FAKULTI TEKNOLOGI KEJURUTERAAN ELEKTRIK DAN ELEKTRONIK

PROJECT : Commersial Offer

1.0	BVI 1112 TECHNOLOGY SKILL & DEVELOPMENT IN ELECTRONIC AUTOMATION I

BIL	NO ID	NAME
1	VC24002	DERIWAN AKHMAL BIN MOHD NASIR
2	VC23047	SYAMSUL ARIFIN BIN AWI BOWO

TABLE OF CONTENT

CONTENTS	PAGES
1.0 INTRODUCTION	1
2.0 OBJECTIVE	1
3.0 TECHNICAL PROPOSAL	1 – 14
4.0 QUOTATION SUMMARY	15
5.0 BILL OF MATERIAL (BOM)	16 - 17
6.0 LABOR COST	18
7.0 CONSUMABLE COSTS	18 – 19
8.0 TRAINING COSTS	19
9.0 TERM & CONDITIONS OF THE SUPPLY	19 – 21
10.0 PROJECT ORGANIZATION CHART	21
10.1 ROLE and RESPONSIBILITY OF THE TEAM	22 – 23
11.0 GANTT CHART	24
11.1 DETAILED BREAKDOWN of ACTIVITIES	25 - 26

1.0 INTRODUCTION

This project is to upgrade an existing mini plant by changing from a conventional relay control system to a modern PLC control system. Upgrading process includes replacing 1 induction motor and 6 directional valve to 7 induction motor controlled by PLC using brand Siemens. The technical proposal focuses on setup an electrical diagram of three phase motor system. It includes key component like main control panel VAC, 24VDC Control Voltage, Emergency Stop features and a Siemens PLC system. It also includes Commercial Offer which is BOM, Labor Cost, Consumable Cost, Training Cost and Terms & Conditions Supply of the project.

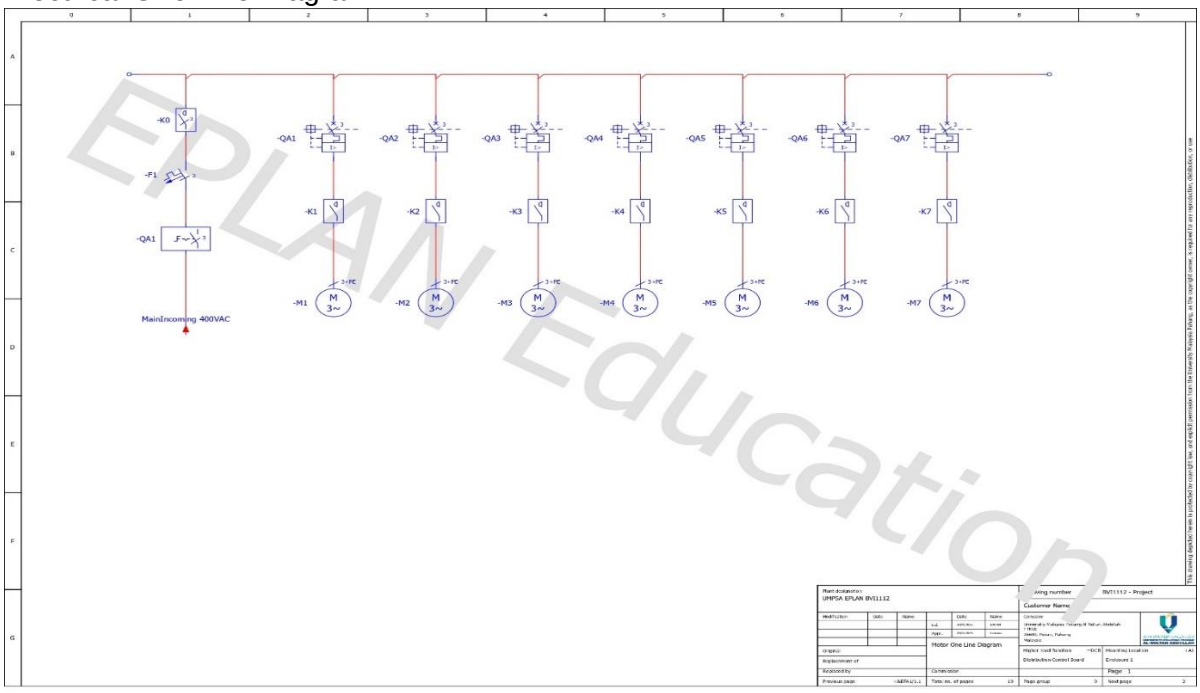
2.0 OBJECTIVE

i) Make the process more automated and reliable
ii) Improve the system flexibility and make it easier to maintainance
iii) Boost performance and efficiency by using PLC control based
iv) Provide technical and commercial offer to ensure the project overview is clear

3.0 TECHNICAL PROPOSAL

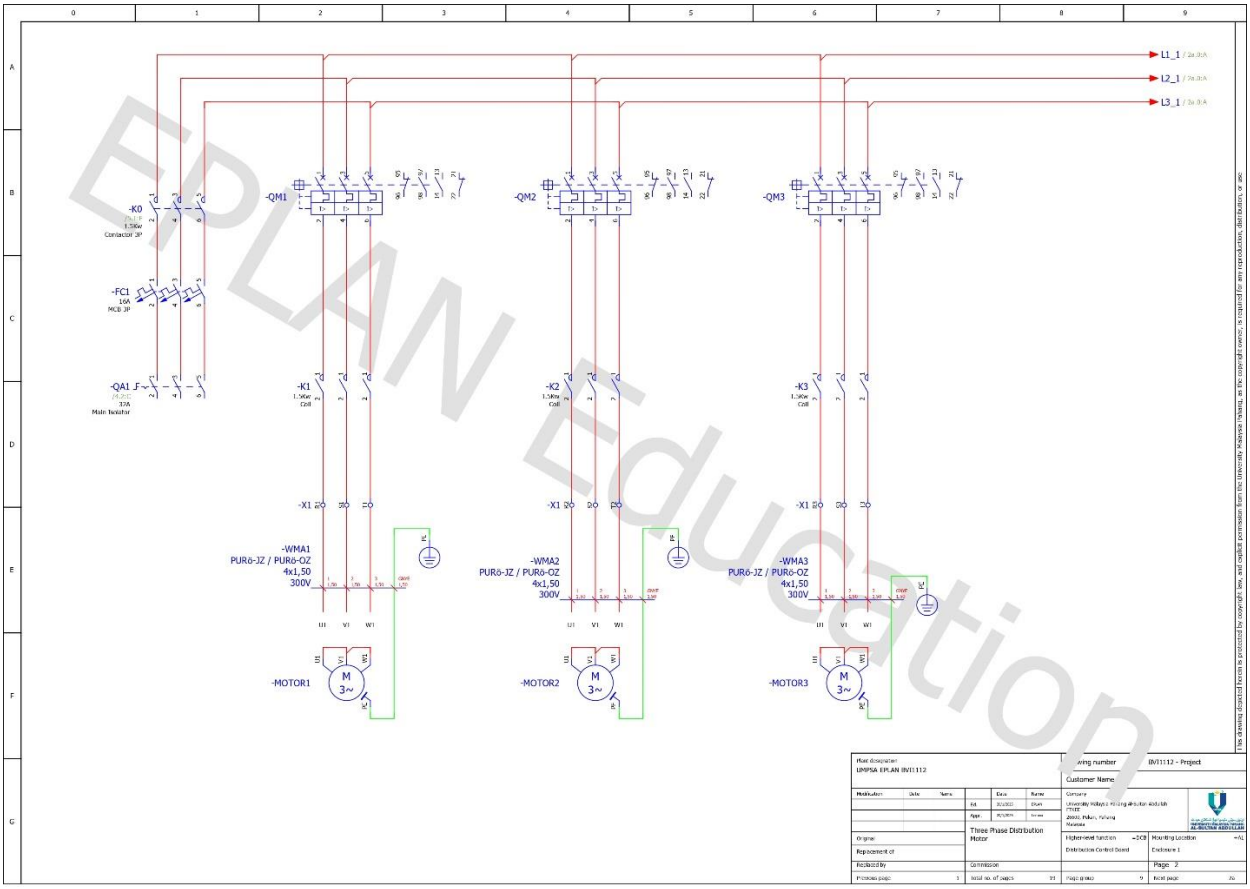
All technical drawing are provided below:

