

Level 3 Diploma in Plumbing & Domestic Heating (9189)

Version 1-3 (November 2020)

Plumbing & Domestic Heating

Level 3 Diploma in Plumbing & Domestic Heating (9189)

Candidate logbook



November 2020

Version 1.3

Candidate name	
Candidate enrolment no	
Date of registration with City & Guilds	
Date enrolled with centre	
Centre name	
Centre number	
Centre address	
Programme start date	
Centre contact	
IQA name	
EQA name	

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Candidate logbook



Version and date	Change detail	Section
1.3 November 2010	Behaviours added	Appendix

Level 3 Diploma in Plumbing & Domestic Heating (9189)

Personal Details

Candidate Details

Surname:		Forename(s):	
Address:			
			Postcode:
County			
Home Tel:		City & Guilds Enrolment No:	

Awarding Details

Programme	
C&G Scheme/Complex Level:	

Centre Details Name:

Address:		Centre No:	
			Postcode:
County			
Telephone:		Centre Contact:	
Examinations Officer:		Internal Verifier:	
External Verifier:		Assessors:	

Employer Details Name:

Address:		Work Based	
			Postcode:
County			
Telephone:		Contact Name:	

Managing Agent Name:

Address:		Training Advisor:	
			Postcode:

County

Telephone:

The Candidate's Workplace Evidence Record is his/her personal record of achievement in practical work carried out mostly in the workplace. It may not be possible to replace this document which therefore should be kept in good condition, in a safe place, to be used by the candidate to record progress of practical work

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Using the Candidate Workplace Evidence logbook

No workplace tasks should be carried out until the relevant area of knowledge has been covered.

Various tasks must be completed in the workplace to complete the logbook. Your assessor will provide a full and thorough briefing of this documents use, however here's a summary of the process for the candidate: • Identify and carry out a task in the workplace which covers some of the required evidence in the tracker.

- Notify your expert witness that you are carrying out the task, they will have to sign off the paperwork afterwards so you will need to obtain a sample signature.
- Complete the task and complete the required detail in the candidate record (template included). You should ensure as much evidence as possible is covered.
- Obtain the signature on the candidate record from the expert witness. They will be signing to say you have completed the task to a good industry standard.
- At a suitable point agreed by your assessor have the evidence assessed by them and sign off the evidence on the tracker. This may not be after every task but at an agreed point when multiple tasks have been completed. Questioning may be carried out and recorded as part of this process.
- This process will be repeated until all evidence is covered and signed off by the assessor. Internal quality assurance will also be carried out by the centre at various intervals.

You will need to provide proof of being able to do all the tasks to be able to say that you are competent and preparing well for end point assessment.

Simulation and evidence from the workplace

It is expected that all evidence should come from the workplace to ensure a good range of work experience is achieved by the candidate. If the apprentice's employer cannot expose the apprentice to full range of candidate tasks, required in the logbook, onsite then this should not prevent the candidate achieving and alternative work experience should be sourced.

Common types of assessment methods

There are several methods of providing proof of competence which are commonly used in this logbook. The assessor will use various methods of assessing evidence produced to make a judgement on whether or not you are competent in specific areas.

Direct observation DO

This is where your assessor visits your workplace to see you doing a particular job to identify whether the work you have carried out is to an acceptable standard. The assessor will complete a record of observation to document what has been observed and achieved

Product assessment PA

This is where your assessor while visiting site checks work that you have previously carried out while he/ she was not present. This checking process will include discussion with your competent witness (supervisor). This may be used in conjunction with a direct observation to assess a wider range of criteria

Reflective account RA

This is where evidence is recorded and documented on the candidate record and assessed after the task has been completed. This is verified by the competent witness.

Witness testimony WT

This is where a competent witness or supervisor may complete the candidate record or a written account to verify you have completed various tasks to industry standard.

Professional Discussion PD

This is where the assessor will have a discussion with the learner about certain types of experience and activities relating the assessment criteria. This logbook has dedicated sections for professional discussion, but it can also be used to support other assessment methods. This must be documented or recorded.

Questioning

Oral and written questioning can be used to assist the assessor with decision making and to verify sufficient knowledge and understanding of the task. This will be used to support completion of the candidate records as necessary.

Evidence recording documentation

Candidate Record

Completed by the candidate when carrying out tasks in the workplace. Reference to the evidence tracker is crucial when completing the document to ensure all evidence covered is recorded. One candidate record will cover multiple pieces of evidence. Copies of the candidate record template is included in the document. If you have similar job sheets available from the workplace then these can be used as an alternative. All candidate records or company job sheets required must then be verified by a competent witness assigned to you in the workplace. Only when all documentation is complete and signed by the witness can this then be assessed by your assessor. The more evidence covered will mean less candidate records

Evidence tracker

Completed by you and your assessor to check all aspects of each unit/section have been achieved.

Supporting evidence

Supporting evidence is additional evidence that supports the work carried out. Guidance to supporting evidence requirements can be discussed with your assessor. It is recommended that evidence from the workplace is used to support candidate records. This could be photographs, videos risk assessments, method statements, service sheets or any other site documentation to support the task.

All supporting evidence must be clearly identified and referenced.

Requirements for on-site observation by the assessor (direct observation)

Evidence requirements

Evidence must be gathered across a minimum of four different jobs/site addresses. It is an expectation that candidates will require more than the minimum four jobs to meet the full range required. All range items must be assessed unless the number of range items required is identified.

Direct observation requirements

The information below identifies the **minimum** direct observation requirements of the performance evidence for this unit.

A requirement of this qualification is that you are directly observed on a minimum of six occasions in the workplace by a suitably qualified assessor, 2 first fix, 2 second fix and 2 commission of relevant systems as below.

Observation 1- First fix installation of a significant amount of pipework and associated fixings and fittings from the required range, picking up the requirements for health and safety holistically as part of the visit.

Observation 2- First fix installation of a significant amount of pipework and associated fixings and fittings from the required range, picking up the requirements for health and safety holistically as part of the visit.

Observation 3- Second fix complete installation of **two major components** from the required range in group A and associated pipework fixings and fittings picking up the requirements for health and safety holistically as part of the visit. More than one visit to site may be required to capture both of the required component installations.

Observation 4- Second fix complete installation of **two major components** from the required range in group A and associated pipework fixings and fittings picking up the requirements for health and safety holistically as part of the visit. More than one visit to site may be required to capture both of the required component installations.

