

Level 3 NVQ Diploma in Heating and Ventilating Industrial and Commercial Installation (6188-30)

Candidate performance evidence logbook
600/1009/5



www.cityandguilds.com
January 2014
Version 2.0

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Level 3 NVQ Diploma in Heating and Ventilating Industrial and Commercial Installation (6188-30)

Candidate performance evidence logbook

Qualification title	Number	QAN
Level 3 NVQ Diploma in Heating and Ventilating Industrial and Commercial Installation	6188-30	600/1009/5

Version and date	Change detail	Section
2.0 January 2014	Amend rules of combination	Introduction

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1 About your candidate logbook

1.1 Contact details

Candidate name	
Candidate enrolment no	
Centre name	
Centre number	
Programme start date	
Date of registration with City & Guilds	

Keep a record of relevant contact details in the space provided below. You may find it helpful to make a note of phone numbers and e-mail addresses here.

Your Assessor(s)	
Your Internal Verifier	
Quality Assurance Contact	

1 About your candidate logbook

1.2 Introduction to the logbook

This logbook will help you complete the units in City & Guilds' **Level 3 NVQ Diploma in Heating and Ventilating Industrial and Commercial Installation (6188-30)**. It contains forms you can use to record your evidence of what you have done.

About City & Guilds

City & Guilds is your awarding body for this qualification. City & Guilds is the UK's leading awarding body for vocational qualifications.

Information about City & Guilds and our qualifications is available on our website **www.cityandguilds.com**.

2 The assessment process

The following people at your centre will explain the assessment process and help you achieve your unit(s).

The assessor/tutor

The assessor/tutor is the person you will have the most contact with as you work towards your unit(s). You may have more than one assessor/tutor depending on which unit(s) you take or you may be assessed by a person who is not your tutor.

The internal verifier

The internal verifier maintains the quality of assessment within the centre.

The external verifier

The external verifier works for City & Guilds and helps to ensure that your centre meets the required standards for quality and assessment.

3 Using your logbook

Recording forms

This logbook contains all of the forms you and your assessor will need to plan, review and organise your evidence. Your assessor will be able to help you decide which forms you need to complete and help you fill them in.

Please photocopy these forms as required.

4 Qualification structures

To achieve the **Level 3 NVQ Diploma in Heating and Ventilating Industrial and Commercial Installation (6188-30)**, learners must achieve 50 credits from the mandatory units plus a minimum of 7 credits from **one** of the optional groups, in the table below.

This Logbook includes only those units assessed by performance in the workplace (marked with an *).

City & Guilds unit number	Unit accreditation number	Unit title	Credit value	GLH
Mandatory units				
301	R/602/2498	Understand how to organise resources within BSE	3	26
302	R/502/9151	Understand and carry out electrical work on industrial and commercial heating and ventilating systems and components	12	102
303	R/602/4851	Understand industrial and commercial cold water system installation and pre-commissioning techniques	5	42
304	Y/602/4852	Understand industrial and commercial hot water system installation and pre-commissioning techniques	5	42
305	K/602/4855	Understand industrial and commercial heating system installation and pre-commissioning techniques	5	42
306	A/602/4858	Understand industrial and commercial chilled water system installation and pre-commissioning techniques	5	42
307	F/602/4862	Understand the principles and requirements of industrial and commercial fuel systems	12	112
* 308	Y/602/4897	Install H&V industrial and commercial systems	3	4
Optional group A				
309	H/602/4871	Understand industrial and commercial H&V maintenance techniques	5	38
*310	Y/502/8194	Maintain industrial and commercial H&V systems	2	4

City & Guilds unit number	Unit accreditation number	Unit title	Credit value	GLH
Optional group B				
311	D/602/4884	Understand industrial and commercial oxy-acetylene pipe jointing techniques	5	38
*312	K/602/4905	Perform industrial and commercial oxy-acetylene pipe jointing techniques	2	4
Optional group C				
313	K/602/4886	Understand industrial and commercial manual metal arc pipe jointing techniques	5	38
*314	T/602/4907	Perform industrial and commercial manual metal arc pipe jointing techniques	2	4

5 Overall unit sign-off

The following units are included in the rules of combination for the **Level 3 NVQ Diploma in Heating and Ventilating Industrial and Commercial Installation (6188-30)**. Learners must achieve Unit 308, plus either Unit 310, 312 or 314, in line with the rules of combination listed previously in this document, towards achievement of the overall qualification.

City & Guilds unit	Unit title	Unit Achieved Yes/No	Assessor Initials	Date
308	Install heating and ventilation industrial and commercial systems			
310	Maintain industrial and commercial heating and ventilating systems			
312	Perform industrial and commercial oxy-acetylene pipe jointing techniques			
314	Perform industrial and commercial manual metal arc pipe jointing techniques			

Declaration

I confirm that the evidence supplied for the above selected units is authentic and a true representation of my own work. The work logged is my own work carried out during my normal work duties.