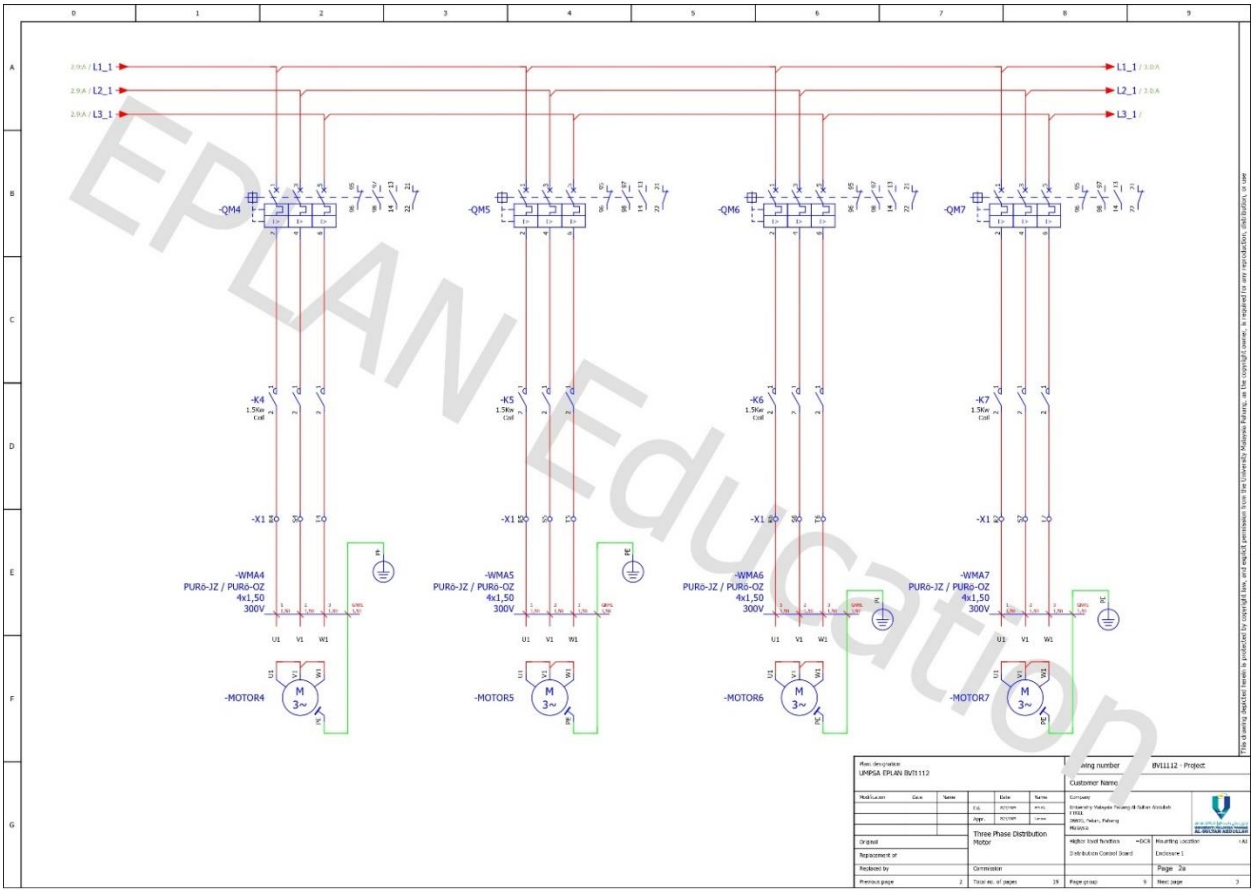
1) Electrical One Line Diagram



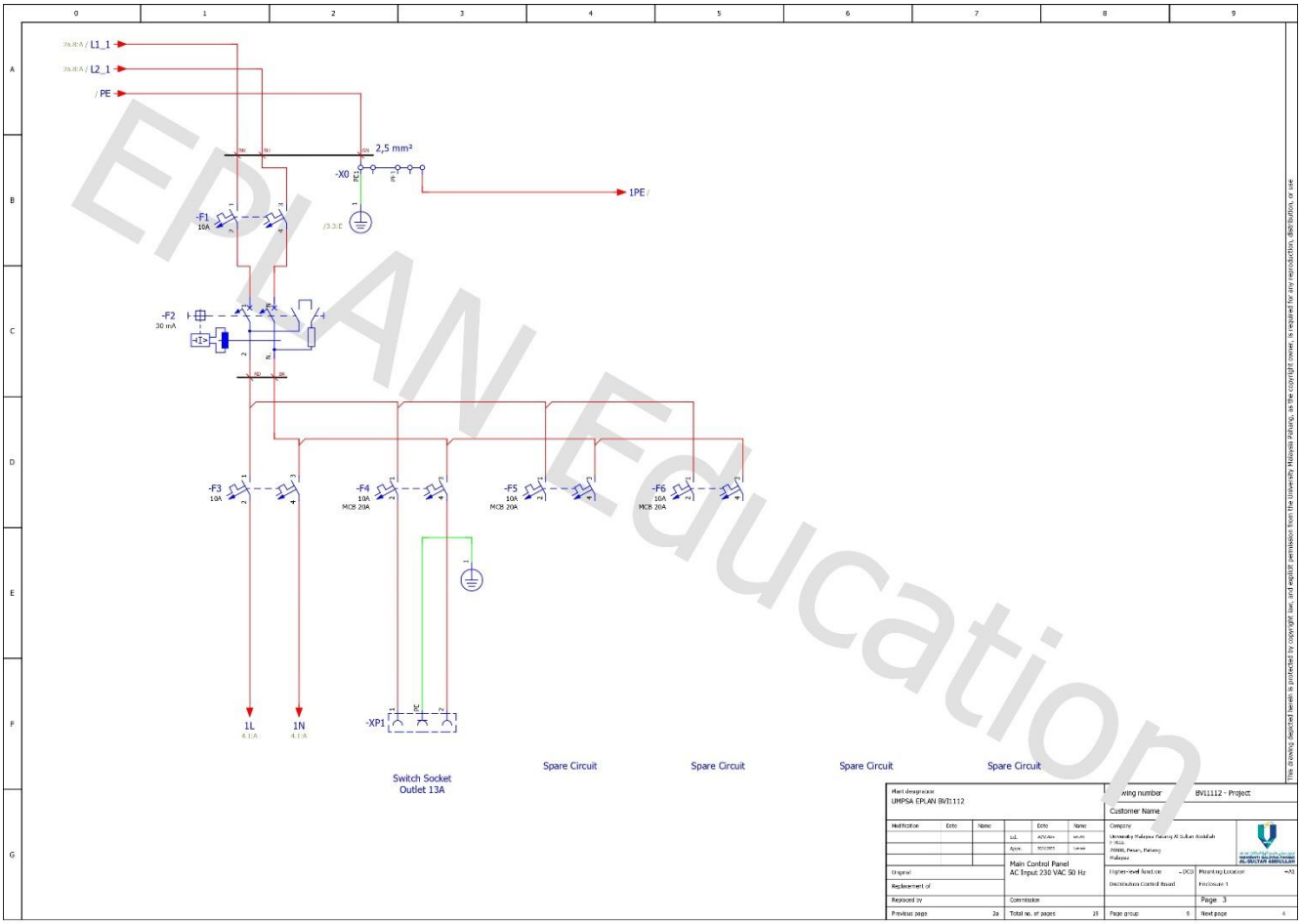
2) Schematic Diagram

