

TRADE OF  
**Pipefitting**

PHASE 2

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Module 4

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Pipe Installation

UNIT: 6

**Piping System Assembly**

*Produced by*

**SOLAS**

**An tSeirbhís Oideachais Leanúnaigh agus Scileanna**  
Further Education and Training Authority

*In cooperation with subject matter expert:*

Finbar Smith

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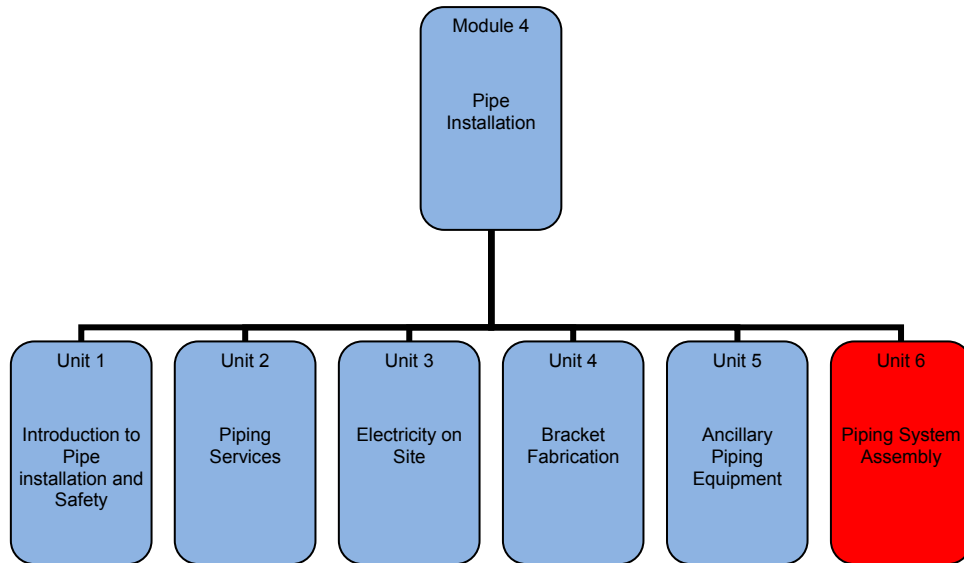
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## Unit Objective

There are six Units in Module 4. Unit 1 focuses on Introduction to Pipe Installation and Safety, Unit 2; Piping Services, Unit 3; Electricity on Site, Unit 4; Bracket Fabrication, Unit 5; Ancillary Piping Equipment and Unit 6; Piping system assembly.

This unit identifies how best to approach a practical task and how proper planning and preparation can help contribute to ensuring a project is completed on time.



## Learning Outcome

By the end of this unit each apprentice will be able to:

- Read and interpret engineering drawings as per Exercise No.s 2.4.6a, 2.4.6b, 2.4.6c, 2.4.6d and 2.4.6e in orthographic projection.
- Quantify materials for given project and complete BOM as per Exercise No.s 2.4.6a, 2.4.6b, 2.4.6c, 2.4.6d, 2.4.6e, 2.4.6f and 2.4.6g
- Plan work sequence section of the project.
- Gather pipe, fittings and components required to make Spools 1 and 2 as per BOM.
- Mark out, cut, thread, fit and assemble components for Spool 1 and 2 as per Exercise No.s 2.4.6a and b.
- Gather pipe, fittings and components required to make Spool 3 as per BOM.
- Mark out, cut, glue, fit and assemble components for Spool 3 as per Exercise No. 2.4.6c
- Gather pipe, fittings and components required to make Spool 4 as per BOM.
- Mark out, cut, fit, assemble components and tighten compression joints for Spool 4 as per Exercise No. 2.4.6d.
- Gather pipe, fittings and components required to make 20L vessel as per BOM.
- Mark out, cut, fit and weld components for 20L vessel as per Exercise No. 2.4.6e
- Gather pipe, fittings and components required to make heat exchanger as per BOM.
- Mark out, cut, fit and weld components for heat exchange as per Exercise No. 2.4.6f
- Assemble and bracket piping system assembly as per Exercise No. 2.4.6g
- Prepare and pressure test pipe assembly.
- Dismantle piping system assembly and restock reusable parts.

