requirements of the works.
- They inform the client of the specific requirements of the works.
- They form part of the project health and safety file.

THESIS DOCUMENT-METHOD STATEMENTS

Section Three

Types of Method Statements

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Section Three

Types of Method statements.

There are basically two types of method statement, a generic type and a project specific type.

Generic Type

A generic method statement is the most popular type to be issued by employers, as these involve very little work. The generic method statement will have been created previously and the only changes that occur will usually be the likes of "project name", and "clients name".

The generic method statement will list basic activities for the employee but will not identify any specific details for the project. (Refer to appendices 'D')

These types of method statement will usually only be acceptable for small work activities that involve very little risk to the employee or anyone affected by the work. An example of a generic method statement has been drafted and may be similar to a shown below.

METHOD STATEMENT

Manual Washing Cars in Forecourt

1. Carry out initial jet wash of car using power washer.

2. Fill bucket with hot water.

3. Use hot water and cleaning sponge to manually wash car surfaces.

4. Carry out final jet wash of car using power washer.

The generic method statement shows the basic tasks that are to be carried out for the manual washing of a car in a garage forecourt. It does not identify any risks associated with the work.

Section Three (continued)

Types of Method statements.

Project specific Type

A project specific type method statement will be created after usually visiting the work place to view where the work activities are to take place. This type of method statement involves more work for the employer.

The project specific type method statement should identify all aspects of the work and inform the relevant parties of any requirements or hazards associated with the works. An employer should appoint within their company, a competent person who is familiar with compiling method statements and has knowledge of the tasks that are to be performed. They should ideally have some experience in health and safety, as this topic will require to be included within the project specific document.

This type of method statement will show the task being carried out as per the generic method statement but will also identify other key issues, as shown below.

Client: Car Sales Anonymous

Document: METHOD STATEMENT
For
Manual Washing Cars in Forecourt

Section 1. Scope of Works.

1.1 To wash the cars manually as directed on the daily worksheet.

Section 2. Site-specific Details.

2.1 The water supply for the power washer is located at the rear of the garage structure, therefore adequate care and attention must be taken when routing the hose from the water supply to the power washer.
Due to the location of the water supply in relation to the wash area, it has been deemed necessary to use a reinforced hose instead of a flexible hose.

2.2 The hot water supply is located in the workshop kitchen and delivers hot water at 60^{o}c. Due to the water temperature, a steel bucket shall be utilised for collection of the hot water.

Section Three (Continued)

Types of Method statements.

Section 3. Method of Working.

3.1 The method used to wash the cars will be as follow:

- Inform all relevant parties of intention to carry out work.
- Connect reinforced hose to water supply by mechanical fixing.
- Purge rigid hose with water.
- Connect rigid hose to the power washer
- Ensure power supply is available and connect power washer to the power supply.
- Test power washer operates and water supply connections are sound.
- Select first car for washing and position in the wash area.
- Ensure the car handbrake is applied.
- Ensure all doors and windows are shut on the car to be cleaned.
- Apply first power wash over complete area of the selected car.
- Collect hot water from the workshop kitchen and mix the hot water with cold until the water temperature is 45^{o}c maximum.
- Insert cleaning agent into hot water.
- Using a clean sponge apply hot water vigorously over all surfaces until satisfied with the finish.
- Apply final power wash over complete area of the selected car.
- The forecourt manager will be requested to view the completed work.

Upon completing the work as shown on the daily worksheet all cars will have been put back on display. The power supply will have been disconnected and the power washer will have been put in the storeroom in the workshop area.
The reinforced hose will have been disconnected and drained of excess water, and will have been rolled up and returned to the storeroom area of the workshop.

Section 4. Assessment of Significant Risks.

4.1 Access Requirements.

- Access will be required to the wash area, kitchen area, and workshop storeroom

4.2 Authorised and unauthorised access.

- Authorised personnel will only be permitted access to the wash area.
- Signs shall be posted at all access points in the wash area to advise of the restricted area.

4.3 Working at Heights.

- Not applicable.

Section Three (Continued)

Types of Method statements.

