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Acknowledgement

First of all, I would like to express my gratitude to Allah for allowing me to complete my final industrial training report through his guidance and blessings.

Kejuruteraan Jayagas Sdn Bhd provided me with an excellent chance for learning and skilled development. Therefore, I considered myself a really lucky individual as I was given a chance to be part of it. I am also thankful for the opportunity to meet so many good people and professional workers who assisted me throughout my internship.

Next, I am using this opportunity to express my deepest gratitude to my Co-Supervisor, Mr. Zaifirdaus, and Mr. Aiman who, despite being busy with their work, managed to spend time out to hear, advise, and guide me on the task that was given and show me the right way to pursue my dream as an engineer. Then, I would like to give special thanks to my Industrial Supervisor, Mr. Jack Chong for accepting me as one of the interns at this company. Through his arrangement, my internship at Jayagas was made much easier and I want to acknowledge him contribution gratefully.

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Abstract

This internship report contains the details of my industrial training at one of the gas firms in the Kuala Lumpur area, Kejuruteraan Jayagas. This report recounts my six-month internship in the engineering department at Kejuruteraan Jayagas Sdn Bhd, located in Taman Maluri, Cheras, Kuala Lumpur, which began on February 21, 2022.

Prior to graduation, students pursuing a Diploma in Chemical Engineering at UiTM Pasir Gudang, Johor are needed to complete six months of industrial training at one of the associated organizations, such as an oil and gas company or engineering firm. Students are allowed to choose any engineering firm with which to complete their internship, so long as the firms offer relevant work.

Industrial training exposes students to a real-world working environment where they can deepen their skills and apply what they acquired in university to increase market reliability. During industrial training, students improved their communication and technical skills, demonstrating that they will be able to create strong relationships and work well with others after graduation. Students can increase their technical skills, which helps them work more efficiently and confidently in unforeseen situations. By preserving professional ethics while working, students can develop soft skills and build a network. If their talents are strong, a company may hire them. Finally, the student must complete assignments with a sustainable and environment mindset.

In this internship report, I will describe and elaborate on the experiences and occurrences I encountered throughout my internship, as well as the knowledge I gained. For instance, the activities or tasks I performed or participated in, in addition to the difficulties and difficulties I encountered during this internship. Furthermore, a summary of the company for which I interned for six months will be included in this report.

As an assistant engineer, I have had extensive exposure to the engineering area, particularly the gas industry. It gave me the opportunity to understand the documentation and operation of the project from beginning to end, as well as the procedures involved in the process. I was able to obtain important experience by participating actively in course-related projects, which was one of its major benefits. These first-hand experiences and knowledge that I learned during my internship cannot be obtained through textbooks or lecture classes alone. Moreover, I am able to apply the facts and theories I have acquired in class to my daily work.

Overall, I am learning a great deal from this training programme. Now I am able to expose myself to the industrial world and gas sector technical knowledge relevant to chemical engineering. I also have the opportunity to apply the theoretical information I gained at UiTM Pasir Gudang to the assigned assignment. Consequently, I discovered that this industrial training is incredibly beneficial for the learner.

List of Tables

<i>Table 1: Industrial training placement</i>	12
<i>Table 2: Industrial schedule</i>	12
<i>Table 3: Company supervisor information</i>	12
<i>Table 4: Working Time</i>	15
<i>Table 5: Public holiday</i>	15
<i>Table 6: Absence schedule</i>	15
<i>Table 7: Jayagas’s Vision, Mission, and Motto</i>	17
<i>Table 8: Jayagas projects</i>	20
<i>Table 9: Weekly report</i>	42

List of Figures

Figure 1: Process Flow.....	14
Figure 2: Organization Chart.....	18
Figure 3: Labelling "Gas" Arrow.....	19
Figure 4: Repainting Pipe with Yellow Color	19
Figure 5: Kejuruteraan Jayagas Staff.....	21
Figure 6: Jayagas Company at Taman Maluri, Cheras.....	21
Figure 7: Master quotation list	43
Figure 8: Quotation at Travelling Duck Midvalley	44
Figure 9: Quotation at Travelling Duck Midvalley	45
Figure 10: Schedule of technical data for Sunway Carnival.....	46
Figure 11: Schedule of technical data for IOI Puchong Mall.....	47
Figure 12: Ekoki's server.....	48
Figure 13: Kejuruteraan Jayagas's server	48
Figure 14: Pipe price list.....	49
Figure 15: Ekoki's server.....	49
Figure 16: Ekoki price list	50
Figure 17: Bill of quantity for Madam Kwan @ Shamelin.....	51
Figure 18: Site visit to Nanyang Coffee @ Midvalley.....	52
Figure 19: Site visit to AVECENA Gloves Factory @ Seremban	53
Figure 20: Site visit to United Point Mall.....	53
Figure 21: Site visit to Monash Sunway University	54
Figure 22: Site visit to Madam Kwan Centralized Kitchen @ Shamelin	55
Figure 23: Meter reading at malls	55
Figure 24: Labelling at Fuya Energy @ Sarawak.....	56
Figure 25: Fuya Energy's calculation.....	57
Figure 26: Fuya energy pipe stress calculation	58
Figure 27: Preventative maintenance report	59
Figure 28: Method statement's cover page.....	60

Table of Contents

Acknowledgement	2
Declaration.....	3
Abstract	4
List of Tables.....	6
List of Figures.....	7
Introduction of Industrial Training	10
1.1 Overview.....	10
1.2 Objective of Industrial Training.....	11
1.3 Industrial Training Placement.....	12
1.3.1 Industrial Schedule.....	12
1.3.2 Company Supervisor Information	12
Chapter 1 Company Profile	13
2.1 Company Background.....	13
2.2 Company History	16
2.3 Vision and Mission	17
2.4 Organization Chart.....	18
2.5 Main Product / Service Provided to The Client	19
Chapter 2 Overview of The Training	21
3.1 Introduction	21
3.2 Summary of The Training and Experience Gained	22
Task 1 : Quote price for small project.....	22
Task 2 : Assist engineer in tendering process.....	22
Task 3: Write Bill of Quantity	23
Task 4 : Project’s site visit.....	24
Task 5 : Pipe Calculation for Approval to Install (ATI) submission.....	24
Task 6 : Inspection and preventive maintenance report	25
Task 7 : Method Statement.....	25
3.2.1 Weekly Activity	26
Chapter 4 Details of Experiences (Report on Job/Task/Project)	43
4.1 Introduction	43
4.2 Details of The Training and Experience Gained	43

4.2.1	Task 1 : Quote price for small project	43
4.2.2	Task 2 : Assist engineer in tendering process.....	46
4.2.3	Task 3 : Write Bill of Quantity	51
4.2.4	Task 4 : Project Site Visit	52
4.2.5	Task 5 : Pipe Calculation for Approval to Install (ATI)	56
4.2.6	Task 6 : Inspection & Preventative Maintenance Report.....	59
4.2.7	Task 7 : Method Statement	60
4.3	Problem Encountered and Approach Adopted for Solving Problem	62
4.4	Professional and Ethical Issues	63
4.5	Health, Safety, Environmental and Sustainable Aspects	64
Chapter 5 Conclusions		66
5.1	Conclusions.....	66
5.2	Suggestion and Recommendation	67
Reference		68
Appendix		69

Introduction of Industrial Training

1.1 Overview

The Industrial Training Program is a learning activity outside of university so that students get the appropriate exposure to the real working environment. This programme was held to make students adapt and experience working in a real environment as an engineer by applying their theoretical knowledge to the job and tasks given by their supervisor. Students are required to undergo industrial training for the purpose of being awarded a certificate or diploma upon graduation. Industrial training is a prerequisite for students in higher level education for all courses in universities, including Universiti Teknologi Mara (UiTM) branch Pasir Gudang. In order to improve the working level and skills of graduates, the plan was introduced to improve the qualifications of the required industrial training. In addition, industrial training requires the demonstration of appropriate social skills and responsibilities while performing assigned tasks while keeping professional ethics. Furthermore, students can enhance their communication skills and exhibit their capacity for independent and lifelong learning. Lastly, the student must demonstrate an environmental and sustainable approach to completing assignments.

Student were exposed with real experience where they had a position in the company which related to chemical engineering course such as project engineer and site engineer. A project engineer is a specialist who is in charge of the technical and engineering aspects of the projects they are assigned to. They are in charge of managing the project's budget, planning, and people to guarantee that all elements fulfil technical specifications. Before becoming an engineer, industrial training helps to generate students with solid work ethics and professionalism. More professional engineers can be developed with the assistance of local engineers who taught students throughout the internship, based on the acquired and considered experience. A site engineer is responsible for attending the site visit and site meeting. In addition, they were required to understand the drawings and communicate with the client in order to execute the work correctly. In fact, they are accountable for submitting paperwork like Approval to Install (ATI) and Approval to Operate (ATO).

A company's management can also be observed by students, such as how attentive they are about the health and safety of the workers under them. The student can then propose suggestions and recommendations based on their own experience. Plus, students got a clear view of the task's step-by-step progression when they executed the assigned work instead of listening to the lecturer and just consulting the book.

This report describes the pupils' activities and acquired knowledge over the past six months. I am able to experience this as a student because a company placed me as an assistant engineer for both projects and site engineers. This increased my exposure to the engineering sector and enhanced my abilities in numerous areas, such as preparing tender documents, reading drawings, performing calculations, and more.

1.2 Objective of Industrial Training

The major goal of industrial training is to expose students to a real-world working setting where they may develop their knowledge and put what they learnt in university into practice in order to improve the reliability of the market. Students were able to improve their communication and technical abilities during this industrial training since it demonstrates that the student can develop strong relationships and work effectively with others once they graduated. Student also can improve their technical skills and enable students to perform more efficiently and confidently because people with technical skills are more confident when confronted with unexpected situations. In addition, students are able to develop their soft skills and build a network of contacts through gaining job experience in a company by maintaining professional ethics. If their talents are strong, a corporation may contact them and offer them a position within the organization. Finally, the student must exhibit an environmentally conscious and sustainable attitude to assignment completion.

1.3 Industrial Training Placement

Address	
Telephone Number	
Website	_____
Email	_____
Business Nature	Gas industry

Table 1: Industrial training placement

1.3.1 Industrial Schedule

Industrial Training Duration : 21 st February 2022 – 4 th August 2022	
Day	Time
Monday	9 AM – 6 PM
Tuesday	9 AM – 6 PM
Wednesday	9 AM – 6 PM
Thursday	9 AM – 6 PM
Friday	9 AM – 6 PM
Break Hour	<ul style="list-style-type: none"> • 12 PM – 1 PM • 1 PM – 2 PM
Working Hours	<ul style="list-style-type: none"> • 8 hours

Table 2: Industrial schedule

1.3.2 Company Supervisor Information

Name	
Position	
Company	
Department	
Phone Number	
Email	_____

Table 3: Company supervisor information

Chapter 1 Company Profile

2.1 Company Background

Jayagas Company is an enterprise based in Malaysia. Its main office is in Cheras, Kuala Lumpur. The company operates in the gas industry. KJG has its own operation office with adequate skilled and professional staffs specializing in gas that are able to handle enquiries and problems related to this industry. They have three (3) qualified personnel registered as Competence Person with Suruhanjaya Tenaga and two (2) qualified welder registered with JKKP. The office is fully furnished with latest office automation and has over Thirty (30) skilled staff under its wing and is all well trained.

Jayagas started its first operation as an authorized distributor of Petronas Liquefied Petroleum Gas Cylinder. The distribution of LPG at that time only converges to residential/household needs and factories in the vicinity of KL and Klang Valley. During that period, most of the client have expressed the need of gas piping installation to be included as part of our services.

As such, due to the vast increased in demand for such services, Kejuruteraan Jayagas Sdn Bhd (KJG) was finally established on 12 January 1991 to execute the installation of Liquefied Petroleum Gas (LPG) and Natural Gas (NG) Piping System covering the Government Bodies and Public Sector such as factories, restaurants & pubs, hotels, condominiums and apartments, schools, colleges, universities, to name a few. KJG specializes in Designing, Installation, Servicing and Maintenance of LPG and NG. The scopes of work covered are: -

- a) Fully Design, Supply, Install, Test & Commission of LPG and NG Reticulation System included underground distribution line
- b) Installation of LPG Bulk Tank
- c) Natural Gas Infra Line Piping Works from the Service Station to premises
- d) Installation of Vaporizer, LPG Liquid Auto Changeover and others gas equipment.
- e) Submission to relevant authorities for approval

KJG has registered with Kementerian Kewangan, Pusat Khidmat Kontraktor (PKK), Lembaga Pembangunan Industri Pembinaan Malaysia (CIDB), Suruhanjaya Tenaga (ST) [formerly known as Jabatan Bekalan Elektrik dan Gas Malaysia (JBEG)], Jabatan Keselamatan dan Kesihatan Pekerjaan (JKKP), Petronas Dagangan Berhad dan Gas Malaysia Sdn Bhd.

A Jayagas-managed project follows the process flow for a single project, from inception to completion. First, the consultant of one company will request a price quote from KJG for the project and provide a drawing of the store. So, when our engineer offers a price based on the drawing they provide, they will return the cover letter and quotation to the consultant. If the consultant and store owner agree on the price, they will proceed to prepare a submission drawing. To accomplish this, the site supervisor will visit the shop and sketch the pipeline that will be installed. The site supervisor will then give the draughtsman the sketch to be drawn in AutoCAD and deliver it to the person responsible for ATI submission.

The responsible party then prepares and organizes all necessary paperwork and submits it to Suruhanjaya Tenaga (ST) or Jabatan Keselamatan dan Kesihatan Pekerjaan (JKKP). It will be approved by ST/JKKP officers in approximately two months. After that, the Jayagas maintenance team can begin installing gas piping on the site. As soon as the installation is complete, the site engineer will be responsible for designing the as-built drawing so that the draughtsman can create it in AutoCAD. The as-built drawings differ from the submission drawings because they must account for obstacles such as machinery blocking the pipeline. The person responsible for submission will prepare and gather all drawings and other documentation to be submitted to ST/JKKP for the officer's approval of the gas piping to begin operation, which is an ATO submission. The site engineer will conduct a pressure test and a snoop test on the pipeline before submitting the ATO. After determining that it is safe to operate the pipe, the responsible party will submit all documentation, including drawings and other verification, to the ST/JKKP officer, who will then grant permission to operate in the range of 2 months. Lastly, the shop's gas pipeline began functioning.

