

Assessment 1: Project Planning for Construction (ACBA5001)

Management and Quality Management in Construction

(Method Statements)

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The overall word count of this assessment is showing as 2850 however; form headers are used and repeated throughout, they contain 450 words, references and appendices have 250 words, therefore; main body text contains approximately 2150 words.

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The List of References and Appendices are included within the Method Statement.

I. Introduction

This is a report on how method statements are used to manage the quality of work during the construction of a four bedroomed detached house. This original Method Statement is written as a first draft for internal first and Second-fixing of residential plumbing works. Bens Plumbing Ltd is created as a demonstration of how a small company can produce a professional document that not only facilitates a quality approach to the work at the construction stage but in doing so prioritises the health, safety and environmental challenges that affect their staff, and all those around them. (Thomas,2023),

Bens Plumbing Ltd

Method Statement 1

Part A – Plumbing First-fix

Part B – Plumbing Second-fix

Author

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0	Bens Plumbing Ltd	QHSD-msp1A&B	Ben Jeffs		12/12/23

Reviewed By

Reviewed by:	Company:	Job title:	Signature:	Date:
	BPL	Quality Manager		
	BPL	Lead Plumber		
	Client			

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Note: any site-based changes to this Method Statement must be recorded and approved via Appendix 13.1.

1. Project Details

Bay Villas is a small residential development by Swansea Homes, comprising ten off, four-bedroom detached properties. Bens Plumbing Ltd are successful in their tender bid to provide all materials and services for the installation of hot and cold-water pipework system, heating systems and waste systems.

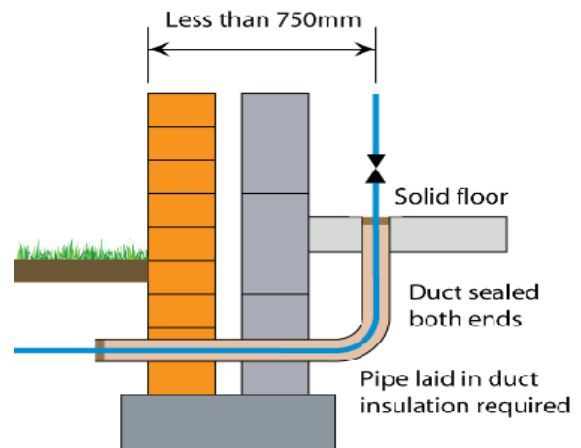
2. Scope of Work

2.1. Legislation and Best Practice

All works are carried out in accordance with the legal requirements of the Health and Safety at Work Act (HASAWA, 1974), the Building Regulation (BR, 2010), the Water Regulations (WR, 2017), the Construction Design & Management Regulations 2015 (CDM, 2015), as directed by contract specifications and drawings, and in compliance to industry best practices provided by the British Standards Institute (BSI, 2023)

2.2. Limits of Contract Responsibility

The buried mains service pipework and building entry pipework is by the groundwork contractor; this includes the buried water meter cabinet, containing the smart meter and associated controls. Building entry pipework passes through the cavity wall into the utility room where it terminates at the internal stopcock valve. (Chudley & Greeno, 2013) (WR, 2017).



The stopcock valve is the point of responsibility transfer to Bens Plumbing Ltd. As specified in the architects' plumbing drawing (see step 5) the incoming 25mm stop cock valve will terminate in a 25mm push fit connection. (see step 9.2).