Section 4. Assessment of Significant Risks (continued)

4.4 Control of Substances Hazardous to Health.

- The cleaning agent used in the warm water is a domestic type soap based liquid. It is housed in the manufacturers packaging and shall only be used upon wearing of the Personnel protective equipment supplied.
- If any of the liquid is swallowed the following action should be taken.
    - Drink copious amount of fresh water.
    - Do not force vomiting.
    - Seek medical advice.
- If any of the liquid has contact with the eyes the following action should be taken.
    - Rinse eyes with fresh water.
    - Seek medical advice.
- If the liquid has contact with bare skin the following action should be taken.
    - Rinse affected area with fresh water.
    - The cleaning agent is organically based and does not pose any threat to the environment.

4.5 Noise.

- The noise generated by the power washer will require the user to wear ear protection.
- The noise generated by the power washer does not require any other person in the vicinity of the wash area to wear ear protection unless they are exposed for 15 minutes or longer.

4.6 Manual Handling.

- The power washer is of a light construction and is positioned on a four-wheeled trolley; the trolley will only require to be moved into position by one operative.

4.7 Working in a Hazardous Area.

- The wash area will become very wet during the cleaning works and care will be taken entering and leaving the area.
- During winter months the wash area shall have salt spread evenly to prevent the build up of ice on the road surface.

Section 5. Resources.

- One operative shall be used for the works

Section Three (Continued)

Types of Method statements.

Section 6. Control Measures.

A permit to work shall be obtained from the forecourt manager prior to setting up equipment.

Section 7. Personnel Protective Equipment. (PPE)

The following PPE shall be issued and worn by the operative during the works.

- Rubber soled steel toecap footwear.
- Full length overalls.
- Waterproof jacket and leggings.
- Water proof gloves.
- Eye protection.

Section 8. Emergency arrangements

Emergency arrangements are detailed on the permit to work and are as per Car Sales Anonymous health and safety document, which is available for viewing in the forecourt managers' office.

Section 9. Risk Assessment.

The risk-involved whist carrying out the work has been deemed as significantly low; therefore, no special measures are required.
This shall be reviewed on a monthly basis to ensure that there are no new risks that were not present during the first assessment.

Section 10. Information issued to.

The method statement will be issued for approval to the forecourt manager, the workshop manager and the operative; a copy shall be kept in the workshop on view, on the "work ongoing board"

Section 11. Monitoring and Compliance.

The operative shall complete a daily sign off sheet and issue it to the forecourt manager; the forecourt manager shall inspect all areas used by the operative to ensure that all works are progressing as per the permit to work and this method statement, as required.
The forecourt manager shall issue corrective action directives to the operatives employer in the first instance and the employer shall take action with the operative should the need arise.

THESIS DOCUMENT-METHOD STATEMENTS

Section Four

Example of an Early Method Statement

Issued by Anthony McMahon C.S.A Member 3165/IM

Section Four

Example of an Early Method Statement.

The example of an early method statement I have chosen is based on the APOLLO 13 mission by NASA in April 1970. It is well documented that this mission was in danger of turning into a disaster with fatalities not being a possibility, but a probability.

The problems started after fifty-five hours and fifty-five minutes into the mission, when the astronauts heard and felt what they described as “A Pretty Big Bang”. The astronauts and the ground crew made an assessment, and they discovered that for some reason, two of the three fuel cells in the service module were “dead”, this incident had put the astronauts safety in real danger.

The ground crew realised that action was required to assist the astronauts if they were to return home safely. As two of the fuel cells were dead in the service module there was an insufficient power supply to use the spacecraft in accordance with normal operating procedures.

The ground crew had to compile a method statement, which would allow the spacecraft to be operated whilst minimising the power output required to operate life safety systems and other equipment.

I have listed the problems, and the steps that were taken by the astronauts using the protocol supplied by the ground crew.

Section Four (continued)

Example of an Early Method Statement.

Problems that required a method statement to be produced.