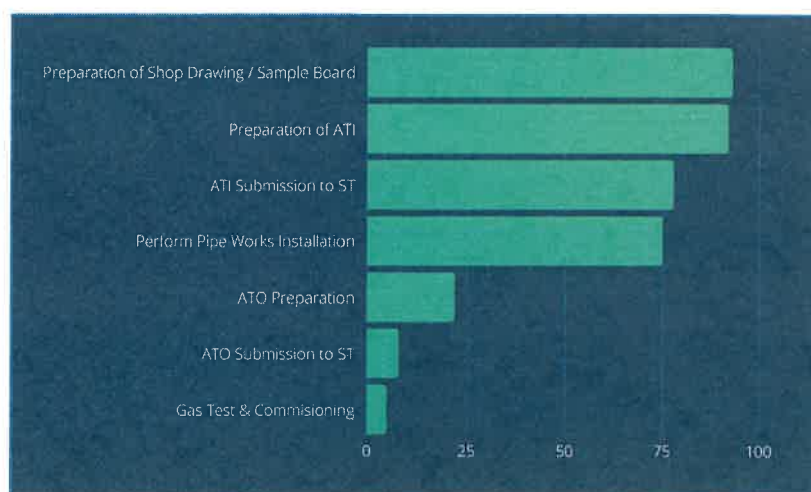


Figure 1: Process Flow

Days	Working Time	Operating Period
Monday to Friday	9 AM – 1 PM 1 PM – 2 PM 2 PM – 6 PM	4 hours 1 hour 4 hours (Total : 8 hours)
Saturday & Sunday	Weekend Holiday	-

Table 4: Working Time

Public Holiday		
Days	Date	Days
Nuzul Al-Quran	19 th April	Tuesday
Labour Day	2 nd May	Monday
Hari Raya Aidilfitri	3 rd – 4 th May	Tuesday – Wednesday
Wesak Day	16 th May	Monday
Yang Di-Pertuan Agong's Birthday	6 th June	Monday
Hari Raya Haji	11 th July	Monday

Table 5: Public holiday

Date	Reasons
8/4/2022	Sick
28/4/2022	Sick
5/5/2022	Hari Raya Aidilfitri
6/5/2022	Hari Raya Aidilfitri
7/6/2022	Hari Raya Haji

Table 6: Absence schedule

2.2 Company History

Jayagas first started its operation in 1982 as an authorized distributor of Petronas Liquefied Petroleum Gas Cylinder under Perniagaan Jayagas (946040-X) (201101017904). The distribution of LPG at that time was focused on residential and factories within Greater Kuala Lumpur. After ten years of business growth, the business subsequently ventured into two related specialist businesses in 1991: Kejuruteraan Jayagas Sdn Bhd (210990-T) (199101000680) and Jayagas Petroleum Products Sdn Bhd (219903-X) (199101009591).

KJG related work includes Engineering & Maintenances, Testing and Commissioning of Gas Piping Reticulation (LPG / NG / NGV /GASES) for the Government Bodies, Public Sector such as Restaurant, Factories, Hotels, Schools, Universities, Condominium, Apartments and unit houses. JPP is authorized Petronas Dealer for Bulk LPG and Petroleum products via road tanker for supply to commercial users, hotels, transport companies, industrial users (factories) & building contractors throughout the whole Malaysia including Sabah and Sarawak.

Jayagas then expand to and supply products to domestic, commercial and industrial markets, mainly in Liquefied Petroleum Gas (LPG) and Natural Gas (NG) industries. Supporting gas industries; both in technical and trade aspect. Jayagas is committed to market Liquefied Petroleum Gas (LPG) and provide all related services to end-users in accordance with the Malaysian Energy Commission (Suruhanjaya Tenaga Malaysia - ST)'s and Department of Occupational Safety and Health (Jabatan Keselamatan dan Kesihatan Pekerjaan - JKKP)'s guidelines.

Besides KJG, Ekoki Engineering also existed which is the Authorised Distributor/Agent of Kagla Inbest Corporation, Japan and Daehan GM Corporation, Korea for the supply and installation of their wide range of vaporizer and gas meter.

The operating firms that comprise the Jayagas Group of Companies share a shared mission and core principles that connect them together. Each firm operates independently while adhering to the same fundamental principles, strategic planning process, people selection and development, core systems platform, and continuous improvement approach. All of this enables us to be a one-stop solution provider.

2.3 Vision and Mission

VISION AND MISSION

With Jayagas, we continuously aspire to improve our service to our partners with high quality, well priced & maintained LPG, whilst leading in efficiency and long-term sustainability

MOTTO

The most important part of our business is to be a one stop solution service provider

Table 7: Jayagas's Vision, Mission, and Motto

2.4 Organization Chart

KEJURUTERAAN JAYAGAS SDN BHD

ORGANIZATION CHART

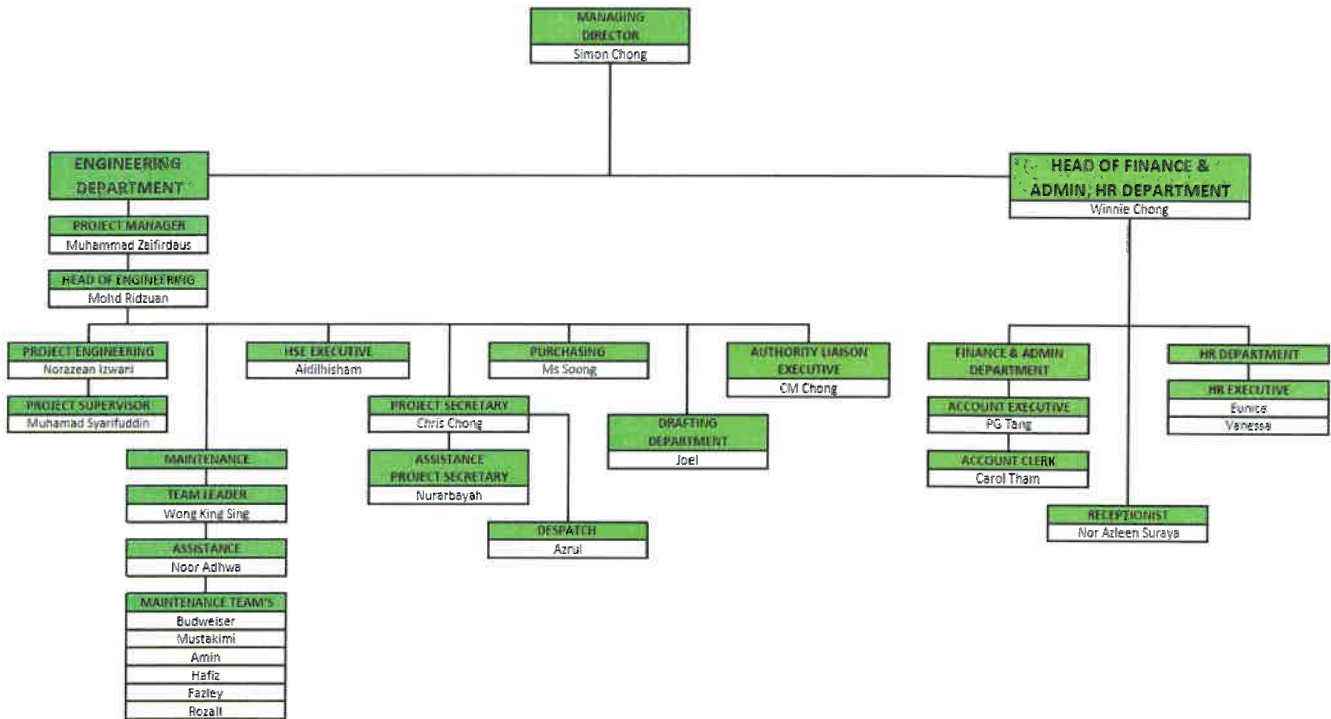


Figure 2: Organization Chart

2.5 Main Product / Service Provided to The Client

Jayagas Sdn Bhd's main product is Liquefied Petroleum Gas (LPG) and Natural Gas (NG). Jayagas has several small companies that provide various services, such as PJG, which supplies gas to homes or restaurants, KJG, which is in charge of projects such as designing piping lines that supply LPG or LNG at restaurants, malls, and condominiums, maintenance-related engineering, JPP, which is in charge of reading meters, and Ekoki Engineering Sdn Bhd, which supplies equipment to Kejuruteraan Jayagas Sdn Bhd. I was assigned to the KJG department, which was relevant to my coursework. In this section, I will discuss the services provided in the Kejuruteraan Jayagas department.

Kejuruteraan Jayagas provided so many services which is installation of Liquefied Petroleum Gas (LPG) and Natural Gas (NG) system such as maintenance services and piping works at mall, school, and restaurants. Maintenance services is a service where the assigned teams will fix the existing piping lines that Jayagas designed before such as repainting pipe, replacing valves, reapply labelling, fixing leakage and others as along as the piping were under contract with Jayagas Sdn Bhd. While piping works is a service where Jayagas supply, deliver, install, test and commissioning the Liquefied Petroleum Gas (LPG) and Natural Gas (NG) reticulation system. The goal is to always provide residents with a safe, and comfortable working environment. Other than that, they also perform tank's cleaning and repairing which is necessary to remove any moss/weed and avoid tank from getting a rust. Furthermore, to repair any of gas equipment on bulk tank's part that is broken. Plus, they also provided non-destructive test which is ultrasonic flaw detection, dye penetrant testing, ultrasonic thickness gauging, holiday test, radiographic interpretation, and magnetic particle inspection. There's also fabrication works service which maintenance team will perform painting and coating of pipe and bulk tank. Lastly, they also provided cryogenic tank and also provided maintenance services for the cryogenic tank.



Figure 3: Labelling "Gas" Arrow



Figure 4: Repainting Pipe with Yellow

3.2 Summary of The Training and Experience Gained

This chapter will elaborate on the tasks generally during the industrial training at Kejuruteraan Jayagas Sdn Bhd as an assistant engineer.

Task 1 : Quote price for small project

A project quotation could comprise the quoted items and services, contact information, special trade agreements and discounts, and any applicable taxes and surcharges. It seeks to attract clients and has won the bid to give the project to a management company. Project management requires the ability to monitor, review, and manage the pipeline of project quotations and orders.

The services, basic contact information, special trade agreements and discounts, schedule of technical data, and projected taxes and surcharges for a project are included in a project quotation. We may also choose the activities or tasks for a project and establish a task and subtask hierarchy. For each action, we may add information about its time and duration, as well as the abilities and experience required of personnel doing the task.

The quotation for the project is a non-binding estimate of the required work. When the information in the quotation is copied to a project connected with a project contract, it becomes part of a legally enforceable agreement between the parties. If the customer approves the project quotation, we can replicate its contents into a project. Simultaneously, we can copy the project quotation information to the project forecast.

Task 2 : Assist engineer in tendering process

When a lot feeder seeks to have construction work performed, a procurement procedure will be required. There are a range of procurement methods, all of which can be utilized for construction projects of varying scopes.

Project tendering is the practice of seeking bids from potential construction contractors for the execution of certain construction work packages. It is a frequent means of acquiring construction services. The procedure of soliciting tenders is essential for obtaining a fair price and the best value for the work. When acquiring construction services, lot feeders should seek to gain value for their money. Before beginning the tendering process, this necessitates a precise project specification and the selection of the optimal delivery method.

The bidding process should implement and observe the core values of fairness, clarity, simplicity, and accountability, and develop the concept of risk allocation to the party best suited to assess and manage it. The purpose of tendering is to ensure genuine competition, and received bids are evaluated based on specific criteria. These criteria may be described in terms of finances, either a simple review of bid amounts or a more complicated evaluation that takes into account predicted expenditures during the life cycle of the completed project. It may also consider non-financial aspects like as time, recommended methods, and skill levels, or a combination of these factors. All bidders should be able to bid on an equal footing, which requires that they all receive the same information and, most crucially, that this information is accurate and complete enough to allow them to analyse the project's ramifications and submit tenders accordingly.

The tendering procedure is not always straightforward, and each step of the procedure requires time and money. Therefore, it makes economic sense to avoid overburdening bidders with irrelevant information requirements and to focus on those that are pertinent to the task to be performed. Faced with conflicting financial constraints, the majority of construction contractors will conduct their own evaluation of the projects for which they desire to submit a bid and will be less likely to do so if the procedures involved are burdensome.

Task 3: Write Bill of Quantity

The bill of quantities (BQ) is a document created by the cost consultant that gives project-specific measured quantities of the items of work defined in the tender paperwork by drawings and specifications. The quantities may be measured in number, length, area, volume, weight or time. Before preparing a bill of quantities, the design must be complete and a specification must be drafted.

The bill of quantities is supplied to bidders so that they can estimate the cost of executing the project. The bill of quantities supports bidders in calculating construction costs for their bid, and because it ensures that all bidders price the same quantities, it also offers a fair and accurate tendering procedure.

The contractor submits bids in accordance with the bill of quantities, indicating the price for each component. This itemized bill of quantities represents the offer of the bidder. As the offer is comprised of prescribed elements, it is feasible to directly compare both the overall price and individual items with other tenderers' offers, allowing for a detailed evaluation of whether aspects of a tender may represent excellent or poor value. This information is useful during bid discussions.

Task 4 : Project's site visit

Site visits are a part of the bidding procedure. They include travelling to the location where you intend to deploy your services in order to gather in-depth information. Site visits are not just a universal component of the bidding process. On one bid, a site visit may be required, on another, it may be optional, and on a third, it may be unavailable. This is just another reason to carefully examine the bid materials. Not all bid documents are formatted in the same manner.

When working in the gas sector, site visits are crucial for obtaining information that may not be available in the tender documents, as well as an opportunity to obtain specific information from those familiar with the location.

Pipeline installation also necessitates a site visit to monitor the development of the project. In addition, if you are required to submit a pricing document, site visits provide you with the opportunity to gather information that you could never obtain through tender paperwork. This will allow you to develop a realistic pricing plan, keeping you from pricing incorrectly high or low.

Task 5 : Pipe Calculation for Approval to Install (ATI) submission

Pipe calculations are required for Approval to Install (ATI). There are two types of pipe calculation: pipe pressure and pipe stress. Its purpose is to test whether the pipe's wall thickness can withstand the pressure and whether the pipe's size is adequate for use. This is because we do not wish to encounter problems once the pipeline is operational. This could cause the pipe to leak since it is unable to withstand the pipe's high pressure.