# 1.0 Piping System Assembly

## Key Learning Points

- Read and interpret engineering drawings for the project.
- Quantify materials for the given project and complete an accurate Bill of Materials for the project
- Plan a correct sequence of work for the project
- Assemble all the required tools and materials required to complete the project
- Mark out, cut, fit and weld all the components required to complete the project
- Test all pipework and assemble all components to complete the project.

## Practical Task

*This is a practical task. Please refer to relevant sections of the course notes and your instructor for additional information and instruction.*

# 1.1 Exercise No. 2.4.6a

MTO	
It	Description QTY
1	1 1/2" RF BSP Flange m/s 1
2	1 1/2" BSP Barrel Nipple m/s 2
3	1 1/2" BSP Elbow m/s 1
4	1 1/2" BSP Ball Valve m/s 1
5	1 1/2"x1" Reducing Bush m/s 1
6	1" BSP Barrel Nipple m/s 1
7	1" BSP Union m/s 1

DIMENSIONS	GEN.TOL	SCALE	MATERIAL	DRG.NO
mm	±	NTS	—	2.4.6a
TITLE				FILE
SPOOL 1				PF20406a
DO NOT SCALE	PH:2	MOD:4	SHEET 1 OF 1 SHEETS	

## 1.2 Exercise No. 2.4.6b

Item	Description	QTY
1	1 1/2" RF BSP Flange Galvanised m/s	1
2	1" BSP Barrel Nipple Galvanised m/s	3
3	1"x1/2" Screwed BSP Red Tee Galvanised m/s	2
4	1" BSP Union Galvanised m/s	1

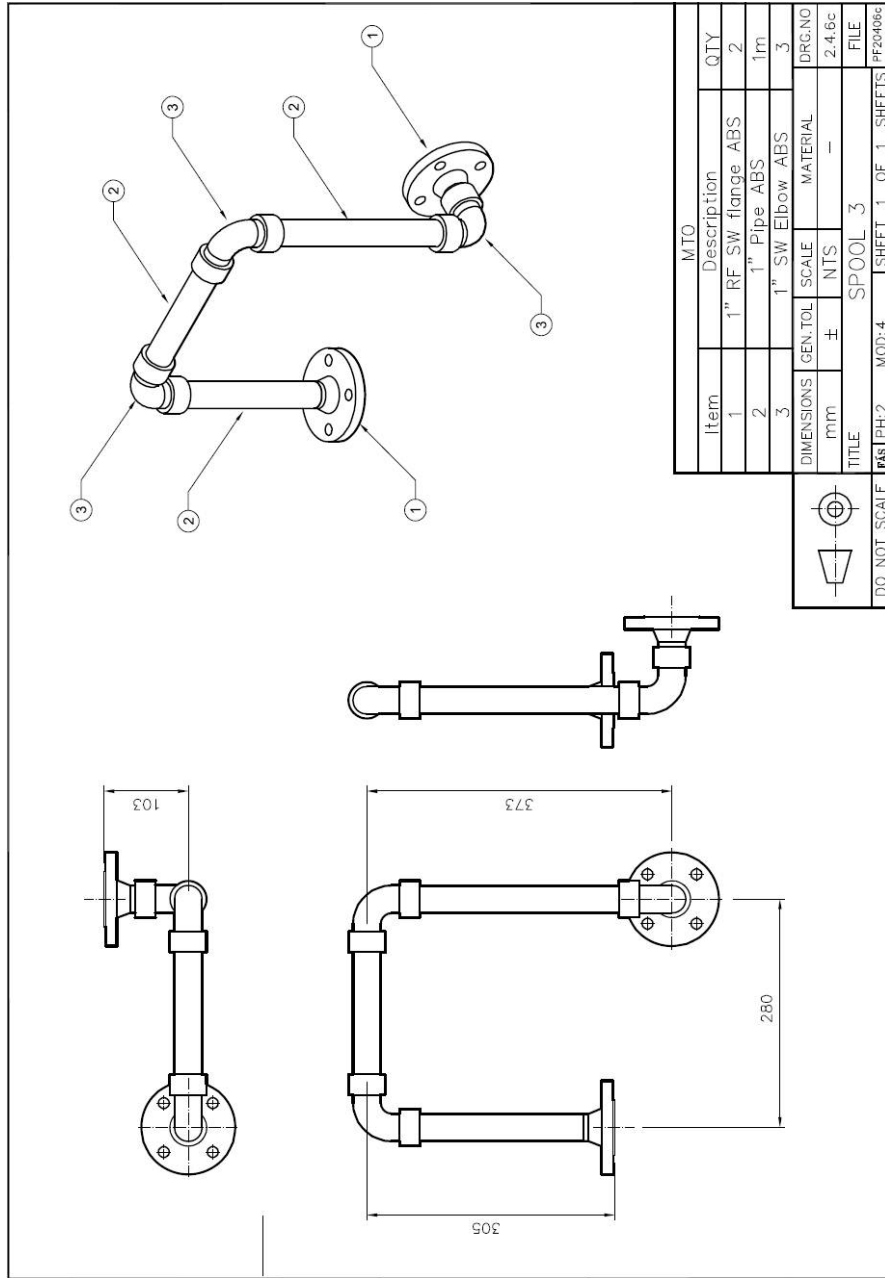
DIMENSIONS	GEN:TOL	SCALE	MATERIAL	DRG:NO
mm	±	NTS	—	2.4.6b