1. Loss of power supplies from two out of three fuel cells in the service module.

2. Due to the fuel cell problems the astronaut's oxygen supply in the command module was limited.

3. Due to the fuel cell problems the astronauts water supplies in the command module was limited.

4. Carbon dioxides build up, due to no power in the command module.

5. The spacecraft trajectory required changing as it was still heading on course to the moon, the spacecraft would have to be manoeuvred into position to fly around the moon and put on a new course back to earth.

6. Re-charging of the command module batteries. (These form part of the crucial power supply for re entry into the earth's atmosphere)

Section Four (continued)

Example of an Early Method Statement.

The problems listed previously were dealt with in great detail by the ground crew, listed below is the section index and solutions, which formed the backbone of the method statement used.

Section 1. POWER:

The loss of power from the two fuel cells in the service module meant that power would have to be used from the lunar module batteries.

All non-essential electronics were isolated.

Section 2. OXYGEN

The oxygen supply packs in the lunar module, which were to be used for the lunar landing, would now be utilised for maintaining a minimum amount of oxygen required to sustain life.

Section 3. WATER

The water supplies left were estimated at 150 litres, virtually all this water was required for the cooling system so after careful calculation and re-calculation the astronauts were only allowed a daily ration of 0.20 litres each.

Section 4. CARBON DIOXIDE

The canisters used for trapping the carbon dioxide had a limited life span (quoted as 60-person hours). The canisters in the lunar module had spigots that were round but the command module canister spigots were rectangular, this obviously caused a problem.
The solution was to use various equipment from within the command and lunar module. (As listed below)

Space suit hoses. Cardboard. Plastic stowage bags.

Lunar module canisters Command module canisters

The above equipment was bonded together by using “grey duck tape”, not very conventional but nobody complained, because it worked.

Section Four (continued)

Example of an Early Method Statement.

Section 5. RE-CHARGING OF THE COMMAND MODULE BATTERIES.

The problem with maintaining a charge on the command module batteries was that there was only one electrical path between the lunar module and the command module. The electrical path was only normally used for monitoring power usage by the lunar module systems.
This electrical path was only established after the spacecraft launch and after docking with the lunar module, it is connected by use of a temporary umbilical cord arrangement.
The ground crew studied the electrical schematics and devised a configuration of switches and circuit breakers so that a trickle current was passed along this sensor circuit

Section 6. SPACECRAFT TRAJECTORY

As the spacecraft was travelling through vacuum, there was nothing to disperse the cloud of service module debris that had enveloped the spacecraft. They couldn't use the telescope to make star sightings as glints of sunlight reflecting off the debris made it almost impossible.
The astronauts were exhausted and by now were making uncharacteristic mistakes, they persevered and with assistance from the ground crew and by using the sightings of the sun and the crescent of the earth, the trajectory was lined up perfectly.

Of course the above method statement as I have shown it is very basic, but it can be seen, that without great thought by the ground crew and the astronauts and an agreed method of working, the Apollo 13 spacecraft and her crew would have been lost.

THESIS DOCUMENT-METHOD STATEMENTS

Section Five

Pros' and Cons for Method Statements

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Section Five

Pros' and Cons for Method Statements

This section deals with the arguments for and against method statements.

Pros'

The key to effective work control is the definition of a scope of work. If there is no accurate work scope, how can an employer and their employees have any hope of controlling the work adequately?

Defining the work to be performed impacts on all aspects of work control, it is not possible to set reliable timescales and resource requirements if the scope of work has not been defined.

The advantages of having a method statement prepared and approved for use are listed below.

- The operative has information allowing him to have a greater knowledge of the project requirements prior to attending the workplace.

- The operative will have details of any risks associated with the work.

- The operative can carry out the work in the knowledge that his employer has taken the time to review the workplace and has taken measures to ensure the work can take place in a safe and efficient manner.

- The employer will have full confidence that his operative has all the relevant details to allow the work to proceed safely and efficiently.

- The client has a greater knowledge of what the contractor/operative will be doing and what activities, if any, they have to provide assistance for.

- The issue of an approved project specific method statement will allow the employer and client understand the division of responsibilities between them.

- The operatives have to adhere to the method statement and cannot diverge from the agreed method of working unless another method statement is issued and approved, this cuts out contractors being able to cut corners to save time and money.