Before we can begin calculations, we must complete the project's drawing and the pipeline flow. Numerous procedures must be completed, including labelling, measuring length, establishing pipe size, and calculating the consumption rate. Calculation is complete when the acceptable pressure drop is acceptable.

Task 6 : Inspection and preventive maintenance report

As a crucial component of a maintenance programme, inspections involve tasks that assess the state of equipment and identify the tools, materials, and manpower necessary to service it.

A maintenance inspection is the evaluation of the condition of machinery or equipment. The goal of a maintenance inspection is to establish what tools, materials, and personnel are required to maintain their good condition. Inspections can identify minor problems before they become costly fixes. Inspections guarantee that systems are operating properly and assist prevent equipment breakdown. As part of their overall maintenance programme, virtually every plant or facility must undertake frequent inspections.

Task 7 : Method Statement

When it comes to the health and safety of projects, especially in the construction sector, method statements are of the utmost importance. These documents are used in conjunction with risk assessments to ensure the safety of particular high-risk project tasks and activities. Method statements are documents that provide specific instructions on how to perform job safely. Method statements are essential for maintaining health and safety on the job site.

The goal of method statements is to indicate the safety precautions to be implemented in order to mitigate the identified risks. They describe the equipment to be used during projects, as well as the control equipment and PPE necessary to ensure the safety of workers and site visitors while tasks are in progress.

Each work is subdivided into steps, and the method statement evaluates the risks associated with each step prior to outlining how to control and reduce risks. The statement should also address the risks connected with tasks and activities' byproducts. For instance, if waste is generated, the document must include safe disposal procedures. It will also contain more general information, such as the number of hours to be spent on each activity, the work sequence, management and duties, and emergency procedures.

3.2.1 Weekly Activity

Week & Date	Weekly Summary
Week 1 (21.02.22 – 25.02.22)	<ul style="list-style-type: none"> • First Meeting and briefing from Mr. Jack Chong. • Tighten OPSO device and change the spring of 10-60mbar to 60-90mbar regulator. • Wrote quarterly inspection report • Study ISO documentation • Wrote inspection checklist report • Site visit to Nanyang Coffee @ Midvalley • Observe engineer changing solenoid valve
Skills Obtained	<ul style="list-style-type: none"> • Develop on-hands skill for changing solenoid valve • Improve communication skills with staff • Observe & understand gas pipeline works

Week & Date	Weekly Summary
Week 2 (28.02.22 – 04.03.22)	<ul style="list-style-type: none"> • Prepare tender documents & wrote cover letter for Emerald Rawang Clubhouse & Smart Glove City. • Review comments from JKKP and DOSH for audit • Engage with Aidil, safety officer about the OSH performance document • Self-study about Jayagas Engineering
Skills Obtained	<ul style="list-style-type: none"> • Learn how to prepare tender documents • Exposed to Occupational Safety & Health performance report

Week & Date	Weekly Summary
<p style="text-align: center;">Week 3 (07.03.22 – 11.03.22)</p>	<ul style="list-style-type: none"> • Renew emergency contact information • Went to maintenance office to observe and learn gas pipeline and equipment function • Explanation about requalification works • Went to United Point Mall to see gas farm • Sketch gas pipelines for Pavillion Bukit Jalil • Wrote Bill of Quantity • Measuring Pipe on drawing using scale ruler (1:100) • Wrote quotation report • Prepare rectification report • Practice sketching isometric gas pipeline based on previous drawing
<p style="text-align: center;">Skills Obtained</p>	<ul style="list-style-type: none"> • Exposed to gas pipeline flow and their functions • Know what to do in requalification works in general • Learned how to sketch gas pipeline and sketch isometric drawing • Learn how to write bill of quantity, quotation, rectification report

Week & Date	Weekly Summary
<p style="text-align: center;">Week 4 (14.03.22 – 18.03.22)</p>	<ul style="list-style-type: none"> • Complete quotation report for Nando's Pavilion Bukit Jalil • Prepare cover letter, schedule of technical data, schedule of unit prices for Huawei Offices • Went to Ekoki Engineering Sdn Bhd to recognize gas equipment • Prepare customer satisfactory survey for all commercial projects • Learned to open a project file with Mrs. Arbayah • Wrote bill of quantity (assisted by Mr. Zaifirdaus) and measuring pipe length for Madam Kwan @ Shamelin
<p style="text-align: center;">Skills Obtained</p>	<ul style="list-style-type: none"> • Learned how to write quotation letter • Know how to prepare cover letter, schedule of technical data, schedule of unit prices • Exposed to various gas equipment • Learn how to read drawing, measure pipe length • Learn how to write bill of quantity

Week & Date	Weekly Summary
Week 5 (21.03.22 – 25.03.22)	<ul style="list-style-type: none"> • Study ISO documentation • Laminate emergency contacts • Supervisor asked to solve calculation problem regarding how many masses of LPG gas lost. Refer lecturer, Mr zaki regarding the question given since could not understand. Complete the calculation.
Skills Obtained	<ul style="list-style-type: none"> • Learn how to solve calculation problem by studying and referring to people • Improved communication skills • Exposed to ISO documentation

Week & Date	Weekly Summary
Week 6 (28.03.22 – 01.04.22)	<ul style="list-style-type: none"> • Prepare the tender documents for submission to client/consultant • Wrote and submit cover letter to Pembinaan Teguh Maju Sdn Bhd • Write schedule of technical data for MRSM Sik, Kedah • Open project file for MRSM Sik, Kedah and Madam Kwan @ Shamelin • Print out and create a “on” “off” labelling for maintenance team • Went to Madam Kwan with supervisor for a site visit
Skills Obtained	<ul style="list-style-type: none"> • Know how to prepare tender document • Know how to prepare cover letter, schedule of technical data, schedule of unit prices • Know how to open project's file • Exposed to actual project's site

Week & Date	Weekly Summary
<p style="text-align: center;">Week 7 (04.04.22 – 07.04.22)</p>	<ul style="list-style-type: none"> • Re-wrote the revised report for Genting project – add header, add information related • Wrote method statement for Sunway International School • Re-do calculation for pipe pressure calculation and pipe labelling • Measuring the pipe by using 1:100 scale ruler on the drawing • Calculate consumption rate for one point to one point • Filled in schedule of technical data • Site visit to Madam Kwan Centralized Kitchen @ Shamelin • Went to Ekoki Engineering Sdn Bhd to see gas detector type IP65 & IP67 • Wrote bill of quantity for Sunway International School (SIS) • Filled in schedule of technical data, unit prices, cover letter, and so on for Condominium Awana at Genting Highlands
<p style="text-align: center;">Skills Obtained</p>	<ul style="list-style-type: none"> • Learn how to wrote method statement report • Gain knowledge by studying and asking people about underground pipe installation • Improved skills on calculation works, measurement, and labelling • Improving in preparing schedule of technical data, unit prices, and cover letter.

	<ul style="list-style-type: none"> • Exposed and learn the progress of gas installation at the site • Know the different between two types of gas detector • Improve skills on writing bill of quantity
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Week & Date	Weekly Summary
<p>Week 8 (11.04.22 – 15.04.22)</p>	<ul style="list-style-type: none"> • Revise method statement for requalification project prepared by Aiman. Separated by 6 sections: <ul style="list-style-type: none"> - Flushing & Cleaning Tank - Filling of The LPG Into the Tank - Flaring & Purging - Hydrostatic Testing - Magnetic Particle Inspection - Pneumatic Testing - Ultrasonic Thickness Gauging • Wrote catalogue report for gas equipment for Sunway International School • Emailed catalogue report and method statement to client • Wrote method statement for Kem Bera @ Pahang
<p>Skills Obtained</p>	<ul style="list-style-type: none"> • Gain knowledge about requalification process flow • Learn how to fill in catalogue report from the Ekoki's catalogue • Learn and improve skills on how to write method statement

Week & Date	Weekly Summary
<p style="text-align: center;">Week 9 (18.04.22 – 22.04.22)</p>	<ul style="list-style-type: none"> • Wrote method statement for Kem Bera @ Pahang • Do corrections for catalogue documents for Sunway International School • Prepare tender documents • Wrote material requisition form (MRF) for Madam Kwan guided by Aiman
<p style="text-align: center;">Skills Obtained</p>	<ul style="list-style-type: none"> • Learn and improved skills on how to write method statement • Know how to prepare tender documents • Learn how to wrote material requisition form (MRF)

Week & Date	Weekly Summary
<p style="text-align: center;">Week 10 (25.04.22 – 29.04.22)</p>	<ul style="list-style-type: none"> • Prepare tender documents • Measure pipe length • Wrote bill of quantity • MRF were revised by Aiman & add more equipment to be ordered • Hands out MRF to Mrs. Ng at Ekoki Engineering Sdn Bhd & revised the MRF again with her • Act as a witness for Hup Seng project with Mr. Zaifirdaus.
<p style="text-align: center;">Skills Obtained</p>	<ul style="list-style-type: none"> • Know how to prepare tender documents • Know how to measure pipe length • Improve skills on writing bill of quantity • Improved skills on writing MRF

Week & Date	Weekly Summary
Week 11 (02.05.22 – 04.05.22)	<ul style="list-style-type: none"> • Open project file for natural gas system for Amsteel Mills @ Klang • Compile transmittal form in the project file • Wrote Material Requisition Form (MRF) for Rubberex Old Factory at Ipoh
Skills Obtained	<ul style="list-style-type: none"> • Know how to open project's file • Learn how to fill in transmittal form • Improve skills on writing material requisition form (MRF)

Week & Date	Weekly Summary
Week 12 (09.05.22 – 13.05.22)	<ul style="list-style-type: none"> • Prepare tender documents for Sunway Project • Filled in schedule of technical data & financial data • Mr. Zaifirdaus teach on how to markup price based on project • Attend meeting with JKKP officers along with Mr. Zaifirdaus at AVECENA Gloves factory @Seremban • Join meeting for Sunway Project via Microsoft Teams • Compiling Approval to Install (ATI) & Approval to Operate (ATO) documents for project in their own project file
Skills Obtained	<ul style="list-style-type: none"> • Know how to prepare tender documents • Know how to prepare schedule of technical data • Learn how to markup on project's price • Observe and learn what issues discussed in the meeting

	<ul style="list-style-type: none"> • Learn on what documents need to be prepared in ATI and ATO documents
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Week & Date	Weekly Summary
Week 13 (16.05.22 – 20.05.22)	<ul style="list-style-type: none"> • Prepare tender documents for Sunway Projects • Filled in schedule of technical data & double checked with Mr. Zaifirdaus • Submit tender document for Sunway via link provided. Manage to submit at 4:30 PM. • Went to site visit with Howard, engineer at Sunway Monash University and also Sunway International School to check on gas pipeline & gas store for LPG. I visited their labs, kitchens, LPG gas store, and café. • Create & design proposal slide presentation for Liquefied Natural Gas (LPG) supply. • Do research & study about company, characteristic of gas, type of gas & services provided.
Skills Obtained	<ul style="list-style-type: none"> • Know how to prepare tender documents • Know how to prepare schedule of technical data • Exposed and learn on the flow of gas pipeline installation on the site • Gain knowledge about the Liquefied Petroleum Gas (LPG) and Natural Gas (NG)

Week & Date	Weekly Summary
<p style="text-align: center;">Week 14 (23.05.22 – 27.05.22)</p>	<ul style="list-style-type: none"> • Make corrections on slide for previous comment from supervisor after he reviewed the presentation slide. • Prepare 2 copy of Operation and Maintenance Manual (OMM) for Sunway Carnival @ Penang • Print out drawing in A1 size & do comb binding for OMM at Maluri Photo Studio • Do quotation for after meter project where I need to : <ul style="list-style-type: none"> - Design pipeline on drawing - Measure pipe length - Contact client & enquire about the existing pipe, dropper location & double confirm kitchen equipment - Refer to Mr. Zaifirdaus for the pipeline design - Do bill of quantity • Wrote cover letter for the project and sent email to the client
<p style="text-align: center;">Skills Obtained</p>	<ul style="list-style-type: none"> • Improving skills on preparation of proposal slides • Learn how to prepare Operation and Maintenance Manual (OMM) documents • Learn how to prepare quotation report • Learn how to design pipeline • Know how to measure length of the pipe • Know how to write bill of quantity • Skilled at preparing cover letter for project

Week & Date	Weekly Summary
<p style="text-align: center;">Week 15 (30.05.22 – 03.06.22)</p>	<ul style="list-style-type: none"> • Prepare tender documents • Filled in schedule of technical data • Self-study on past project's quotation • Compile invoice & drawing into project files • Open project files for Men Ken Do, Menal Korean BBQ • Site visit to Madam Kwan Centralized Kitchen to see the site progress with Aiman • Observe fabrication works & baby tank gas farm progress • Requested client to bring sample of kitchen equipment later to measure dimension • Wrote tender declaration form & work schedule for Sunway's project • Inform Aiman to bring me for a site visit at Madam Kwan later
<p style="text-align: center;">Skills Obtained</p>	<ul style="list-style-type: none"> • Good at preparing tender documents • Know how to prepare schedule of technical data • Skilled at opening project's file • Learn progress of the main project at the site • Learn on the process of fabrication works and gas farm installation • Improve communication skills • Know at preparing declaration form and work schedule

Week & Date	Weekly Summary
<p style="text-align: center;">Week 16</p> <p style="text-align: center;">(06.06.22 – 10.06.22)</p>	<ul style="list-style-type: none"> • Prepare tender documents for Sunway to be submitted before 12 PM • Do 3 Quotations for Top Glove at Factory 5 (Copy & Paste) by referring to past quotation and format • Double check cost of whole projects before submitted again to Sunway since it has a slight mistake on past submission • Supervisor asked me & Aiman to review the as built drawing for ATO submission since the Madam Kwan project is done
<p style="text-align: center;">Skills Obtained</p>	<ul style="list-style-type: none"> • Know how to prepare tender documents • Learn and improve skills on preparation of a quotation report • Improve skills of reading drawing

Week & Date	Weekly Summary
<p style="text-align: center;">Week 17</p> <p style="text-align: center;">(13.06.22 – 17.06.22)</p>	<ul style="list-style-type: none"> • Self-learning on project quotation and tender documents • Make a note for file location for easier find • Wrote inspection report for Sushi Zanmai @ Gurney Paragon Mall • Open project file for Travelling Duck @ Midvalley • Volunteer to teach HR staff on how to prepare PowerPoint • Help Mr. Zaifirdaus with labelling information board for pipe, fittings, & accessories • Prepare & arrange tender documents