The answers in the question bank are my own work and discussed with my assessor on completion. 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 the requirements of the selected units with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor Name:	
Assessor Signature:	
Date:	

IV Name:	
IV Signature:	
Date:	

Unit 308

Install heating and ventilation industrial and commercial systems

Level: 3

Credit value: 3

UAN: Y/602/4897

Outcome 1	Be able to complete preparation work for industrial and commercial cold water, hot water, heating and chilled water systems installation activities			
Criteria		Candidate initials	Assessor initials	Evidence reference
1	assess the work location and report factors that will impact on the work to one of the following:			
	<ul style="list-style-type: none"> • line manager 			
	<ul style="list-style-type: none"> • main contractor 			
	<ul style="list-style-type: none"> • consultant 			
2	confirm that job information and documentation for cold water, hot water, heating and chilled water system installation is available and appropriate including systems:			
	<ul style="list-style-type: none"> • cold water: one of the following: 			
	<ul style="list-style-type: none"> - boosted 			
	<ul style="list-style-type: none"> - high rise building systems 			
	<ul style="list-style-type: none"> • hot water: one of the following: 			
	<ul style="list-style-type: none"> - storage (indirect) 			
	<ul style="list-style-type: none"> - unvented 			
	<ul style="list-style-type: none"> - secondary circulation 			
	<ul style="list-style-type: none"> - instantaneous (plate heat exchanger) 			
	<ul style="list-style-type: none"> • heating: both of the following: 			
	<ul style="list-style-type: none"> - low temperature hot water heating 			
	<ul style="list-style-type: none"> - medium temperature hot water heating 			
	<ul style="list-style-type: none"> • chilled water two of the following: 			
	<ul style="list-style-type: none"> - air conditioning systems 			
<ul style="list-style-type: none"> - heat rejection systems 				
<ul style="list-style-type: none"> - chilled beams 				
<ul style="list-style-type: none"> - fan coil units and air handling units 				

	<ul style="list-style-type: none"> • job information and documentation 			
	<ul style="list-style-type: none"> - statutory regulations/codes of practice 			
	<ul style="list-style-type: none"> - industry standards 			
	<ul style="list-style-type: none"> - industry guides/good practice guides/ verbal instructions 			
3	use job information and documentation to ensure that the following are fit for purpose:			
	<ul style="list-style-type: none"> • equipment 			
	<ul style="list-style-type: none"> • tools 			
	<ul style="list-style-type: none"> • labour resources 			
4	confirm the points in the work process where liaison with other persons will be required from one of the following:			
	<ul style="list-style-type: none"> • contractor/consultant 			
	<ul style="list-style-type: none"> • other site workers 			
	<ul style="list-style-type: none"> • site visitors 			
	<ul style="list-style-type: none"> • supervisor or line manager 			
5	demonstrate that job information on key aspects of the work has been issued to relevant people including user instructions or manufacturer's instructions			
6	demonstrate that authorisation has been obtained from the relevant person(s) prior to commencement of the work, from one of the following:			
	<ul style="list-style-type: none"> • contractor/consultant 			
	<ul style="list-style-type: none"> • other site workers 			
	<ul style="list-style-type: none"> • site visitors 			
	<ul style="list-style-type: none"> • supervisor or line manager 			
7	identify any pre work damage or defects to existing equipment or building features, record and report it to one of the following:			
	<ul style="list-style-type: none"> • contractor/consultant 			
	<ul style="list-style-type: none"> • other site workers 			
	<ul style="list-style-type: none"> • site visitors 			
	<ul style="list-style-type: none"> • supervisor or line manager 			
8	demonstrate that suitable personal protective equipment has been worn throughout the duration of work preparation activities			

9	verify that the materials needed to complete the job are free from damage and take appropriate action should any defects be found: from materials used for cold water, hot water, heating and chilled water systems installation activities including all of the following:			
	• copper pipe			
	• plastic			
	• stainless steel			
	• steel flues			
	• low carbon steel			
10	complete preparatory work for the installation of cold water, hot water, heating and chilled water systems to include:			
	• use of material and equipment requisites where appropriate			
	• confirmation that the selection of material, equipment and components are compatible to the installation			
	• confirmation that the work location is ready for installation activities			
	• confirmation of secure site storage for tools, equipment, materials and components			
	• confirmation of suitable access equipment			
	• confirmation of suitable lifting equipment where required			
	• completion of risk assessments			
	• completion of method statements.			

Outcome 2	Be able to identify industrial and commercial cold water, hot water, heating and chilled water systems, equipment and components			
Criteria		Candidate initials	Assessor initials	Evidence reference
1	verify that site drawings, plans and the work location is in accordance with the specific installation requirements for cold water, hot water, heating and chilled water systems			
2	confirm that the proposed job specification for cold water, hot water, heating and chilled water system installation complies with:			
	• statutory regulations			
	• codes of practice			
	• industry standards			
	• industry guides/good practice guides			

	<ul style="list-style-type: none"> • specifications 			
--	--	--	--	--

3	confirm that relevant persons have been notified and agreement achieved on any changes required to the job specification prior to commencement of the work from one of the following:			
	<ul style="list-style-type: none"> • contractor/consultant 			
	<ul style="list-style-type: none"> • supervisor or line manager. 			

Outcome 3		Be able to install industrial and commercial cold water, hot water, heating and chilled water systems		
Criteria		Candidate initials	Assessor initials	Evidence reference
1	verify that job information applicable to the installation process is available and conforms to:			
	<ul style="list-style-type: none"> • statutory regulations 			
	<ul style="list-style-type: none"> • codes of practice 			
	<ul style="list-style-type: none"> • industry standards 			
	<ul style="list-style-type: none"> • industry guides/good practice guides 			
2	verify that materials, tools, equipment and resources necessary for the installation of cold water, hot water, heating and chilled water systems are:			
	<ul style="list-style-type: none"> • available as required 			
	<ul style="list-style-type: none"> • safely and securely stored 			
	<ul style="list-style-type: none"> • meet industry requirements 			
3	position and fix control components for one of the following systems:			
	<ul style="list-style-type: none"> • cold water 			
	<ul style="list-style-type: none"> • hot water 			
	<ul style="list-style-type: none"> • hot water heating 			
4	inspect and confirm that all aspects of the installation process conform with industry requirements, including:			
	<ul style="list-style-type: none"> • statutory regulations 			
	<ul style="list-style-type: none"> • codes of practice 			
	<ul style="list-style-type: none"> • industry standards 			
	<ul style="list-style-type: none"> • industry guides/good practice guides 			
	<ul style="list-style-type: none"> • verbal instructions 			

	<ul style="list-style-type: none"> • manufacturers instructions 			
5	verify that methods of working ensures that any damage to customer/client property and building features is avoided during work activities			
6	report problems which may affect the progress of the installation, to the line manager or contractor/consultant, including:			
	<ul style="list-style-type: none"> • compliance with specification 			
	<ul style="list-style-type: none"> • resource issues. 			

