

National Unit Specification: general information

UNIT	Construction Crafts: Plumbing of Sanitary Appliances (Intermediate 2)
CODE	DX0T 11
COURSE	Construction Crafts (Intermediate 2)

SUMMARY

This Unit is an optional Unit within the *Intermediate 2 Construction Crafts Course* and has been designed to be taken as part of that Course.

The Unit is suitable for candidates with no previous plumberwork experience and may also provide progression for candidates who have successfully completed the *Intermediate 1 Construction Crafts Course* or Units.

The Unit is based on practical workshop activities which involve the assembly and installation of a significant piece of standard sanitaryware such as a kitchen sink, a wash hand basin or a WC. Candidates will also install, connect and fix associated pipework to the sanitary appliances. Candidates will select and use of a range of relevant plumberwork tools and materials and develop safe working practices and general skills that will prepare them more fully for the workplace.

Candidates who achieve this Unit should feel confident in widening their experience in plumberwork by taking other Intermediate 2 Units in this trade area.

OUTCOMES

- 1 Select, use and maintain plumbing tools and materials.
- 2 Assemble, fit and fix a sanitary appliance.
- 3 Install pipework to a sanitary appliance.

Administrative Information

Superclass:	TH
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RECOMMENDED ENTRY

While entry is at the discretion of the centre, candidates would normally be expected to have attained one of the following, or equivalent:

- ◆ *Intermediate 1 Construction Crafts: Plumbing Unit*
- ◆ *Intermediate 1 Construction Crafts: Practical Copper Pipework Unit*

CREDIT VALUE

1 credit at Intermediate 2 (6 SCQF credit points at SCQF level 5*).

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

CORE SKILLS

There is no automatic certification of Core Skills in this Unit.

Opportunities for developing aspects of Core Skills are highlighted in *Guidance on Learning and Teaching Approaches for this Unit*.

National Unit Specification: statement of standards

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Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit Specification. All sections of the statement of standards are mandatory and cannot be altered without reference to the Scottish Qualifications Authority.

OUTCOME 1

Select, use and maintain plumbing tools and materials.

Performance Criteria

- (a) Selection of tools and materials is appropriate for the work to be done.
- (b) Tools are used in the correct manner.
- (c) Tools are used solely for the purpose which they are intended.
- (d) Tools are cleaned, maintained and stored correctly.
- (e) Surplus materials are carefully stored correctly.
- (f) Health and safety requirements are complied with during all activities.

OUTCOME 2

Assemble, fit and fix a sanitary appliance.

Performance Criteria

- (a) The appliance is assembled in accordance with manufacturer's instructions.
- (b) The assembled appliance is free from damage and excessive marking.
- (c) The appliance is positioned correctly, levelled and secured in accordance with manufacturer's instructions.
- (d) Associated fittings are fitted and fixed in accordance with manufacturer's instructions.
- (e) A quality check is carried out on the finished work against prescribed standards and tolerances.
- (f) Health and safety requirements are complied with during all activities.

OUTCOME 3

Install pipework to a sanitary appliance.

Performance Criteria

- (a) Pipe material and associated fittings are selected correctly for a given appliance and location.
- (b) Pipework is free from excessive marking.
- (c) Pipework is cut square and free from burrs.
- (d) Pipework is completed using appropriate fittings and in accordance with current industry practice.
- (e) A quality check is carried out on the finished work against the prescribed standards tolerances.
- (f) Health and safety requirements are complied with during all activities.

National Unit Specification: statement of standards (cont)

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EVIDENCE REQUIREMENTS FOR THIS UNIT

Performance evidence is required to show that all Outcomes and Performance Criteria have been achieved.