Observation 5- Complete commissioning of **two of the system types** from the required range picking up the requirements for health and safety holistically as part of the visit. More than one visit to site may be required to capture both of the required system types.

Observation 6- Complete commissioning of **two of the system types** from the required range picking up the requirements for health and safety holistically as part of the visit. More than one visit to site may be required to capture both of the required system types.

Competent witness requirements

Your company will be required to nominate a competent witness to sign-off and confirm that you did the work detailed in each task to the relevant industry standard. The competent witness must be occupationally competent and technically knowledgeable in the areas of work. The assessor may request a professional discussion or copy of CV and certificates to establish competence and brief the witness of the duties required. One or more people can be used as a competent witness and this person/people will be signing off the job as satisfactory completed within the workplace. Any questions around the competent witness should be discussed with the assessor. Because of the responsibility of this role a sample signature is required before any job sheets can be assessed. All tasks and candidate records must be signed off by the competent witness before the assessor can accept them as evidence.

Logbook Sign Off

Declaration

I confirm that the evidence supplied for this logbook is authentic and a true representation of my own work. The work logged is my own work carried out during my normal work duties. I have been observed in my workplace by my assessor on several occasions.

Candidate Name	
Candidate Signature	
Date	

I confirm that this candidate has achieved all criteria and the requirements of this logbook and this has been assessed accordingly. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Unit number	113 (outcome 1)
OFQAL Ref	603/4146/4
Unit name	Install, commission, service and maintain domestic plumbing and heating systems
Section aim:	The aim of this section is to enable learners to demonstrate safe working practices in real working environment
Level	3
Evidence	Evidence is required preparing across a range of criteria identified in the below tracker Direct observation requirements: There are no minimum direct observation requirements however it is expected that assessors will consider H&S during all 6 direct observations • The expectation is that all criteria to be met through DO when naturally occurring • All criteria must be completed in the reflective account by the learner (either to support the DO or as part of a separate job) • As a minimum all criteria must be met on one occasion
Hints and tips	Many of the outcomes may be met naturally when completing the 6 direct observations, the reflective account from the learner will help confirm outcomes and provide additional evidence. Green – assessor to complete Blue – candidate to complete

Tracker			Evidence
The tracker should be referred to by the assessor during each direct observation and when assessing the RA. All criteria must be met on at least one occasion unless otherwise stated			
LO 1 Apply health and safety and welfare in the workplace.	DO number	Response	RA1
1.1 Use personal protective equipment			
1.2 Ensure appropriate provision for first aid is in place			
first-aid kit			
accident book			
nominated person			
1.2 Ensure appropriate provision for fire safety is in place			
fire extinguisher			
evacuation procedure			
muster points			
1.3 Comply with information, warning, mandatory instruction and			

prohibition notice			
1.4 Perform manual handling techniques			
1.5 Ensure appropriate facilities are in place for welfare and personal hygiene			
1.6 Transport and store tools and equipment appropriately			
1.7 Verify appropriate access and exit routes to and from the work location (3 of the following)			
adequate lighting			
routes free from obstruction			
follow safety signs and notices			
emergency exit routes in place			
appropriate barriers			
1.8/1.9 Identify the procedure for reporting when a potential hazard is found in the workplace/report potential hazard			

1.10 Dispose of waste materials			
1.11 Demonstrate safe working practices when joining pipework			
1.12 Produce a risk assessment / method statement in accordance with organisational procedures			
1.13 Use access equipment in the workplace (2 of the following)			
ladder			
tower scaffold			
stepladder			
platform (MEWP).			

Candidate Reflective Account (RA) Health & Safety May be to support one of the DO's or be a separate job	
Job Location and description	
LO 1 Apply health and safety and welfare in the workplace.	
1.1 Provide examples of how you have used personal protective equipment for specific tasks on site.	
1.2 Provide details to ensure you have appropriate provision for the following on site.	
First aid kit and location	
Accident book and location	
Who the nominated first aid person is and location	
1.2 Provided details to ensure you have appropriate provision for fire safety on site.	
Appropriate fire extinguisher and location	
Fire evacuation procedure for site and muster point	
1.3 Provide an example of the following signs and sources of information from site and how you have had to comply with them.	
Information sign	
Warning sign	
Mandatory instruction	
Prohibition notice signs	
1.4 Describe a situation where you have applied manual handling techniques	

1.6 Provide details of how you transport tools and equipment around site and how they are stored appropriately

1.7 Verify how you have ensured access and exit routes to and from the work locations are appropriate. Consider - adequate lighting routes, free from obstruction, follow safety signs and notices emergency, exit routes in place appropriate barriers

1.5, 1.10, 1.11, 1.12 Produce a risk assessment for the complete job or a task within the job – (4 are prepopulated) **Risk Assessment 1**

Number	Overview/criteria	Describe Hazard	Hazard rating (out of 5)	Likelihood rating (out of 5)	Risk rating
1	Recycling waste materials				
2	Joining pipework				
3	Welfare facilities				
4	Working at height eg. ladders, tower scaffold, stepladder, platforms				
5					
6					
1.8, 1.9 - Method used to report hazards -					

1.12 Following on from the risk assessment - Produce a method statement

Number	Hazard as identified in Risk Assessment 1	Control measure/action required to ensure activity can be carried out safely
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1		Control measure
		Action required and responsible person
2		Control measure
		Action required and responsible person
3		Control measure
		Action required and responsible person
4		Control measure
		Action required and responsible person
5		Control measure
		Action required and responsible person
6		Control measure
		Action required and responsible person

Health & Safety

Supporting evidence requirements

Direct observation reports 1-6 – should acknowledge reference to H&S

Photographic evidence – 2 unique photographs in relation to any of the criteria 1.1 – 1.13 – may be provided from DO 1-6 or RA

Photograph 1 – Ref criteria -

Photograph 2 – Ref criteria -

**Oral questions/confirmation of evidence Feedback
and forward planning:**

Candidate Signature	Candidate Name	Date
Competent witness signature	Competent witness name	Date
Assessor Signature	Assessor Name	Date
IQA Signature (as required)	IQA Name	Date

