Engineers' Salary from Professional Engineers Perspective: The Solution & Proposal

IEM

POSITION PAPER

FOREWORD

The Task Force Committee on Engineers' Salary Issues for Consulting Engineers, established by the Institution of Engineers Malaysia (IEM), is a vital initiative focused on addressing salary concerns for consulting engineers in Malaysia.

The need for this committee is closely linked to several key factors that require immediate and ongoing action to improve well-being and balance within the engineering profession. It is also expected to serve as a starting point for resolving salary issues and related matters in other service fields.

This initiative outlines the need and primary goals of establishing the Committee on the Salary Issues of Engineers from Professional Engineers Perspective, which aims to understand, advocate, improve, and resolve salary issues faced by consulting engineers in Malaysia.

The consulting engineering profession is a vital aspect of Malaysia's engineering sector, playing a significant role in national development and economic growth. Consulting engineers contribute to various infrastructure projects, technological development, and innovation, helping to enhance the quality of life and the competitiveness of the country.

However, issues related to salaries, recognition, and the well-being of consulting engineers have become a major concerned in recent years.

Our Task Force** hopes that this report will serve as a guide for the relevant authorities to thoroughly assess solutions to the salary challenges faced by consulting engineers, particularly in relation to the Scale of Fees (SOF) and its associated issues.

***** Note: Issues related to the salaries of engineers in fields other than consulting engineers are addressed separately from this report.***

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REPORT'S LIMITATIONS

The limitations of this report are as below:

1. **Dependency on the Existing Data and Information**: This report is dependent on the existing data and information including relevant references until the publish date of this report that is on December 2023.
2. **Statistical Survey Data of Salaries**: The data of engineer salaries obtained is dependent on many factors including the sizes of consultancy firms, types of projects, working experiences and geographical locations.
3. **Salary Determination Factors**: The salary determination factors by the employers only include the sizes of consultancy firms, types of projects and current economy situations. This report derives from many sources involving respondents from various geographical locations that may affect the salaries.
4. **Changes in Regulations and Policies**: Salary regulations and its related policies with regard to consulting engineer profession may change from time to time and may influence the outcome of this report.
5. **Imperfection in the Analysis**: Although this report aims to provide a detailed and critical analysis on the issue of low salaries of engineers, but the proposed solutions can still be reassessed by the stakeholders.
6. **Limitation of Actual Actions:** This report provides views, proposals and part of the solutions, however, it is still dependent on the implementation of appropriate actions by the government to the clients, employers and consulting engineers themselves.

While this report does have some limitations, our goal is to address the underlying issues with engineer salaries from the perspective of consulting engineer evaluations. These findings could be a valuable starting point for addressing engineer salary issues in other sectors too.

EXECUTIVE SUMMARY

The issue of low starting salaries of graduate engineers in engineering consultancy field is serious and needs to be addressed immediately.

The Institution of Engineers Malaysia (IEM), as a non-governmental organization dedicated to the advancement of the engineering profession, is resolutely committed to addressing this issue. Its objective is to ensure that engineering remains a compelling career choice for the younger generation, given the critical role engineers play in the country's growth and development.

This report begins with a detailed outline of the chronological development of the engineer salary issue as it has been presented in some media. This includes highlighting the problems that arise related to engineer salaries in several reported incidents.

This report also presents the reasons why this problem occurs and the historical sequence of the development of the construction industry ecosystem which is the cause of the crippling salary rates.

This report examines the impact on the future of the country as a result of the engineer salary issue. A survey was done from the Task Force Committee on Engineer Salary Issues among Engineering Consultancy Practice (ECP) in September 2023 becomes the key highlights through the evaluation of the opinion polls of the consulting engineers and the need for appropriate rewards.

The discussion also extends to individual investment in becoming a professional engineer as well as the investment made by the country in producing quality engineers. The close relationship between the engineering profession and the country’s economy is analysed in detail, including its impact that is wide on both sides. A high investment can produce an engineer with a commensurate return.