Outcome 4	Be able to complete soundness tests on industrial and commercial cold water, hot water, heating and chilled water systems	Candidate initials	Assessor initials	Evidence reference
1	confirm through visual inspections that the following systems conform with industry requirements:			
	<ul style="list-style-type: none"> • cold water (one of the following): 			
	<ul style="list-style-type: none"> - boosted 			
	<ul style="list-style-type: none"> - high rise building systems 			
	<ul style="list-style-type: none"> • hot water (one of the following): 			
	<ul style="list-style-type: none"> - unvented 			
	<ul style="list-style-type: none"> - secondary circulation 			
	<ul style="list-style-type: none"> - instantaneous (plate heat exchanger) 			
	<ul style="list-style-type: none"> • heating (two of the following): 			
	<ul style="list-style-type: none"> - low temperature hot water heating 			
	<ul style="list-style-type: none"> - medium temperature hot water heating 			
	<ul style="list-style-type: none"> • chilled water (two of the following): 			
	<ul style="list-style-type: none"> - air conditioning systems 			
	<ul style="list-style-type: none"> - heat rejection systems 			
	<ul style="list-style-type: none"> - chilled beams 			
	<ul style="list-style-type: none"> - fan coil units and air handling units 			
2	confirm that the cold water, hot water, heating and chilled water system is ready to receive soundness tests to cover:			
	<ul style="list-style-type: none"> • pipework 			
	<ul style="list-style-type: none"> • appliances 			
	<ul style="list-style-type: none"> • components 			
3	verify that procedures for:			
	<ul style="list-style-type: none"> • cleaning 			
	<ul style="list-style-type: none"> • flushing 			
	<ul style="list-style-type: none"> • charging systems have been carried out in accordance with industry requirements			
4	confirm procedures for establishing that input services to the system components are suited to the intended purpose for two of the following:			
	<ul style="list-style-type: none"> • water company mains 			
	<ul style="list-style-type: none"> - mains fed, direct, or indirect 			
	<ul style="list-style-type: none"> • gas 			
	<ul style="list-style-type: none"> • oil 			

5	verify that a soundness test to one of the following systems conforms with appropriate industry standards, guides and good practice guides:			
	• cold water			
	• hot water			
	• heating			
	• chilled water			
6	implement pre-commissioning tests and checks in accordance with appropriate industry requirements, including:			
	• statutory regulations			
	• codes of practice			
	• industry standards			
	• industry guides/good practice guides			
	• verbal instructions			
7	implement checks to confirm:			
	• system cleanliness			
	• use of additives where appropriate			
	• system is charged			
	• un-commissioned systems and components cannot be activated.			

Outcome 5 Be able to complete commissioning of industrial and commercial cold water, hot water, heating and chilled water systems				
Criteria		Candidate initials	Assessor initials	Evidence reference
1	verify the availability of the relevant industry specifications and guidelines on the performance of cold water, hot water, heating and chilled water systems including:			
	systems:			
	• cold water: one of the following:			
	- storage (indirect)			
	- non storage (direct)			
	- boosted			
	- high rise building systems			
	• hot water: one of the following:			
	- open vented			
	- storage (indirect)			
	- unvented			
	- secondary circulation			
	- instantaneous (plate heat exchanger)			

	<ul style="list-style-type: none"> • heating: two of the following: <ul style="list-style-type: none"> - low temperature hot water heating - medium temperature hot water heating • chilled water two of the following: <ul style="list-style-type: none"> - air conditioning systems - heat rejection systems - chilled beams - fan coil units and air handling units 			
2	confirm that liaison has taken place during the commissioning process in order to minimise disturbance to work routines including liaison with one of the following: <ul style="list-style-type: none"> • contractors • other site workers • site visitors • supervisor/line manager 			
3	conduct mechanical and control performance checks and adjustments in accordance with industry specifications for the following: <ul style="list-style-type: none"> • hot and cold water system components including all of the following: <ul style="list-style-type: none"> - cold water storage cistern - pressure booster sets - hot water storage vessels, including high temperature to low temperature calorifiers - appliance control valve or tap, terminal fittings • and a minimum of any two from the following: <ul style="list-style-type: none"> - electric and gas water heaters - stop valves - shower mixing valves - blending valves - mixing valves - circulating pumps (bronze) - expansion vessels - RPZ valves - feed and expansion cistern (primary system) heating system: <ul style="list-style-type: none"> • appliances: <ul style="list-style-type: none"> - modular - sectional - high efficiency - biomass 			

	<ul style="list-style-type: none"> • components (all of the following): 			
	- hot water storage vessels			
	- radiators			
	- convector heaters, natural and assisted			
	- panel heaters			
	- ceiling coils			
	- thermostatic control of heating systems			
	- time control of heating systems			
	- energy management systems			
	- motorised valves			
	- pumps/accelerators			
	- temperature and pressure relief valves			
	- expansion vessels			
	chilled water system:			
	<ul style="list-style-type: none"> • appliances (two from the following): 			
	- refrigeration plant			
	- FCU			
	- A/C plant			
	- cooling towers			
	- air handling units			
	- heat exchangers			
	- chilled beams			
	<ul style="list-style-type: none"> • components (two from the following): 			
	- isolation valves			
	- three and four port valves			
	- temperature & humidity stats			
	- calorifiers			
	- actuators			
	- RPZ valves			
4	confirm that appropriate system information is available to the line manager.			