Unit number	113 (outcome 2 Prep)
OFQAL Ref	603/4146/4
Unit name	Install, commission, service and maintain domestic plumbing and heating systems
Section aim:	The aim of this section is to enable learners to demonstrate occupational competence in the preparation of building fabric and materials prior to the installation of plumbing systems
Level	3

Evidence	Evidence is required preparing across a range of criteria identified in the below tracker Direct observation requirements: Due to the nature of preparation there are no minimum direct observation requirements although tasks could be observed if naturally occurring as part of a site visit. • All criteria must be met through the recorded section (PD&RA) • It is expected that some of the criteria will be witnessed naturally through DO 1&2 (this can be acknowledged on the tracker in this section) Supplementary evidence is required as identified in the section below
Hints and tips	This section has a variety of assessment methods to assist in the capturing of naturally occurring preparation tasks Professional discussion – PD Reflective account – RA Direct Observation - DO

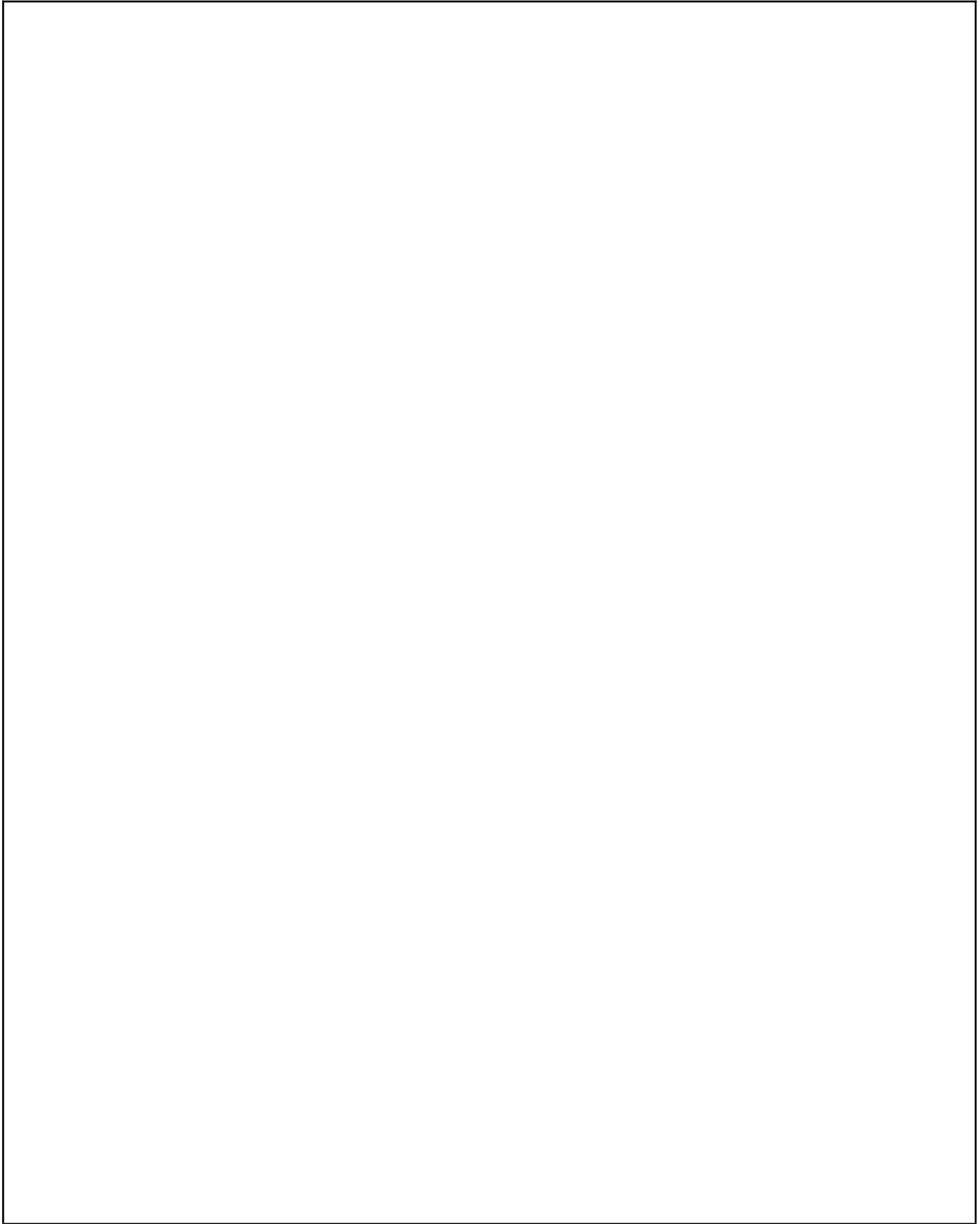
LO 2 Prepare for the installation of plumbing and heating systems and components.	Reference	Assessor Initials	
		DO (If met during Obs 1 or 2)	RA
2.1 Check that all necessary job information is available	Prep 1 PD		
2.2 Liaise with other persons to confirm the detail of the installation work to be carried out	Prep 1 PD		
2.3 Comply with health and safety requirements (min 2 of the following)			
risk assessment	Prep 1 PD		
method statements	Prep 1 PD		
work permits	Prep 1 PD		
2.4 Carry out preparatory work (all of the following)			
safe and unobstructed access to work areas	Prep 2 a RA		
safe storage of materials tools and equipment	Prep 2 b RA		
reporting pre-existing damage	Prep 2 c RA		
protecting the building fabric	Prep 2 d RA		
drilling masonry walls or concrete floors	Prep 2 e RA		
cutting/drilling holes in timber floor joists	Prep 2 f RA		
cutting notches in timber floor joists	Prep 2 g RA		
cutting chases in wall or floor	Prep 2 h RA		
2.5 Comply with organisational procedures for completing documentation that is required during work operations (3 of the following)			
variation order	Prep 1 PD		
timesheets	Prep 1 PD		
work programme	Prep 1 PD		
material or plant requisitions	Prep 1 PD		

delivery note	Prep 1 PD		
LO 2 Prepare for the installation of plumbing and heating systems and components. (PREP 1) PD To be completed by the assessor during a professional discussion with the candidate reflecting activities from a site task or job.			
Candidate briefed on assessment criteria for the professional discussion		Yes / No	
Job Location and description			
LO 2 Prepare for the installation of plumbing and heating systems and components.			
2.1 State how you checked that all necessary job information was available before you commence the job. What was this information and how was it used?			
2.2 Provide details of how you liaised with the customer or representative to confirm the details of the work planned with them.			
2.3 Outline how you complied with the following documents and procedures whilst working in industry? Risk assessment, Method statement, Work permit			