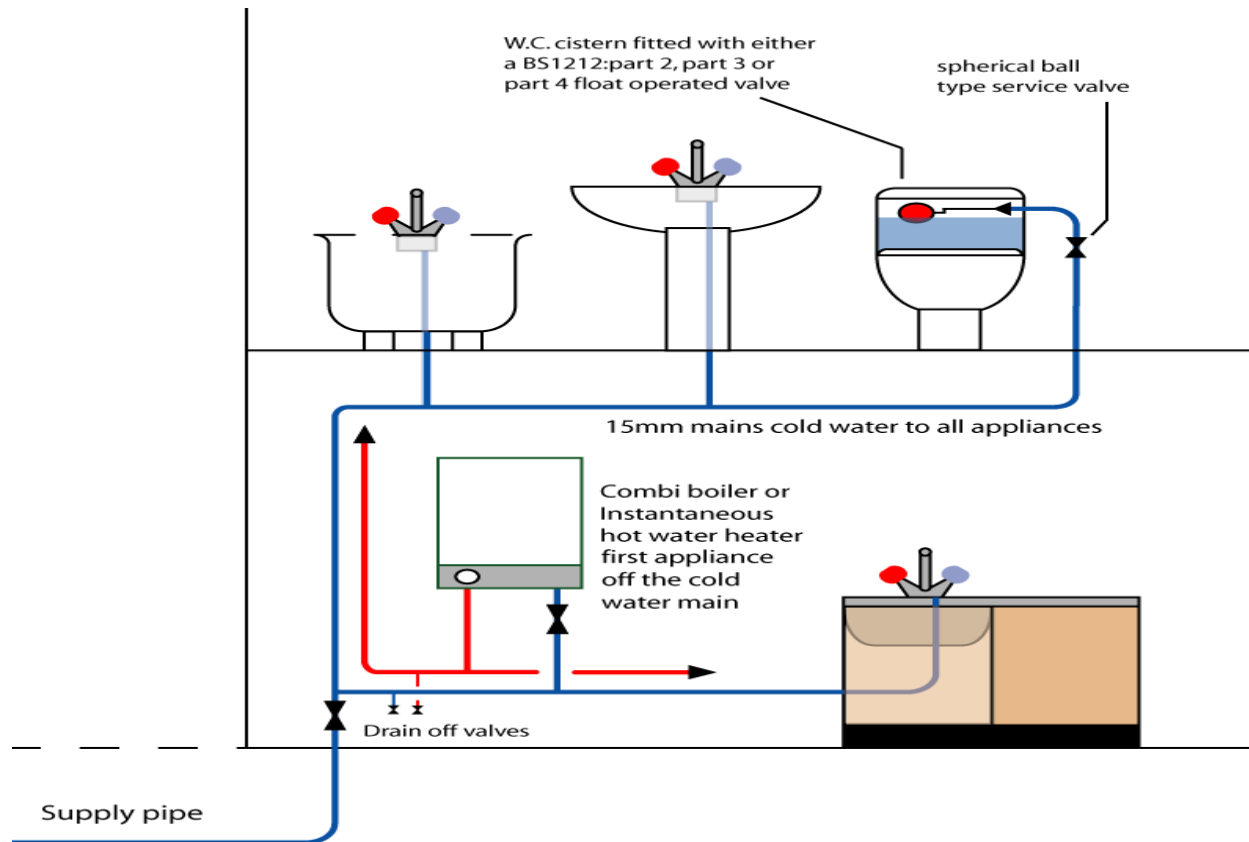
2.3.Plumbing First-fix: includes the provision of materials, installation, testing and commissioning of the internal cold and hot water pipework to termination isolation valves (TIV) at the following room positions:

Reminder: Cold water supply pipework commences at stopcock valve.

Hot water supply pipework commences at combination boiler.

2.3.1. Termination Isolation Valve Positions (TIV Positions)

- 2.3.1.1. Utility – combination boiler and sink
- 2.3.1.2. Kitchen - sink
- 2.3.1.3. Cloakroom - sink and WC cistern
- 2.3.1.4. Bathroom – bath, sink and WC cistern
- 2.3.1.5. Bedroom ensuite – sink and WC cistern



2.4.Plumbing Second-fix: includes the provision of materials, installation, testing and commissioning of the internal cold and hot water pipework from the First-fix **TIV Positions** to the appliances.