TITLE	PH:2	MOD:4	SHEET 1	OF 1	SHEETS	FILE
SPOOL 2						PF20408b



### 1.3 Exercise No. 2.4.6c

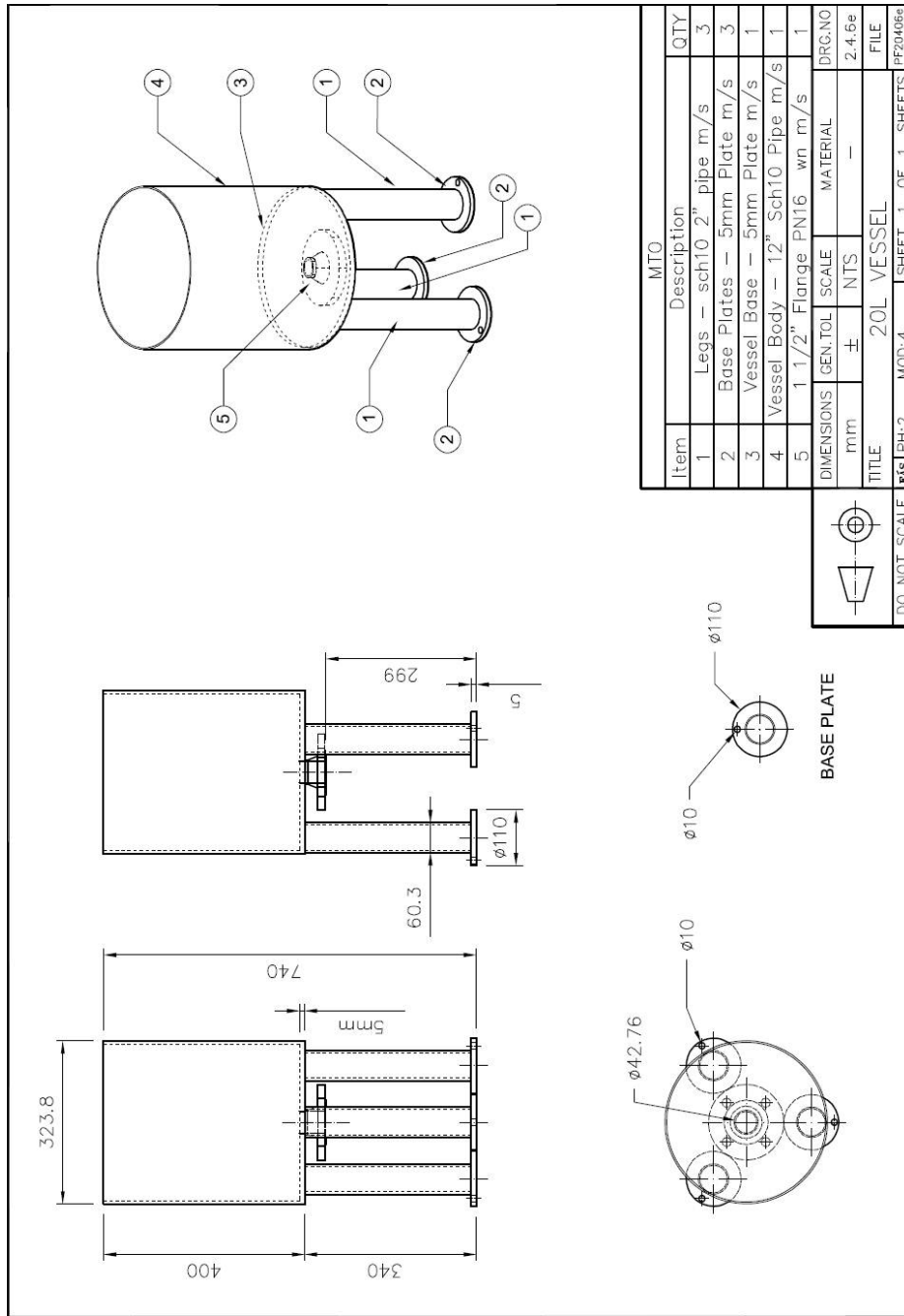


### 1.4 Exercise No. 2.4.6d

MTO		Item	Description	QTY
1	1"	RF BSP Flange	m/s	1
2	1"	BSP Male x 1" Compression	Brass	1
3	1"x1/2"	Compression Reducing	Tee Brass	1
4	1"	Compression Elbow	Brass	4
5	1"	Copper Tube	2m	
6	1"	Compression Ball Valve	Brass	1
7	1/2"	Compression Ball Valve	Brass	2

DIMENSIONS:	GEN. TOL	SCALE	MATERIAL	DRG. NO.
	±	NTS	—	2.4.6d
DO. NOT SCALE	PH:2	MOD:4	SPOOL 4	
TITLE			SHEET 1 OF 1 SHEETS	
FILE			PF20406d	