	<ul style="list-style-type: none"> • Filled in schedule of technical data, schedule of unit prices • Write method statement for welding control for carbon steel pipe for inspection test plan • Wrote pressure test report for requalification works of 30KL tank @ First World Genting
Skills Obtained	<ul style="list-style-type: none"> • Learning how to prepare quotation and tender documents • Learn how to prepare inspection report • Could identify gas equipment easily • Know how to prepare tender documents • Know how to fill in schedule of technical data and schedule of unit prices • Learn and improve skills on how to prepare method statement • Know how to prepare pressure test report

Week & Date	Weekly Summary
<p>Week 18</p> <p>(20.06.22 – 24.06.22)</p>	<ul style="list-style-type: none"> • Write method statement for welding control for carbon steel pipe for inspection test plan • Read Certification Scheme for Personnel (CSWIP) 3.0 about visual welding inspector such type of welding defects • Do research on scope of work for visual welding inspector, welder and other personnel that involve in welding control • Prepare technical bid and financial bid documents

	<ul style="list-style-type: none"> • Method statement done & submitted the document to Howard, engineer to review • Create & design poster for services that Jayagas provided to their client • Prepare tender documents for 3-storey bungalow at Tropicana that due on June 24th 2022, before 12 PM • Filled in technical data & wrote declaration letter of non-collusion • Prepare transmittal form & send to Amzar to submit the tender documents in hardcopy • Re-write quotation for Mr. Zaifirdaus
<p style="text-align: center;">Skills Obtained</p>	<ul style="list-style-type: none"> • Learn and study on how to prepare method statement for welding control • Know how to prepare financial bid and technical bid • Improving skills in designing poster • Skilled in preparing the tender documents • Good at preparing schedule of technical data • Learn how to write declaration of non-collusion letter

Week & Date	Weekly Summary
<p style="text-align: center;">Week 19 (27.06.22 – 01.07.22)</p>	<ul style="list-style-type: none"> • Design poster for Non-Destructing Test (NDT) services • Do a meter reading at Mall which is Subang Parade Mall, Sunway Putra Mall, 3 Damansara, Plaza 33, & PJ33 Mall

	<ul style="list-style-type: none"> • Draft pipe calculation for Fuya Energy @ Sarawak & give Ridzuan, engineer to reviewed • Open project file for MRSM Tanah Merah, Kelantan • Self-learning on Approval to Install (ATI) & Approval to Operate (ATO) submission • Follow an update from Aiman on Madam Kwan's project • Do quotation for Aroi De Thai @ Palm Garden Hotel Putrajaya • Ridzuan came to teach me on the pipe calculations for Fuya Energy @ Sarawak
<p>Skills Obtained</p>	<ul style="list-style-type: none"> • Learn and know how to read meter • Improving skills on labelling and calculation works • Know how to open project's file • Know the progress of the project that I assisted • Learn how to do a quotation report

Week & Date	Weekly Summary
<p>Week 20 (04.07.22 – 08.07.22)</p>	<ul style="list-style-type: none"> • Assisted Mr. Zaifirdaus in preparing tender documents for IOI Puchong Mall to be send in hardcopy, Excel files & CD-R • Prepare tender for MRSM Tanah Merah, Kelantan • Filled in schedule of technical data, schedule of unit prices for both projects • Inform Mr. Zaifirdaus to notice client on the wrong calculation of total prices for IOI Puchong Mall's project

	<ul style="list-style-type: none"> • Print 2 copy Operation & Maintenance Manual (OMM) • Fold A1 Drawing using ISO method with total of 24 pieces of drawing • Wrote preventive maintenance report for Longi's project in Sarawak
Skills Obtained	<ul style="list-style-type: none"> • Know how to prepare tender documents • Know and skilled in filling in schedule of technical data, schedule of unit prices • Know how to prepare OMM documents • Learned on folding A1 size drawing using ISO method • Know how to prepare preventative maintenance report

Week & Date	Weekly Summary
<p>Week 21</p> <p>(11.07.22 – 15.07.22)</p>	<ul style="list-style-type: none"> • Open project files for new projects • Print out and prepare file divider and ISO documents • Compile tender document into tender files for reference • Wrote Material Requisition Form (MRF) & delivered to Ekoki Engineering Sdn Bhd
Skills Obtained	<ul style="list-style-type: none"> • Know how to open project's file • Know how to prepare file divider and ISO documents • Know how to filing tender documents • Know how to prepare MRF

Week & Date	Weekly Summary
Week 22 (18.07.22 – 22.07.22)	<ul style="list-style-type: none"> • Maintain a record of all bid documents in the file • Prepare report and presentation for the industrial training • Open project's file • Filing Approval to Install (ATI) & Approval to Operate (ATO) document • Prepare pressure test report for two bulk tanks for Genting's project • Teach Jayagas staff to take over my task
Skills Obtained	<ul style="list-style-type: none"> • Know how to file tender documents • Know How to open project's file • Know how to filing ATI and ATO document • Know how to prepare pressure test report • Improving social skills and communication skills

Week & Date	Weekly Summary
Week 23 (25.07.22 – 29.07.22)	<ul style="list-style-type: none"> • Write material requisition form (MRF) for Grab Kitchen • Do tender revised for IOI Puchong Mall and self-explanation letter
Skills Obtained	<ul style="list-style-type: none"> • Know how to prepare tender • Know how to write MRF

Week & Date	Weekly Summary
Week 24 (01.08.22 – 05.08.22)	<ul style="list-style-type: none"> • Prepare material submission form document for Kem Bera @ Pahang
Skills Obtained	<ul style="list-style-type: none"> • Learn to prepare material submission form

Table 9: Weekly report

Chapter 4 Details of Experiences (Report on Job/Task/Project)

4.1 Introduction

During the course of this training that lasted for six months, I was responsible for a wide variety of activities and responsibilities, including documentation and operation. This chapter provides specific information regarding the duty that passes to me as an assistant engineer.

4.2 Details of The Training and Experience Gained

4.2.1 Task 1 : Quote price for small project

Project quotation divided by four parts which is preliminaries, gas reticulation pipe works, gas detector system, and labor charges. Quotation that was given to me is The Travelling Duck at Midvalley and Aroi De Thai at Palm Garden Hotel Putrajaya. Firstly, for The Travelling Duck is a after meter piping works project so as soon as I received the task from Mr. Zaifirdaus, I open the project code used for recognize each project and I listed down this project to make sure other project would not use the same project code. So, for the project code or also known as reference number for The Travelling Duck at Midvalley is “KJG(Q)/MZZ/NAA/2022/164b”.

DATE	REFERENCE NO.	CLIENT	PROJECT	AMOUNT (RM)	DISCOUNT (RM)	GRAND TOTAL (RM)	PROJECT CODE
19.05.2021	KJG (Q)/CW/NAH/2022/153	Dats Management S/B	to supply & change LPG main piping system (leaking area only)				
19.05.2022	KJG (Q)/CW/2022/154	Han Hual Iaya Enterprise	QUOTATION TO SUPPLY, DELIVER, INSTALL AND COMMISSIONING OF LPG STORE & PIPING WORKS				
19.05.2022	KJG (Q)/CW/NAH/2022/155	Uasals One	to run monthly visual inspection (under contract) for House of P&G, MV				
20.06.2022	KJG (Q)/CW/2022/156	TFCC	QUOTATION TO SUPPLY DELIVER INSTALL AND COMMISSIONING OF 4 LOT LPG RETICULATION AT UNITED POINT FOODCOURT (AFTER METER)				
20.07.2022	KJG (Q)/CW/2022/157	Saraway College IPB Sdn Bhd	3nos gas store and pipe inspection and PGI				
20.09.2022	KJG (Q)/CW/2022/158	Saraway Education Group Sdn Bhd	3nos gas store and pipe inspection and PGI				
23.09.2022	KJG (Q)/MZZ/2022/159	palmgardenhotel.com	to install party				
23.09.2022	KJG (Q)/MZZ/2022/160	Sunway	QUOTATION TO INSTALL NEW PIPING DROPPER C/W ACCESSORIES (BEFORE METER) FROM NEAREST MAIN PIPING TO LG2.06				
24.05.2022	KJG (Q)/MZZ/2022/161	Genting Resort Sdn Bhd	additional LPG pipe at hotel (Rm. embassy) RT				
24.05.2022	KJG (Q)/CW/NAH/2022/162	Advanced Packaging	to supply & install flange BV				
27.05.2022	KJG (Q)/CW/NAH/2022/163	Wahidreem Ktani	PM works				
27.05.2022	KJG (Q)/MZZ/NAH/2022/164	Midvalley	After Meter Works				
30.05.2022	KJG (Q)/MZZ/2022/165	Detunconeri International Sdn Bhd	LPG before meter pipework at datum jelatek kl				
30.05.2022	KJG (Q)/CW/NAH/2022/166	Sophie Condo Man 1 Kiara R-13-1	to dismantle LPG piping system c/w report				
30.05.2022	KJG (Q)/MZZ/2022/167	Coffee Coffee	RU 200KG tank				
31.05.2022	KJG (Q)/MZZ/NAH/2022/168	Mental Korean BBR	Before Meter Works				
31.05.2022	KJG (Q)/CW/2022/169	Permal Gas	LNG System				
01.06.2022	KJG (Q)/AAZ/CW/2022/170	Suara Sakti	After Meter				
01.06.2022	KJG (Q)/AAZ/CW/2022/171	Royal Hotel Sdn Bhd	GAS SYSTEM				
02.06.2022	172	Suria KLEC	LNG Reticulation System				
03.06.2022	KJG (Q)/MZZ/2022/173	Palm Garden	Dismantle LPG dropper				

Figure 7: Master quotation list

After open project code, I proceed to open template for quotation which was already provided in server. Then I determine what service we will do based on the work which is after meter gas reticulation system. So, the services needed for preliminaries is preliminaries, mobilization, demobilization, & miscellaneous, engineering calculation, drawings, and documentation, and Suruhanjaya Tenaga (ST) approval.

JAYAGAS
KEJURUTERAAN JAYAGAS SDN BHD (C10990-T)

OUR REF : KJGQ/MZZ/NA/2022/164b
 DATE : 3-Jun-22

Prokitch Solution (M) Sdn Bhd,
 No. 46, Jalan Seleguri,
 Taman Chi Liang,
 41200, Klang.

ATTN : Ms. Calista
 EMAIL : prokitchs@gmail.com

TEL : 012 619 5365
 FAX : -

Dear Sir / Ma'am,

REVISE QUOTATION FOR AFTER METER PIPING WORKS @ THE TRAVELLING DUCK, MIDVALLEY

SCHEDULE OF PRICES					
ITEM	DESCRIPTION	QTY	UNIT	RATE (RM)	AMOUNT (RM)
A	PRELIMINARIES				
1	Preliminaries, Mobilization, Demobilisation & Miscellaneous - Provide Worker's Insurance - Transport the piping material, equipment and tools to site - Travelling and Petrol	1	Lot	L/S	L/S
2	Engineering Calculation + Drawings + Documentation - Engineering Calculation, consists of Pressure Drop Calculation, Pipe Sizing Calculation, Pipe Wall Thickness Calculation and Pipe Routing Drawings To Malaysia Standard M.S. 930 & M.S. 850 and ASME B31.8 for NG Piping Systems - Endorsement drawings and documentation by competent person - Prepare shop drawings & As-Built Drawings	1	Lot	L/S	L/S
3	ST's Approval (Subject to Authority approval / normally takes 5-6 weeks) - Submission of ATI & ATO - Follow up with ST's inspection to obtain ATI - To arrange site visit for ST's inspector. Note: Client to provide soft copy site drawings	1	Lot	L/S	L/S
Collection to Summary of Prices					

Figure 8: Quotation at Travelling Duck Midvalley

Then, for natural gas reticulation pipe works we divided into before gas meter works and after gas meter works which then will be break down into several gas equipment and pipe needed for the project. After that, is gas detector system and lastly labor charge which is the supervisor, welder, and fitter salary.

JAYAGAS
KEJURUTERAAN JAYAGAS SDN BHD (108990-D)

PROJECT : After Meter Works
 SITE : THE TRAVELLING DUCK @ MID VALLEY
 SERVICE : LPG

SCHEDULE OF PRICES					
ITEM	DESCRIPTION	QTY	UNIT	RATE (RM)	AMOUNT (RM)
B	N-GAS RETICULATION PIPE WORKS AND CONTROL To supply, deliver, install, test and commission and handing over in and off the complete gas piping system and all accessories required as per specification and drawings:-				
	1 Before Gas Meter Works To connect 1 1/4" dia Sch 40 Carbon Steel Pipe welded or threaded, painted in yellow colour, tapping from existing gas dropper to the proposed gas dropper location. Complete with pipe fittings, pipe support and label with Arrow "Gas".	1	lot		
	2 After Gas Meter Works To install 1 1/4" dia Sch 40 Carbon Steel Pipe welded or threaded, painted in yellow colour, tapping from existing main pipe to the proposed gas dropper location. Complete with pipe fittings, pipe support and label with Arrow "Gas"	1	lot		
	3 0-30 psi Pressure Gauge (Atlantis) complete with 1/4" dia Ball Valve (Omega) and fittings.	2	nos		
	4 1/2" dia Ball Valve (Omega)	4	nos		
	5 1" dia Ball Valve (Omega)	2	nos		
	6 Solenoid Valve, 1 1/4" diameter, Brand Techno, (normally open)	1	nos		
	7 Second stage regulator (BP1805)	4	nos		
	8 Fusal connection to kitchen equipment (Rubber Orange Hose)	6	lot		
	9 Testing & Commissioning of NG Piping System before handing over.	1	lot		
	10				
C	Gas Detector System				
	1 Gas Detector (GASTRONICS- GTD-2000EX) 24 VDC complete with relay.	2	pcs		
	2 Installation Control Panel complete with Key Switch, Emergency Push Button, Buzzer, Siren and Strobe Light. Note: Power supply & Kitchen Hood Signal by others.	1	lot		
	3 Installation of normal wiring and fitting to Gas Detector, Solenoid Valve & Control Panel.	1	lot		
D	Overtime: Labour charge night work (3 nights)				
	1 Supervisor, Welder and Fitter	1	Per		
Collection to Summary of Prices					

Figure 9: Quotation at Travelling Duck Midvalley

Next, we determine the price which is in this project, the unit prices were given by Mr. Zaifirdaus and my job is total up the amount of the whole project. After that, I will save the document in PDF format and pass it to Mrs. Chris, or Mr. Zaifirdaus to email the quotation to clients. These procedures also applied to quotation for Aroi De Thai at Palm Garden Hotel Putrajaya.