Performance evidence will be supported by assessor observation checklists. This evidence will be generated from assignments consisting of practical activities carried out in supervised workshop conditions. The evidence may be gathered at different points throughout the Unit. The practical activities will cover:

- ◆ selecting appropriate tools
- ◆ using tools in a correct manner and solely for the purpose for which they are intended
- ◆ cleaning, maintaining and returning tools to store on completion
- ◆ selecting appropriate materials
- ◆ carefully storing surplus materials correctly
- ◆ assembling, fitting, positioning and fixing **one** sanitary appliance in accordance with manufacturer's instructions
- ◆ fitting and fixing associated fittings to the sanitary appliance
- ◆ measuring, cutting, fitting and fixing associated pipework to sanitary appliance in accordance with good practice (both plastic and copper pipework to be covered and each service to a length not exceeding 3 metres; the copper pipework to include forming bends)
- ◆ carrying out a quality check on completed work before submitting for final assessment
- ◆ maintaining a clean and tidy workplace and adhering to health and safety requirements throughout all activities

The NAB item for this Unit provides an assessor checklist and details of the practical assignments to exemplify the national standard. Centres wishing to develop their own assessments should refer to the NAB to ensure a comparable standard.

National Unit Specification: support notes

UNIT Construction Crafts: Plumbing of Sanitary Appliances (Intermediate 2)

This part of the Unit Specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT

The content in this Unit covers plumbing work activities at an introductory level, however, candidates will be working with full-size kitchen and bathroom appliances and the associated pipework they will carry out is realistic in nature. The sanitary appliances will be fixed in position and the pipework will have to be carefully planned and accurately installed in order to connect to the fixed position of the appliances.

In this Unit the candidate is required to develop the ability to select and use tools correctly and safely. At Intermediate 2 candidates will use a variety of tools. It is therefore important that the learning takes place in a supervised workshop/site environment as safe use of tools is an important aspect of this Unit.

Candidates with little or no prior experience in plumbing crafts work will benefit from practice in pipework cutting, bending and jointing exercises. Once they have gained some proficiency in these tasks they can proceed to the more specific tasks required of the Unit.

During the process of practical work the candidate will become accustomed to the use of plumberwork terms and will be able to demonstrate knowledge and understanding of these terms when carrying out practical plumbing tasks. The main content of the Unit will be learning the methods and skills required to assemble, fit and fix an item of sanitaryware with associated fittings and pipework, all in accordance with given drawings or manufacturer's instructions. Candidates should be taught good working practices at each stage and should learn how to carry out a quality check on their own work at suitable intervals and on completion.

Outcome 1 requires the candidate to select tools, and to handle, transport, position, and store both tools and materials. Materials used will include copper and plastic pipes and fittings and the sanitary appliances themselves along with their own particular fittings and fixings. Candidates will use standard plumbing tools and proprietary pipecutters.

Outcome 2 covers the assembly of sanitary appliances. This normally requires assembly in accordance with a particular manufacturer's instructions. However, having learned how to follow one set of instructions, candidates are likely to be in a good position to interpret instructions for a different appliance or the same type of appliance from a different manufacturer. Techniques in fixing appliances to wall and floor surfaces may differ according to the nature of the background or surface. Candidates should become familiar with a small variety of fixing types.

Outcome 3 requires the candidate to install pipework to the assembled and fixed sanitary appliance. Both copper and plastic pipework will be included. Candidates will learn the requirements for supply, waste and overflow pipes as is relevant to each appliance and will practise these installations. Sundry fittings such as valves should be included in pipework assemblies. Copper pipework installations will include forming bends in pipework. Care should be taken in the planning of pipework routes to the appliance and in measuring pipework to length for connections. Pipework will include joints in the running length as well as pipeclips as required. The overall pipework assembly must be built to given standards and tolerances. Candidates will carry out a quality check on their own work against the tolerances given.