From the survey, there are many issues plaguing the engineering firms that hinder the employers from providing better salary packages to graduate engineers. This section discusses the various aspects that affect the engineering firms, especially in the context of Salary and Consultant Scale of Fees Issues. This includes the origins of the emerging demands related to engineer salaries, the chronology of the

development of the situation in the engineering profession, as well as the obstacles faced by the engineering consultancy firms.

The report also investigates various government policies that have a significant impact, such as unreasonable contract terms and conditions, policies related to the appointment of key consultants, the bidding system for consultancy services and so on. In addition, it is also highlighted how the governance of agencies, statutory bodies, as well as GLC/GOC influencing the management of engineering firms.

Although the proposed solutions to the Salary and Consultant Scale of Fees Issues are not comprehensive, each solution mechanism is still explained in detail in this report in the format of Main Value Scenario and Value-Added Scenario (refer to Chapter 5), then most of these proposed solutions can be refined and implemented by the stakeholders to deal with the issues that have been expressed in this report.

Overall, this report provides a comprehensive overview of the various aspects related to the Issues of Engineer Salaries and Consultant Scale of Fees, considering the impact on the country, engineering firms, as well as its relevance to the international trade agreements and then providing proposed Solutions and Action Plan that to be translated into a REALITY.

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1. INTRODUCTION

The journey of an engineer starts from obtaining an engineering degree to becoming a professional practitioner as a Professional Engineer from a PE (Professional Engineer) or a PEPC (Professional Engineer with Practising Certificate).

In Malaysia, there are various sectors for engineers to serve other than in the public services including engineering consultancy firms (covering 60%) either as owners/shareholders or employees, research & development, construction, building services, maintenance, manufacturing, plantation, aviation, maritime, sales, oil & gas industry, as well as lecturers or teaching engineers in higher education institutions.

Malaysia still needs many more engineers to drive the country's development. As per towards the end of 2024, there are a total of 204,117 engineers registered with the Board of Engineers Malaysia compared to 32.4 million Malaysians (one engineer for every 160 people whereas engineer requirement standard ratio 1:70) and are breakdown as follows:

Individual (as per 31st October 2024)

:: Professional Engineer with Practising Certificate: 8807
:: Professional Engineer: 7980
:: Accredited Checker Structural: 13
:: Accredited Checker Geotechnical: 17
:: Graduate Engineer: 204117
:: Engineering Technologist: 16162
:: Inspector of Works: 6683

Consultancy Company (as per 31st October 2024)

:: Body Corporate: 1283
:: Multidisciplinary: 49
:: Partnership: 196
:: Sole Proprietorship: 641

From BEM Website November 2024

According to the Ministry of Education's statistics, from 1997 to 2020, an estimated 16,000 engineers have graduated each year from local universities with the cumulative total of all engineers currently estimated at about 400,000 although

those registered with the Board of Engineers Malaysia as graduate engineers are only about 35%.

According to the latest report, the five main fields of the current engineering profession are Mechanical, Electrical, Civil & Structural, Electronics and Chemical with a need of 1,000 every year.

Even so, the production rate of engineers graduating has been decreasing over the past 20 years due to factors such as students' lack of interest in entering the STEM field, low salary schemes and lower position of engineering career not commensurate with the efforts to achieve the qualification.

This report has been prepared to present suggestions, proposals, and solutions to the crisis that has impacted the engineering profession over the past 20 years, based on the chronology shared on social media, as outlined below:

1.1 Chronology of Engineer Salary Issue on Social Media and Media Statements

23rd October 2019: *Berita Harian*:
GAJI JURUTERA STATIK; Engineer salaries have not changed in the past 20 years, according to Prof. Ir. Megat Johari Mohd Nor of the Board of Engineers Malaysia.

28th October 2021: *Utusan Malaysia*:
JURUTERA MISKIN; The starting salary for engineers has remained unchanged since the early 2000s, according to Dato' Ir. Wan Nazari Wan Jusoh

29th October 2021: BEM
BEM'S RESPONSE: BEM has issued a counter statement through a "Press Statement" in Utusan Malaysia regarding the *Jurutera Miskin* (Poor Engineer) article, which refers to the salary scheme for engineers in the public service.