4.2.2 Task 2 : Assist engineer in tendering process

I helped Mr. Zaifirdaus with the tendering procedure that he was involved in. There, I discovered what kind of document I needed to put together and what kind of information I should include in it. The consultant or the customer will send the invitation to submit a tender via email, with the necessary documentation attached. Following that, either Mrs. Chris or Mr. Zaifirdaus will open the project file in preparation for the bid. They attached a schedule of technical data, a schedule of unit prices, a quotation form, a statement of non-corruption, a questionnaire, and various other documents to the file, all of which are intended for the tenderer to read and consider. In this part of the process, I helped Mr. Zaifirdaus fill out the schedule of technical data and the schedule of unit prices, as well as prepare the letter declaring that there was no corruption involved. After that, I will make sure to get Mr. Zaifirdaus' signature as well as the company chop. The Madam Kwan Centralized Kitchen at Shamelin, the 3-Storey Bungalow at Tropicana Indah, IOI Puchong Mall, MRSM Sik Kedah, MRSM Tanah Merah Kelantan, Sunway Carnival Penang, Huawei Offices at TRX Exchange, and Emerald Rawang Clubhouse are just few of the tender documents that I assisted with.

I was required to fill out the specifics for the pipe and gas equipment that was used for the schedule of technical data. These details included, for instance, the brand of the ball valve, the country of manufacturing, the material, the standard of compliance, and the pressure rating or class.

Item	Description	Base Specification	Tenderer's Offer
1	Schedule 40 Pipe		
	Manufacturer	Hebei Shengtian /Equivalent	Hebei
	Country of Manufactured	Tenderer to fill in	Malaysia
	Material	Schedule 40 seamless steel pipe	(Carbon Steel)
	Standard of Compliance	API 5L Grade B	
	Pressure Rating / Class	Tenderer to fill in	MS 830 / MS 730
2	Schedule 80 Pipe		
	Manufacturer	Tenderer to fill in	Hebei
	Country of Manufactured	Tenderer to fill in	Malaysia
	Material	Schedule 80 seamless steel pipe	
	Standard of Compliance	Tenderer to fill in	Grade B
	Pressure Rating / Class	Tenderer to fill in	MS 830 / MS 730

Figure 10: Schedule of technical data for Sunway Carnival

SCHEDULE OF TECHNICAL DATA

DESCRIPTION	PARTICULARS	
	BASE TENDER SPECIFICATION	TENDERER OFFER
a) GAS PRESSURE REGULATOR		
Manufacturer	Clesse Novacore/Fisher Regal/Spanton Control Claessing Anzol Eq	Clesse - Novacore ³
Country of Origin		UK
Type/Model		BPI803
b) BALL VALVE		
Manufacturer	Rukin/Mark Biscione/ Claessing Kroll Regal	Empirol
Country of Origin		Italy
Type/Model		Omega
c) EMERGENCY SHUT-OFF VALVE		
Manufacturer	Fisher Regal Equal	Madas
Country of Origin		Italy
Type/Model		Terco Valve
d) POLYETHYLENE SHUT-OFF VALVE		
Manufacturer		
Country of Origin		
Type/Model		
e) SOLENOID VALVE		
Manufacturer	Electro valve/Geos/Disarhent Anzol Equal	Techno-control
Country of Origin		Italy
Type/Model		JA4DC



Figure 11: Schedule of technical data for IOI Puchong Mall

It is necessary for me to consult Ekoki Engineering, which is Jayagas's primary source of supply, in order to retrieve all of the information. After that, I log into the Ekoki server, which is located on the server. Following that, I looked for the catalogue of the equipment. In the event that I was unable to obtain the required information, I would then inform to Mr. Zaifirdaus, and he would then inquire with Mrs. Ng, the person in charge of Ekoki or another supplier. After that, he would send the information to me directly.

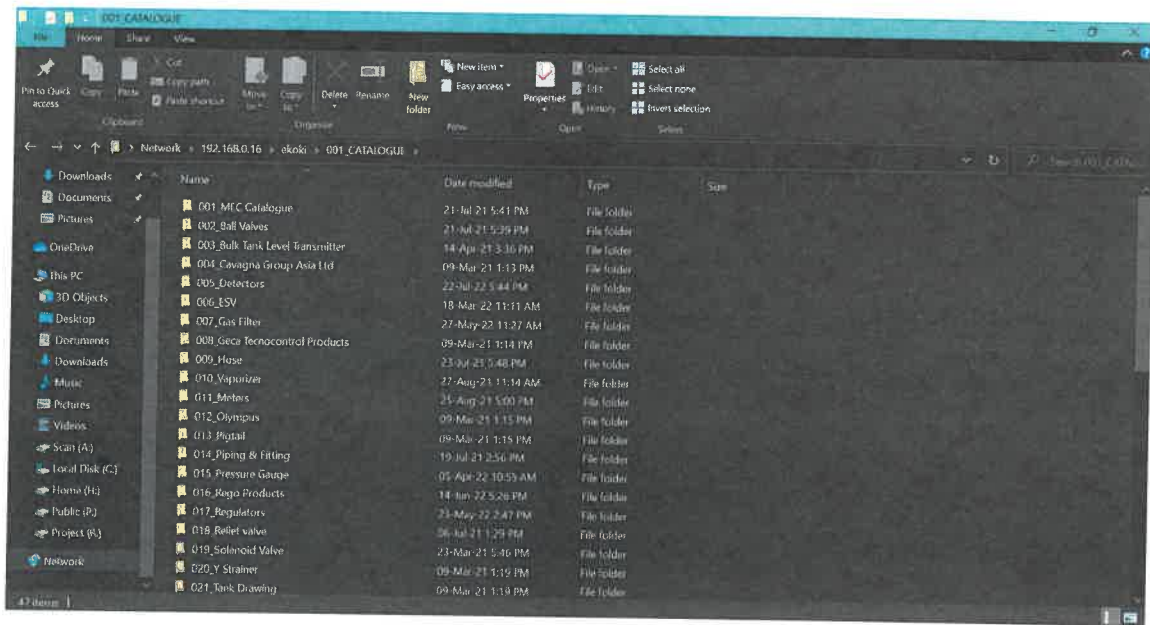


Figure 12: Ekoki's server

The schedule of unit prices for the pipe and gas equipment is the next thing I work on once I have finished filling out the schedule of technical data. In this form, I need to enter in the prices that are listed per unit for each size available. I am referring to the file that contains the pipe price list that is located on the KJG server. In the event that the prices are not present, I will let Mr. Zaifirdaus know, and he will retrieve the prices. After that, he is going to provide me the rates.

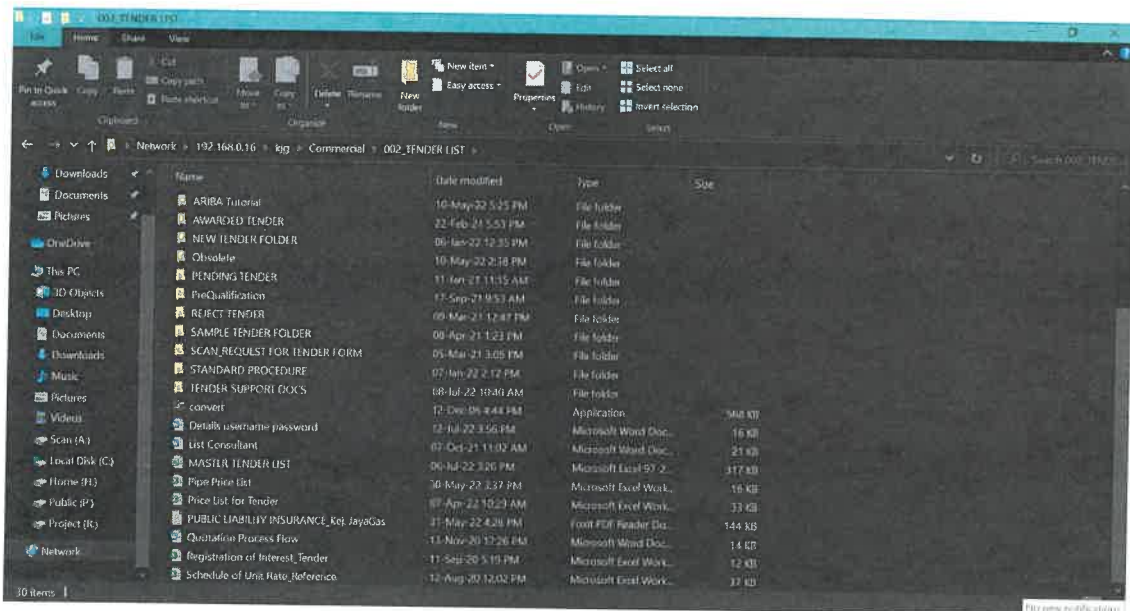


Figure 13: Kejuruteraan Jayagas's server

Last Update: 30-May-22

SCHEDULE 40						SCHEDULE 80		
No	Size		Pipe	Tee	Elbow	Pipe	Tee	Elbow
	Inch	mm	Price per meter (RM)	Price per pc (RM)	Price per pc (RM)	Price per meter (RM)	Price per pc (RM)	Price per pc (RM)
1	1/2"	15	95.00			135.00		
2	3/4"	20	118.00			135.00		
3	1"	25	138.00			155.00		
4	1 1/4"	32	165.00			185.00		
5	1 1/2"	40	220.00			240.00		
6	2"	50	245.00			265.00		
7	2 1/2"	65	290.00					
8	3"	80	313.00					
9	4"	100	390.00					
10	5"	125	415.00					
11	6"	150	445.00					
12	8"	200	545.00					
13	10"	250	840.00					

Figure 14: Pipe price list

In the event that the prices for the gas equipment are not included on the prices list for the Ekoki server, I consult with Mrs. Ng. I refer to Ekoki's prices list. Therefore, she will check with the supplier first to find the pricing, and then she will send them to me.

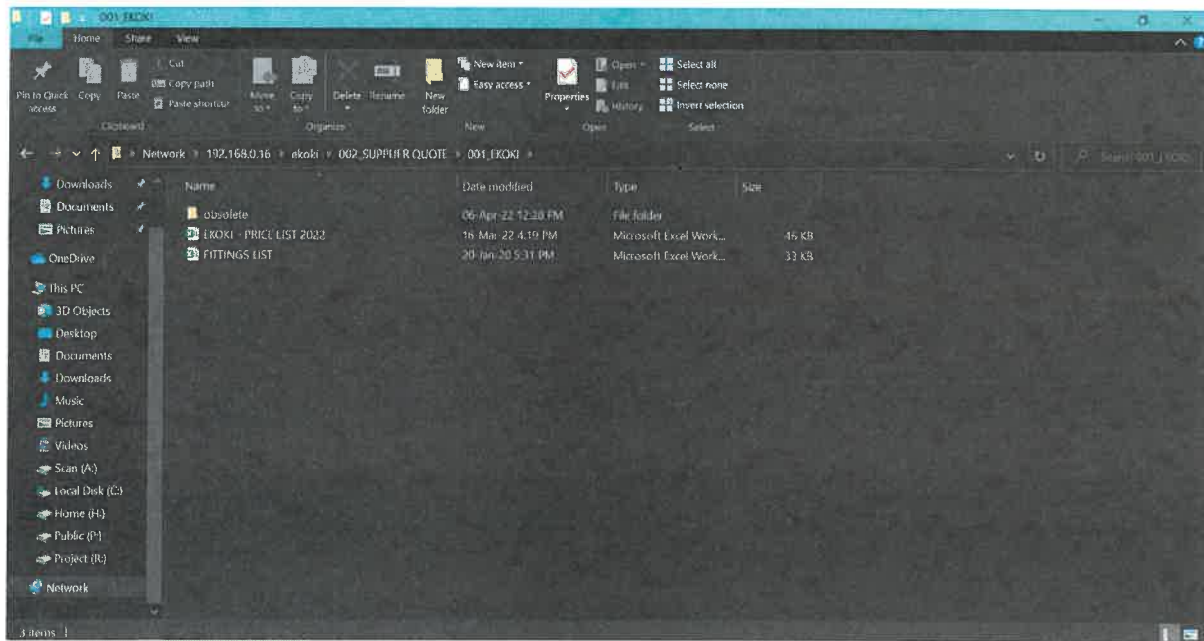


Figure 15: Ekoki's server

	D	E	F	G
S.3269.N.35	3/4"	25.50	38.30	
S.0271.N.36	1"	41.50	61.70	
S.0271.N.37	1 1/4"	63.00	83.60	
S.0271.N.38	1 1/2"	100.00	137.55	
S.0271.N.39	2"	118.20	166.65	
2.0 ENOLGAS OMEGA KEY LOCKED BALL VALVE	3/4"	67.00	130.00	
2.0 ENOLGAS OMEGA KEY LOCKED BALL VALVE	1"	86.00	150.00	
3.0 ENOLGAS STEEL BALL VALVE	1/2"	16.60	28.40	
4.0 HAMAI BRASS BALL VALVE	BBS-01-08RC	1/2"	24.00	29.00
4.0 HAMAI BRASS BALL VALVE	BBS-01-15RC	1/2"	30.20	36.40
4.0 HAMAI BRASS BALL VALVE	BBS-01-20RC	3/4"	36.20	55.00
4.0 HAMAI BRASS BALL VALVE	BBS-01-25RC	1"	58.50	68.90
4.0 HAMAI BRASS BALL VALVE	BBS-600-32RC	1 1/4"	99.00	113.00
4.0 HAMAI BRASS BALL VALVE	BBS-600-40RC	1 1/2"	109.90	126.00
4.0 HAMAI BRASS BALL VALVE	BBS-600-50RC	2"	192.10	221.50
5.0 KITZ SZA TYPE 600 BRASS BALL VALVE	FIG.SZA	1/2"	21.30	24.20

Figure 16: Ekoki price list

Once I have all of the pricing with me, I will need to write them down. Prior to that, the prices are going to be increased by between thirty and forty percent depending on the project. After that, Mr. Zaifirdaus will chop and sign into all of the forms and sign them.