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3. Personnel, Communication & Important Site Locations

Bens Plumbing Ltd (Plumbing Contractor)

Ben Jeffs- Project Manager (Chartered) – overall management. Tel 07984 555111
 Andy Tap- Lead Plumber (Level 4 BTEC)– primary site contact. Tel 07984 555222
 Paul Drain- Plumber (Level 4 BTEC) – reserve site contact. Tel 07984 555333
 John Sample- Assistant Plumber (Level 3 BTEC)

Swansea Homes (Client)

Dave Boss– Project Manager – overall site management. Tel 07984 555444
 Robert Counter– Quantity Surveyor – commercial matters. Tel 07984 555555
 Simon Smooth– Quality Health Safety & Environmental Manager. Tel 07984 555666

Important Site Locations

First Aid station is located at site portacabin office.
 Welfare, toilets, kitchen and mess room are located adjacent to site portacabin office.
 Incident muster station is located at the car park adjacent to site portacabin office.

4. Tools and Equipment

Power tools (cordless 24 volt), lighting systems (cordless 24 volt), test pump & gauge (manual operation), pipe benders, pipe cutters, spill kit, first-aid kit x 2, general hand tools and consumables; e.g.: spanners, pliers, hammers, grips, drivers, drill bits, reamers, thread sealant, disposable wipes. (CIPHE, 2023)

5. Linked Contract Documents

Client:

Architects drawing - Plumbing Layout. Document number SHBVplumbing1.
 CDM Construction Phase Plan.
 Site induction emergency procedures and Health & Safety Provisions.

Bens Plumbing Ltd:

Health Safety and Environmental Policy Statements.
 Contract Risk Assessments Document: QHSD-RA4.
 Combi Boiler and heating first and Second-fix. Document: QHSD-msp2A&B.
 Waste, greywater and sewage first and Second-fix. Document: QHSD-msp3A&B.

Contract Specific COSHH Assessment Document: QHSD-COSHH5 and separate manufacturers COSHH assessment for: PTFE sealant, WD40 penetrating lubrication oil, Fuchs red rubber grease, Debs Jizer cleaner degreaser, Cutting paste.

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6. PPE Requirements

Safety helmet, safety glasses, protective gloves, steel-toe boots, knee pads – where necessary whilst working on knee(s), dust mask/respirator - where appropriate due to cutting, ear protection - where appropriate whilst using or near loud machinery, hi-vis vest. (HASAWA, 1974)

7. Planning and Access

Project commencement date: 1st March 2024

Estimated completion date: 1st March 2025

The Plumbing works are to be phased on a rolling programme for all ten homes, in synchronisation with planned available access. First-fix plumbing access will follow completion of all block and masonry work. Second-fix plumbing access will follow dry wall First-fix stages.

Note: Successful completion of this scope of work requires liaison and cooperation with other contractors who are responsible for the supply and installation of the appliances.

8. Materials

Plastic materials are predominantly thermoplastic polymer solid wall coiled pipe and fittings; in 25mm and 15mm diameter. The material is called polybutylene (PB) and it is **manufactured** to BS17291, 2006 (Thermoplastics pipes and associated fittings for hot and cold water for domestic purposes in buildings). (BSI,2023)

The jointing system is a push-fit fitting. (BPF, 2023)

Pipe supports and clips are in accordance with BS15955, 2001 (Specification for the **installation** of thermoplastic pipes and associated fittings for use in domestic hot and cold services in buildings). (BSI, 2023)

Copper and copper alloys are in accordance with - Seamless, round copper tubes for water and gas in sanitary and heating applications - BS EN 1057, 2010. (BSI, 2023)

Copper alloy flexible hosing and fittings for cold and hot water are in accordance with BS EN 13618, 2016 (BSI, 2023)

9. Procedure, Control and Sequencing

9.1. General

9.1.1. Preparation

Ensure the work area is accessible and that conditions are safe to commence work.

Ensure necessary tools and materials are on hand

Fittings and pipe should be kept clean and undamaged before use. Ensure the pipe is free of score marks.