Outcome 6 Be able to complete fault identification on industrial and commercial cold water, hot water, heating and chilled water systems				
Criteria		Candidate initials	Assessor initials	Evidence reference
1	<ul style="list-style-type: none"> • system users 			
	<ul style="list-style-type: none"> • visual inspections 			
	<ul style="list-style-type: none"> • diagnostic tests 			
2	confirm that the relevant persons have been advised that fault diagnosis and rectification activities can cause potential disruption, including one of the following:			
	<ul style="list-style-type: none"> • customers 			
	<ul style="list-style-type: none"> • other site workers 			
	<ul style="list-style-type: none"> • site visitors 			
3	implement procedures for diagnosing faults in system components in accordance with industry specifications including:			
	<ul style="list-style-type: none"> • hot and cold water, a minimum of any two from the following: 			
	<ul style="list-style-type: none"> - electric and gas water heaters 			
	<ul style="list-style-type: none"> - stop valves 			
	<ul style="list-style-type: none"> - shower mixing valves 			
	<ul style="list-style-type: none"> - blending valves 			
	<ul style="list-style-type: none"> - mixing valves 			
	<ul style="list-style-type: none"> - circulating pumps (bronze) 			
	<ul style="list-style-type: none"> - expansion vessels 			
	<ul style="list-style-type: none"> - RPZ valves 			
	<ul style="list-style-type: none"> - feed and expansion cistern (primary system) 			
	<ul style="list-style-type: none"> • heating, all of the following: 			
	<ul style="list-style-type: none"> - hot water storage vessels 			
	<ul style="list-style-type: none"> - radiators 			
	<ul style="list-style-type: none"> - convector heaters, natural and assisted 			
	<ul style="list-style-type: none"> - panel heaters 			
	<ul style="list-style-type: none"> - ceiling coils 			
	<ul style="list-style-type: none"> - thermostatic control of heating systems 			
	<ul style="list-style-type: none"> - time control of heating systems 			
	<ul style="list-style-type: none"> - energy management systems 			
<ul style="list-style-type: none"> - motorised valves 				
<ul style="list-style-type: none"> - pumps/accelerators 				
<ul style="list-style-type: none"> - temperature and pressure relief valves 				
<ul style="list-style-type: none"> - expansion vessels 				

	<ul style="list-style-type: none"> • chilled water, (two from the following): 			
	- isolation valves			
	- three and four port valves			
	- temperature & humidity stats			
	- calorifiers			
	- actuators			
	- RPZ valves			
4	confirm that procedures for reporting diagnosed faults in systems and components have been carried out in accordance with industry specifications.			

Unit 308

Install heating and ventilation industrial and commercial systems

Declaration

I confirm that the evidence supplied for this unit is authentic and a true representation of my own work. The work logged is my own work carried out during my normal work duties.

The answers in the question bank are my own work and discussed with my assessor on completion. 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 the requirements of this unit with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor Name:	
Assessor Signature:	
Date:	

IV Name:	
IV Signature:	
Date:	

Unit 310

Maintain industrial and commercial heating and ventilating systems

Level: 3

Credit value: 2

UAN: Y/502/8194

Outcome 1	Be able to complete preparation work for industrial and commercial heating and ventilation system maintenance activities			
Criteria		Candidate initials	Assessor initials	Evidence reference
1	check the work location and report factors that will impact on the work to the supervisor or line manager			
2	source appropriate job information and documentation for heating and ventilation system service and maintenance requirements including any two from the following:			
	<ul style="list-style-type: none"> • systems: 			
	<ul style="list-style-type: none"> - cold water: 			
	<ul style="list-style-type: none"> > storage (indirect) 			
	<ul style="list-style-type: none"> > non storage (direct) 			
	<ul style="list-style-type: none"> - hot water: 			
	<ul style="list-style-type: none"> > open vented 			
	<ul style="list-style-type: none"> > storage (indirect) 			
	<ul style="list-style-type: none"> > unvented 			
	<ul style="list-style-type: none"> > secondary circulation 			
	<ul style="list-style-type: none"> > instantaneous (plate heat exchanger) 			
	<ul style="list-style-type: none"> - heating: 			
	<ul style="list-style-type: none"> > low temperature hot water 			
	<ul style="list-style-type: none"> > medium temperature hot water 			
	<ul style="list-style-type: none"> - air: 			
	<ul style="list-style-type: none"> > air conditioning systems 			
	<ul style="list-style-type: none"> > heat rejection systems 			
	<ul style="list-style-type: none"> > tempered air ventilation systems 			
	<ul style="list-style-type: none"> • job information and documentation: 			
	<ul style="list-style-type: none"> - statutory regulations 			
<ul style="list-style-type: none"> - codes of practice 				
<ul style="list-style-type: none"> - industry standards 				
<ul style="list-style-type: none"> - industry guides/good practice guides 				
<ul style="list-style-type: none"> - verbal instructions 				