After that, I will draught a declaration of non-corruption letter, which will be based on the consultant's letter. If they request it, we are obligated to provide it. Mr. Zaifirdaus will then complete the quotation form and hand it to me once he has finished. I will copy and paste again using a pen containing black ink, calculate the total amount of whole projects, and record it on the quotation summaries. After that, I will prepare a cover letter for this project in order to inform the consultant and shop owner of the total project cost.

Then, I will organize the documents and rescan them into the server so that Mr. Zaifirdaus can send them to the client, as there are documents that require printing. If the consultant demands a hard copy, I will print off the entire document, complete the transmittal form, and have the maintenance team send the document to the specified address.

4.2.3 Task 3 : Write Bill of Quantity

Preparing a bill of quantity serves as an excellent guide for producing quotations. My first step in writing a bill of quantity was to learn how to interpret the drawing, so I requested the engineer on site to show me what each symbol meant. To measure the pipe length, they showed me how to use a scale ruler to convert it into meter units. After that, I added a 30% markup to the pipe's length. Based on the drawing, I then count the number of ball valves, regulators, reducers, and other fittings and accessories utilized in the project and determine the size of each piece of equipment and pipe. Then I enter what I've learned into an excel spreadsheet. For each piece of pipe and equipment, I take the price per unit and multiply it with quantity to get the overall cost. I gave them to the engineer to look over before they used them as a basis to produce a quotation.


		BILL OF QUANTITY (BQ)		Doc No: PR-P01-F002	
Korporataraan Jayagas Sdn Bhd				Revision : 1	
PROJECT NAME	Madam Kwan LPG Piping				
LOCATION	No. 16, Jalan Shamelin Niaga 2, Taman Shamelin Perkasa, Kuala Lumpur				
PROJECT PERSON INCHARGED					
DATE	21-Mar-22				
QUOTATION REFERENCE NO					
NO	DESCRIPTION	QTY	UNIT RATES (RM)	MARK UP (%)	FINAL AMOUNT (RM)
1	Sch 40 pipe (meter) Size: 1" (25 mm)	30	145.00	65.00	7,177.50
2	Sch 40 pipe Size: 1 1/4" (32 mm)	48	141.05	65.00	11,171.16
3	Sch 40 pipe Size: 1 1/2" (40 mm)	42	169.00	65.00	11,711.70
4	Ball Valve (Omega) Size: 1"	30	53.95	30.00	2,104.05
5	Ball Valve (Omega) Size: 1 1/2"	1	130.00	30.00	169.00
6	Pressure gauge, Range: 0-30 Psi	5	39.00	30.00	253.50
7	Brand: Atlantis	-	-	-	
8	Ball Valve (Omega) Size: 1/8" (for gauge)	5	19.50	30.00	126.75
9	Solenoid valve, 24V/ 230Vac, Size: 1 1/2"	2	770.90	30.00	2,004.34
10	Normally open , Brand: Medas				
11	Second Stage regulator (Novacomet) BP2402	2	754.00	30.00	1,990.40
12	Final connection, rubber hose	30	85.00		2,550.00
13	Flaring work - Yes / No	1	500.00		500.00
14	Pressure testing	1	500.00		500.00
15	Commissioning of LPG system	1	500.00		500.00
16	Control panel d/w wiring	1	40000.00		40,000.00
17	Gas Detector (Gastron) 230Vac, d/w relay	16	156.00	30.00	3,244.80
18	Labour charge - Day	15	2000		30,000.00

Figure 17: Bill of quantity for Madam Kwan @ Shamelin

4.2.4 Task 4 : Project Site Visit

I was given a chance to follow an engineer to go for a site visit to observe and learn about the process of gas piping installation and inspection. The engineers that brought me are Mr. Aiman, Mr. Zaifirdaus, and also my supervisor, Mr. Jack Chong. Some of the sites that I go to are Nanyang Coffee at Midvalley, Mille Caffè at United Point Mall, Madam Kwan Centralized Kitchen at Shamelin, and AVECENA Gloves Sdn Bhd at Seremban.

At Nanyang Coffee, I followed Mr. Aiman and Mr. Redzuan to go meet with Gas Malaysia Sdn Bhd and also to hand out ATO documents, but at that time, Aiman did not bring the complete document, so he had to send it later to Gas Malaysia. Then, I also watched Mr. Redzuan change the solenoid valve from the normally closed to the normally open type because the owner did not want the normally closed type. So, Redzuan had to call my supervisor to bring the normally open type and bring it to the site since it was an emergency matter. In the inspection, the client was told that the pipe was too close to the wall, which is against the laws for pipe installation. So, Redzuan and Aiman had to open the screw and bracket and fix the position of the pipe before screwing it again.



Figure 18: Site visit to Nanyang Coffee @ Midvalley

Then, I went to a meeting with JKKP officers along with Mr. Zaifirdaus at Avecena Gloves Seremban for the officers to check the ATO documents. The officer gave a briefing on what needs to be improved. The officer stated that the drawing must have a stamp and signature from the consultant to show its authenticity. Then, the officer and also the factory owner went to the place of operation to see the project for themselves, and then we went back to the offices.



Figure 19: Site visit to Avecena Gloves Factory @ Seremban

Furthermore, I went to United Point Mall with Mr. Aiman and he show me the Liquefied Petroleum Gas (LPG) bulk tank gas farm and he explained to me the flow of the piping there. He stated that they used bypass line is because if incase one piping had problem then they can use bypass line to operate and supply gas to the kitchen in the mall while the maintenance team fix the issues. Then he also explained to me the function of vaporizer, emergency shut off valve, regulator and so on.



Figure 20: Site visit to United Point Mall

Then I also went to Sunway Monash University by following Howard to see the gas pipeline at every lab, kitchen, café, and gas store. It was very necessary to understand the pipeline so that it would be easier for me to do tenders and bills of quantity. I also see different types of tanks, such as bulk tanks and baby tanks. Plus, Howard explained to me why the site visit is needed, which is to retrieve the actual pipeline design instead of looking at the drawing. Then, we can change or add on any services needed in the quotation before sending it to the client. This makes the job easier and the operation smoother. Plus, Jayagas can also prevent their company from losing money.



Figure 21: Site visit to Monash Sunway University

Following that, I went to Madam Kwan Centralized Kitchen in Shamelin to monitor the progress of pipe installation, as this is my main project. I visited the site with Aiman several times and attended meetings with the other subcontractors. I also checked on the progress of the baby tank farm and visited with our welding and installation subcontractor, Osman, to get an approximate start date for installing the pipe. I also observed the subcontractor performing fabrication work, which required them to paint the pipe with yellow paint to identify it as a gas line. I learned a lot on this project because I was able to understand the project's process flow from beginning to end.



Figure 22: Site visit to Madam Kwan Centralized Kitchen @ Shamelin

Finally, I went for a meter reading, which implies that my job is to read the monthly usage of gas at each kitchen that Jayagas is in charge of in the malls. The goal of this task is to familiarize me with the gas pipeline. As I read the meters, I could see how they designed the pipeline. Instead of just looking at the isometric drawing, I could see how engineers designed it in reality. The malls that I visited are Sunway Putra Mall, Subang Parade Mall, 3 Damansara Mall, Plaza 33 Mall, and PJ33 Mall.



Figure 23: Meter reading at malls

4.2.5 Task 5 : Pipe Calculation for Approval to Install (ATI)

The pipe calculation consists of pipe pressure calculation and pipe size calculation. Both the calculations for Madam Kwan's Centralized Kitchen in Shamelin and Fuya Energy in Sarawak were my responsibility. This calculation is included in the proposal for Approval to Install (ATI).

The purpose of the pipe sizing calculation is to determine whether the pipe size is adequate for usage in this kitchen. First, I need to determine the kitchen's supply pressure. Fuya Energy in Sarawak, for instance, utilised 20 psi of pressure. It will then display the lowest permissible pressure, which is 18.4 psi, indicating that the outlet pressure must not be lower than 18.4 psi. Then, I must label the drawing, which requires me to refer to both the plan layout and the isometric drawing. To move to the next phase, I placed a node on the pipeline depending on the ball valve location and pipe size. I must ensure that the labelling is accurate because it will affect the calculation.

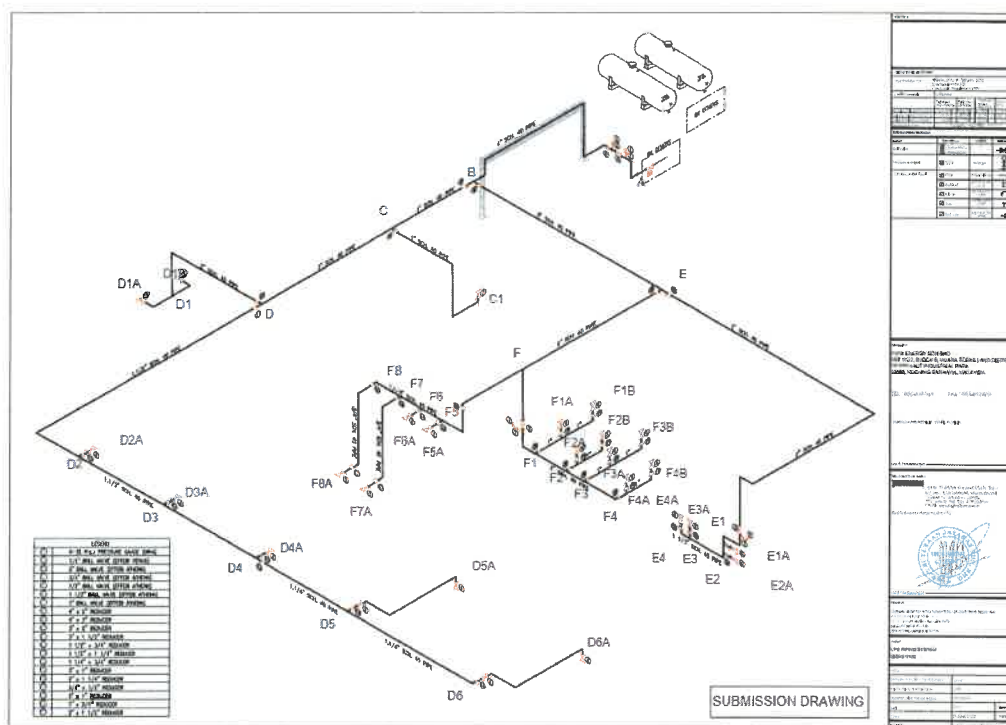


Figure 24: Labelling at Fuya Energy @ Sarawak

After completing the labelling process, I move on to the calculation. The formula is already provided in the Excel file, but I must locate and insert other information to obtain the result. Initially, I used a scale ruler to measure the pipe length based on the drawing. Depending on the consultant, the scale varies for each project's drawing, such as 1:100 and 1:150. If the scale of

the plan is 1: 100, then the actual dimensions are 100 times longer than the measures shown on the plan. Therefore, 1 centimeter on the plan equals 100 centimeters (1 meter) in length, which corresponds to a scale of 1:150. Consequently, I measured the pipe length from node to node and then converted the measurement to meters before entering the data into the calculation. Then I calculate the consumption rate between nodes. The consultant may or may not supply the consumption rate, so we engineers must determine the consumption rate for each inlet. For example, the consumption rate at Fuya Energy is approximately 120,000 btu per hour based on the shop and equipment used. However, for Madam Kwan, the consumption rate was provided because it is a centralized kitchen with a high consumption rate, so it is necessary and safe for the consultant to provide the information. After that, I enter the pipe size from node to node based on the drawing, and the pressure outlet or pressure drop reveals the outcome. Therefore, if pressure outlet is greater than the minimum allowable pressure and pressure drop is less than 1.6 psi, the calculation is complete and we can submit Approval to Install (ATI) to Jabatan Keselamatan dan Kesihatan Pekerjaan (JKKP) or Suruhanjaya Tenaga (ST).

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 E-mail : jayagas_eng@yahoo.com

PROJECT NAME : LPG PIPING SYSTEM for FUYA ENERGY SARAWAK										
HIGH PRESSURE PIPE SIZING CALCULATION										
									Date	4/7/22
Supply Pressure				=	20.000	psi				
Maximum Allowable Pressure Drop				=	1.600	psi	%			
Minimum Allowable Pressure				=	18.400	psi				
$Q = (KL) (D^2.625) \{ [(P1^2) - (P2^2) (Y)] / [(Cr) (L) (F)] \} ^{0.541} (b) (z)$										
Where:										
Q	=	Consumption rate (Btu/hr)	Cr	=	Factor for viscosity, density and temperature		1.26			
D	=	Inside diameter of pipe (inches)	L	=	Pipe length (ft)					
P1	=	Upstream pressure (psi)	F	=	Base friction factor for air, 1					
P2	=	Downstream pressure (psi)	b	=	Base friction factor for any fluid, 3188.9 btu/cu ft					
Y	=	Supercompressibility factor, 1	e	=	Viscosity of gas, 1					
SN	=	Supply node	DN	=	Delivery node					
Node	DN	Length		Q	Dia.theory	Dia.actual	P1	P2	P Drop	% P Drop
SN	DN	(ft)	(m)	(Btu/hr)	(inches)	(inches)	(psi)	(psi)	(psi)	(%)
A	B	65.6	20.0	2,160,000.00	1.028	4.00	20.0000	19.9997	0.00027	0.00137
B	C	16.4	5.0	960,000.00	0.567	3.00	19.9997	19.9997	0.00006	0.00031
C	C1	13.1	4.0	120,000.00	0.245	1.00	19.9997	19.9994	0.00022	0.00109
C	D	16.4	5.0	840,000.00	0.539	3.00	19.9994	19.9994	0.00005	0.00024
D	D1	13.1	4.0	240,000.00	0.319	2.00	19.9994	19.9994	0.00003	0.00014
D1	D1A	3.3	1.0	120,000.00	0.184	1.00	19.9994	19.9993	0.00005	0.00027
D1	D1B	3.3	1.0	120,000.00	0.184	1.00	19.9993	19.9993	0.00005	0.00027
D	D2	32.8	10.0	600,000.00	0.547	1.50	19.9993	19.9978	0.00149	0.00745
D2	D2A	3.3	1.0	120,000.00	0.184	1.00	19.9978	19.9977	0.00005	0.00027
D2	D3	9.8	3.0	480,000.00	0.392	1.50	19.9977	19.9974	0.00030	0.00148
D3	D3A	3.3	1.0	120,000.00	0.184	1.00	19.9974	19.9974	0.00005	0.00027
D3	D4	9.8	3.0	360,000.00	0.351	1.50	19.9974	19.9972	0.00017	0.00087
D4	D4A	3.3	1.0	120,000.00	0.184	1.00	19.9972	19.9971	0.00005	0.00027
D4	D5	9.8	3.0	240,000.00	0.301	1.25	19.9971	19.9969	0.00020	0.00099
D5	D5A	3.3	1.0	120,000.00	0.184	1.00	19.9969	19.9969	0.00005	0.00027
D5	D6	9.8	3.0	120,000.00	0.231	1.25	19.9969	19.9968	0.00006	0.00028
D6	D6A	3.3	1.0	120,000.00	0.184	1.00	19.9968	19.9968	0.00005	0.00027
B	E	39.4	12.0	1,200,000.00	0.739	3.00	19.9968	19.9966	0.00022	0.00112
E	E1	39.4	12.0	480,000.00	0.521	2.00	19.9966	19.9963	0.00029	0.00147
E1	E1A	3.3	1.0	120,000.00	0.184	1.00	19.9963	19.9962	0.00005	0.00027
E1	E2	9.8	3.0	360,000.00	0.351	1.25	19.9962	19.9958	0.00042	0.00211
E2	E2A	3.3	1.0	120,000.00	0.184	1.00	19.9958	19.9957	0.00005	0.00027
E2	E3	9.8	3.0	240,000.00	0.301	1.25	19.9957	19.9955	0.00020	0.00099

Figure 25: Fuya Energy's calculation

In addition, pipe stress calculation is performed to assess if the thickness of the pipe can withstand the pressure inlet. I was also provided with the Excel file of the calculation, in which I was required to enter the nominal outside pipe diameter, which can be found on Google. As this was my first time performing this calculation, I was closely supervised by the engineer himself. The pipe's actual wall thickness, which may be derived via the pipe sizing calculation, was then entered. I may then compare the calculated wall thickness with the actual wall thickness after obtaining the result. The calculated wall thickness is the bare minimum thickness required for the pipe. Consequently, if the actual value is more than the calculated value, the calculation is complete and you may proceed with the pipe's size and submit it to JKKP or ST. This calculation was repeated for every size such as 1 inch, 2-inch, 1.5 inch, and so on.