a) Three phase distribution motor

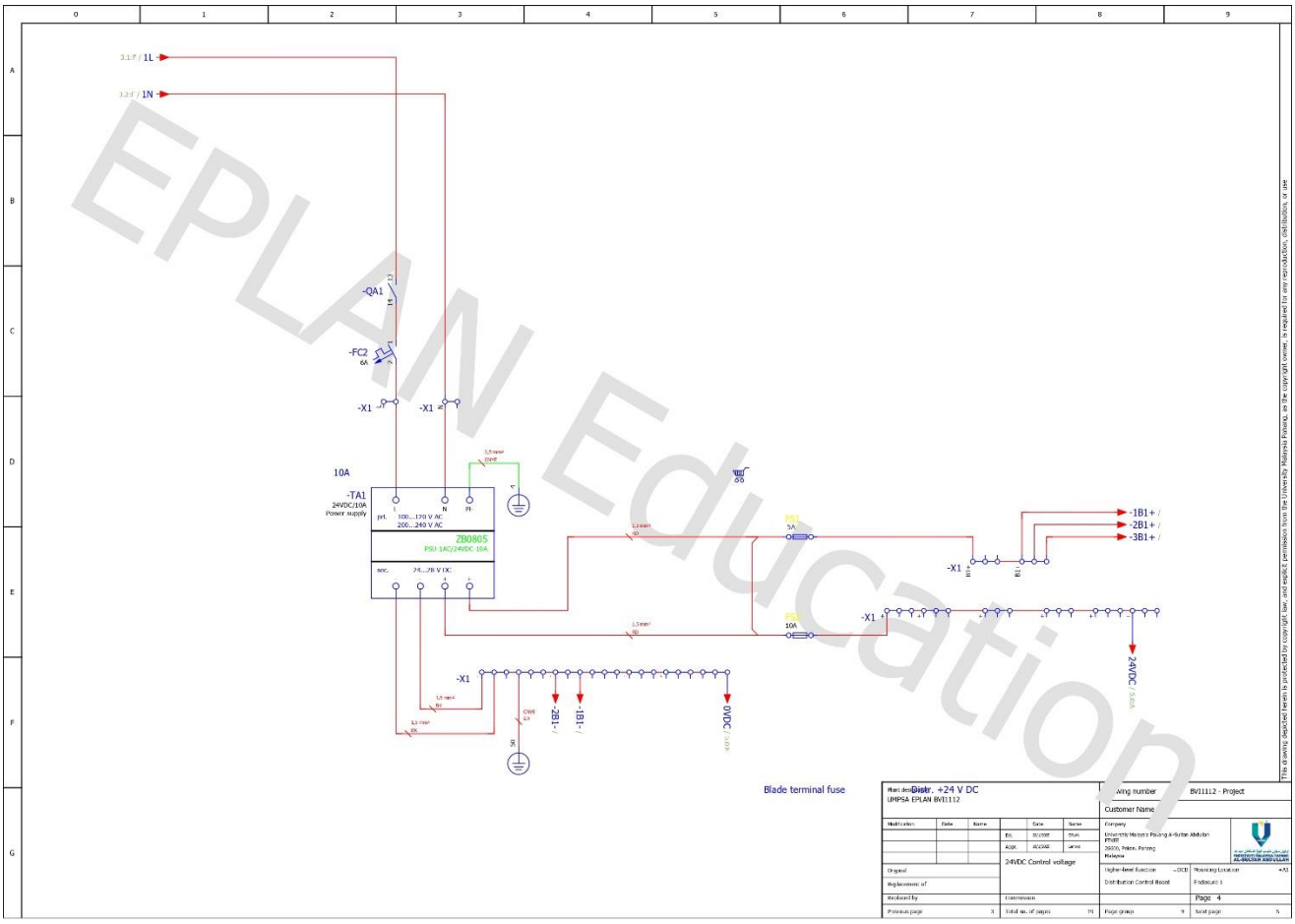




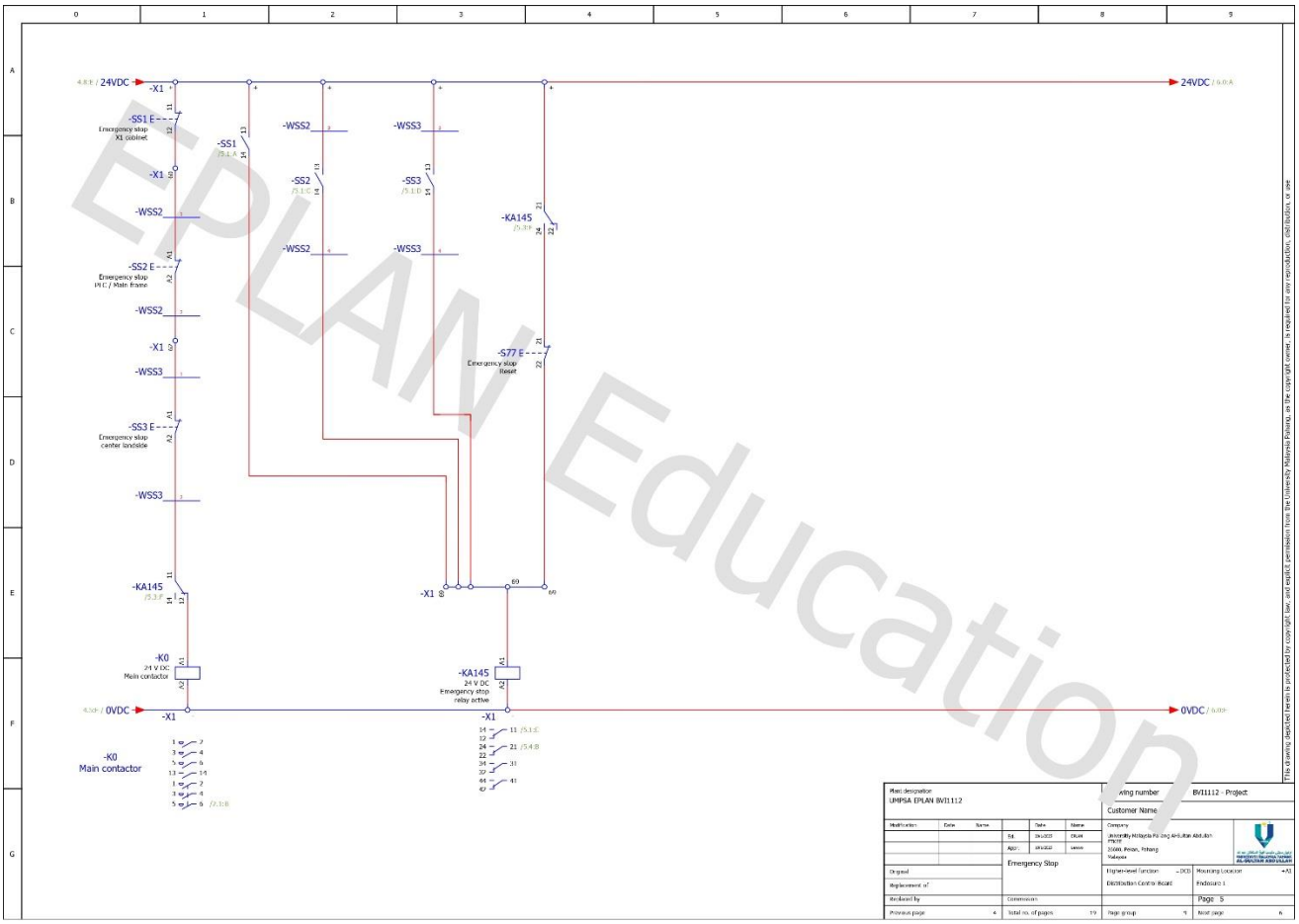
b) Main Control Panel AC Input 230 VAC 50 Hz