5th November – 11th November 2021: ACEM
ACEM conducting survey on Fresh Engineers' Starting Salary

22nd November 2021: BEM Special Task Force
BEM established a Special Task Force on the issue of engineer salaries led by Dato' Ir. Murad Omar.

08th December 2021: BEM Engagement Day
A comprehensive discussion on the *"Jurutera Miskin"* issue was conducted during the BEM Engagement Day at the JKR Headquarters.

18th December 2021: *Utusan Malaysia*
A media report by *Utusan Malaysia* informed that only 15% of the 100,000 engineering graduates work in the engineering profession due to lack of job opportunities and workload not commensurate with the salary.

14th June 2022: BEM WEBINAR SERIES 2022:
Revision of BEM Scale of Fees 1998; presented via Hybrid chaired by Dato' Ir. Nor Hisham Mohd Ghazali and panel members consisting of Dato' Paduka Ir. Mr. Keizrul Abdullah, Ir. Chen Thiam Leong & Ir. Prem Kumar.

18th September 2022: *Berita Harian*
According to BEM President, Datuk Seri Mohamad Zulkefly bin Sulaiman, 35% of engineers in this country receive a starting salary below RM2000.00 based on a study by the BEM task force.

20th August 2022: BEM Annual Dinner 2022
YAB Prime Minister, Dato' Seri Ismail Sabri Yaacob informed that engineer salaries need to be reviewed at the BEM Dinner in reference to the BEM Report.

26Th August 2022: BEM Report:
Determination of Engineer Starting Salary for new fresh engineers by BEM recommended is RM3,000.00.

28th October 2022: BEM Convention 2022
Talk Engagement on "Jurutera Miskin' issue presented by the BEM Executive Director informing the current situation of the issue of engineer wages for all sectors.

24th August 2023: BEM Convention 2023
Mini-Workshop: 'Unveiling the Reality: Findings on *'Gaji Permulaan Jurutera Rendah'* chaired by Dato' Ir. Dr. Ahmad Murad Omar (BEM Task Force Chairman)

28th March 2024: HRMAsia Media
Malaysia faces STEM talent drain as salaries stagnant amidst Malaysia's evolving job landscape and the rise of the gig economy, stagnant salaries threaten to undermine STEM talent retention.

19th September 2024: Engineers & Marvex (IEM Convention)
The SUN Media: Malaysia must address the issue of remuneration and salary of engineers, said Deputy Prime Minister Datuk Seri Fadillah Yusof.

13th November – 14th November 2024 (Sarawak) & 19th November – 20th November (Sabah); 2024 BEM Roadshow
Two (2) related topics from two speakers: Ensuring Fair Compensation: Updates to the BEM Scale of Fees (Ir. Chen Thiam Leong), Addressing the Challenge: Improving Engineers' Starting Salary (Dato' Ir. Haji Ahmad Murad Omar).

1.2 The establishment of the task force committee on engineer salary Issue from the Professional Engineers Perspective

The purpose of Institution of Engineers Malaysia (IEM) to establish the Task Force Committee on low engineer salaries in the consulting engineer services sector is to look into the following areas:

1. **Assessing the Salary Issue**: This Special Committee on the Salary of Consulting Engineers may aim to assess in depth issues related to the salaries of consulting engineers in Malaysia. This includes understanding the salary trends, factors that affect the salaries including salary comparisons with other professions.
2. **Understanding the Professional Requirements**: The purpose also includes understanding the professional needs of consulting engineers in terms of salary and benefits. This includes identifying what consulting engineers consider a fair salary and how this salary affects their motivation and well-being.
3. **Advocating for Fair Salaries**: The committee gives full confidence to IEM to be the voice for consulting engineers in discussions with employers, government bodies, and other bodies on the salary issue. They can work to achieve better fair salaries for this profession.
4. **Increasing Awareness**: IEM takes responsibility to raise awareness among consulting engineers about the importance of salary and benefits issue. This education and awareness can help consulting engineers to understand their value and take steps to increase their salaries.
5. **Submitting Suggestions and Recommendations**: The purpose of this report includes making recommendations to the government, employers, and industry on ways to increase engineer salaries for the well-being of consulting engineers. This includes proposed changes in salary policies and its related regulations.
6. **Strengthening the Profession**: IEM takes responsibility and purpose including strengthening the engineering profession in the industry and economy of the

country. A fair Engineer Salary and Consultant Scale of Fees is one of the important factors in retaining and attracting talent in this field and can play an important role in the development of the economy and the progress of the country.