National Unit Specification: support notes (cont)

UNIT Construction Crafts: Plumbing of Sanitary Appliances (Intermediate 2)

In addition to the vocational content in this Unit, candidates should be encouraged to develop the general work practices and attitudes which are valued by employers. These employability skills should be delivered as an integral part of the Unit. Opportunities will arise in various practical contexts to discuss the value of, for example, good time-keeping and attendance; thorough planning and preparation, working co-operatively and in small teams; acknowledging safe systems of work; maintaining a clean, tidy and organised workplace; checking own work to ensure it is of an appropriate standard; adopting a positive attitude to learning; demonstrating a willingness to follow instructions and taking a positive attitude to feedback on performance.

Candidates should learn about waste minimisation and sustainability. In a practical way they can contribute to this by careful use of materials and by promptly returning surplus materials to the store.

Relevant aspects of current health and safety legislation, current COSHH Regulations, manual handling legislation and any systems of work relevant to the candidates' workshop/workplace should be explained and adhered to as part of the work of this Unit. Candidates should be helped to appreciate the requirement to be clean, presentable and appropriately dressed for the workshop. The wearing of Personal Protective Equipment (PPE), including protective clothing when required, should be emphasised.

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Experiential learning is the main approach recommended for this Unit. This involves learning through practical experiences and activities. For example, one of the key aspects of this Unit is that candidates learn how to use plumbing tools and materials in a correct and safe manner. This can best be achieved by candidates actually undertaking practical plumbing activities in a supervised workshop environment.

Experiential learning also involves reflecting on experiences/activities, identifying strengths and areas for improvement. It is important to encourage candidates throughout this plumbing Unit to evaluate their own work and progress. They should be encouraged to seek advice and set themselves goals to build confidence and competence in undertaking tasks. Teaching candidates how to use checklists containing realistic standards and tolerances will help them to evaluate their practical plumbing skills. They will also require constructive feedback on peripheral aspects of the plumberwork task such as using tools, planning and setting out the work area and health and safety procedure. Often such feedback is best delivered on a one-to-one basis.

Candidates who undertake this Unit at Intermediate 2 with little or no prior experience of practical plumberwork may benefit from extra practice in pipe jointing exercises. They should learn how to cut, bend and connect pipework as well as the work in connection with the installation of sanitary appliances. The time taken developing competence in the different aspects of pipe installations will permit candidates to move with confidence to the more complex work in fabricating pipework installations for a fixed kitchen or bathroom appliance.

Checking standards of work against prescribed tolerances is a very useful skill and habit that candidates will develop during the Unit. For example, in undertaking various plumbing practical exercises, candidates should check that all work is completed accurately and within measured tolerances. The construction industry is very keen on producing work that is 'right first time' and quality checks are an inherent part of the work in the industry. Candidates can be encouraged to approach their work with care and build in a checking process as part of good practice.

National Unit Specification: support notes (cont)

UNIT Construction Crafts: Plumbing of Sanitary Appliances (Intermediate 2)

During the delivery of this Unit candidates should be encouraged to learn and use common plumbing terms with a view to helping them remember these terms. This will help discussions of technical matters with tutors.

Individual candidates should be encouraged to use and develop techniques suited to their own physical strengths and abilities. Nevertheless, good trade practice should be emphasised at all times.

It is recommended that, prior to candidates commencing any practical activity, that the teacher/lecturer demonstrates the correct and safe way to undertake the activity. Candidates should also be provided with simple diagrammatic drawings of exercises to assist them in undertaking these practical tasks.

Responsible, safe behaviours in the workplace can be demonstrated and practised as part of the essential work routine, for example: candidates will learn that leaving plumbing tools, equipment and materials randomly around a workspace could be a tripping hazard. Candidates will learn how to use tools and equipment in a safe manner and the correct ways to clean and maintain tools. Daily routines in the workplace will include ongoing hazard identification and the maintenance of a clean and tidy workspace.

Opportunities for developing aspects of Core Skills should be incorporated where they arise naturally in the teaching and learning process. For example, candidates will be required to read instructions for work activities, including information about different materials and jointing compounds; they will also take part in discussions with peers and tutors regarding work activities, interpretation of drawings, materials, use of tools and workshop protocols. They will need to demonstrate, at all times, clear and courteous communication with their peers, supervisors and technicians. All of these activities present opportunities for developing oral and reading communication skills.