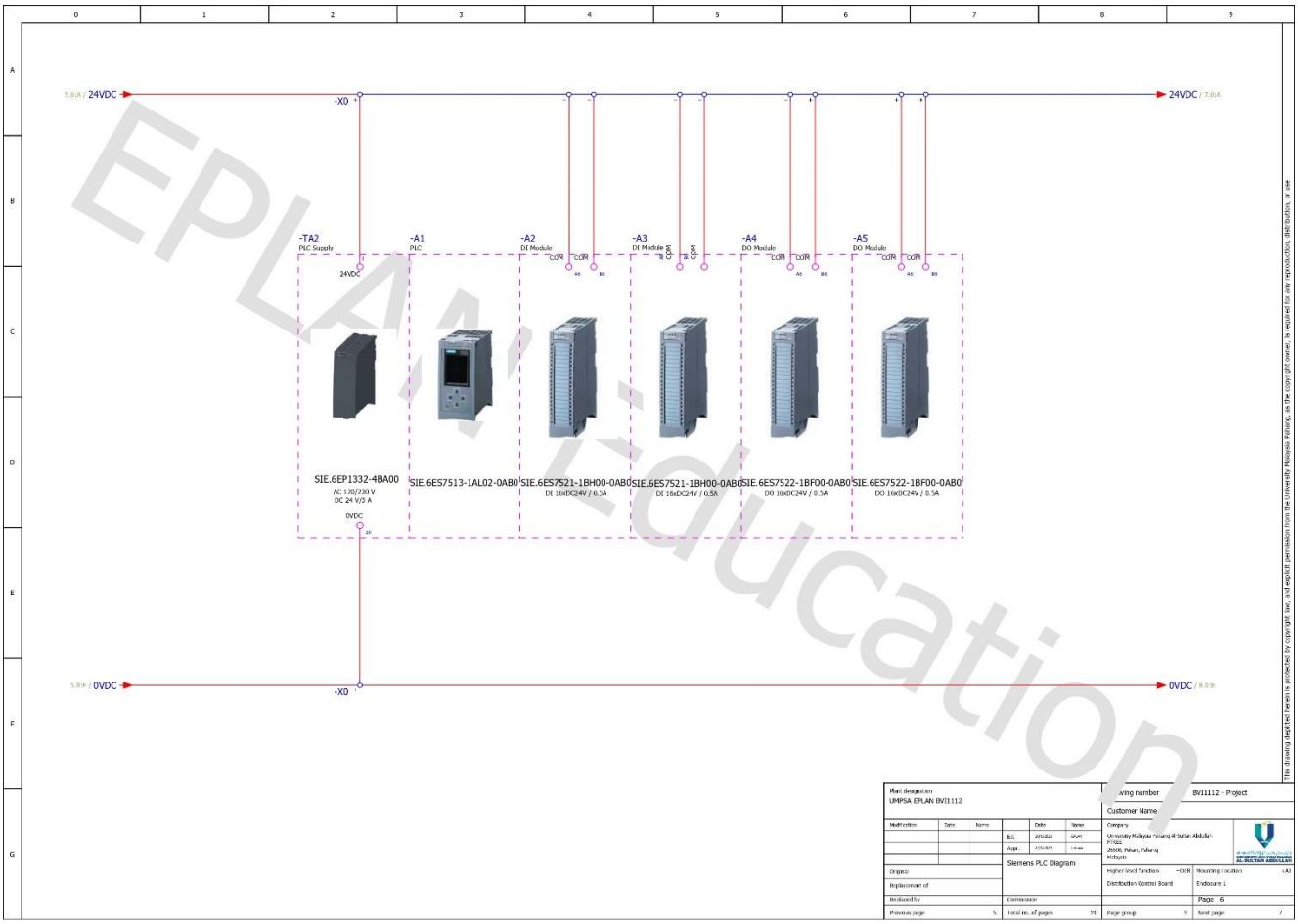
c) 24VDC Control Voltage



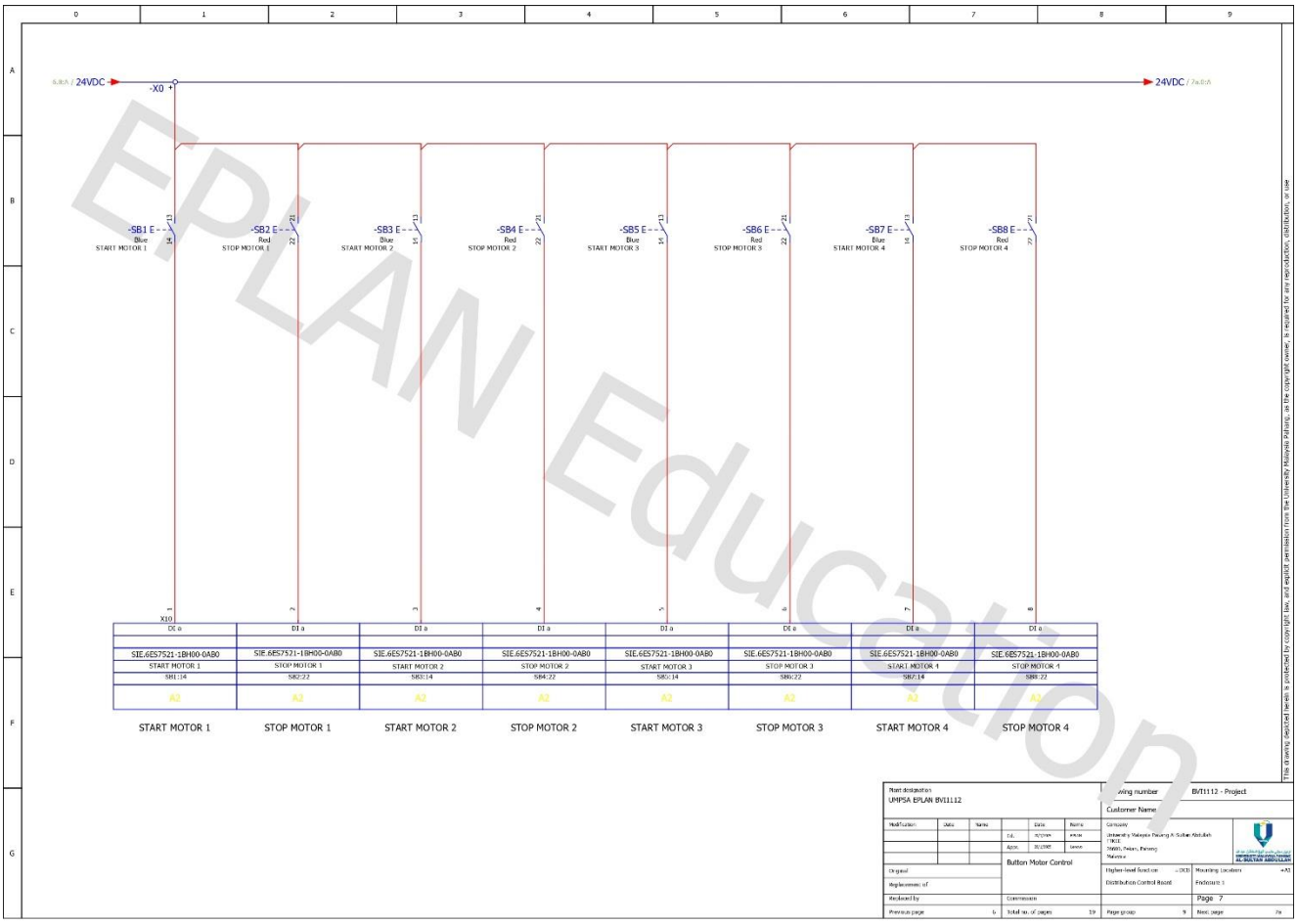
d) Emergency Stop

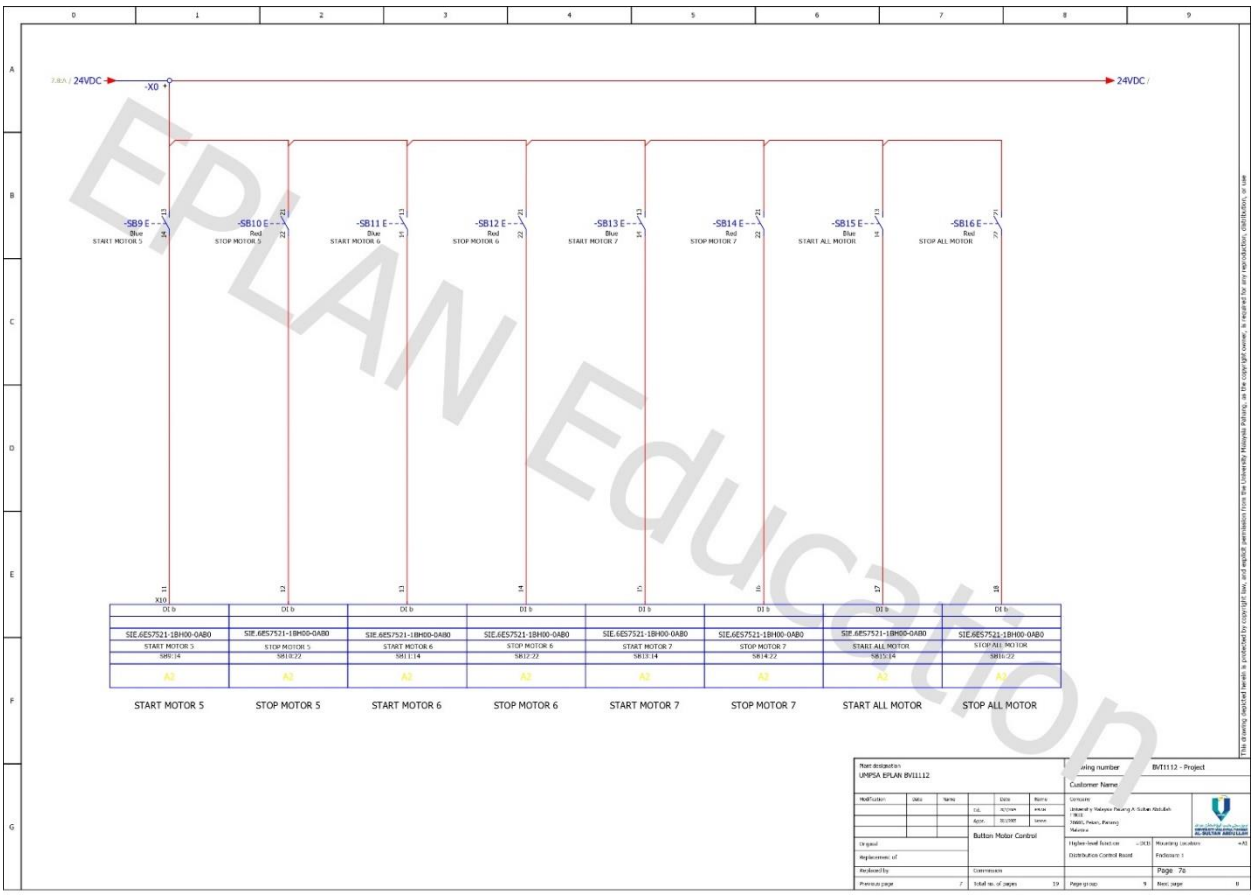


e) Siemens PLC Diagram

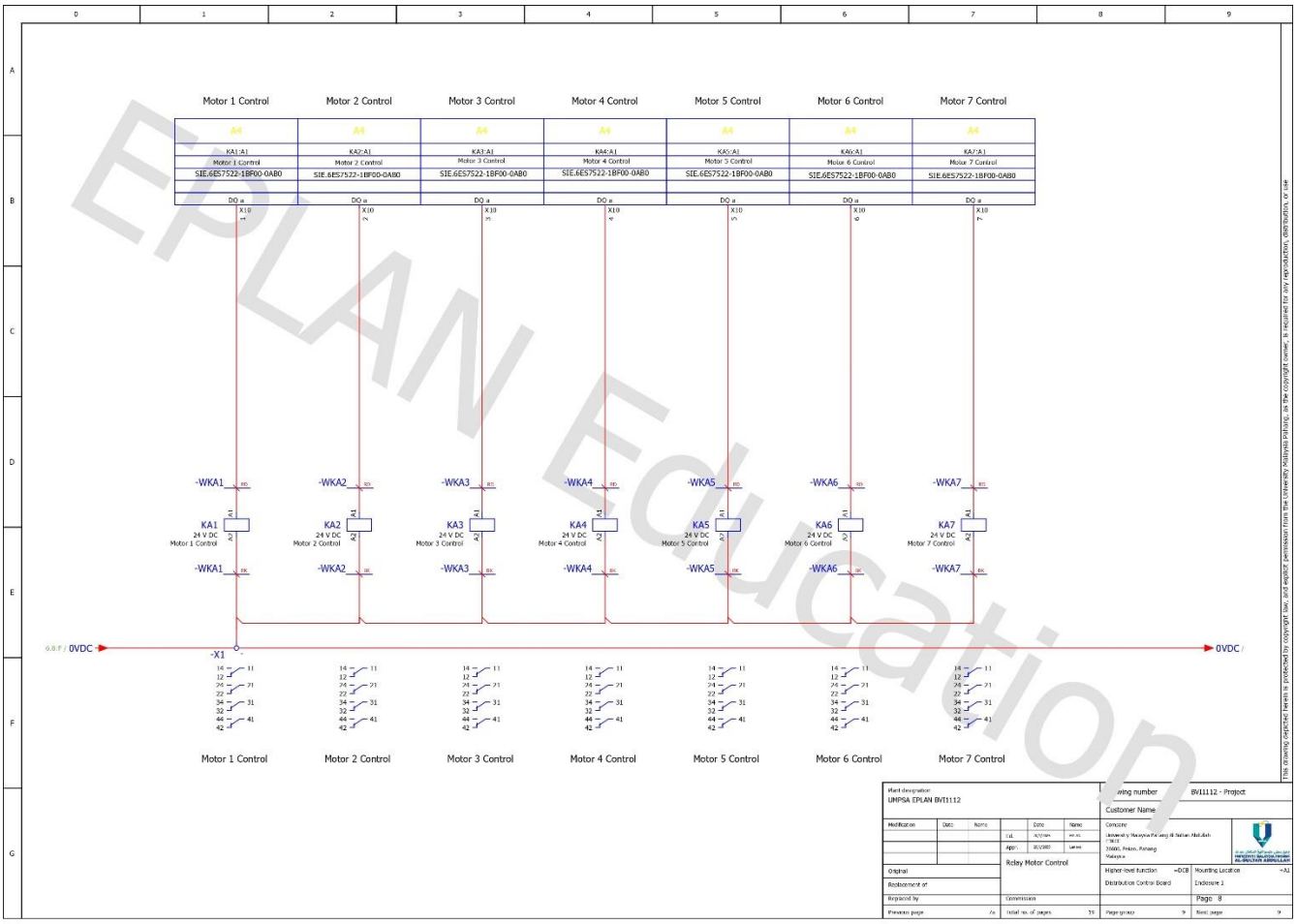


f) Button Motor Control

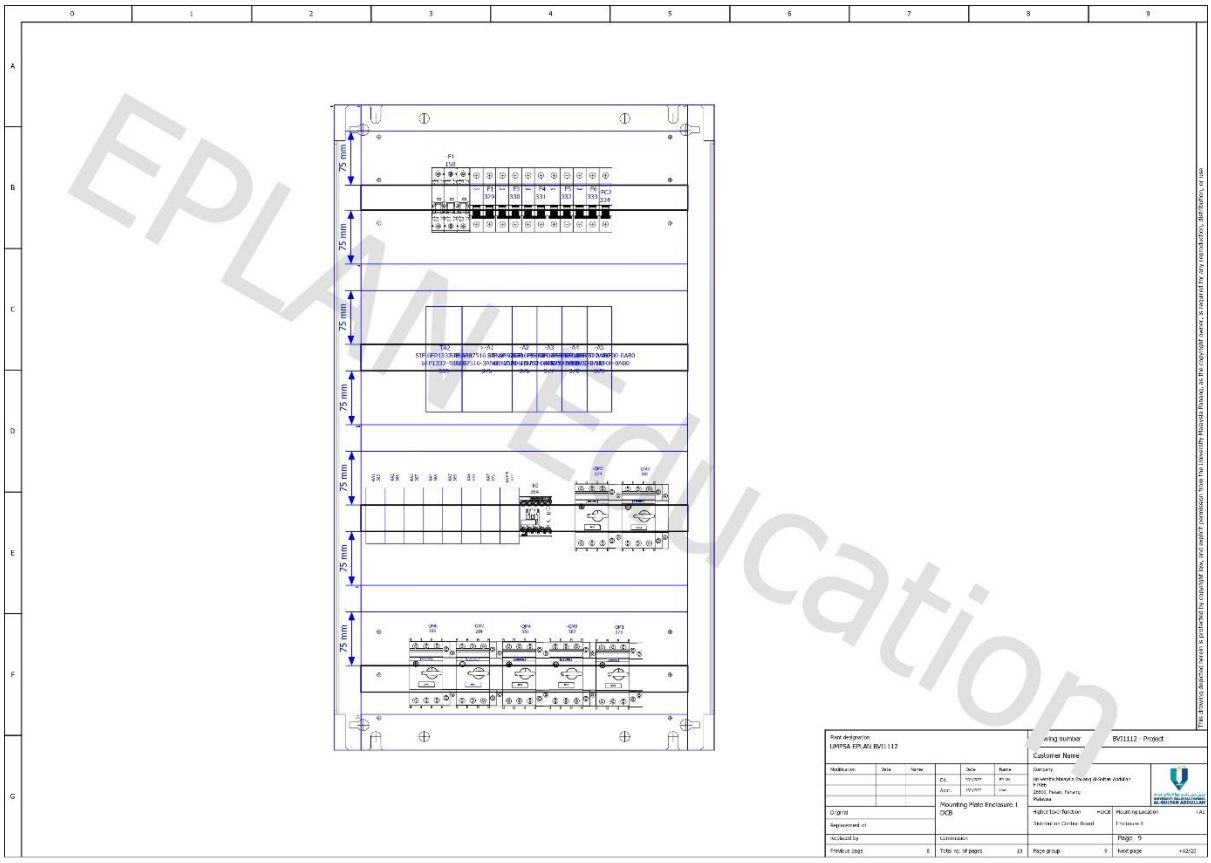




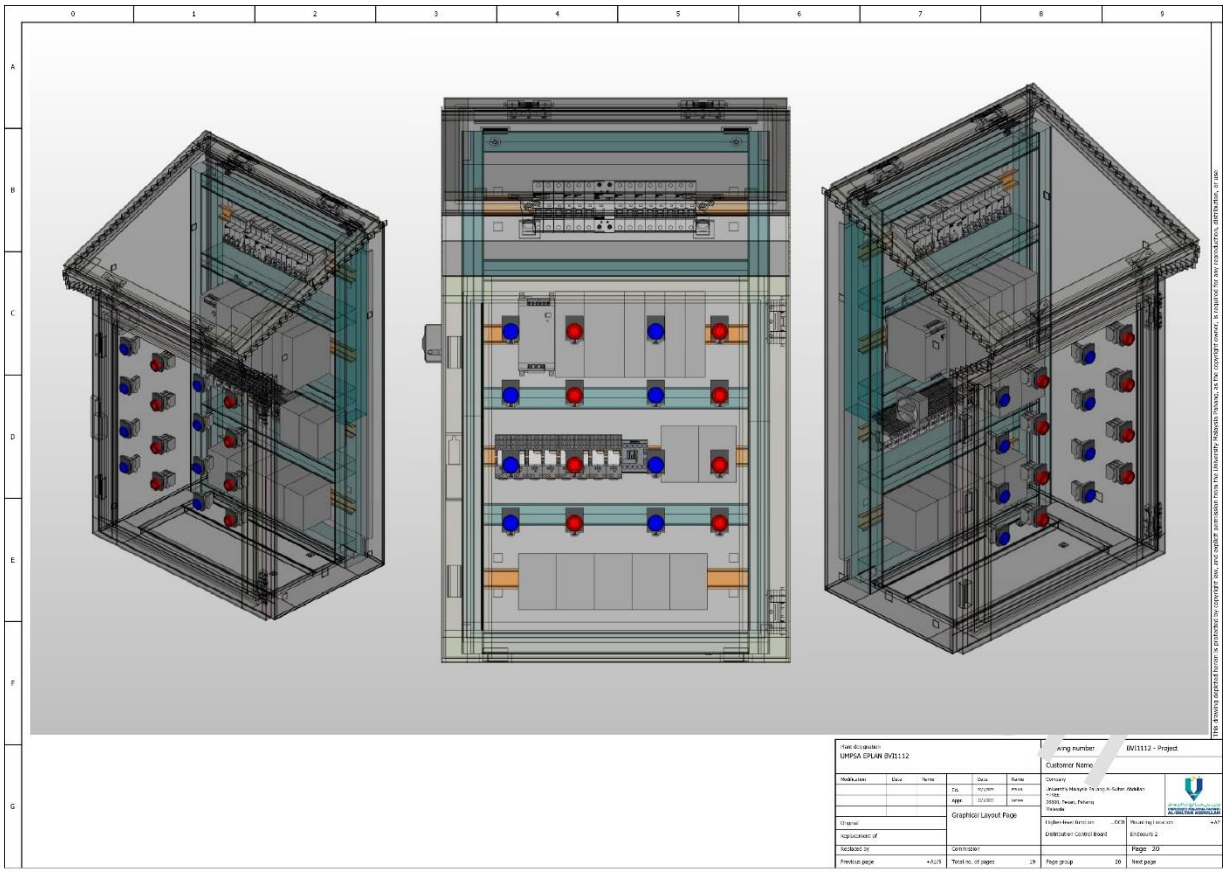
g) Relay Motor Control



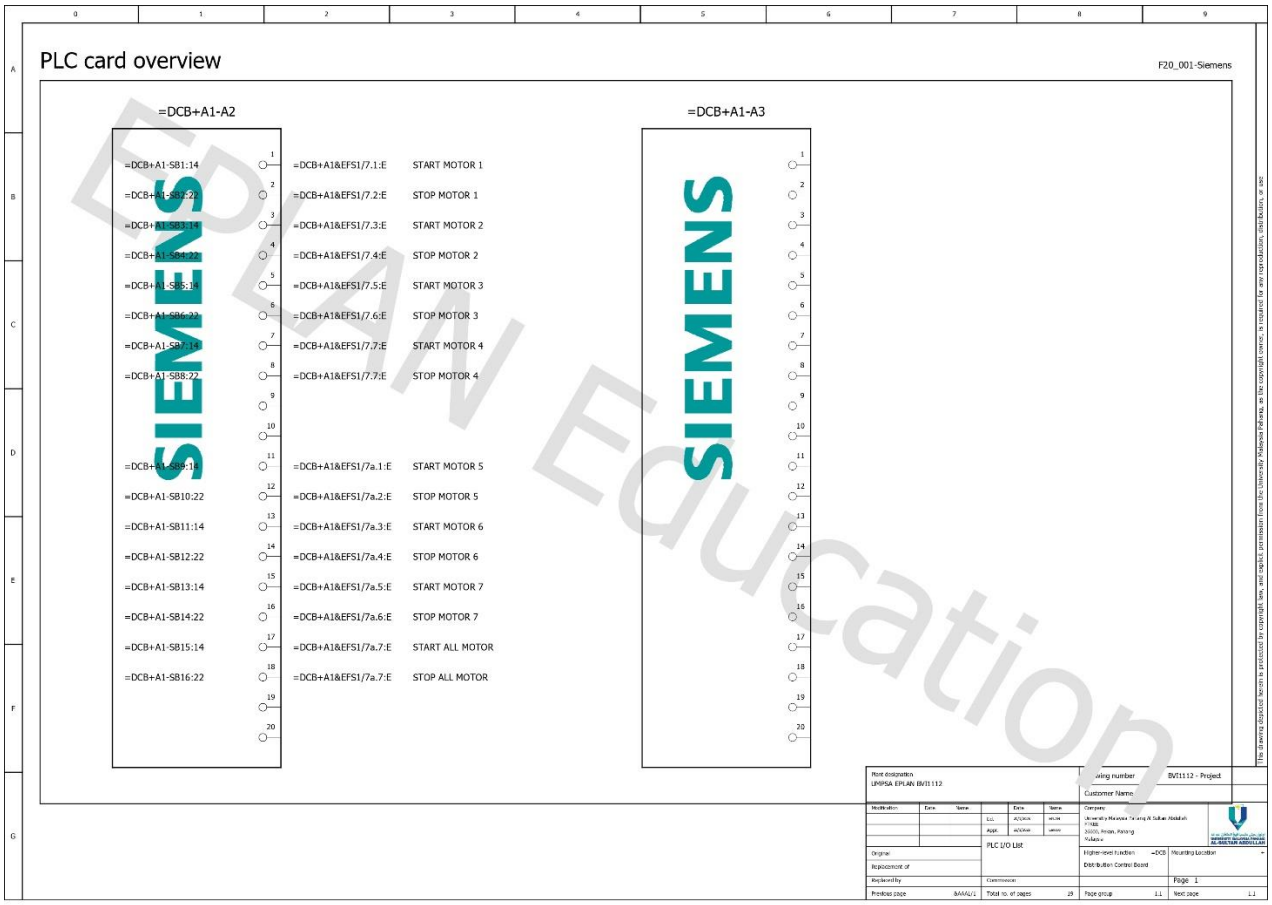