1.3 IEM's Roles and Consulting Engineer Salary Rates

The role of IEM in taking responsibility on the engineer salary issue is a positive step in understanding and addressing the real issues and problems in the engineering profession. This can help to improve the well-being and justice in this profession. As per year end 2023, IEM has the following memberships:

Grade	2019	2020	2021	2022	2023
Distinguished Hon. Fellow	2	2	2	2	3
Hon. Fellow	28	27	27	27	27
Fellow	739	772	776	787	787
D. Member	1	1	1	1	1
Hon. Member	7	7	7	7	7
Senior Member	39	45	52	54	55
Member	11,048	11,647	11,389	10,950	10989
Senior Graduate Member	281	320	372	433	441
Graduate	9,303	9,441	9,099	8,846	8,097
Engineering Technologist Graduate Member	-	-	-	81	72
Engineering Technician Graduate Member	-	-	-	18	21
Incorporated	115	120	105	85	88
Affiliate	27	34	29	28	31
Associate	53	59	61	58	58
Student	26,969	31,419	25,167	25,257	27,637
Total	**48,612**	**53,894**	**47,087**	**46,634**	**48,314**

Diagram 1: All Engineers (Source: 64th Annual Report Session 2022/2023 IEM, Malaysia)

	DHF	HF	F	DM	HM	SM	M	SG	G	ETG	ETnG	IM	A	AM	S	TOTAL
Kedah-Perlis	0	0	9	0	0	1	273	11	244	3	1	1	0	4	1672	**2219**
Penang	0	1	33	0	0	4	565	28	475	6	2	4	0	1	1366	**2485**
Perak	0	2	24	0	0	2	413	14	473	6	4	9	2	3	2395	**3347**
Kelantan	0	0	5	0	0	2	128	3	85	3	0	1	0	0	1427	**1654**
Pahang	0	0	5	0	0	1	140	7	188	3	0	2	2	2	1279	**1629**
Terengganu	0	0	6	0	0	1	147	11	100	1	0	1	0	0	1051	**1318**
Sarawak	0	2	37	0	0	5	806	32	739	4	1	6	0	7	3339	**4978**
Miri	0	0	16	0	1	0	78	6	107	0	0	1	0	1	135	**345**
Southern	0	1	55	0	1	4	675	34	618	1	3	6	1	3	4318	**5720**
Melaka	0	0	9	0	0	2	179	10	195	2	0	1	0	0	1026	**1424**
N. Sembilan	0	0	13	0	3	0	303	21	319	3	1	2	0	1	1260	**1926**
Sabah	0	2	40	0	0	1	605	19	494	3	1	1	1	2	1027	**2196**
IEM HQ	3	18	523	1	2	32	6551	244	4040	35	8	52	24	34	7296	**18863**
Overseas	0	1	12	0	0	0	126	1	20	2	0	1	1	0	46	**210**
TOTAL	**3**	**27**	**787**	**1**	**7**	**55**	**10989**	**441**	**8097**	**72**	**21**	**88**	**31**	**58**	**27637**	**48314**

Diagram 2: All Engineers by State (Source: 64th Annual Report Session 2022/2023 IEM, Malaysia)

The Institution of Engineers Malaysia (IEM) shall play a significant role in advocating for the interests of engineers in Malaysia, including those related to salary and working conditions. IEM shall address engineers' interests concerning the fees rates of consulting engineers in Malaysia with regards to engineer's salary due to the followings:

1. Advocacy for Fair Compensation

- **Salary Benchmarking and Recommendations**: IEM helps to establish salary benchmarks for engineers in Malaysia by conducting surveys and gathering data on industry trends particularly that involve ECP stakeholders including government bodies, employers, and other professional associations, to ensure that engineers receive fair and competitive compensation for their work.