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HIGH PRESSURE PIPE STRESS DESIGN CALCULATION																						
Type of Pipe :	2" dia Sch 40 Vapor line																					
Pipe Material :	A 106 Gr B/ API 5L-B Sch 40																					
Code Reference :	ASME B31.8-2018 EDITION																					
Formula used to determine the wall thickness																						
$t = P \times D / (2 \times S_t \times F \times E \times T)$																						
Where	<table> <tr> <td>D =</td> <td>2.375 :</td> <td>Nominal Outside pipe diameter, { in }</td> </tr> <tr> <td>Pa =</td> <td>50 :</td> <td>Design Pressure in Psig</td> </tr> <tr> <td>E =</td> <td>1 :</td> <td>Longitudinal Joint Efficiency</td> </tr> <tr> <td>F =</td> <td>0.6 :</td> <td>Design Factor</td> </tr> <tr> <td>T =</td> <td>1 :</td> <td>Temperature degrading Factor</td> </tr> <tr> <td>St =</td> <td>35000 :</td> <td>Yield Strength</td> </tr> <tr> <td>t =</td> <td></td> <td>Pipe thickness, { in } API Sch 40</td> </tr> </table>	D =	2.375 :	Nominal Outside pipe diameter, { in }	Pa =	50 :	Design Pressure in Psig	E =	1 :	Longitudinal Joint Efficiency	F =	0.6 :	Design Factor	T =	1 :	Temperature degrading Factor	St =	35000 :	Yield Strength	t =		Pipe thickness, { in } API Sch 40
D =	2.375 :	Nominal Outside pipe diameter, { in }																				
Pa =	50 :	Design Pressure in Psig																				
E =	1 :	Longitudinal Joint Efficiency																				
F =	0.6 :	Design Factor																				
T =	1 :	Temperature degrading Factor																				
St =	35000 :	Yield Strength																				
t =		Pipe thickness, { in } API Sch 40																				
Calculated wall thickness, t	<table> <tr> <td>=</td> <td>$P \times D / (2 \times S_t \times F \times E \times T)$</td> </tr> <tr> <td>=</td> <td>0.00282738 in</td> </tr> </table>	=	$P \times D / (2 \times S_t \times F \times E \times T)$	=	0.00282738 in																	
=	$P \times D / (2 \times S_t \times F \times E \times T)$																					
=	0.00282738 in																					
Actual wall Thickness	<table> <tr> <td>=</td> <td>0.154 in (API Sch 40)</td> </tr> <tr> <td>></td> <td>Calculated Wall Thickness 0.0028274 in</td> </tr> </table>	=	0.154 in (API Sch 40)	>	Calculated Wall Thickness 0.0028274 in																	
=	0.154 in (API Sch 40)																					
>	Calculated Wall Thickness 0.0028274 in																					
* 2 in Schedule 40 Pipe can be used																						

Figure 26: Fuya energy pipe stress calculation

4.2.7 Task 7 : Method Statement

I was tasked with writing method statements for Sunway International School, a three-storey bungalow in Tropicana Indah, and Kem Bera in Pahang. This method statement describes and outlines installation procedures for the Liquefied Petroleum Gas Piping System for aboveground pipe. It describes the procedure for the installation, testing, and commissioning of aboveground pipes.

Here, I am aware of the development of the gas installation, for which a pilot test is performed prior to any excavation. The primary objective of piloting is to determine the actual position of the above-ground natural gas piping based on the approved drawing. Then, the approved materials are brought to the site, and a pipe support bracket is installed to secure the pipe's routing position. The pipe is next fitted, followed by the welding of the fittings. The pneumatic testing will be performed, which consists of testing and commissioning pipe welding and threading, the pressure regulator, and the valves using the various methods described in the method statement. Next, an inspection will be conducted, and if everything is in satisfactory shape, approval will be granted. If not, the installation will be rechecked and corrected until testing reveals that everything is in a good state. The project will be handed back to the owner after the completion.

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**SUPPLY, DELIVERY, INSTALLATION, TESTING AND
 COMMISSIONING WORKS FOR LPG SYSTEM – PROJEK
 PEMBANGUNAN KEM BERA FASA 2A, TRIANG, PAHANG**

TECHNICAL SUBMITTAL
METHOD STATEMENT FOR INSTALLATION OF LIQUIFIED PETROLEUM GAS RETICULATION PIPING SYSTEM

LPG Contractor : Kejuruteraan Jayagas Sdn Bhd
 Document Number : MS/001
 Rev : 0


Prepared by: Kejuruteraan Jayagas Sdn Bhd		Approved by:
		
Name: Muhamad Zafiridau Bin Zamudin Date: 15 April 2022		Name: Date:

Figure 28: Method statement's cover page

In fact, I also prepare method statements for welding control inspection test plans. The objective of this method statement is to ensure that carbon steel pipe welding control is performed safely in accordance with local authority rules, customer requirements, and applicable standards. It includes Welding Procedure Specification (WPS), Welding Procedure Qualification Record (WPQR), Welder Qualification Test (WQ), and imperfection factors such as joint type, weld flaws, electrode, current, and welder abilities.

The purpose of welding control is to ensure the safety, dependability, and strength of welded works. Welding control is necessary for construction welding projects in order to limit the number of weld flaws. Welding control must always be conducted under controlled conditions, supervised primarily by a visual welding inspector in accordance with an approved work procedure plan and documented in a visual welding inspection report.

To create the content, I must conduct independent research, which entails searching the internet for relevant information and reading online articles. In addition, I must review the Certification Scheme for Personnel (CSWIP) 3.0 Visual Welding Inspector Notes, which are intended for welders, operators, line inspectors, and foremen who perform visual examinations of welded joints. It can also be utilised by those who inspect the quality of welding, as well as those who require fundamental training in welding inspection in addition to a qualification.

4.3 Problem Encountered and Approach Adopted for Solving Problem

There were several problems that I encountered, one of which was that I could not solve the mass loss calculation that my supervisor gave me. I studied and learned through many websites and books, but all had a different method of solving the calculation. I made three draughts that were rejected by my supervisor. I am also referring to the engineer there, who is Mr. Aiman, but he did not know how to solve the calculations. So, I decided to ask and discuss with Mr. Zaifirdaus, who is also an engineer, the issues that I was going through. He provided me with logic and a hint to solve the calculations. Then, I tried to solve the calculation and made a draught and sent it to my supervisor for him to review. Luckily, the calculation was correct and it was accepted. He also asked Mr. Aiman to review the calculation and explain to me further the logic and formula used in the calculation.

I also have a problem with making a label on the gas pipeline found in the project drawing. I don't know where I should put the nodes because I am confused about reading and interpreting isometric drawings. I also don't know how to name the node because the node should be named in order. This is still a problem for me, even though I have been taught repeatedly by my supervisor and Aiman. Finally, I asked for help and guidance from Mr. Zaifirdaus for the labelling process, as he has experience with this process. It took a long time and required Mr. Zaifirdaus to teach me repeatedly for me to understand. Finally, I have managed to complete my task of labelling the drawings and placing the nodes accurately from one point to another by taking into account the size factor of the pipe and point for ball valves.

Lastly, I also had a problem with tender submission for Sunway Carnival project. I was assigned to download all the documents given through the website that the client provided about the Sunway Project, but it was divided into two, namely the Sunway Upgrade Project and also the Sunway CP2 Project. Then, due to the line problem, I downloaded both projects' documents and they were mixed with each other. At that time, I didn't notice that the document was mixed up, so I put it in the project file on the server. After that, the tendering process and preparing documents started, and me and Mr. Zaifirdaus completed and sent the documents for both projects. After that, the client contacted Mr. Zaifirdaus and said many documents were incomplete and their project titles were also different, along with the documents. The submission time has already ended and we cannot update the submitted documents. The client also told us that our company might be rejected because of incomplete and confusing documents. After that, I became nervous and kept apologizing to Mr. Zaifirdaus for my carelessness, to which he replied that it was okay

because he didn't check properly either. Mr. Zaifirdaus has appealed to Sunway to reopen the submission session for us to update the correct documents. Thankfully, the next day, Sunway informed us that they had reopened the website to send the document to us. Then, me and Mr. Zaifirdaus refilled and compiled the correct documents and then scanned them to be sent to Sunway. Finally, me and Mr. Zaifirdaus managed to send complete documents for both projects.

4.4 Professional and Ethical Issues

Both in the workplace and in one's private life, ethical conduct is of the utmost importance. Immoral behavior is undesirable in the job; this is not the place to demonstrate respect for fundamental moral principles. Throughout my internship, I have practiced various professional and ethical issues that help me to be a person of excellent character.

Equally as crucial as it is to demonstrate dedication to our work is to maintain ethical behavior. Often, it is difficult to determine when you should speak up against things with which you disagree and when you should remain silent and trust your superiors. I likewise find it difficult to decide when to report the unethical actions of others and when to mind my own business. During the course of my internship, I came to the realization that things generally resolve themselves and come to light without my interference. I've also determined that it's best to avoid office drama unless things have gotten out of hand. My personal conviction is that it is best not to interfere in the affairs of others and to avoid nonsense.

Keeping my promises throughout this internship is also very essential to me. I have multiple ongoing tasks; therefore, I am occasionally confused about my timetable. However, I've been doing my best to fulfil every deadline and keep my initial commitments. By taking this internship, I have also undertaken numerous duties in the company. And I will continue to put in my best effort so that I can keep my word and exhibit exemplary work ethic as a student.

There were occasions when I completed the tasks assigned to me by my supervisor, yet my supervisor was still on the phone with a client. While I would be tempted to bring out my phone and play with it, it was crucial that I maintain a professional attitude because my desk is visible to my boss. Instead of using this leisure time for personal activities, I would assess my work, assist other employees, and engage in self-study.

4.5 Health, Safety, Environmental and Sustainable Aspects

Health and safety among workers are important to make sure that all staff are able to focus on their job and finish their task on time and also to maintain the quality of work. In order to achieve this goal, each individual must have an awareness toward health and safety issues. From this internship, I had observed this matter throughout 6 months of working in offices and also sites.

I could see that Jayagas is highly concerned about COVID-19 concerns in terms of health. Every employee, whether they work in the office or on the maintenance team, is needed to undergo a COVID test twice a month before entering the workplace. If an employee is infected with COVID, they will notify the company group and request that everybody classified as a close contact undergo a COVID test. They also provide their employees with COVID test kits. In addition, they always wear face masks while working, which is in accordance with SOP.

Personal protection equipment (PPE) must be worn by all employees and engineers on site visits, including myself, and mask. The worker is required to wear safety shoes, a safety helmet, and a safety jacket. Therefore, Jayagas complies to this rule. Even when communicating, engineers who visit the site wear surgical face masks, which is a smart precaution.

In Malaysia, approximately 57,000 tonnes of paper are dumped into landfills per month, which is comparable to cutting down 680,000 trees of marketable size. The majority of paper waste ends up in drains and rivers, generating issues such as flash floods and pools of stagnant water where mosquitoes grow. This results in complications such as sickness, landslides, and traffic gridlock. Recycling paper can greatly reduce the amount of waste that is dumped daily in landfills. It also saves local governments a substantial amount of money, as they spend between 40 and 70 percent of their yearly budget on waste disposal and collection. The Jayagas staff uses a great deal of paper on a daily basis, so when they make a mistake while printing, they return the paper to the recycle bin. If one side of the paper is still blank, they will reuse it for printing. If the paper can no longer be utilized for printing, however, it will be placed in a paper recycling bin. A recycling company will collect the recyclable paper once every month. So, Jayagas is proficient in office waste management.

Regulation 30 (2) under Factories and Machinery (Safety, Health, and Welfare) Regulation 1970 prescribed that there shall be provided and maintained for any person employed in that work a seat of a design, construction, and dimensions suitable for him and the work, together with a foot-rest is necessary to support his feet in order to reduce fatigue; and the arrangement shall be such that the seat is adequately and properly supported while in use for the purpose for which it

is provided. In this case, Jayagas had absolutely done a good job where they provided me with a convenient and comfortable seat and table for me to do my tasks. This increased my level of focus and I could seat in a long time without having back pains. My workstations are well designed as it is on the comfortable height and position. All of the equipment that I frequently use, and the work itself are within easy reach. There is no stretching or twisting movement involved in my everyday work routine.