3) 2D Equipment Layout

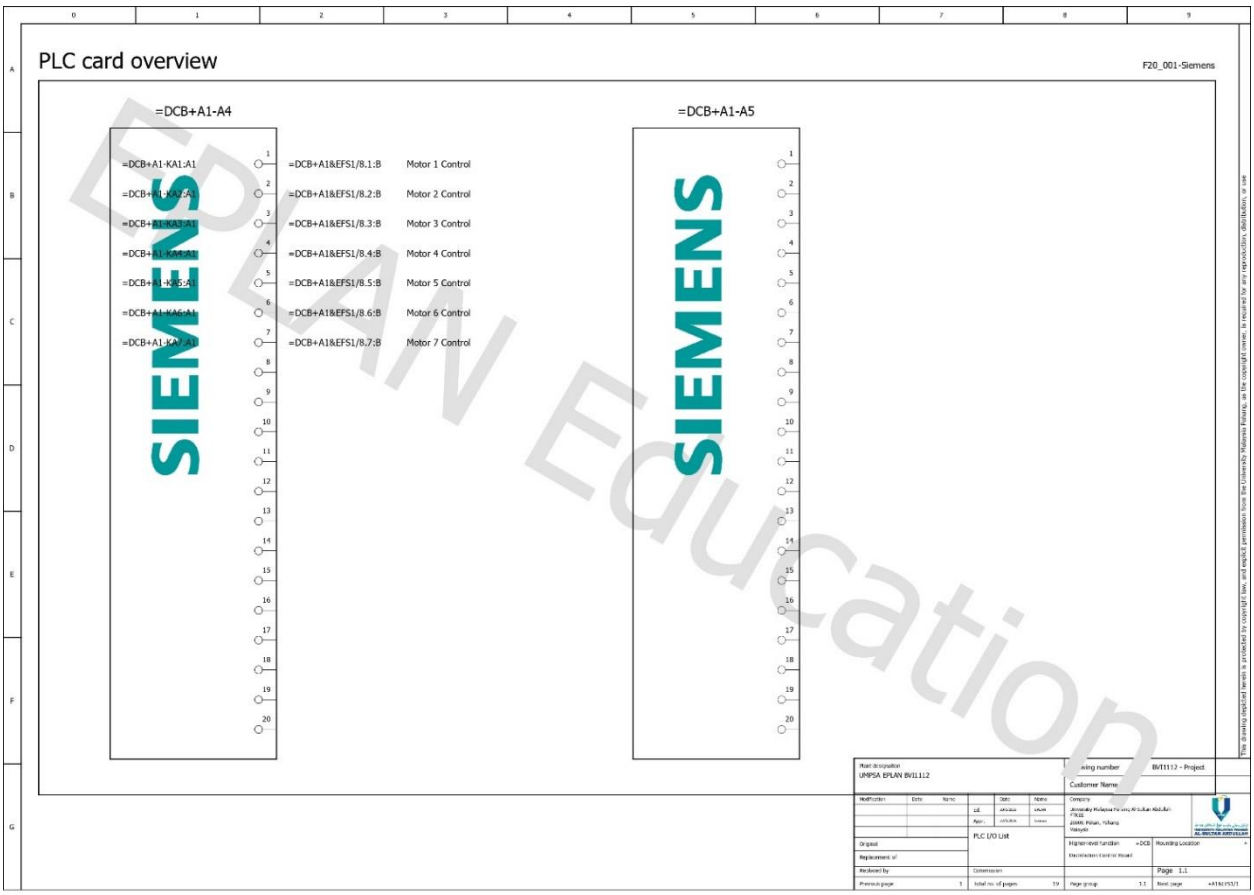


4) 3D Equipment Layout



5) PLC I/O List




PLC card overview
F20_001-Siemens
=DCB+A1-A4
=DCB+A1-A5
SIEMENS
SIEMENS
=DCB+A1-KA1:A1
=DCB+A1-KA2:A1
=DCB+A1-KA3:A1
=DCB+A1-KA4:A1
=DCB+A1-KA5:A1
=DCB+A1-KA6:A1
=DCB+A1-KA7:A1
=DCB+A1&EFS1/8.1:B
=DCB+A1&EFS1/8.2:B
=DCB+A1&EFS1/8.3:B
=DCB+A1&EFS1/8.4:B
=DCB+A1&EFS1/8.5:B
=DCB+A1&EFS1/8.6:B
=DCB+A1&EFS1/8.7:B
Motor 1 Control
Motor 2 Control
Motor 3 Control
Motor 4 Control
Motor 5 Control
Motor 6 Control
Motor 7 Control
UMPSA EPLAN BV11112
BV11112 - Project
Customer Name
PLC I/O List
Page 1.1
EPLAN Education
This drawing/digital media is protected by copyright law, and explicit permission from the University Malaysia Pahang, as the copyright owner, is required for any reproduction, distribution, or use.