3	use job information and documentation to ensure that the following is fit for purpose:			
	• equipment			
	• tools			
4	identify the points in the work process where liaison with other persons may be necessary:			
	• other site workers			
	• site visitors			
5	demonstrate that job information on key aspects of the work has been issued to relevant people including user instructions or manufacturer's instructions			
	• other site workers			
	• site visitors			
6	demonstrate that authorisation has been obtained from the relevant person(s) prior to commencement of the work, from one of the following:			
	• other site workers			
	• site visitors			
7	demonstrate that suitable personal protective equipment has been worn throughout the duration of work preparation activities			
	• supervisor or line manager			
	• supervisor or line manager			
7	note any pre-work damage or defects to existing equipment or building features should it exist, and report to the job supervisor or your line manager			
8	demonstrate that suitable personal protective equipment has been worn throughout the duration of work preparation activities			
9	check that the resources needed to complete the job are free from damage and take appropriate action should any defects be found			
10	complete preparatory work for the maintenance of heating and ventilation systems, to include:			
	• use of material and equipment requisites where appropriate			
	• confirmation that the selection of material, equipment and components are compatible to the installation			
	• confirmation that the work location is ready for service and maintenance activities			
	• confirmation of secure site storage for tools, equipment, materials and components			
	• confirmation of suitable access equipment			
	• confirmation of suitable lifting equipment where required.			

Outcome 2	Be able to maintain industrial and commercial heating and ventilation systems, equipment and components			
Criteria		Candidate initials	Assessor initials	Evidence reference
1	check that the relevant information is available in order to carry out maintenance work			
2	check that materials, tools and equipment are available for the specified maintenance activity			
3	demonstrate that liaison has taken place with the supervisor or line manager at the key points within the routine maintenance activities to minimise disruption to work routines			
4	one of the following:			
	<ul style="list-style-type: none"> • cold water storage cistern 			
	<ul style="list-style-type: none"> • pressure booster sets 			
	<ul style="list-style-type: none"> • hot water storage vessels 			
	<ul style="list-style-type: none"> • appliance control valve or tap, terminal fittings 			
	and a minimum of any two from the following:			
	<ul style="list-style-type: none"> • electric and gas water heaters 			
	<ul style="list-style-type: none"> • stop valves 			
	<ul style="list-style-type: none"> • shower mixing valves 			
	<ul style="list-style-type: none"> • blending valves 			
	<ul style="list-style-type: none"> • mixing valves 			
	<ul style="list-style-type: none"> • circulating pumps (bronze) 			
	<ul style="list-style-type: none"> • expansion vessels 			
	<ul style="list-style-type: none"> • RPZ valves 			
	perform work activities for routine maintenance that ensure the continued effective operation of the hot and cold water systems and components identified in:			
	one of the following:			
	<ul style="list-style-type: none"> • cold water storage cistern 			
	<ul style="list-style-type: none"> • pressure booster sets 			
	<ul style="list-style-type: none"> • hot water storage vessels 			
	<ul style="list-style-type: none"> • appliance control valve or tap, terminal fittings 			
	and a minimum of any two from the following:			
<ul style="list-style-type: none"> • electric and gas water heaters 				
<ul style="list-style-type: none"> • stop valves 				
<ul style="list-style-type: none"> • shower mixing valves 				
<ul style="list-style-type: none"> • blending valves 				
<ul style="list-style-type: none"> • mixing valves 				
<ul style="list-style-type: none"> • circulating pumps (bronze) 				

	<ul style="list-style-type: none"> • expansion vessels 			
	<ul style="list-style-type: none"> • RPZ valves 			
5	perform work activities for routine maintenance that complies with industry specifications and manufacturer's instructions, for hot water heating systems and components including: <ul style="list-style-type: none"> • shower mixing valves 			
	one from the following:			
	<ul style="list-style-type: none"> • low temperature hot water 			
	<ul style="list-style-type: none"> • medium temperature hot water 			
	and a minimum of three from the following:			
	<ul style="list-style-type: none"> • hot water storage vessels 			
	<ul style="list-style-type: none"> • radiators 			
	<ul style="list-style-type: none"> • convector heaters, natural and assisted 			
	<ul style="list-style-type: none"> • panel heaters 			
	<ul style="list-style-type: none"> • ceiling coils 			
	<ul style="list-style-type: none"> • thermostatic control of heating systems 			
	<ul style="list-style-type: none"> • time control of heating systems 			
	<ul style="list-style-type: none"> • energy management systems 			
	<ul style="list-style-type: none"> • storage calorifiers 			
	<ul style="list-style-type: none"> • non-storage calorifiers 			
	<ul style="list-style-type: none"> • feed and expansion cisterns 			
	<ul style="list-style-type: none"> • pressurisation units 			
	<ul style="list-style-type: none"> • mechanical controls 			
	<ul style="list-style-type: none"> • dosing pots 			
	<ul style="list-style-type: none"> • drain taps 			
	<ul style="list-style-type: none"> • motorised valves 			
	<ul style="list-style-type: none"> • pumps/accelerators 			
	<ul style="list-style-type: none"> • temperature and pressure relief valves 			
	<ul style="list-style-type: none"> • expansion vessels 			
6	perform work activities for routine maintenance that ensure the continued effective operation of the hot water heating systems and components identified in:			
	one from the following:			
	<ul style="list-style-type: none"> • low temperature hot water 			
	<ul style="list-style-type: none"> • medium temperature hot water 			
	and a minimum of three from the following:			
	<ul style="list-style-type: none"> • hot water storage vessels 			
	<ul style="list-style-type: none"> • radiators 			
	<ul style="list-style-type: none"> • convector heaters, natural and assisted 			
	<ul style="list-style-type: none"> • panel heaters 			