- Proper and effective work controls will reduce any abortive works and will improve teamwork.

- The issuing of method statements will improve operative and company efficiency, which, will have a direct, affect on profitability and repeat business.

- The requirements of CDM 1994 will have been met. (refer to appendices 'D')

Section Five (continued)

Pros' and Cons for Method Statements

Cons

The disadvantages of producing method statements are listed below.

- The company would have to train people to become competent at compiling the method statements.

- The usual late order for the works and time restraints associated due to the late placement of the order will put pressure on the contractor to try to use a generic method statement.

- The method statement will be commented on, and may require revising in line with the comments and would require to be reissued.

- The company would have to direct labour to the duty of compiling the documents, remember if they are to be site specific, a visit to the workplace will usually be required and this may not have been included in the budget at the tender stage.

- The operatives have to adhere to the method statement and cannot diverge from the agreed method of working unless another method statement is issued and approved, this cuts out contractors being able to cut corners to save time and money.

THESIS DOCUMENT-METHOD STATEMENTS

Section Six

Conclusion

Section six

Conclusion

A few years ago, I was asked to produce a method statement for air and water balancing in a large office block in Edinburgh by a team of commissioning managers.
I passed this request onto my employer who in time issued me with their generic documents. (Refer to appendices A)

The information was passed onto the commissioning managers through our clients, a ductwork manufacturing company and a heating contractor.

The method statements were returned as status 'C' and our clients advised us that the documentation required would require to be 'site specific'.

I asked for more information regarding the content requirements and our clients could not offer any assistance, I asked the commissioning managers for advice and I was given a basic requirements schedule, it was this basic requirement schedule that allowed me to understand the commissioning manager's requirement.

Using the schedule, I was able to produce further method statements, which after minor adjustments were passed as status 'A' allowing the works to proceed. (Refer to appendices 'B' for final version)

The timescale for getting from initial request to status 'A' was approx 5 weeks.

At the time of the contract it was unusual to receive such a stringent request for the compilation of a method statement that contained such detail, it was usually acceptable for the generic method statement to be issued and for the works to proceed.

The site specific method statement finally accepted contained the same basic scope of works but crucially it also contained other information that allowed our clients to fully understand our requirements when attending site to carry out the works.

Since the project mentioned above, I have been appointed as resident engineer for the client on a project, which required me to witness various commissioning activities ranging from small vent systems to fully operational UPS systems.

The documentation supplied to the management contractor by the package contractors was very inconsistent; the commissioning activities were almost always delayed until the method statements had been rewritten to take into account the site specifics.

The package contractors did not have any guidance from the management contractor to the schedule of requirements necessary for the method statements and this in turn lead to the documents being returned by the design team with comments, many of these method statements were returned as status 'C'.

If, at the beginning of the contract, a schedule of content for method statements had been agreed, it would have saved a lot of time for the management contractor, package contractors and the design team.
(Note; Status 'A' No comments, Status 'B' Proceed adopting comments, Status 'C' rejected.)

Section Six (continued)

Conclusion

The government have recently held a conference (16/10/02); they aim to make organisations more accountable for breaches of the health and safety at work act.

They delivered a report with a clear message that they would introduce a new safety bill with stringent requirements.

One of the areas that they want to see improved is the documentation between clients and contractors. The use of external contractors has increased since the last health and safety act was passed and the government want to ensure that all parties clearly understand their responsibilities, method statements will go someway to alleviating this problem.

Method statements are becoming part and parcel of standard documentation, major companies now expect to see a method statement prepared as part of the tender and take a dim view if they are not supplied.

Companies are gradually falling into line and are now appreciating that a properly prepared method statement can assist them in winning contracts, which in turn can lead to repeat work from a client.

There are however, companies that are still offering resistance when they are requested to supply method statements.