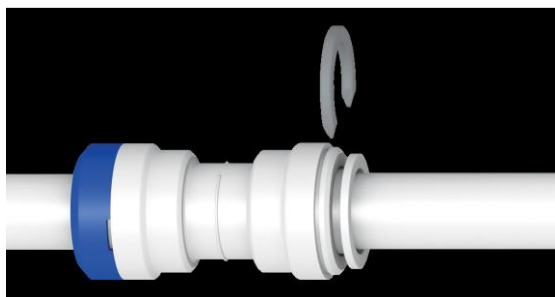
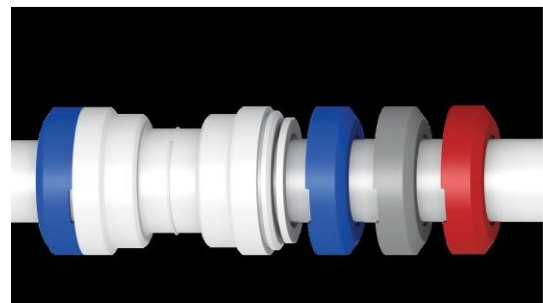
Use pipe cutters, do not use hand saws of any kind.

Cut the pipe square. To prevent damage to the fittings, remove all burrs and sharp edges.

9.1.2. PB Pipe Connection

Where required insert collet cover over pipe; red for hot or blue for cold.

Push pipe into fitting up to the pipe stop. If the pipe has been cut correctly the insertion mark on the pipe will be level with the collet head. Pull to check connection is secure.



Insert collet clip to prevent accidental pipe disconnection.

To disconnect push the collet square against the face of the fitting. With the collet held in position the pipe can be removed. (BPF, 2023)

9.1.3. Copper Pipe Connection

Copper pipe is connected by a compression fitting. Remove the compression nut and compression olive, then put the nut on the tube, followed by the olive. Insert the tube end up to the fitting's tube stop. Slide the olive and the nut down to the fitting body. Tighten the nut using fingers to secure the fitting in place. Tighten the nut further using open ended or adjustable spanners, using the spanner flats incorporated into the fitting body and nut. The second spanner must be used to prevent the fitting rotating as the nut is tightened. (CIPHE, 2023)



9.1.4. Pipe Support

Where possible pipes are to be supported by drilled holes and routed through joists. In accordance with Building Regulations (BR,2010). See Appendix 13.2.



Fit additional PB pipe support clips as follows:

Pipe Diameter	Clip Spacing	
	Horizontal Run	Vertical Run
25mm	800mm	1000mm
15mm	300mm	500mm



PB pipe clips should not be fitted any closer than 60mm from the end of the fitting to allow for expansion.



25mm and 15mm diameter copper pipe is self-supporting, however; where necessary the pipe should be additionally supported, this may be flush to a wall or saddled above the wall.

Ensure pipes are always adequately supported to prevent undue stress or side load on the fittings.

9.1.5. Pipe Bending

Bend PB pipe by installing a pipe clip or joist support at one end and gently curving the pipe by hand to the required shape, and then installing a Second-fixing at the other end.

Care should be taken not to bend PB pipe beyond its recommended bending radius as this can cause kinking. PB pipes that have been damaged during bending should not be used.

The bending radius of PB pipe is 12 times the pipe diameter for unsupported pipe and 8 times the pipe diameter for supported pipe.



For copper pipe use a bending machine.
(CIPHE, 2023)

Do not exceed a 90-degree bend.

9.2. Part A- Plumbing First-fix

From the stopcock valve run the 25mm diameter cold riser PB pipe through the dry wall void to:

- Firstly; the **TIV Position** of the combination boiler in the utility room.....and then secondly via a Tee connector to:
- 1st floor joist level.