	<ul style="list-style-type: none"> • ceiling coils 			
	<ul style="list-style-type: none"> • thermostatic control of heating systems 			
	<ul style="list-style-type: none"> • time control of heating systems 			
	<ul style="list-style-type: none"> • energy management systems 			
	<ul style="list-style-type: none"> • storage calorifiers 			
	<ul style="list-style-type: none"> • non-storage calorifiers 			
	<ul style="list-style-type: none"> • feed and expansion cisterns 			
	<ul style="list-style-type: none"> • pressurisation units 			
	<ul style="list-style-type: none"> • mechanical controls 			
	<ul style="list-style-type: none"> • dosing pots 			
	<ul style="list-style-type: none"> • drain taps 			
	<ul style="list-style-type: none"> • motorised valves 			
	<ul style="list-style-type: none"> • pumps/accelerators 			
	<ul style="list-style-type: none"> • temperature and pressure relief valves 			
	<ul style="list-style-type: none"> • expansion vessels 			
7	perform work activities for routine maintenance that comply with industry specifications and manufacturer's instructions for air systems and components, including:			
	one from the following:			
	<ul style="list-style-type: none"> • air conditioning systems 			
	<ul style="list-style-type: none"> • tempered air ventilation systems 			
	and a minimum of three from the following:			
	<ul style="list-style-type: none"> • isolation valves 			
	<ul style="list-style-type: none"> • three & four port valves 			
	<ul style="list-style-type: none"> • temperature & humidity stats 			
	<ul style="list-style-type: none"> • registers and grilles 			
	<ul style="list-style-type: none"> • actuators 			
	<ul style="list-style-type: none"> • RPZ valves 			
	<ul style="list-style-type: none"> • pumps 			
	<ul style="list-style-type: none"> • fans 			
	<ul style="list-style-type: none"> • filters 			
	<ul style="list-style-type: none"> • air washer 			
	<ul style="list-style-type: none"> • humidifier 			
	<ul style="list-style-type: none"> • attenuators 			
	<ul style="list-style-type: none"> • dampers 			
	<ul style="list-style-type: none"> • heat exchangers 			
	<ul style="list-style-type: none"> • condensers 			
	<ul style="list-style-type: none"> • industry specifications and regulations 			
8	perform work activities for routine maintenance that ensure the continued effective operation of the air systems and components identified in:			

	one from the following:			
	• air conditioning systems			
	• tempered air ventilation systems			
	and a minimum of three from the following:			
	• isolation valves			
	• three & four port valves			
	• temperature & humidity stats			
	• registers and grilles			
	• actuators			
	• RPZ valves			
	• pumps			
	• fans			
	• filters			
	• air washer			
	• humidifier			
	• attenuators			
	• dampers			
	• heat exchangers			
	• condensers			
	• industry specifications and regulations			
9	confirm that maintenance records have been completed accurately and checked by the supervisor or line manager.			

Unit 310

Maintain industrial and commercial heating and ventilating systems

Declaration

I confirm that the evidence supplied for this unit is authentic and a true representation of my own work. The work logged is my own work carried out during my normal work duties.

The answers in the question bank are my own work and discussed with my assessor on completion. 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 the requirements of this unit with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor Name:	
Assessor Signature:	
Date:	

IV Name:	
IV Signature:	
Date:	

Unit 312

Perform industrial and commercial oxy-acetylene pipe jointing techniques

Level: 3

Credit value: 2

UAN: K/602/4905

Outcome 1	Be able to complete preparation work for industrial and commercial compressed gas welding activities			
Criteria		Candidate initials	Assessor initials	Evidence reference
1	carry out a risk assessment for welding processes in the work location			
2	carry out a method statement for welding processes in the work location including requirements for:			
	<ul style="list-style-type: none"> • storage of materials and finished products 			
	<ul style="list-style-type: none"> • availability of service supplies 			
	<ul style="list-style-type: none"> • informing appropriate people at key stages in the welding process 			
	<ul style="list-style-type: none"> • reporting problems 			
	<ul style="list-style-type: none"> • joining procedures 			
	<ul style="list-style-type: none"> • job instructions 			
3	select personal protective equipment (PPE) appropriate to the work activity being carried out			
4	select and confirm that pipe and materials are appropriate for the specific welding processes			
5	select and confirm that equipment is appropriate and properly prepared for the specific welding/cutting/ grinding processes to be completed			
6	select and prepare compressed gas cutting equipment and grinding equipment for the preparation of pipework materials for welding			
7	use cutting and grinding equipment safely and correctly to prepare pipework materials for welding in accordance with provided welding specifications			
8	confirm that preparations have been completed in line with organisational procedures.			

Outcome 2		Be able to connect pipework by industrial and commercial compressed gas welding		
Criteria		Candidate initials	Assessor initials	Evidence reference
1	confirm that checks have been completed to establish:			
	<ul style="list-style-type: none"> joint preparation 			
	<ul style="list-style-type: none"> welding equipment 			
	<ul style="list-style-type: none"> consumables comply with specifications and are fit for purpose			
2	select and use tools and inspection equipment to carry out compressed gas welding of pipework and confirm they are fit for purpose			
3	weld pipework materials to conform with job specifications on all of the following:			
	<ul style="list-style-type: none"> LCS pipe 			
	<ul style="list-style-type: none"> pipe headers 			
	<ul style="list-style-type: none"> weld-on bends and elbows 			
	<ul style="list-style-type: none"> weld-on tees 			
	<ul style="list-style-type: none"> weld-on flanges 			
	<ul style="list-style-type: none"> weld-on valves 			
	<ul style="list-style-type: none"> butt welds 			
	<ul style="list-style-type: none"> branch welds 			
	weld pipe and fitting by the following joint methods:			
	<ul style="list-style-type: none"> vertical horizontal butt (all positions) 			
	<ul style="list-style-type: none"> horizontal vertical butt 			
	<ul style="list-style-type: none"> fillet 			
4	confirm that welding equipment has been safely isolated after welding activities			
5	conduct industry approved checks and tests on completed work to confirm:			
	<ul style="list-style-type: none"> compliance with specification 			
	<ul style="list-style-type: none"> any defects 			
	<ul style="list-style-type: none"> any corrective action 			
6	verify that waste materials and temporary attachments have been dealt with in line with approved procedures			
7	demonstrate approved methodologies for dealing with and reporting problems:			
	<ul style="list-style-type: none"> within scope of control 			
	<ul style="list-style-type: none"> outside scope of control 			
8	complete relevant documentation including weld test reports.			