Opportunities for developing other aspects of Core Skills will arise when candidates measure and cut pipes and make allowances for the length of fittings. It will be particularly important to get measurements to fixed positions correct. These will include dimensions to fixed appliances such as the waste outlet or incoming cold water connection for a wash hand basin. These are all aspects of Numeracy.

Sanitary appliances are sometimes awkward to manually handle and manoeuvre into position. This may require two or more people to cooperate in lifting the appliance and provide opportunity to develop skills in Working with Others.

Where this Unit is taken alongside the *Intermediate 2 Construction Crafts: Employability Skills Unit*, candidates will have additional opportunities to develop an awareness of the general work practices and attitudes that employers value. Integrated activities will involve the candidate assessing his/her own performance on time-keeping and attendance, planning and preparation, working co-operatively and in teams, maintaining a tidy and safe work area, checking own work, demonstrating a positive attitude to learning, showing a willingness to follow instructions and responding positively to feedback on performance. Candidates will also seek the views of teachers/lecturers and will identify areas for improvement and take responsibility for action plans. These activities will add value to the candidate's experience and help to enhance employability.

National Unit Specification: support notes (cont)

UNIT Construction Crafts: Plumbing of Sanitary Appliances (Intermediate 2)

Outcome 1 should be integrated with Outcomes 2 and 3. Candidates can naturally select, use and manage hand tools, equipment and materials when carrying out practical plumberwork tasks. Where it is possible to do so, underpinning knowledge should be integrated with practical activities in the workshop or project area. Nevertheless, underpinning knowledge is not separately assessed in this Unit. Applied knowledge is assessed by observation as candidates complete each practical task.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

It is expected that candidates will be given as much practice as possible in practical plumbing techniques prior to being set the assessment tasks. This is important in this Unit because candidates are dealing with sizeable kitchen or bathroom appliances and if they are incorrectly handled or not fixed correctly the whole exercise could be jeopardised and even be hazardous.

The Evidence Requirements for the Unit detail the quality and quantity of practical work to be produced for the Unit assessment. Standards required from the assessment tasks are significantly less onerous than those required by National Occupational Standards. Nevertheless, such an approach introduces candidates to the kind of quality regime they will experience if and when they pursue a career as a plumber in the construction industry.

The assessment of all three Outcomes can be integrated since completing the practical activities required for Outcomes 2 and 3 also provides evidence that candidates can meet the requirements of the Outcome 1 regarding the selection and use of tools, equipment and materials.

Examples of the kind of activities that could be used for the assessment of this Unit would be the assembly, fitting and fixing of **one** of the following:

- ◆ a wash hand basin
- ◆ a kitchen sink
- ◆ a shower tray and showerhead
- ◆ a WC complete with pan and cistern

In each case the relevant standard fittings would be fitted by the candidate. For example, the wash hand basin would require a waste, handwheels (taps) and a plug and chain.

Candidates would also be required to install and connect the soil or waste pipework or overflow where applicable, plus one other piped service to the appliance, for example, the cold supply or hot supply.

Assessor observation checklists and other assessment records should be maintained and kept up to date to keep track of candidate progress and to provide evidence for internal and external moderation purposes. The NAB for this Unit provides an assessor observation checklist.

Centres may develop their own instruments of assessment but these must be of a comparable standard to the NAB. Pre-moderation of own instruments of assessment by the SQA is strongly recommended.

National Unit Specification: support notes (cont)

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(Intermediate 2)

CANDIDATES WITH DISABILITIES AND/OR ADDITIONAL SUPPORT NEEDS

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering alternative Outcomes for Units. Further advice can be found in the SQA document *Guidance on Assessment Arrangements for Candidates with Disabilities and/or Additional Support Needs* (www.sqa.org.uk).