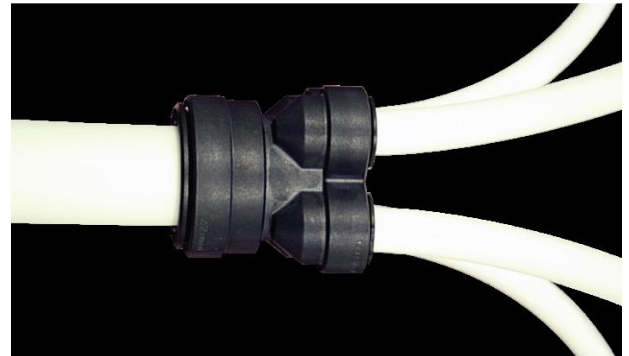
Connecting, supporting and bending as necessary.

At joist level run 25mm diameter cold PB pipe to each room that contains the **TIV Positions**, as identified by architects' drawing. **Connecting, supporting and bending as necessary.**

To cover all locations at joist level will require the fitting of tee connectors.

Using branch connectors route the 15mm diameter cold PB pipe for each of the **TIV Positions** on both the ground and first floor.

Route through and along joists as necessary. Utilise dry wall cavity for vertical positioning. **Connecting, supporting and bending as necessary.**



Note that the architect has requested the **TIV Positions** be kept as near to floor level as possible.

From combination boiler position run the 25mm diameter hot riser PB pipe through the dry wall void to 1st floor joist level. Connecting, supporting and bending as necessary.

Repeat the above steps in 9.2 for the hot water pipe installation

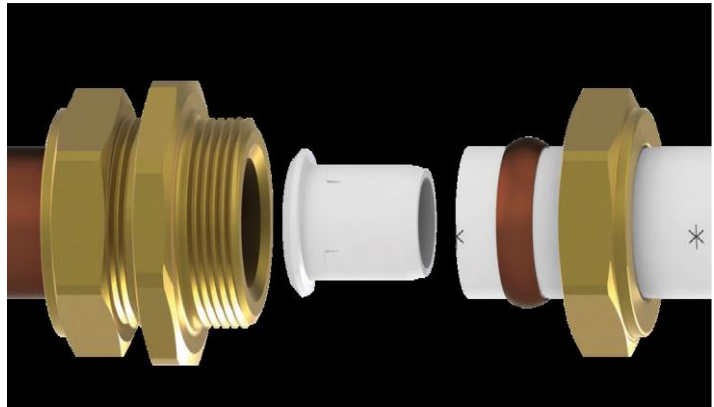
9.3. Part B- Plumbing Second-fix

Following installation of appliances by others. Connect appliances to **TIV Positions**. The Second-fix pipework should not be visible upon completion.

9.3.1. Combination Boiler

At the **TIV Position** of the combination boiler in the utility room connect the 25mm copper pipe using the compression adapter fitting.

Fit Insert into PB pipe. This must be used to withstand the compressive pressure of the olive.



Ensure The olive is located within the length of the pipe insert and the pipe fully inserted into the fitting.

This connection should not need more than 2 full turns after the olive has gripped the pipe.

Connecting, supporting and bending as necessary.

9.3.2. Sink

At the **TIV Positions** of each sink connect the 15mm copper pipe using compression adapter fitting as shown in step 9.3.1.



Attach 15mm flexible hoses to taps and adapter fitting

Where additional length is needed, fit short runs of 15mm copper pipe.



Connecting, supporting and bending as necessary.

9.3.3. WC Cistern

At the Cold TIV position of each WC Cistern connect the 15mm copper pipe using compression adapter fitting as shown in step 9.3.1

Fit the 15mm flexible hose.

Connecting, supporting and bending as necessary



9.3.4. Bath

At the TIV position of the bath connect the 15mm copper pipe using compression adapter fitting as shown in step 9.3.1.

Fit the 15mm flexible hoses.

Connecting, supporting and bending as necessary



9.3.5. Testing

On completion of the plumbing, **Test** for leaks in accordance with the British Standard BS 8558, 201. Design, installation, testing and maintenance of services supplying water and BS EN 806 Specifications for water installations inside buildings. (BSI,2023) (WR, 2017)



To carry out a hydraulic wet test.