2.5 Explain how you followed organisational procedures for completing documentation that is required during work operations (min 3 of the following) a) Use of variation orders or variation to initial site plans b) Timesheets or how you record time spent on various sites c) Work programmes or scheduling of various tasks on site d) Ordering of materials and specific plant required e) Delivery notes and taking delivery of materials	
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Supporting evidence requirements, A minimum of one piece of supporting evidence such as site documentation or photograph should be included for the below criteria

Criteria circle as appropriate	(2.1, 2.2, 2.3 or 2.5)
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2.4 Carry out preparatory work	Ref	Candidate description meeting each criteria identifying task and job location		
		Job location	Task Description	Date
Safe and unobstructed access to work areas	Prep 2a			
Safe storage of materials tools and equipment	Prep 2b			
Reporting preexisting damage	Prep 2c			
Protecting the building fabric	Prep 2d			

Drilling masonry walls or concrete floors	Prep 2e			
Cutting/drilling holes in timber floor joists	Prep 2f			
Cutting notches in timber floor joists	Prep 2g			
Cutting chases in wall or floor surfaces	Prep 2h			

Prep 2.4

Supporting evidence requirements

Photographic evidence – 4 unique photographs in relation to any of the Prep 2.4 - 2a-2h,

Photograph 1 – Ref criteria -

Photograph 2 – Ref criteria -

Photograph 3 – Ref criteria -

Photograph 4 – Ref criteria -

Feedback and forward planning:

Candidate Signature	Candidate Name	Date
Competent witness signature	Competent witness name	Date
Assessor Signature	Assessor Name	Date
IQA Signature (as required)	IQA Name	Date

On-site pre-assessment plan	Observation 1- First fix installation of a significant amount of pipework and associated fixings and fittings			
	Candidate prepared for assessment:	Yes / No	Assessment location	Type of work to be carried out
	Candidate briefed on appeals procedure:	Yes / No		
	Candidate specific requirements discussed	Yes / No		
Observation report				

Health & Safety references in relation to outcome 1						
Record of any additional oral Q&A - Feedback and forward planning						
Verification	Assessor name		Assessor signature		Date	
	Candidate name		Assessor signature		Date	
	IQA		IQA signature		Date	
	EQA		EQA Signature		Date	

On-site pre-assessment plan	Observation 2- First fix installation of a significant amount of pipework and associated fixings and fittings			
	Candidate prepared for assessment:	Yes / No	Assessment location	Type of work to be carried out
	Candidate briefed on appeals procedure:	Yes / No		
	Candidate specific requirements discussed	Yes / No		
Observation report				

Health & Safety references in relation to outcome 1						
Record of any additional oral Q&A - Feedback and forward planning						
Verification	Assessor name		Assessor signature		Date	
	Candidate name		Assessor signature		Date	
	IQA		IQA signature		Date	
	EQA		EQA Signature		Date	

Unit number	113 (outcome 3)
OFQAL Ref	603/4146/4
Unit name	Install, commission, service and maintain domestic plumbing and heating systems
Section aim:	The aim of this section is to enable learners to demonstrate installation of plumbing systems including a range of associated appliances and pipework
Level	3
Evidence	Evidence is required preparing across a range of criteria identified in the below tracker Evidence requirements There are two direct observations required for second fix installation that help meet LO3. • Observation 3 and 4 - Second fix: complete installation of two major components from the required range in group A and associated pipework fixings and fittings picking up the requirements for health and safety holistically as part of the visit. • Reflective accounts – these are included to assist in gathering additional evidence that may be required to meet the full range
Hints and tips	Many of the outcomes may be met through the two direct observations, and the additional reflective accounts will help meet the ranges required Green heading – completed by the assessor Blue headings – completed by the candidate

Tracker - Assessor to initial when criteria is met – each criteria must be met on at least one occasion unless otherwise stated					
LO 3 Install plumbing and heating systems and components in the workplace	Direct Obs 3	Direct Obs 4	RA1	RA2	RA3
3.1 Confirm that the incoming or outgoing main supplies meet the requirements of the system or component					
3.2 Plan the installation and pipe work routes using relevant job information.					
3.3 Complete installation work on plumbing systems (candidates must be assessed on cold and hot water systems and then one of the remaining three)					
cold water systems					
hot water systems					
central heating systems					
sanitation systems					
gravity rainwater systems					
Position and fix pipework (3 of the following)					
copper					
plastic pressure pipe					
steel (screwed or pressed)					
stainless steel					
plastic (drainage)					
rainwater					
3.4 Position and fix components (candidates must be assessed on six components from Group A with at least three on more than one occasion and three components from Group B)					
Group A					
bath					
WC					
wash hand basin					
sink					
shower and tray					
cylinder					
boiler (connections)					
soil stack system					
rainwater guttering system					

F&E/CWS Cistern					
pump					
motorised valves					
radiator					
water conditioner/filter					
Group B					
urinal					
bidet					
booster pump/shower pump					
accumulators/expansion vessels					
fan convector					
low loss header					
macerator or waste water lifter/pump					
greywater/rainwater station					
water softener/filter					
refrigerator cold connection					
washing machine/dishwasher					
underfloor heating circuit and underfloor manifold					
outside tap installation					
Backwater protection components (e.g. EA, EB, EC, ED)					
3.5 Connect pipework to system controls and main components					
Complete a range of jointing methods during pipework installation (4 of the following)					
compression					
push fit plastic pressure					
push fit waste					
soft soldered					
crimped					
glues/adhesives					
fusion welded					
threaded/screwed					
3.7 Carry out a soundness test to industry requirements on systems pipework and components					