Furthermore, Kejuruteraan Jayagas was concerned about the percentage of carbon emissions released into the environment. So, based on their schedule, they would calculate the carbon emission release in order to control the percentage release of the carbon to the atmosphere. This is a good step toward environmental protection because carbon emissions can generate a greenhouse effect and climate change by trapping heat, and they can contribute to respiratory ailments due to smog and air pollution.

In addition, the pantry and the KJG department share a room without separators, so when the staff cooks in the pantry, an unpleasant odor is produced. It pollutes the workplace environment with odors. Inadequate air ventilation has also contributed to the rapid and prolonged spread of the bad odor across the office. This causes distraction for me and other department employees. Therefore, this situation must be prevented, and Jayagas' supervisors must be concerned about it.

Chapter 5 Conclusions

5.1 Conclusions

This internship has been a fantastic and fulfilling experience overall. I can say that my job at Jayagas has provided me with a wealth of knowledge. Not only did I acquire useful skills, but I also had the chance to meet many wonderful people. The working environment at Jayagas was always welcoming, making me feel perfectly at home. During industrial training, I also felt like I was able to contribute to the organization by assisting and working on projects. However, I believe there are a few parts of the job that I could have performed more effectively and on which I need to focus. During my training, I realized that observation is essential for determining a problem's core cause. In addition to my project and daily activities During the course of my project, I worked with my colleagues and engineers to identify the issues. Moreover, the project indirectly teaches me to work independently, self-discipline, be thoughtful and patient, have self-confidence, take initiative, and solve obstacles. In addition, my communication skills are enhanced when I interact with people. I realized that I needed to be able to communicate effectively with the staff of the Jayagas in order to complete my work earlier than expected. During my training term, engineers have provided me with constructive criticism and guidance when I have made mistakes. However, such advice is helpful in helping me change and prevent repeating the same mistakes. It taught me to be more cautious, to maintain concentration, and to constantly double-check my work before submitting documents.

My internship with Jayagas has been a success overall. I was able to acquire practical skills, work in a terrific setting, and establish lifelong connections. I could not be more appreciative.

5.2 Suggestion and Recommendation

During my training, I would want to advise that this organization recruit more young and qualified workers so that they can gain experience and develop their talents. Young employees can provide your organization a new perspective and a different way of thinking. The majority of young workers are eager to learn, gain experience, and use their talents. This excitement is excellent for team building, efficiency, and morale in the job. Plus, younger generation has grown up with technology. Their strong passion for technology and the speed with which they can apply and comprehend various technologies distinguish them from past generations in the workforce. Employing young employees has a favorable and significant impact on the business's adoption and utilization of new software and technology.

In addition, Jayagas should be active on social media by creating Instagram, Twitter, and Facebook company accounts. The majority of people now seek for desired services on social media. Therefore, Jayagas will benefit from being active on social media, as consumers will discover and recognize the company and its services more readily. In addition, social media is one of the primary locations where individuals express their opinions, worries, and inquiries. Therefore, Jayagas may promptly respond to clients in a public forum, allowing other customers to observe the caliber of its customer service at the same time building their trust to use Jayagas services.

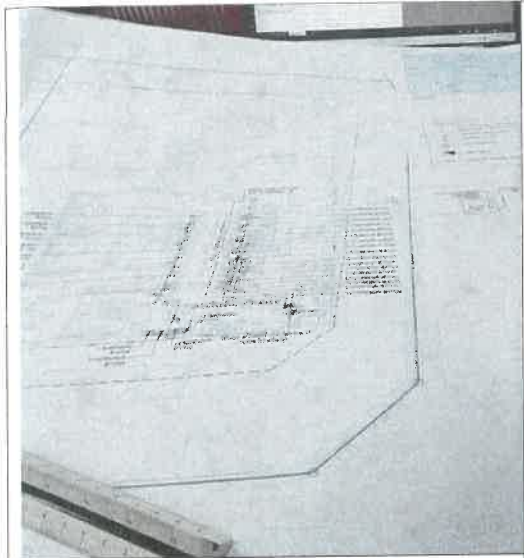
Lastly, I would like to advise that Jayagas give internship students with a training schedule so that they have a better understanding of their responsibilities while working for Jayagas. As a student, I could plan what I should do and who I should contact in order to complete the activity. This will aid students in developing their independence. In addition, they are not required to wait for their supervisor to provide instructions before performing the work or responsibilities.

Reference

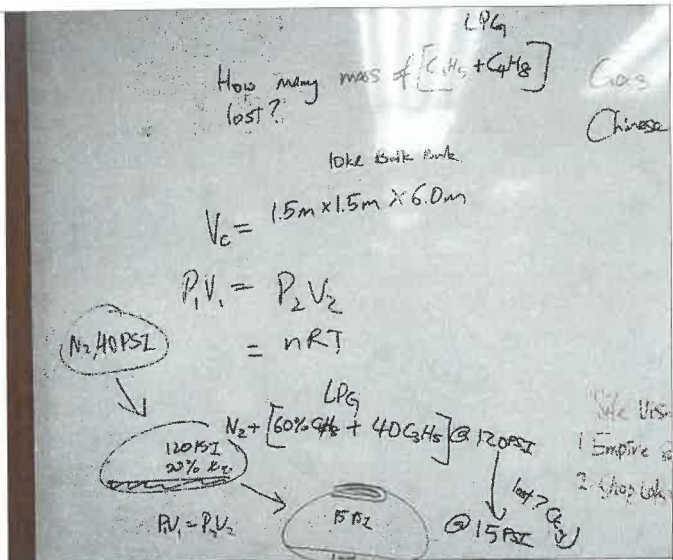
- 1) Paper | Thanam – Scrap and Recycle Specialists in Kuala Lumpur, Malaysia. (2022, July 30). Paper | Thanam – Scrap and Recycle Specialists in Kuala Lumpur, Malaysia; www.thanam.com.my.
<https://www.thanam.com.my/paper/#:~:text=Every%20month%2C%20over%2057%2C000%20tonnes%20of%20marketable%20size>
- 2) Guidelines on occupational safety and health for seating at work. Retrieved from <https://www.dosh.gov.my/index.php/legislation/guidelines/ergonomic/604-02-guidelines-on-occupational-safety-and-health-for-seating-at-work-2003/file>
- 3) Guidelines for Manual Handling at Workplace 2018. Retrieved from <https://www.dosh.gov.my/index.php/legislation/guidelines/ergonomic/2959-guidelines-for-manual-handling-at-workplace-2018/file>
- 4) JAYAGAS | LPG | Malaysia. (n.d.). JAYAGAS; www.jayagas.com. Retrieved July 31, 2022, from www.jayagas.com
- 5) Standard Sample Guideline from Miss Noor Hidayu Binti Abdul Rani
- 6) Individual
 - Mr. Chong Wei Jet (Industrial Supervisor)
 - Mr. Zaifirdaus Bin Zainudin (Head of Engineering)

Appendix

	
<p><i>Solenoid Valve</i></p>	<p><i>Sample Installation at Ekoki Engineering Sdn Bhd</i></p>
	
<p><i>Solenoid Valve System at Nanyang Coffee Midvalley</i></p>	<p><i>Normally Close Solenoid Valve</i></p>



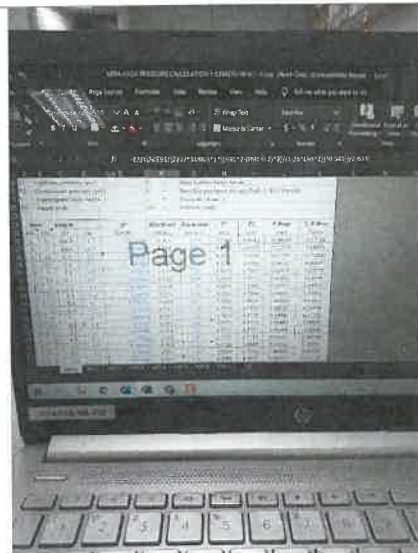
Madam Kwan's Plan Layout Drawing



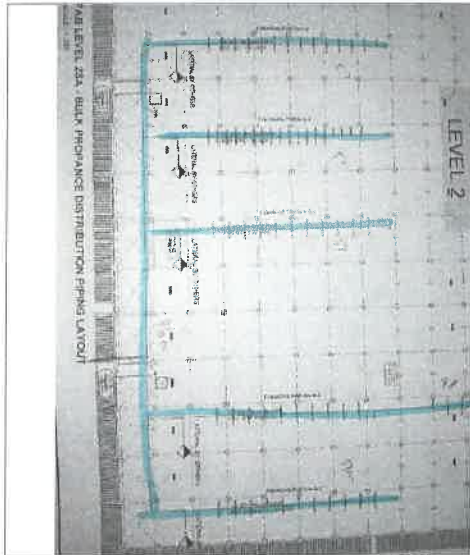
Question Given By Supervisor



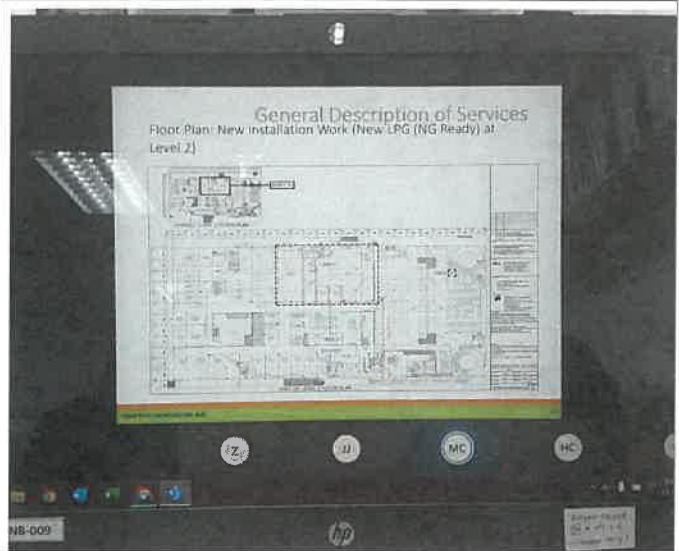
Labelling's Process for Madam Kwan's



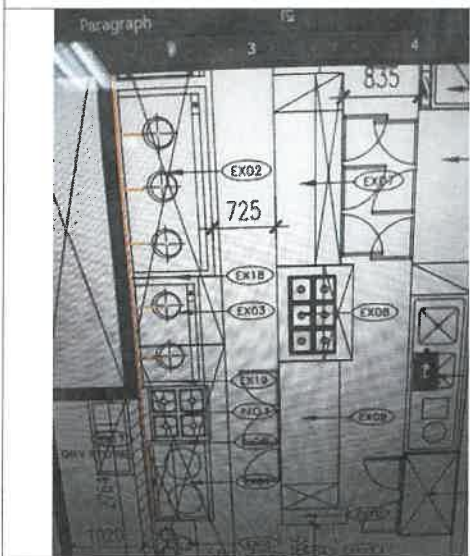
Pipe Calculation's Progress



Piping Measurement's Process



Sunway's Group Meeting



Piping Design's Progress



Avecena Glove's Gas Pipeline



Sunway Monash University Site Visit With Howard

NG GAS RETICULATION PIPE WORKS AND CONTROL
 To supply, deliver, install, test and commission and handing over in and off the complete gas piping system and all accessories required as per specification and drawings.

After Gas Meter Works
 To install 1 1/4" dia Sch. 40 Carbon Steel Pipe welded or threaded, painted in yellow colour, tapping from existing main pipe to the proposed gas dropper location. Complete with pipe fittings, pipe support and label with Arrow "Gas".

0-30 psi Pressure Gauge (Atlas) complete with 1/4" dia Ball Valve (Omega) and fittings.
 1/2" dia Ball Valve (Omega).
 1" dia Ball Valve (Omega).
 Solenoid Valve, 2" diameter, Brand Elektroga, (normally open)
 Second stage regulator (BP1803)
 Final connection to kitchen equipment (Rubber Orange Hose)
 Testing & Commissioning of NG Piping System before handing over.

Gas Detector System
 Gas Detector (NRG) GTD7, 230VAC complete with relay.
 Installation Control Panel complete with Key Switch, Emergency Push Button, Buzzer, Siren and Strobe Light. **Note: Power supply & Kitchen Hood Signal by others.**
 Installation of normal wiring and fitting to Gas Detector, Solenoid Valve & Control Panel.

QTY	UNIT	PRICE	TOTAL
1	lot		
2	nos		
3	nos		
1	nos		
1	nos		
4	nos		
8	nos		
1	lot		
3	nos		
1	lot		
1	lot		

Page 2

Bill Of Quantity Report Template



Folding Drawing Follow ISO Method



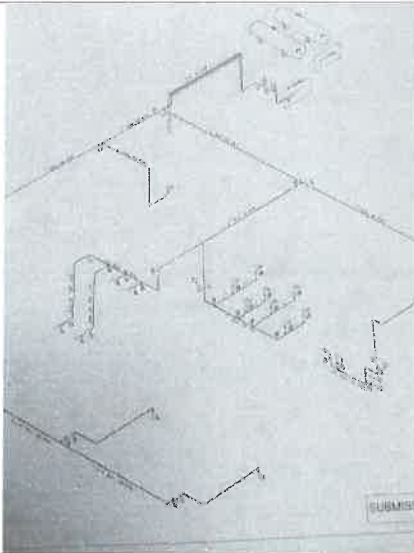
Madam Kwan's Site



Main Pipe's Installation



Meter Reading At Malls



Labelling Process For Fuya Energy @ Sarawak

SCHEDULE OF TECHNICAL DATA
22

DESCRIPTION	PARTICULARS	
	EMULY NUMBER SPECIFICATION	EMULY NUMBER QUANTITY
1. LPG GAS DETECTOR SYSTEM		
Manufacturer	Yong Guan	1
Quantity of Pipes	Number Pipes	1
Detector Type/Model	YGP 100	
System Tube/Model		
Cable Type/Model		
2. PIPEWORK AND FITTINGS & PG FITS		
Manufacturer	Wipac Metal Works Sdn Bhd	1
Country of Origin	Malaysia	
Type/Model	AP/304 SS	
3. PIPING & VALVE		
Manufacturer	Rohatex Piping Sdn Bhd	
Country of Origin	Malaysia	
Type/Model		
Gas Meter: Analog/Digital Type with 4-20 mA Interface	Zenon	
Manufacturer	Zenon	
Country of Origin	Malaysia	
Type/Model		
Commissioning Phase		
Approved Certificate	MSA	

Schedule of Technical Data