## 1.5 Exercise No. 2.4.6e

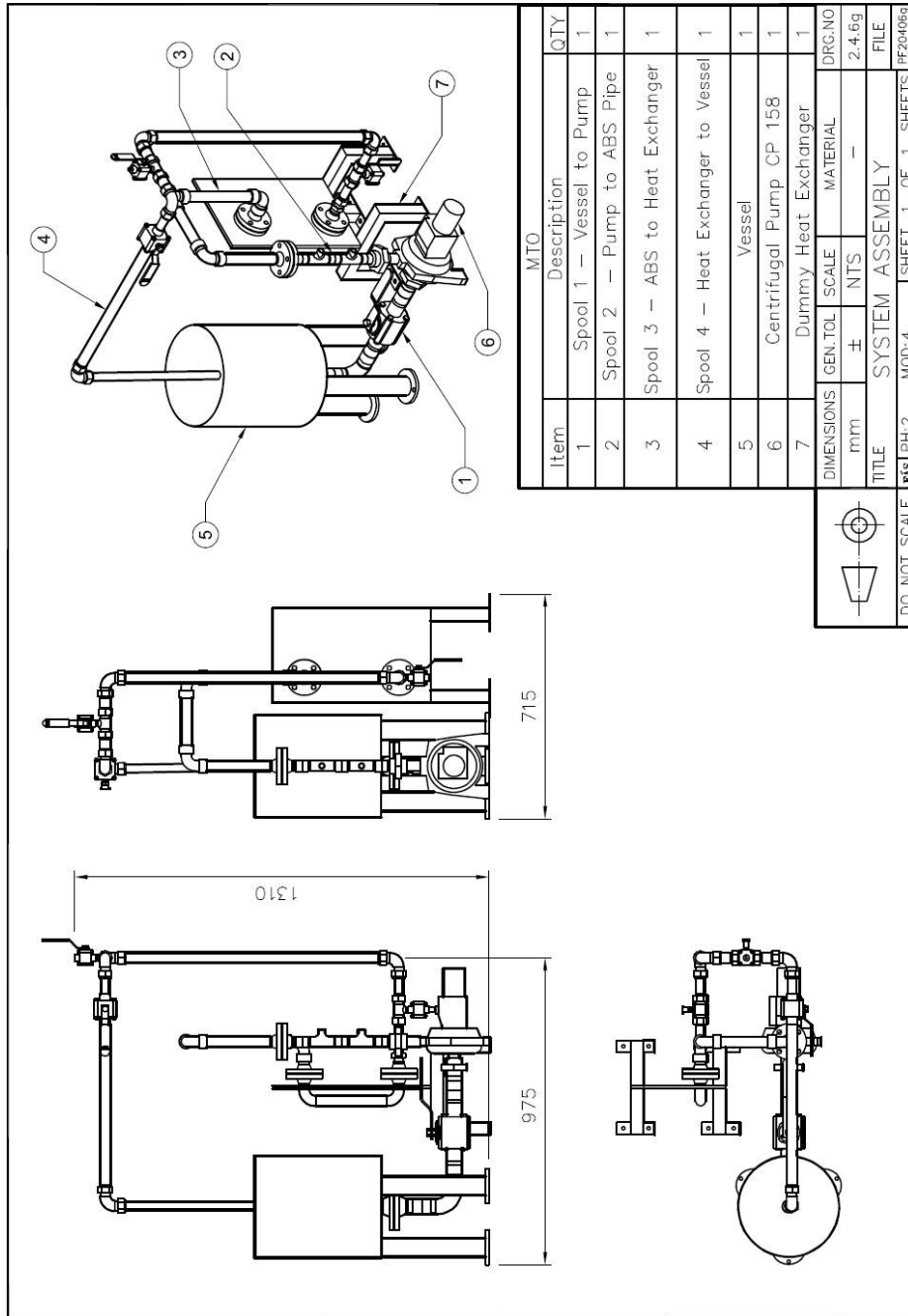


## 1.6 Exercise No. 2.4.6f

MTO		
Item	Description	QTY
1	1 1/2" Box Section x 2mm thk m/s	2
2	1" Sch 10 BW Elbow m/s	2
3	1" Sch 10 Pipe m/s	1
4	1" RF WN Flange m/s	2
5	5mm Plate m/s	1

DIMENSIONS	GEN. TOL	SCALE	MATERIAL	DRG. NO
mm	±	NTS	—	2.4.6f
TITLE DUMMY HEAT EXCHANGER				FILE
DO NOT SCALE	PAS PH:2	MOD:4	SHEET 1 OF 1 SHEETS	PF20406f

# 1.7 Exercise No. 2.4.6g



# Exercises

Complete practical project as directed in exercise sheets 2.4.6a to 2.4.6g

## Additional Resources

Title	Author	Ref. Code
The Induction Book, “ <i>Code of Behaviour &amp; Health &amp; Safety Guidelines</i> ”	SOLAS	
Basic Welding and Fabrication	W Kenyon	ISBN 0-582-00536-L
Fundamentals of Fabrication and Welding Engineering	FJM Smith	ISBN 0-582-09799-1
<i>Workshop processes, practices and materials</i> , 3 <sup>rd</sup> edition, Elsevier Science & Technology	Black, Bruce J 2004	ISBN-13: 9780750660730
New Engineering Technology	Lawrence Smyth & Liam Hennessy	ISBN 086 1674480

### Videos:

- Understanding welding fumes
- Welder on Site...Be Aware (Vocam)
- Powered hand tool safety (Vocam)
- Industrial Ergonomics (Vocam)

Available from:

***Vocam Ireland***

***Circle Organisation Ltd***

***Friar Street, Thurles, Co Tipperary, Ireland***

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