Many of these companies still take the view that preparing a method statement will cost them money, the fact is, if they fail to take the necessary steps of compiling and issuing method statements, that have been prepared with sufficient detail**, it will indeed cost them money as this type of company will miss out on a useful opportunity to review the efficiency and effectiveness of its operations, ultimately the client may take their business elsewhere.**

THESIS DOCUMENT-METHOD STATEMENTS

Section Seven

Appendices

Section Seven

Appendices

Appendices A.	Original method statement for air balancing in an office block.
Appendices B.	Final method statement for air balancing in an office block.
Appendices C.	Example of contractor's method statement showing comments from the commissioning managers
Appendices D.	Extract from Managing health and safety in construction. (C.D.M)
Appendices E.	Extract from BSRIA guide ref 11/98.

Appendices A.

Original method statement for air balancing in an office block.

SCOTTISH WIDOWS

METHOD STATEMENT No. 1680/1

VENTILATION SYSTEM

Issued by Anthony McMahon C.S.A Member 3165/IM

METHOD STATEMENT No. 1680/1

GENERAL VENTILATION SYSTEM

Static Checks

1. Obtain authority from installation contractor to work on system.
2. Open all grille blades and dampers and visually check ducting.
3. Open volume control dampers.
4. Ensure dampers move freely.
5. Check fire dampers are open.
6. Check system cleanliness.
7. Check flexible connections are straight and not off set.
8. Inspect AHU's and fans for damage and remove transit fixings.
9. Check belt, bearings, alignment etc.
10. Check filters.
11. Record fan and motor data.
12. Check external louvres.
13. Select suitable pitot traverse test points, in conjunction with commissioning manager, drill same and affix reference label.
14. Check with controls commissioning engineer as to electrical status.
15. Complete relevant sections of precommissioning check list.

METHOD STATEMENT No. 1680/1

GENERAL VENTILATION SYSTEM

Starting AHU's, Fans etc.

1. Obtain authority from the controls commissioning engineer and start fan.
2. Close the main volume control damper, if fitted.
3. Attach Amp Meter and start fan.
4. Check starting current and running current.
5. Switch off if:-
    a) The motor rotation is incorrect;
    b) The running current is high;
    c) The starter is noisy;
    d) Excessive vibration.
6. If normal proceed with Item No. 7.
7. Open volume control dampers slowly. Check the running current until FLC is reached and set damper at this maximum position, if it is not yet fully open.
8. Complete relevant sections of precommissioning check list.

METHOD STATEMENT No. 1680/1

GENERAL VENTILATION SYSTEM

Balancing

1. Measure the system total volume and external resistance, check it is between 100 - 120%. Advise of design deviations.

2. Check all grille velocities and record.

3. Calculate proportional balancing factors for grilles.

4. Regulate grilles on index leg to the index grille progressively back through the system until all grilles are in a balance to tolerances given in CIBSE Code A.

5. Check the main AHU system total volume and regulate to design (pulley change if required).

6. Carry out final readings and record.

7. Lock and mark duct mounted regulating dampers.

8. Compile hand-written results and submit for design team comment and arrange for demonstration of results.

9. Demonstrate results and obtain acceptance signature.

10. Ensure all test points are plugged.

METHOD STATEMENT No. 1680/1

GENERAL VENTILATION SYSTEM

Key Equipment Used

1. Rotary Vane Anemometer (Velocity, m/s)
2. Micromanometer with Pitot Static Tube (Static Pressure, Pa. Velocity, m/s)
3. Tachometer (Rev/Min)
4. Amp Probe (Amps)

Calibration certificates, where relevant to above, issued with final report.

Fabricated hoods of known free area factor will be used as required to measure grille velocities.

Appendices B.

Final method statement for air balancing in an office block.

ISSUED BY: A McMahon **PRESENTATION BY: KG**

SCOTTISH WIDOWS

TESTING/BALANCING METHOD STATEMENT No. 1680/1 (Rev 3)
SUPPLY & EXTRACT VENTILATION SYSTEMS
SHELL AND CORE

JOB NO.1680 **WP4095**

BRANKIN ENGINEERING
BROXBURN

Issued by Anthony McMahon C.S.A Member 3165/IM

TABLE OF CONTENTS

1. INTRODUCTION

This document covers the testing/balancing of the supply and extract ventilation systems and has been carefully compiled from the latest recommended methods (cibse,bsria) in present use in the building services industry.