Direct Observation 3 Second fix complete installation of two major components from the required range in group A and associated pipework fixings and fittings, picking up the requirements for health and safety holistically as part of the visit.						Ref: DO3
Job location					Date	
Job description -						
System type (may be multiple)	Cold Water	Hot Water	Central Heating	Sanitation	Rain water	
Components installed - Group A						
Bath		Pump		Soil stack system		
Wash hand basin		Radiator		F&E/CWSC Cistern		
Shower tray		WC		Motorised valves		
Boiler (connections)		Sink		Water conditioners / filters		
Rainwater/guttering systems		Cylinder				
Components installed - Group B						
Urinal		Greywater / rainwater station		Low loss header		
Booster pump / shower pump		Underfloor heating circuit and underfloor manifold		Waste water lifter / pump (saniflow or similar)		
Fan convector		Backflow protection components (e.g. EA, EB, EC or ED)		Water softener/filter		
Macerator		Bidet		Washing machine / dishwasher		
Refrigerator cold connection		Accumulators / expansion vessels		Outside tap installation		

Joining methods used					
Compression		Glues/adhesives		Crimped	
Push fit valve		Push fit plastic PP		Fusion weld	
Soft soldered		Threaded/screwed			
Pipework installed					
Copper		Plastic (drainage)		Stainless steel	
Steel (screwed or pressed)		Plastic pressure pipe		Rainwater	

Observation report			
Overview of the installation - Provide details of incoming supplies, which system components/appliances were installed, clipping, dressing of the components, positioning, fixing, levelling, soundness testing and how the learner carried out this process			
Soundness test satisfactory	Yes/no	Relevant documentation completed	Yes/No
Feedback and next steps			

Candidate Signature	Candidate Name	Date
Competent witness signature	Competent witness name	Date
Assessor Signature	Assessor Name	Date
IQA Signature (as required)	IQA Name	Date

Direct Observation 4 Second fix complete installation of two major components from the required range in group A and associated pipework fixings and fittings, picking up the requirements for health and safety holistically as part of the visit.						Ref: DO4
Job location					Date	
Job description -						
System type (may be multiple)	Cold Water	Hot Water	Central Heating	Sanitation	Rain water	
Components installed - Group A						
Bath		Pump		Soil stack system		
Wash hand basin		Radiator		F&E/CWSC Cistern		
Shower tray		WC		Motorised valves		
Boiler (connections)		Sink		Water conditioners / filters		
Rainwater/guttering systems		Cylinder				
Components installed - Group B						
Urinal		Greywater / rainwater station		Low loss header		
Booster pump / shower pump		Underfloor heating circuit and underfloor manifold		Waste water lifter / pump (saniflow or similar)		
Fan convector		Backflow protection components (e.g. EA, EB, EC or ED)		Water softener/filter		

Macerator		Bidet		Washing machine / dishwasher	
Refrigerator cold connection		Accumulators / expansion vessels		Outside tap installation	
Jointing methods used					
Compression		Glues/adhesives		Crimped	
Push fit valve		Push fit plastic PP		Fusion weld	
Soft soldered		Threaded/screwed			
Pipework installed					
Copper		Plastic (drainage)		Stainless steel	
Steel (screwed or pressed)		Plastic pressure pipe		Rainwater	

Overview of the installation - Provide details of incoming supplies, which system components/appliances were installed, clipping, dressing of the components, positioning, fixing, levelling, soundness testing and how the learner carried out this process

Soundness test satisfactory	Yes/no	Relevant documentation completed	Yes/No

Feedback and next steps

Candidate Signature	Candidate Name	Date
Competent witness signature	Competent witness name	Date
Assessor Signature	Assessor Name	Date
IQA Signature (as required)	IQA Name	Date

Reflective Account 1 3.1-7 install plumbing and heating systems and components					Ref: RA1	
Job location				Date		
Job description -						
System type (may be multiple)	Cold Water	Hot Water	Central Heating	Sanitation	Rain Water	
Components installed – Group A						
Bath			WC			
Wash hand basin			Sink			
Shower/tray			Cylinder			
Boiler (connections)			Soil stack system			
Rain water/guttering system			F&E/CWSC Cistern			
Pump			Motorised valves			
Radiator			Water conditioners/filters			

Components installed – Group B			
Urinal		Bidet	
Booster pump / shower pump		Accumulators / expansion vessels	
Fan convector		Low loss header	
Macerator		Waste water lifter / pump (saniflow or similar)	
Greywater/rainwater station		Water softener/filter	
Refrigerator cold connection		Washing machine / dishwasher	
Underfloor heating circuit and underfloor manifold		Outside tap installation	
Backflow protection components (e.g. EA, EB, EC or ED)			
Joining methods used			
Compression		Push fit plastic PP	
Push fit waste		Threaded/screwed	
Soft soldered		Crimped	
Glues/adhesives		Fusion weld	
Pipework installed			
copper		plastic pressure pipe	
steel (screwed or pressed)		stainless steel	
plastic (drainage)		rainwater	

Reflective Account	
Confirm how incoming or outgoing supplies met requirements of system and components.	
Confirm what job information was used and how pipework routes were planned and marked out.	

Evidence 2

Candidate Signature	Candidate Name	Date
Witness signature	Witness name	Date
Assessor Signature	Assessor Name	Date
IQA Signature (as required)	IQA Name	Date

Reflective account 2					Ref: RA2	
3.1-7 install plumbing and heating systems and components						
Job location					Date	
Job description -						
System type (may be multiple)	Cold Water	Hot Water	Central Heating	Sanitation	Rain Water	
Components installed - Group A						
Bath			WC			
Wash hand basin			Sink			

Shower/tray		Cylinder	
Boiler (connections)		Soil stack system	
Rain water/guttering system		F&E/CWSC Cistern	
Pump		Motorised valves	
Radiator		Water conditioners/filters	
Components installed - Group B			
Urinal		Bidet	
Booster pump / shower pump		Accumulators / expansion vessels	
Fan convector		Low loss header	
Macerator		Waste water lifter / pump (saniflow or similar)	
Greywater/rainwater station		Water softener/filter	
Refrigerator cold connection		Washing machine / dishwasher	
Underfloor heating circuit and underfloor manifold		Outside tap installation	
Backflow protection components (e.g. EA, EB, EC or ED)			
Joining methods used			
Compression		Push fit plastic PP	
Push fit waste		Threaded/screwed	
Soft soldered		Crimped	
Glues/adhesives		Fusion weld	
Pipework installed			
copper		plastic pressure pipe	
steel (screwed or pressed)		stainless steel	
plastic (drainage)		rainwater	

Reflective Account	
Confirm how incoming or outgoing supplies met requirements of system and components.	