4.0 QUOTATION SUMMARY

Project Name : Changing Conventional Relay Control into PLC Controller

Customer Name : Ir. Mohamad Rahimi Bin Mohamed Rodzi

Date : 24/1/2025

Item Description	**Total Price**
Bill of Material	RM 42,899.28
Labor Cost	RM 9160.00
Consumable Cost	RM 3480.00
Training Cost	RM 4080.00
Total	**RM 59,619.28**

5.0 BILL OF MATERIAL (BOM)

Item	Model	Brand	Quantity	Price per item (RM)	Total price(RM)
Junction Box Pulpet Assy	TP 6746.500	Rittal	1	4575.18	4575.18
Alofree Cableduct 37.5x75 Black	PA037N	Canaplast	9	150.00	1350.00
Rail Din 35	TS 35 C/20	Weidmuller	4	55.92	223.68
Pur Control Cable Purö-jz 4g1,5 Mm² Gy	PURö-JZ / PURö-OZ	HELU	1	33.65	33.65
Terminal	STS 2,5-TWIN-PE	Phoenix contact	3	41.21	123.63
Terminal 2,5mm²	STS 2,5-TWIN	Phoenix contact	35	12.16	425.6
Fuse Holder	3036372	Phoenix contact	2	34.54	69.08
Fuse	33-051-41	Littelfuse	1	5.35	5.35
Fuse	33-050-97	Littelfuse	1	7.39	7.39
Plug-in Bridge	FBS 2-8	PXC	1	4.10	4.10
Terminal 2,5mm²	STS 2,5-TWIN BU	PHOENIX	8	10.76	86.08
Cpu 1516-3 Pn/Dp, 1mb Prog., 5mb Data	SIE.6ES7516-3AN01-0AB	Siemen	1	12542.19	12542.19
S7-1500, Di 16x24vdc Hf	SIE.6ES7521-1BH00-0AB	Siemen	2	1580.35	3160.7
S7-1500, Dq 8x24vdc/2a Hf	SIE.6ES7522-1BF00-0AB	Siemen	2	1830.61	3661.22
Main Circuit Breaker	5SY6 210-7	Siemen	5	106.67	533.35
Mcb 3-pol 16a	5SY6 316-7	Siemen	2	142.91	285.82
Rcbo Elm	SIE.5SU1354-6KK20	Siemen	1	468.04	468.04
Circuit Breaker 230/400v 6ka, 1-pole, C, 6a, D=70mm	5SY6106-7	Siemen	1	110.91	110.91
Terminal Jumper	FBS 2-5	Phoenix contact	20	20.19	403.8
Terminal Jumper	FBS 5-5	Phoenix contact	15	9.89	148.35
Contactor	3RT2016-1BB41	Siemens	1	239.97	239.97

Relay Socket	ECOR-2-BSC3/4X21	PXC	8	18.92	151.36
Single Relay	REL-IR4/LDP-24DC/4X21	PXC	8	33.75	270
Relay Retaining Bracket	RIF-RHM-2	PXC	8	3.91	31.28
Main Circuit Breaker	172200	Baco	1	194.55	194.55
Lock Handle Grey 66x66mm	174601	Baco	1	56.63	56.63
Sealing Ip65	172267	Baco	2	26.89	53.78
Auxiliary Block	172179		1	43.39	43.39
Thermal-magnetic Circuit Break	3RV2111-1HA10	Siemens	7	754.36	5280.52
Auxiliary Block	3RV2901-1E	Siemens	7	132.67	928.69
Auxiliary Block	ZBE102	Schneider	1	30.74	30.74
Push Button Blue	XB4BA61	Schneider	9	79.35	714.15
Legend Holder	ZBZ35	Schneider	2	79.68	159.36
Legend	1704673	KW	2	6.08	12.16
Auxiliary Block	ZBE-101	TELEMEC	16	47.85	765.6
Frame +Sign Plate +Engraving	ZB2BY2002	Schneider	18	80.00	1440
Pushbutton Red Flush	XB4BA42	Schneider	8	173.55	1388.4
Trigger Action Button Black	ZB5-AS52	TELEMEC	3	109.78	329.34
Auxiliary Block	ZB5-AZ105	TELEMEC	3	38.42	115.26
Gland Nut	52103020	LAPPKABEL	2	218.68	437.36
Gland	52104312	LAPPKABEL	2	22.85	45.7
Gland Ms-m16 4.5-10mm	SKINTOP MS-M16	JJ LAP	2	25.96	51.92
24 V Dc Schuetz,ac3:3kw 1s Dc24v,steh	XALD01	Telemecaniq ue	1	70.79	70.79
1 Phase Switched-mode Power Supply 24 V Dc	ZB0805	IFM	1	867.38	867.38
Power Supply S7-1500 70 W	SIE.6EP1332-4BA00	Siemens	1	1002.83	1002.83
Total Cost (RM)				**42899.28**	

6.0 LABOR COST

Role	Task Description	Hours	Rate / Hour (RM)	Total Cost (RM)
Design Engineer	System Design	60	25	1500
Technicians/Installer	Installation and wiring	120	15	1800
Programmer	Programming the PLC	90	22	1980
Project Manager	Testing and Commisioning	50	28	1400
Safety Engineer	Identify potential Hazard	40	20	800
QA Engineer	Quality Check	60	18	1080
Training Specialist	Trainer	20	15	300
Customer Support Specialist	Primary Contact for Client	20	15	300
Total Cost (RM)				**9,160.00**

7.0 CONSUMABLES COSTS

Consumable Item	Quantity	Unit Price (RM)	Total Cost (RM)
Cable Glands (Assorted sizes)	10 pieces	15.00	150.00
Conduit Pipes (PVC/Metal)	20 meters	12.00	240.00
Conduit Fittings (Elbows, Couplings)	15 pieces	8.00	120.00
Electrical Tapes (Insulation)	5 rolls	10.00	50.00
Cable Ties (Heavy-duty)	2 packs	25.00	50.00
Wiring Labels/Tags	1 set	30.00	30.00
Heat-shrink Tubing (For Cable Ends)	1 pack	30.00	30.00
Lugs and Ferrules (Assorted sizes)	50 pieces	2.50	125.00
Three-phase Power Cables	20 meters	50.00	1,000.00
Earth Wire (Green/Yellow)	10 meters	10.00	100.00
Bolts, Nuts, and Washers (Assorted)	1 box	50.00	50.00
Cable Trays or Ladder Racks	5 meters	100.00	500.00
Cable Clips/Brackets	30 pieces	5.00	150.00
Marking Paint or Stickers	1 can	20.00	20.00
Wire Ducts (PVC, 40x40mm)	10 meters	18.00	180.00
Splicers (For Wire Connections)	5 pieces	40.00	200.00

Heat Shrink Label Cassette (Compatible)	5 pieces	80.00	400.00
Cleaning Supplies (Rags, Solvents)	1 set	50.00	50.00
Industrial Gloves (Electrical Safety)	1 pair	35.00	35.00
Total Cost (RM)			**3480.00**

8.0 TRAINING COSTS

Training Desc	Participant	Duration (Hour)	Trainer Cost (RM)
Safety & Induction	All Personnel	4	480.00
PLC Operation Training	Operators, Supervisor	8	960.00
PLC Programming & Troubleshooting	Programmer, Technician	12	1440.00
System Installation & Maintanance Procedure	Installer, Technician	10	1200.00
Total Cost (RM)			**4080.00**

9.0 TERMS & CONDITIONS OF THE SUPPLY

1. Scope of Work

The supplier agrees to deliver and install the required components and systems as specified in the project scope. Any additional work outside the agreed scope will require a formal change order and may incur extra charges.

2. Pricing

All prices quoted are in Malaysian Ringgit (RM) and are exclusive of applicable taxes unless otherwise stated. Prices are fixed upon order confirmation. Any changes requested by the buyer that impact the cost will require a revised quotation.

3. Delivery Schedule

The supplier will adhere to the agreed delivery schedule, ensuring all components and materials arrive on time. In the event of unforeseen delays due to force majeure or buyer-related issues, the supplier will communicate promptly to renegotiate timelines.

4. **Payment Terms**

Payment must follow the agreed schedule:

- 40% deposit upon order confirmation.
- 30% upon delivery of components.
- 30% upon completion of installation, testing, and commissioning.

Invoices must be settled within 14 days of issuance to avoid delays. Late payments may incur interest or penalties as stipulated in the invoice terms.

5. **Warranty**

A 12-month warranty is provided for all components and workmanship, beginning on the date of commissioning. The warranty covers defects in materials or workmanship but excludes damages caused by misuse, improper handling, unauthorized modifications, or natural disasters.

6. **Installation and Commissioning**

The supplier will ensure proper installation and perform system testing to meet project specifications. Any additional testing or rework due to changes requested by the buyer will result in additional charges.

7. **Ownership and Risk**

Ownership of all components transfers to the buyer upon full payment. The risk of loss or damage transfers to the buyer upon delivery to the specified site.

8. **Force Majeure**

Neither party will be held liable for delays or failures due to events beyond their control, such as natural disasters, strikes, or government restrictions. Both parties will work in good faith to mitigate the impact of such events.

9. **Confidentiality**

All information shared during the project will be treated as confidential. Neither party may disclose project details to third parties without written consent. This obligation will remain in effect for five (5) years after project completion.