The following sections of this document describe the procedures which, when executed will ensure that the supply and extract ventilation systems have been properly balanced and are operating within the design requirements with fully documented test results.

It should be noted that we are to carry out pre-commissioning, proportional balancing, plant testing and demonstrations. Performance testing does not form part of the scope of works.

2. PRELIMINARIES

On arrival to site, we will ensure that all relevant parties are informed of our attendance, staffing levels and intention to work on site. Providing suitable safety procedures are in operation our staff will then carry out a systematic inspection of both the progress of the building and the building services installations to ensure that the commissioning programme can be reliably carried out.

Any shortfalls or incomplete installations shall be advised verbally to Brankin engineering, a written report will follow at the earliest opportunity.

NOTE

Attendance on site will only take place upon completion of site induction.

3. SITE SAFETY

1. The company's policy of Health and Safety will be adhered to at all times, all operatives will familiarise themselves with any relevant site safety procedures and fire regulations.

2. In areas where it is required for operatives to use stepladders all operatives shall ensure that suitable steps of varying size are utilised.

3. The step ladders will be constructed from aluminium/wood or glass fibre and shall be of a standard acceptable to the construction industry i.e., Class 1 Industrial, the equipment will be inspected on a weekly basis to ensure that are suitable and safe for the intended works.

4. All operatives shall attend site with personal protective equipment and shall wear same as required.

4. CHECKING PROCEDURES

The following inspections will be systematically carried out and reported on: -

1. Does any permit to work system operate on site?
2. Are plant rooms completed and clear of construction debris?
3. Are doors to plant rooms fitted with locks and serviceable?
4. Is an uninterrupted power supply of sufficient capacity available?
5. Are all glazing works complete and all windows closed?
6. Are all curtain walling and building envelope works complete?

All dust generating activities by all trades must have been completed and all areas thoroughly cleaned to prevent ingress of building dust into the ventilation and return air systems.

In some instances it will not be necessary for all items above to be complete for us to carry out our works and this project will be examined on its own merit.

5. INSTRUMENTATION AND CALIBRATION

1. Each piece of testing equipment to be used on this project is identified by its manufacturers Serial N^{o}. And a H. & V. Serial N^{o}.

2. The frequency of calibration of the equipment is determined by the manufacturer; however this is only used as a minimum. The frequency may be increased due to the conditions of use or based on the results or if any doubt of the equipment's accuracy.

3. All equipment is submitted to a suitable independent specialist for calibration and certificates obtained are traceable to national standards.

4. All original calibration certificates are held at head office. Copies to be issued to BRANKIN ENGINEERING prior to testing commencing.

5. Below is a list of instruments to be used on this project:

INSTRUMENT	**MANUFACTURER**	**USE**
Micro manometer	Solomat/Neutronics	Airflow measurement
Anemometer	Airflow Developments	Balancing of air flows
Pitot Tubes*	Airflow Developments	Airflow measurement
Amprobes	Various	Current measurement
Tachometers	Various	Rotational speeds
Balancing Hoods*	Customised In House	Balancing of airflows

NOTE:
*** No calibration required**

6. TEST HOLES

1. Test holes shall be cut into the ductwork using 9 or 12-volt cordless drills, all holes will be plugged using 10mmØ top hat type test plugs.

2. Test hole reference stickers shall be attached to the ductwork.

3. Any insulation cut during test hole cutting shall be made good by the insulation contractor.

4. Test holes shall be positioned in accordance with CIBSE/BSRIA Guidelines where possible and will be subject to sufficient straight lengths of ductwork being available.

7. PRE-COMMISSIONING

1. A pre-commissioning sheet will be incorporated for each system. Checks will be made and comments inserted as necessary, no item on the pre-commissioning sheet will be left blank.

   Pre-commissioning will take place upon receipt of confirmation that the systems are statically complete; this must be issued by BRANKIN ENGINEERING to H&V COMMISSIONING.

   Any shortfalls or incomplete installations shall be advised verbally to Brankin engineering, a written report will follow at the earliest opportunity.

   Pre-commissioning activities will be based around items as included on the test sheets supplied by the commissioning managers.