Confirm what job information was used and how pipework routes were planned and marked out.	
Confirm how pipework was clipped/bracketed	
Overview of your installation - Provide detail of which system components/appliances were installed. Include how these were dressed/made up, positioned, fixed, levelled and how this process was carried out	
Details of soundness test if applicable	
Provide a supporting photograph or reference to supplementary evidence below	

Evidence 1		
Evidence 2		
Candidate Signature	Candidate Name	Date
Witness signature	Witness name	Date
Assessor Signature	Assessor Name	Date
IQA Signature (as required)	IQA Name	Date

Reflective Account 3		Ref: RA3	
3.1-7 install plumbing and heating systems and components			
Job location		Date	

Job description -					
System type (may be multiple)	Cold Water	Hot Water	Central Heating	Sanitation	Rain Water
Components installed - Group A					
Bath			WC		
Wash hand basin			Sink		
Shower/tray			Cylinder		
Boiler (connections)			Soil stack system		
Rain water/guttering system			F&E/CWSC Cistern		
Pump			Motorised valves		
Radiator			Water conditioners/filters		
Components installed - Group B					
Urinal			Bidet		
Booster pump / shower pump			Accumulators / expansion vessels		
Fan convector			Low loss header		
Macerator			Waste water lifter / pump (saniflow or similar)		
Greywater/rainwater station			Water softener/filter		
Refrigerator cold connection			Washing machine / dishwasher		
Underfloor heating circuit and underfloor manifold			Outside tap installation		
Backflow protection components (e.g. EA, EB, EC or ED)					
Jointing methods used					
Compression			Push fit plastic PP		
Push fit waste			Threaded/screwed		

Soft soldered		Crimped	
Glues/adhesives		Fusion weld	

Pipework installed			
copper		plastic pressure pipe	
steel (screwed or pressed)		stainless steel	
plastic (drainage)		rainwater	
Reflective Account			
Confirm how incoming or outgoing supplies met requirements of system and components.			
Confirm what job information was used and how pipework routes were planned and marked out.			
Confirm how pipework was clipped/bracketed			
Overview of your installation - Provide detail of which system components/appliances were installed. Include how these were dressed/made up, positioned, fixed, levelled and how this process was carried out.			

Details of soundness test if applicable	
Provide a supporting photograph or reference to supplementary evidence below	
Evidence 1	

Evidence 2		
Candidate Signature	Candidate Name	Date
Witness signature	Witness name	Date
Assessor Signature	Assessor Name	Date
IQA Signature (as required)	IQA Name	Date

Unit number	113 (outcome 4)
OFQAL Ref	603/4146/4
Unit name	Install, commission, service and maintain domestic plumbing and heating systems, faults
Section aim:	The aim of this section is to enable learners to demonstrate occupational competence in the diagnostic checks, decommissioning, fault repair or component replacement before recommissioning and handing over to the customer.
Level	3
Evidence	Evidence is required diagnosing and rectifying six control or component faults on plumbing and heating systems. Direct observation requirements: Due to the nature of faults there are no minimum direct observation requirements although tasks could be observed if naturally occurring as part of a site visit. If the assessor carries out an observation the fault documentation within this section can be used to record the outcome by the assessor.

Hints and tips, when to complete.	This section has been split to enable the completion of some of the less complex faults earlier on the apprenticeship. It is expected that the first 3 faults would be completed at Phase 2 and the remainder during phase 3. Of the apprenticeship Although a total of six faults 3 from the range must be completed this doesn't have to be completed in any particular order The candidate should record the fault diagnosis and rectification procedures in the documentation provided within this section.
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LO 4 Perform fault diagnosis and rectification procedures	Reference Which fault sheet the 4 items are covered	Assessor initials
4.1 obtain fault information from the customer or end user		
4.1 use manufacturer's instructions to obtain fault information		
4.1 utilise fault diagnosis flow charts when fault finding		
4.1 review previous service history of a faulty component		
4.1-5 perform fault diagnosis and rectification procedures on (3 of the following (a-j) on each occasion diagnostic checks, decommissioning, fault repair or component replacement must be carried out before recommissioning and handing over to the customer.	Reference Which fault sheet the 3 items are covered	Assessor initials
a) system debris		
b) pump failure		
c) leakage		
d) trap seal loss		
e) expansion and contraction		
f) cistern failure		
g) pumping over/persistent venting		
h) emitter cold spots		
i) TRV/ valve		
j) tap/valve failure		

4.1-5 Fault Diagnosis and Rectification Procedures				Reference/Job No					
Job location						Date			
System type	CW		HW		CH		SAN	RWS	

Confirm what procedure below was used to diagnose the fault.

Fault 1

Customer/user discussion		Manufacturer's instructions		Diagnosis flow charts		Service history/ system component analysis	
Overview of how the fault was diagnosed				Confirm process for decommissioning.			
Overview of repair or replacement process				Recommissioning and handover process			
Provide a supporting photograph or reference to supplementary evidence in the below box for a minimum of three of the six (fault) tasks							
Candidate Signature		Candidate Name				Date	
Witness signature		Witness name				Date	

Assessor Signature	Assessor Name	Date
IOA Signature (as required)	IOA Name	Date

4.1-5 Fault Diagnosis and Rectification Procedures				Reference/Job No					
Job location						Date			
System type		CW		HW		CH		SAN	RWS

Confirm what procedure below was used to diagnose the fault.

4.1-5 Fault Diagnosis and Rectification Procedures				Reference/job No		Fault 2			
Job location						Date			
System type		CW		HW		CH		SAN	RWS
Confirm what procedure below was used to diagnose the fault.									
Customer/user discussion		Manufacturer's instructions		Diagnosis flow charts		Service history/ system component analysis			
Overview of how the fault was diagnosed				Confirm process for decommissioning.					
Overview of repair or replacement process				Recommissioning and handover process					

Provide a supporting photograph or reference to supplementary evidence in the below box for a **minimum of three** of the six (fault) tasks

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Candidate Signature		Candidate Name				Date	
Witness signature		Witness name				Date	
Assessor Signature		Assessor Name				Date	
IOA Signature (as required)		IOA Name				Date	

Fault 3

Customer/user discussion		Manufacturer's instructions		Diagnosis flow charts		Service history/ system component analysis	
Overview of how the fault was diagnosed				Confirm process for decommissioning.			
Overview of repair or replacement process				Recommissioning and handover process			
Provide a supporting photograph or reference to supplementary evidence in the below box for a minimum of three of the six (fault) tasks							
Candidate Signature		Candidate Name			Date		
Witness signature		Witness name			Date		
Assessor Signature		Assessor Name			Date		
IQA Signature (as required)		IQA Name			Date		

4.1-5 Fault Diagnosis and Rectification Procedures				Reference/Job No					
Job location						Date			
System type	CW		HW		CH		SAN	RWS	

Confirm what procedure below was used to diagnose the fault.