Ensure connections to all appliances are capped or plugged
Connect hydraulic pump at stop cock valve

Test for 2 bar for 10 minutes followed by:
10 bar for 10 minutes.

No visible loss of pressure is permitted

9.3.6. Finishing

Flush pipework in accordance with BS EN 806, this is essential to remove any harmful debris or contamination or chemical residues.

Clean up the work area, disposing of any waste materials.

Carry out a final visual inspection of all work.

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10. Emergency Arrangements

In the event of an emergency follow the client site procedures as detailed in your site induction training manual. This contains all site Emergency, Health & Safety Provisions:

11. Monitoring and Audit

These works will be subject to a closed loop auditing system where all staff and works are further inspected and signed off by the Bens Plumbing Ltd Project Manager. A further audit is carried out on a contract wide basis to ensure continual compliance to this quality monitoring.

12. List of References

References (accessed December 2023, in alphabetic order)

(Barrys,2010), Introduction to Construction of Buildings, Oxford, Wiley Blackwell

(BPF, 2023) The British Plastics Federation Pipes Group, available at <https://www.bpfpipesgroup.com/>

(BR,2010) The Building Regulations Guidance: part G (sanitation, hot water safety and water efficiency), available at <https://www.legislation.gov.uk/ukpga/1974/37/contents>

(BSI, 2023) British Standards Institute, various codes of practice, available at <https://www.bsigroup.com/en-GB/standards/>

(CDM, 2015) Construction Design and Management Regulations, available at <https://www.legislation.gov.uk/ukpga/1974/37/contents>

(Chudley & Greeno,2013), Construction Handbook, Abingdon, Routledge.

(CIPHE, 2023) The Chartered Institute of Plumbing and Heating Engineering, available at <https://www.ciphe.org.uk/professional/>

(HASAWA, 1974) Health and Safety at Work Act, available at <https://www.legislation.gov.uk/ukpga/1974/37/contents>

(Thomas,2023), UWTSD course notes, Construction Technology.

(WR, 2017) Water Supply (Water Fittings) Regulations, available at <https://www.bsigroup.com/en-GB/standards/>

APPENDIX 13.2

When routing plumbing through joists.

Instructions on the drilling of joists is given in the Building Regulations Approved Document A, and is summarised as follows:

1. Holes should be no greater than 0.25 of the depth of the joist.
2. Holes should be drilled at the neutral axis.
3. Holes should not be less than 3 diameters (centre to centre) apart.
4. Holes should be located between 0.25 and 0.4 times the joist span.



(Barrys,2010),

III. Discussion and Conclusion

The Bens Plumbing Ltd Project Manager has taken a holistic view at this early stage in the contract. To do this he had to connect the theoretical aspects of the project; such as the architects housing design and site plans, with the future needed physical aspects such as people and materials. With the ultimate objective of safe completion of the job, on-time and on-budget.

Using knowledge, experience and industry standards the Project Manager has written a method statement that will provide engineering instructions to those physically carrying out the work, thus reducing the risks they may be exposed to. Additionally; it addresses the quality of all things relating to the work itself as well as the well-being of all those involved in the work and their surrounding environment.

For those constructing on-site, the method statement is the go-to place for all necessary information. Where specific information is not given, the reader is directed where to go to find such information.

The method statement should be of great value to all involved, **BUT** only if it is used properly and more importantly only if it is controlled properly. This method statement must be reviewed internally, it must be approved by the client and must be read and understood by those who will be using it on-site.

Construction work is not a perfect science, things change, sometimes at the last minute; facilitated by Appendix 13.1 of the method statement such changes can be executed in a controlled manner.

Learning after the event is important, this is done by measuring the quality and indeed the success of the work. The method statement includes references to the monitoring and audit of the job, to enable future continual improvement.