10. **Cancellation and Returns**

Orders may be canceled within 7 days of confirmation, subject to a 10% cancellation fee based on the total order value. Custom-made components are non-refundable.

11. Liability

The supplier's liability is limited to the value of the defective components or services provided. The supplier is not responsible for indirect, consequential, or incidental damages. Total liability shall not exceed the total contract value.

12. Governing Law

This agreement is governed by the laws of Malaysia. Any disputes arising will be resolved amicably or referred to arbitration under the Malaysian Arbitration Act 2005.

13. Acceptance of Terms

By confirming the purchase order, the buyer agrees to these Terms and Conditions.

Accepted and Agreed by:

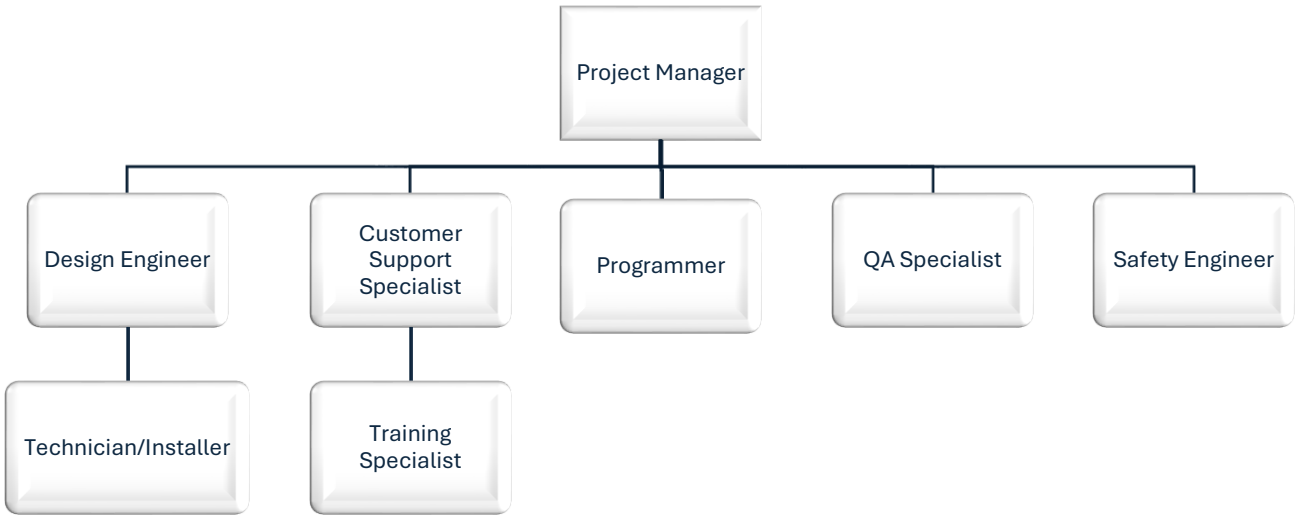
Syamsul and Deriwan Sdn. Bhd.: _

Date: _

Ir. Mohamad Rahimi Bin Mohamed Rodzi: _

Date: _

10.0 PROJECT ORGANIZATION CHART



10.1 ROLE AND RESPONSIBILITY FOR THE TEAM

1. **Project Manager**

- Oversees the entire project and ensures it is completed on time and within budget.
- Coordinates between departments to ensure smooth communication and collaboration.
- Sets project goals, timelines, and deliverables.
- Tracks progress and resolves any project-related issues.
- Ensures adherence to safety, quality, and operational standards.

2. **Design Engineer**

- Creates designs, plans, and specifications for systems, components, or products.
- Collaborates with other departments to ensure designs meet project requirements.
- Provides technical guidance to technicians during implementation.
- Reviews and revises designs based on feedback and testing results.

3. **Safety Engineer**

- Identifies potential risks and implements safety protocols.
- Conducts regular inspections to ensure compliance with safety standards.
- Develops emergency response plans and training programs.
- Investigates accidents or incidents and implements corrective actions.

4. **QA Engineer (Quality Assurance)**

- Develops and implements quality control processes.
- Conducts inspections and tests to ensure products meet specifications.
- Identifies defects and works with engineers and technicians to resolve them.
- Maintains detailed records of testing procedures and results.

5. **Programmer**

- Develops and maintains software or systems required for the project.
- Writes, tests, and debugs code.
- Collaborates with engineers to integrate software with hardware systems.
- Troubleshoots and resolves system issues.

6. **Technicians**

- Executes installation, maintenance, and repair tasks as directed by engineers.
- Tests and inspects equipment to ensure proper functionality.
- Reads and interprets blueprints or technical documents.
- Provides hands-on support during project implementation phases.

7. **Training Specialist**

- Develops and conducts training programs for employees or customers.
- Prepares training materials, manuals, and guides.
- Ensures trainees understand safety, quality, and operational procedures.
- Evaluates the effectiveness of training programs and updates as needed.

8. **Customer Support Specialist**

- Addresses customer inquiries, issues, and complaints.
- Provides product guidance, troubleshooting, and solutions.
- Collaborates with the training specialist to educate customers.
- Collects customer feedback and reports issues to relevant teams.

11.0 GANTT CHART

Task ID	Task Description	WEEK								
		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9
1	Requirements Gathering									
2	Risk Assessment, BOM Finalization									
3	Stakeholder Approvals									
4	Procurement of Materials									
5	Inspect Materials and Prepare Site									
6	Installments and Wiring									
7	Program and Test PLC Logic									
8	System Integration									
9	Debugging and Safety Testing									
10	System-Wide Testing,									
11	Final Acceptance Testing									
12	Operator Training									
13	Final Handover									

	Project Planning
	Project Execution

11.1 Detailed Breakdown of Activities

1. Requirements Gathering (Week 1)

- **Activity 1.1:** Conduct client meetings to gather specific requirements.
- **Activity 1.2:** Review existing system documentation.
- **Activity 1.3:** Identify areas for improvement in the current system.
- **Activity 1.4:** Draft a preliminary system requirements document.

2. Risk Assessment and BOM Finalization (Week 2)

- **Activity 2.1:** Perform a hazard analysis for the system upgrade.
- **Activity 2.2:** Identify critical safety risks and propose mitigation strategies.
- **Activity 2.3:** Compile a comprehensive Bill of Materials (BOM).
- **Activity 2.4:** Validate BOM with stakeholders for approval.

3. Stakeholder Approvals (Week 2)

- **Activity 3.1:** Present project plan and design to stakeholders.
- **Activity 3.2:** Revise plans and documents based on stakeholder feedback.
- **Activity 3.3:** Obtain formal approval to proceed to the next phase.

4. Procurement of Materials (Week 3)

- **Activity 4.1:** Identify reliable suppliers for the required components.
- **Activity 4.2:** Place orders for PLC, motors, and related materials.
- **Activity 4.3:** Track and follow up on delivery schedules.

5. Inspect Materials and Prepare Site (Week 3-4)

- **Activity 5.1:** Inspect delivered materials for quality and compliance.
- **Activity 5.2:** Prepare the site for installation
- **Activity 5.3:** Lay preliminary wiring paths and conduits.

6. Installments and Wiring (Week 4–6)

- **Activity 6.1:** Install the PLC and control panel.
- **Activity 6.2:** Set up three-phase power connections.
- **Activity 6.3:** Connect motors and flow control units to the wiring system.

7. Program and Test PLC Logic (Week 5-6)

- **Activity 7.1:** Develop the PLC logic for controlling the 7 flow units.
- **Activity 7.2:** Simulate PLC functionality on test benches.
- **Activity 7.3:** Debug and refine the logic to address errors.

8. System Integration (Week 6)

- **Activity 8.1:** Connect the PLC with flow control units and motors.
- **Activity 8.2:** Perform an initial integration test of all connected systems.
- **Activity 8.3:** Ensure all hardware and software components communicate correctly.

9. Debugging and Safety Testing (Week 6)

- **Activity 9.1:** Identify and fix system-level errors during operations.
- **Activity 9.2:** Conduct safety checks, including grounding and insulation tests.
- **Activity 9.3:** Verify compliance with regulatory standards.

10. System-Wide Testing (Week 7)

- **Activity 10.1:** Perform load tests for the entire system.
- **Activity 10.2:** Monitor performance under different operational conditions.
- **Activity 10.3:** Ensure all 7 flow units function as intended under PLC control.

11. Final Acceptance Testing (Week 8)

- **Activity 11.1:** Conduct acceptance tests with client representatives.
- **Activity 11.2:** Address any issues or defects identified during testing.
- **Activity 11.3:** Obtain final sign-off on system functionality.

12. Operator Training (Week 8)

- **Activity 12.1:** Develop training materials and user manuals.
- **Activity 12.2:** Conduct on-site training sessions for operators.
- **Activity 12.3:** Simulate operational scenarios to reinforce learning.

13. Final Handover (Week 9)

- **Activity 13.1:** Transfer all documentation to the client.
- **Activity 13.2:** Provide a post-handover support plan.
- **Activity 13.3:** Conduct final project review with the client.