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LO 4 Perform fault diagnosis and rectification procedures	Reference Which fault sheet the 4 items are covered	Assessor initials
4.1 obtain fault information from the customer or end user		
4.1 use manufacturer's instructions to obtain fault information		
4.1 utilise fault diagnosis flow charts when fault finding		
4.1 review previous service history of a faulty component		
4.1-5 perform fault diagnosis and rectification procedures on (3 of the following (a-m) on each occasion diagnostic checks, decommissioning, fault repair or component replacement must be carried out before recommissioning and handing over to the customer.	Reference Which fault sheet the 3 items are covered	Assessor initials
a) accumulator expansion vessel failure		
b) motorised valves not operating		
c) heat exchanger failure		
d) expansion valve		
e) WC macerators/waste water lifter		
f) sink waste disposal units		
g) control failure		
h) pressure relief valve		
i) thermostat		
j) programmer		
k) air admittance valves		
l) condensing boiler condensate		

m) component failure		
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**Fault
4**

Customer/user discussion		Manufacturer's instructions		Diagnosis flow charts		Service history/ system component analysis	
Overview of how the fault was diagnosed				Confirm process for decommissioning.			
Overview of repair or replacement process				Recommissioning and handover process			
Provide a supporting photograph or reference to supplementary evidence in the below box for a minimum of three of the six (fault) tasks							
Candidate Signature		Candidate Name				Date	
Witness signature		Witness name				Date	
Assessor Signature		Assessor Name				Date	

4.1-5 Fault Diagnosis and Rectification Procedures				Reference/Job No					
Job location							Date		
System type	CW		HW		CH		SAN	RWS	

Confirm what procedure below was used to diagnose the fault.

IQA Signature (as required)	IQA Name	Date

4.1-5 Fault Diagnosis and Rectification Procedures				Reference/Job No					
Job location						Date			
System type	CW		HW		CH		SAN	RWS	

Confirm what procedure below was used to diagnose the fault.

Fault 5

Customer/user discussion		Manufacturer's instructions		Diagnosis flow charts		Service history/ system component analysis	
Overview of how the fault was diagnosed				Confirm process for decommissioning.			
Overview of repair or replacement process				Recommissioning and handover process			
Provide a supporting photograph or reference to supplementary evidence in the below box for a minimum of three of the six (fault) tasks							
Candidate Signature		Candidate Name				Date	
Witness signature		Witness name				Date	

4.1-5 Fault Diagnosis and Rectification Procedures				Reference/Job No					
Job location						Date			
System type	CW		HW		CH		SAN	RWS	

Confirm what procedure below was used to diagnose the fault.

Assessor Signature	Assessor Name	Date
IQA Signature (as required)	IQA Name	Date

Fault 6

Customer/user discussion		Manufacturer's instructions		Diagnosis flow charts		Service history/ system component analysis	
Overview of how the fault was diagnosed				Confirm process for decommissioning.			
Overview of repair or replacement process				Recommissioning and handover process			
Provide a supporting photograph or reference to supplementary evidence in the below box for a minimum of three of the six (fault) tasks							

Candidate Signature	Candidate Name	Date
Witness signature	Witness name	Date
Assessor Signature	Assessor Name	Date
IQA Signature (as required)	IQA Name	Date

LO4 Perform Fault Diagnosis And Rectification Procedures (Fault 1-6)
Oral questioning reference /professional discussion record to be utilised to reinforce the documentation or where some criteria was not naturally occurring at the time of assessment.

4.1-5 Fault Diagnosis and Rectification Procedures				Reference/Job No					
Job location							Date		
System type	CW		HW		CH		SAN	RWS	

Confirm what procedure below was used to diagnose the fault.

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Feedback and forward planning:

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Candidate Signature	Candidate Name	Date
Assessor Signature	Assessor Name	Date
IQA Signature (as required)	IQA Name	Date

Unit number	113 (outcome 5)
OFQAL Ref	603/4146/4
Unit name	Install, commission, service and maintain domestic plumbing and heating systems
Section aim:	The aim of this section is to enable learners to demonstrate occupational competence in the pre-commissioning, commissioning and handing over the completed system to the customer.
Level	3
Evidence	Candidates must be assessed on two of the following systems on a minimum of two occasions: • hot and cold water systems • central heating systems • sanitation and drainage systems Direct observation requirements: Complete commissioning of two of the below system types from the required range on two occasions. • hot and cold water systems • central heating systems • sanitation and drainage systems
Hints and tips, when to complete	This section has been split to enable the completion of some of the pre-commissioning checks before any observation takes place. This section would normally be completed at phase 3. Occasion 1 DO 5 (first visit) Candidate completes pre-commissioning of first two system types for example (hot and cold water systems + central heating systems) then the assessor attends to observe the commissioning of both systems. Occasion 2 DO 6 (second visit) Candidate completes pre-commissioning of second two system types for example (hot and cold water systems + Sanitation and drainage) then the assessor attends to observe the commissioning of both systems. Two system types need to be observed on two occasions, so when planning the observations ensure two systems are available for commissioning to avoid extra visits from the assessor.