Unit 312

Perform industrial and commercial oxy-acetylene pipe jointing techniques

Declaration

I confirm that the evidence supplied for this unit is authentic and a true representation of my own work. The work logged is my own work carried out during my normal work duties.

The answers in the question bank are my own work and discussed with my assessor on completion. 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 the requirements of this unit with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor Name:	
Assessor Signature:	
Date:	

IV Name:	
IV Signature:	
Date:	

Unit 314

Perform industrial and commercial manual metal arc pipe jointing techniques

Level: 3

Credit value: 2

UAN: T/602/4907

Outcome 1	Be able to complete preparation work for industrial and commercial manual metal arc welding activities			
Criteria		Candidate initials	Assessor initials	Evidence reference
1	carry out a risk assessment for welding processes in the work location			
2	carry out a method statement for welding processes in the work location including requirements for:			
	• storage of materials and finished products			
	• availability of service supplies			
	• informing appropriate people at key stages in the welding process			
	• reporting problems			
	• joining procedures			
3	select personal protective equipment appropriate to the work activity being carried out			
4	select and confirm that pipe and materials are appropriate for the specific welding processes			
5	select and confirm that equipment is appropriate and properly prepared for the specific welding/cutting/ grinding processes to be completed			
6	select and prepare cutting and grinding equipment correctly for the preparation of pipework materials for welding			
7	use cutting and grinding equipment safely and correctly to prepare pipework materials for welding in accordance with provided welding specifications.			
8	confirm that preparations have been completed in line with organisational procedures			

Outcome 2		Be able to connect pipework by industrial and commercial manual metal arc welding		
Criteria		Candidate initials	Assessor initials	Evidence reference
1	confirm that checks have been completed to establish:			
	• joint preparation			
	• welding equipment			
	• consumables comply with specifications and are fit for purpose			
2	select and use tools and inspection equipment to carry out manual metal arc welding of pipework and confirm they are fit for purpose			
3	weld pipework materials to conform with job specifications on all of the following:			
	• LCS pipe			
	• pipe headers			
	• weld-on bends and elbows			
	• weld-on tees			
	• weld-on flanges			
	• weld-on valves			
	• butt welds			
	• branch welds			
	weld pipe and fitting by the following joint methods:			
	• vertical horizontal butt (all positions)			
	• horizontal vertical butt			
	• fillet			
4	confirm that welding equipment has been safely isolated after welding activities			
5	conduct industry approved checks and tests on completed work to confirm:			
	• compliance with specification			
	• any defects • any corrective action			
6	verify that waste materials and temporary attachments have been dealt with in line with approved procedures			
7	demonstrate approved methodologies for dealing with and reporting problems:			
	• within scope of control • outside scope of control			
8	complete relevant documentation including weld test reports.			

Unit 314 Perform industrial and commercial manual metal arc pipe jointing techniques

Declaration

I confirm that the evidence supplied for this unit is authentic and a true representation of my own work. The work logged is my own work carried out during my normal work duties.

The answers in the question bank are my own work and discussed with my assessor on completion. 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 the requirements of this unit with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor Name:	
Assessor Signature:	
Date:	

IV Name:	
IV Signature:	
Date:	

On Site Assessment Plan / Feedback



Evidence Reference:	
----------------------------	--

Qualification:
Level:

Qualification number:

Candidate name:
Assessor name:

Date:

Candidate prepared for assessment (Provide details below)	Yes / No	Candidate requires support	Yes / No
Candidate briefed on appeals procedure	Yes / No	Support required	

Assessment Location / Address and postcode:

Type of work to be carried out:

Assessor Feedback:
(Use Assessor continuation sheet if required)

Forward Planning:

Candidate Signature:		
Assessor Signature:		Date:
IV/IQA Name:	IV/IQA Signature:	Date:

On Site Observation Report



Evidence Reference:	
----------------------------	--

Qualification:
Level:

Qualification number:

Candidate name:
Assessor name:

Date:

Candidate prepared for assessment (Provide details below)	Yes / No	Candidate requires support	Yes / No
Candidate briefed on appeals procedure	Yes / No	Support required	

Assessment Location / Address and postcode:

Assessor observation:
(Use Assessor continuation sheet if required)

Outcome/ Criteria

Candidate Signature:		
Assessor Signature:		Date:
IV/IQA Name:	IV/IQA Signature:	Date:

Supplementary Evidence Sheet



Evidence Reference:	
----------------------------	--

Qualification:
Level:

Qualification number:

Candidate name:
Assessor name:

Date:

Unit Number:

Completed by: (please tick)

Candidate	Workplace Recorder	Witness
-----------	--------------------	---------

Written Evidence:

Outcome/ Criteria

Candidate Signature:		
Assessor / Workplace Recorder Name:		
Assessor / Workplace Recorder Signature:		Date:
IV/IQA Name:	IV/IQA Signature:	Date:

Oral Questioning Supplementary Evidence Sheet



Evidence Reference:

Qualification:
Level:

Qualification number:

Candidate name:
Assessor name:

Date:

Unit Number:

Assessor question:

Candidate answer:

Outcome/ Criteria

Candidate Signature:		
Assessor Signature:		Date:
IV/IQA Name:	IV/IQA Signature:	Date:

Photographic Supplementary Evidence



Evidence Reference:	
----------------------------	--

Scheme / Award:

Scheme Number:

Level:

Candidate Name:

Unit Number:

Brief description of task being carried out in the photograph (to be completed by candidate):

(Attach Photo in this Box)

Location of photograph:

Candidate Signature:		
Assessor Signature:		Date:
IV/IQA Name:	IV/IQA Signature:	Date:

Workplace Recorder Details



I confirm I am suitably experienced or qualified in line with the industry requirements to act as a witness for this learner. I acknowledge that I will only counter sign documentation requested by the learner where to my knowledge only the learner has completed the work and on the understanding that the work has been carried out to the acceptable standard.

Workplace Recorder Name:	
Workplace Recorder Signature:	Date:

I confirm I am suitably experienced or qualified in line with the industry requirements to act as a witness for this learner. I acknowledge that I will only counter sign documentation requested by the learner where to my knowledge only the learner has completed the work and on the understanding that the work has been carried out to the acceptable standard.

Workplace Recorder Name:	
Workplace Recorder Signature:	Date:

I confirm I am suitably experienced or qualified in line with the industry requirements to act as a witness for this learner. I acknowledge that I will only counter sign documentation requested by the learner where to my knowledge only the learner has completed the work and on the understanding that the work has been carried out to the acceptable standard.

Workplace Recorder Name:	
Workplace Recorder Signature:	Date:

Assessor Continuation Sheet

On Site Assessment Plan/Feedback

On Site Observation



Evidence Reference:	
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Assessor Briefing and Report	Criteria Observed		Assessment
	Outcome	Criteria	Method

Candidate Signature:		
Assessor Signature:		Date:
IV/IQA Name:	IV/IQA Signature:	Date:

Signature Sheet



Anyone who witnesses and signs a piece of the candidate's evidence must provide a specimen signature in the table below.

Witnesses relationship to candidate eg supervisor, customer, lecturer, assessor	Name	Signature	Date

Appendix 1 Summary of City & Guilds assessment policies

Health and Safety

All centres have to make sure that they provide a safe and healthy environment for learning, including induction and assessment. City & Guilds external verifiers check this when they visit assessment centres.

Equal Opportunities

Your centre will have an equal opportunities policy. Your centre will explain this to you during your induction, and may give you a copy of the policy.

City & Guilds equal opportunities policy is available from our website www.cityandguilds.com, City & Guilds Customer Relations Team or your centre.

Access to assessment

City & Guilds qualifications are open to all candidates, whatever their gender, race, creed, age or special needs. Some candidates may need extra help with their assessment, for example, a person with a visual impairment may need a reader.

If you think you will need alternative assessment arrangements because you have special needs, you should discuss this with your centre during your induction, and record this on your assessment plan. City & Guilds will allow centres to make alternative arrangements for you if you are eligible and if the qualification allows for this. This must be agreed before you start your qualification.

City & Guilds guidance and regulations document *Access to assessment and qualifications* is available on the City & Guilds website www.cityandguilds.com, from the City & Guilds Customer Relations Team or your centre.

Complaints and appeals

Centres must have a policy and procedure to deal with any complaints you may have. You may feel you have not been assessed fairly, or may want to appeal against an assessment decision if you do not agree with your assessor.

These procedures will be explained during induction and you will be provided with information about the Quality Assurance Co-ordinator within your centre who is responsible for this.

Most complaints and appeals can be resolved within the centre, but if you follow the centre procedure and are still not satisfied you can complain to City & Guilds.

Our complaints policy is on our website www.cityandguilds.com or is available from the City & Guilds Customer Relations Team or your centre.

Useful contacts

UK learners

General qualification information

International learners

General qualification information

Centres

Exam entries, Certificates, Registrations/enrolment, Invoices, Missing or late exam materials, Nominal roll reports, Results

Single subject qualifications

Exam entries, Results, Certification, Missing or late exam materials, Incorrect exam papers, Forms request (BB, results entry), Exam date and time change

International awards

Results, Entries, Enrolments, Invoices, Missing or late exam materials, Nominal roll reports

Walled Garden

Re-issue of password or username, Technical problems, Entries, Results, e-assessment, Navigation, User/menu option, Problems

Employer

Employer solutions, Mapping, Accreditation, Development Skills, Consultancy

Publications

Logbooks, Centre documents, Forms, Free literature

T: +44 (0)844 543 0033

E: learnersupport@cityandguilds.com

T: +44 (0)844 543 0033

F: +44 (0)20 7294 2413

E: **intcg@cityandguilds.com**

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

E: **centresupport@cityandguilds.com**

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

F: +44 (0)20 7294 2404 (BB forms)

E: **singlesubjects@cityandguilds.com**

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

E: **intops@cityandguilds.com**

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

E: **walledgarden@cityandguilds.com**

T: +44 (0)121 503 8993

E: **business@cityandguilds.com**

T: +44 (0)844 543 0000

F: +44 (0)20 7294 2413

If you have a complaint, or any suggestions for improvement about any of the services that City & Guilds provides, email: feedbackandcomplaints@cityandguilds.com

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City & Guilds is a registered charity
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LB-01-6188-30