8. SUPPLY & EXTRACT VENTILATION SYSTEMS TESTING/ BALANCING (shell and core)

1. An initial Pitot Traverse of the systems will take place, the AHU/fans total and external pressures, fan and motor speeds and motor running current will be recorded. This information will then be related to the fan curve to determine the actual performance (fan curves to be supplied by BRANKIN ENGINEERING).

2. An initial scan of all open ends will take place (using suitably selected instruments) to determine the system index. If any doubt to the authenticity of the system index, the client will be notified and balancing will not proceed until the client requests us to.

3. A proportional balance will now be carried out, working from the index to tolerances in accordance with CIBSE code series "A" 1996 air distribution.

4. Upon completion of proportional balancing a final system Pitot Traverse will be taken along with plant pressures, speeds and motor currents.

5. All dampers will have been locked in position and marked with white spray paint; all test holes will be plugged.

6. The test results will be completed and issued to BRANKIN ENGINEERING for onward transmission to the commissioning managers.

7. Once the system testing and documentation is complete a request for witnessing will be submitted to BRANKIN ENGINEERING and they shall organise the relevant parties.

8. Upon a satisfactory completion of demonstration works a signature will be obtained to confirm test results are acceptable.

8.1 RISK ASSESSMENT

The testing of the supply and extract systems is contained within the plant room and riser area's and as the company health and safety policy will be adhered to, we have deemed that the risk of injury to our operatives or others in the vicinity would be "**VERY LOW"** and therefore no specialist precaution will be required.

We shall monitor site conditions and may amend this assessment should we deem the risk having changed.

9. COMMISSIONING TEST SHEETS

The commissioning test sheets to be utilised on this project are to be supplied by the commissioning managers.

10 LIST OF SYSTEMS TO BE TESTED

AHU1 B1

AHU4D1, 1

AHU4D1, 2

AHU4D1, 3

AHU4D1, 5

AHU8E1, 1

AHU BC2, 4

AHU BC2 C1

AHU BC2 C2

AHU BC2 C3

AHU BC2 C4

AHU BD1 D2

AHU BD1 D3

AHU BD1 D4

AHU BD1 E2

AHU BD1 E3

AHU BD1 E4

AHU BE1 A2

AHU BE1 A3

AHU BE1 A4

AHU BE1 A5

EF BD1 7A + B

EF BD1 29

EF BD3 26

EF BE1 3A +B

EF BE1 4A +B

EF BE1 30

EF BE2 27

EF BF1 9A +B

EF BF1 8A +B

EF C-1, 22

EF D-1, 2

EF F1-16

EF PAC3 20

EF PAC4 25

EF RA1 10

EF RA1 17

EF RB1 11

EF RB2 18

EF RC1 12

EF RC1 19

Appendices C.

Example of contractor's method statement showing comments from the commissioning manager.

Appendices 'C'

JERSEY OPERA HOUSE
CHLORINATION METHOD STATEMENT

Safety

No part of a system shall be used during the disinfection procedure. In addition to marking all outlets with warning cards, Building Services Managers, or the responsible person for the building, should inform all building users of the disinfection before it takes place (including those not normally in attendance during working hours - i.e. cleaners and security guards

All visible dirt and debris should be removed from tanks and the tank(s) and all new pipe work thoroughly flushed with mains water and tested for leaks before disinfection work.

Comments by the commissioning manager

- *Who is to remove dirt and debris from the tanks and how is this to achieved?*
- *What PPE is required?*

Mains supply pipework.

a) A chemical injection point should be fitted to the mains pipe where it enters the site (after the water meter) and Sodium Hypochlorite solution injected until a level of 50 mg/l free chlorine is measured at the end of the mains pipework. All outlets should then be marked with warning cards.

b) The chlorinated water should then be allowed to remain in the system for not less than 1 hour. At the end of this dwell period the residual free chlorine must not be less than 30 mg/l.

c) The mains pipe should be thoroughly flushed until the residual free chlorine level, at the end of the mains pipework, is no greater than that present in the water entering the system from the suppliers main.