LO 5 Commission plumbing and heating systems in the workplace.		Reference		Assessor initials
5.1-5 Candidates must be assessed on two of the following systems on two occasions: - hot and cold water systems - central heating systems - sanitation and drainage systems		Comm 1	Comm 2	
	Record system below	Reference		Assessor initials
System type 1 commission 1		Comm 1		
System type 2 Commission 1		Comm 1		
System type 1 commission 2			Comm 2	
System type 2 commission 2			Comm 2	
5.1 Carry out a visual inspection of the system		Comm 1	Comm 2	
5.2 Charge the system to normal operating pressure and check for leakage		Comm 1	Comm 2	
5.3 Perform a soundness test to industry requirements		Comm 1	Comm 2	
5.4 Flush the system with cold water on completion of soundness testing		Comm 1	Comm 2	
5.5 Operate the system and take performance readings in order to compare them to the design specifications		Comm 1	Comm 2	
5.6 Adjust system controls to establish that the system operates to its design specifications		Comm 1	Comm 2	
5.7 Prepare commissioning records for completed systems		Comm 1	Comm 2	
5.8 Instruct the customer in the efficient and effective operation of the system		Comm 1	Comm 2	

5.1-4 Commission Plumbing and Heating Systems (Pre-Commissioning)			Reference Commission 1		Pre-Commission Document 1 Of 3 From Commission 1	
Job location					Date	
System type (Choose 1)		Cold and Hot water		Central Heating		Sanitation and Drainage
Overview what was visually inspected and checked on installation completion before filling or commissioning commenced						
Overview of how the system was soundness tested, charged/filled						
What checks were made for leakage and how were these rectified as necessary.				How was the system flushed or cleansed as required		
Candidate Signature		Candidate Name			Date	
Witness signature		Witness name			Date	
Assessor Signature		Assessor Name			Date	
IQA Signature (as required)		IQA Name			Date	

5.1-4 Commission Plumbing and Heating Systems (Pre-Commissioning)			Reference Commission 1		Pre-Commission Document 2 Of 3 From Commission 1	
Job location					Date	
System type (Choose 1)	Cold and Hot water		Central Heating		Sanitation and Drainage	
Overview what was visually inspected and checked on installation completion before filling or commissioning commenced						
Overview of how the system was soundness tested, charged/filled						
What checks were made for leakage and how were these rectified as necessary.				How was the system flushed or cleansed as required		
Candidate Signature	Candidate Name				Date	
Witness signature	Witness name				Date	
Assessor Signature	Assessor Name				Date	
IQA Signature (as required)	IQA Name				Date	

5.5-8 Commission Plumbing and Heating Systems (Pre-Commissioning)				Reference Commission 1		Direct Observation Document 3 Of 3 From Commission 1	
Job location						Date	
System type (Choose 2)		Cold and Hot water		Central Heating		Sanitation and Drainage	
Overview of the observation and more technical detail around the 2 of the above system types which were commissioned							
Details of how the candidate completed all required performance and operation checks							
Identify performance readings eg. Flow rates Temperatures Pressure				Identify system adjustments to ensure correct operation and performance of system.			
Overview of what would be explained to the customer (assessor to represent customer as required)				What documentation/commissioning record was completed			

LO 5 Commission plumbing and heating systems		
Supplementary evidence- . Provide a supporting photograph or reference to supplementary evidence in the below box for a minimum of one commission 1 task		
Candidate Signature	Candidate Name	Date
Assessor Signature	Assessor Name	Date
IQA Signature (as required)	IQA Name	Date

5.1-4 Commission Plumbing and Heating Systems (Pre-Commissioning)				Reference Commission 2		Pre-Commission Document 1 Of 3 From Commission 2	
Job location						Date	
System type (Choose 1)		Cold and Hot water		Central Heating		Sanitation and Drainage	
Overview what was visually inspected and checked on installation completion before filling or commissioning commenced							
Overview of how the system was soundness tested, charged/filled							
What checks were made for leakage and how were these rectified as necessary.					How was the system flushed or cleansed as required		
Candidate Signature		Candidate Name				Date	
Witness signature		Witness name				Date	
Assessor Signature		Assessor Name				Date	
IQA Signature (as required)		IQA Name				Date	

5.1-4 Commission Plumbing and Heating Systems (Pre-Commissioning)				Reference Commission 2		Pre-Commission Document 2 Of 3 From Commission 2	
Job location						Date	
System type (Choose 1)		Cold and Hot water		Central Heating		Sanitation and Drainage	
Overview what was visually inspected and checked on installation completion before filling or commissioning commenced							
Overview of how the system was soundness tested, charged/filled							
What checks were made for leakage and how were these rectified as necessary.					How was the system flushed or cleansed as required		
Candidate Signature		Candidate Name				Date	
Witness signature		Witness name				Date	
Assessor Signature		Assessor Name				Date	
IQA Signature (as required)		IQA Name				Date	

5.5-8 Commission Plumbing and Heating Systems (Pre-Commissioning)				Reference Commission 2		Direct Observation Document 3 Of 3 From Commission 2	
Job location					Date		
System type (Choose 2)	Cold and Hot water		Central Heating		Sanitation and Drainage		
Overview of the observation and more technical detail around the 2 of the above system types which were commissioned							
Details of how the candidate completed all required performance and operation checks							
Identify performance readings eg. Flow rates Temperatures Pressure				Identify system adjustments to ensure correct operation and performance of system.			
Overview of what would be explained to the customer (assessor to represent customer as required)				What documentation/commissioning record was completed			

LO 5 Commission plumbing and heating systems		
Supplementary evidence- . Provide a supporting photograph or reference to supplementary evidence in the below box for a minimum of one commission 2 task		
Candidate Signature	Candidate Name	Date
Assessor Signature	Assessor Name	Date
IQA Signature (as required)	IQA Name	Date

LO 5 Commission plumbing and heating systems		
<i>Oral questioning reference /professional discussion record to be utilised to reinforce the documentation or where some criteria was not naturally occurring at the time of assessment.</i>		
<i>Feedback and forward planning:</i>		
Candidate Signature	Candidate Name	Date
Assessor Signature	Assessor Name	Date
IQA Signature (as required)	IQA Name	Date

Appendix 1

Level 3 Diploma in Plumbing & Domestic Heating (9189) – Behaviours

Behaviours	What is required	How met
Honesty and Integrity	Develop trust with customers and colleagues by undertaking responsibilities in an ethical and empathetic manner	
Dependable and responsible	Show conscientiousness through being punctual, reliable and professional. Take responsibility for own judgements and actions. Aware of the limits of their own competence	
Enthusiasm and positive attitude	Demonstrate drive and energy in fulfilling requirements of role	

Quality focus	Be quality focussed in work and in personal standards	
Willingness to learn	Identify own development needs and take action to meet those needs. Keep up-to-date with best practice. Maintain and enhance competence	
Work with others	Work effectively and collaborate with colleagues, other trades, clients, suppliers and the public	
Sustainable working	Give consideration to appropriate use of resources and own actions taking into account the impact on environmental, social and economic factors	

Assessor Signature	Assessor Name	Date
Employer Signature	Candidate Name	Date