Comments by the commissioning manager

- *Warning Signs must be posted prior to works commencing.*
- *Levels of sodium hypochlorite to be witnessed by the commissioning manager. both stages to be witnessed.*
- *If levels are below 30 mg/l, the works must be repeated.*
- *Mains system connects to vending machines, these must be disconnected prior to works commencing.*
- *Coshh data sheets required.*
- *Provide confirmation for chemical handling training.*
- *Provide confirmation from water authority regarding discharge of chemical.*
- *Sample to be issued to the commissioning manager for independent analysis.*

Tanked services.

1a) The entire system and all storage tanks (cisterns) should be full of clean water. A measured quantity of sodium hypochlorite of known strength should then be added to the water in the main cold water storage tank to produce a free residual chlorine concentration of 50 mg/l. The tank should be isolated from the supply while step 1b is carried out, and refilled with water and chlorine as necessary to maintain the initial chlorine concentration in the tank.

1b) Each tap and draw off point should then be opened, working progressively away from the cistern, until the measured residual free chlorine level at each outlet is the same as that in the cistern. Each outlet should then be closed and marked with a warning card indicating that disinfection is in progress and the outlet must not be used. The cistern should then be refilled with clean water up to the overflow level and the free chlorine level again restored to 50 mg/l.

1c) The cistern and pipes should then remain charged with the chlorinated water for one hour. At the end of this dwell time the tap furthest from the cistern should be opened and the level of free chlorine in the water being discharged from the tap should be measured. If the measured free chlorine level is below 30 mg/l the disinfection process must be repeated.

1d) When this test is proved satisfactory the cistern and pipes should be thoroughly flushed with clean fresh mains water until the free chlorine concentration at all outlets is no greater than that present in the suppliers main. All warning cards should then be removed.

Post disinfection

After flushing a sample(s) shall be taken for bacteriological analysis. Where the bacteriological analysis indicates that adequate disinfection has not been achieved, the installation shall be flushed and re-disinfected and further samples taken and analysed.

<u>Comments by the commissioning manager</u>

- *Warning Signs must be posted prior to works commencing*
- *Levels of sodium hypochlorite to be witnessed by the commissioning manager. both stages to be witnessed.*
- *Sample to issue to the commissioning manager for independent analysis. contractor analysis to be presented within one week of works being complete.*
- *Coshh data sheets required.*
- *Provide confirmation for chemical handling training.*
- *Provide confirmation from water authority regarding discharge of chemical.*

Appendices D.

Extract from Managing health and safety in construction.

What contractors must do.

- Provide information to the principle contractor about risks to others created by their work, this information might, for example, come from risk assessments or **method statements**.

The above information can be found on page 42, item 182.
Managing health and safety in construction, CDM regulations 1994
(Approved code of practice)

Appendices E.

Extract from BSRIA guide ref 11/98.

7.3 Delivery of Information (7.3.3 Method statements)

Method statements should be listed in the contractor's quality plan.

In relation to building services, method statements might be produced describing the procedures and methods for the installation of:

- Major central plant items
- Pipework (by type-steel, copper, plastic)
- Ductwork (metal or plastic)
- Insulation (pipes and ducts)
- Controls
- Plumbing, soil waste and sanitary fittings
- Hot and cold water services
- Fire sprinklers, hosereels, dry risers
- Utilities
- Electrical power, lighting and containment systems for specialist sublets.

Furthermore, specialist sub-traders will be required to produce their own method statements defining procedures for the installation of services within the scope of their own sub-contract packages. In a building services context these might include:

- Lightning protection
- Substation and HV switchgear
- Lifts and escalators
- Security systems
- data systems
- Telecommunications
- Fire detection and prevention
- Kitchens and cold rooms
- Electric generators
- BMS
- Commissioning
- Commissioning management.

Prior to the appointment of sub-traders and specialists, the building services installer may only be able to accurately programme the delivery of method statements for work under his direct control. However, based on dates identified on the plant and equipment procurement schedule, he should be able to provide indicative dates for method statements to be provided by others.

The above extract is taken from the BSRIA guide ref 11/98, section 7 (construction) sub section ref 7.3 'Delivery of information'

Issued by Anthony McMahon C.S.A Member 3165/IM