- **Representation in Policy Discussions**: The IEM shall be the best representative to actively participates in discussions with the government and industry players to influence policies that affect engineers' pay and working conditions. It may advocate for policies that ensure engineers are paid according to their qualifications, skills, and experience.

2. Professional Development and Certification

- **Enhancing Career Opportunities**: Since IEM is the organisation that provides training programs, certification, and career development support in which IEM helps engineers improve their skills and qualifications, which in turn can lead to higher salaries and better job prospects as well as promoting the value of continuous professional development to ensure that engineers remain competitive in the job market.

- **Professional Recognition**: As the leading organization for engineering professionals in Malaysia, IEM like BEM or Malaysian Society for Engineering & Technology (MySET) offer opportunities for engineers to be recognized with titles such as Professional Engineer (PE) and Professional Engineer with Practicing Certificates (PEPC). Having such credentials can significantly boost an engineer's salary potential, as certified professionals tend to earn higher wages compared to their non-certified counterparts.

3. Salary Guidelines for Engineers

- **Industry Salary Surveys**: As for records, IEM had periodically conduct salary surveys within the engineering industry to gather data on salary trends across various engineering disciplines. This information had help engineers and employers to align expectations and ensure salaries are competitive within the industry.

- **Salary Recommendations**: Based on these surveys and industry analysis, it may assist as salary guidelines or recommendations to provide a reference for employers and engineers alike. These guidelines may aim to ensure that salaries reflect industry standards and the qualifications and experience of engineers.

In essence, the IEM's function with respect to engineers' salaries is to advocate for fair compensation, support professional development that leads to better earning potential, and ensure that engineers are well-represented in matters related to employment, rights, and compensation.

Therefore, IEM is very concerned about the determination of engineer salary rates including the field of consulting engineer services in Malaysia to ensure the sustainability of the profession, well-being of the professionals, and the development of the country's engineering sector. Fair salaries are an important aspect in achieving this goal.

The starting salary rate of engineers in consulting engineer services in Malaysia that is low as compared to other industry sectors can be caused by several factors, among them are:

1. **High Competition**: Engineering is one of the most competitive fields in Malaysia. There are many engineering graduates competing for limited jobs, which can limit their ability to be offered higher salaries.

2. **Lack of Knowledge of Professional Values**: In general, the community may not fully understand the professional value of consulting engineers in projects. Lack of understanding of their roles in the development and lack of awareness of the services they provide can reduce their ability to maintain higher salaries.

3. **Changing Market Demands**: Economic and market conditions can affect the salary rates. If the economy is experiencing difficulties or projects are reduced, the demand for consulting engineers may decrease, which may put pressure on the salary rates.

4. **Company Size and Type**: Consulting engineers who work for large or leading companies may earn higher salaries than those who work for small companies. In addition, the type of project assigned by the company can also affect the salary, with government or infrastructure projects paying more than private sector projects.

5. **Lack of Interest in Union Organisations**: Most of the consulting engineers are less interested in unionising or organising mass gatherings to solve their problems as compared to other sectors that have strong unions.

6. **Education and Experience**: The engineer salary may also depend on their level of education and experience. New graduates with limited experience may earn a low starting salaries, but their salaries will increase in line with increasing experience and qualifications.

7. **Minimum Wage Policy**: Minimum wage policy set by the government can affect the starting salary rates across the industries, including engineering.

These factors affect the starting salaries of engineers in Malaysia. The recovery of the construction industry after the Covid-19 pandemic also affected the demand. To increase the salary rates in this field, there should be efforts to increase education, awareness of the roles of engineers especially in consulting engineer services, and ensure that the rewards and benefits provided are fair and competitive for those who enter this profession.

2. THE NEED OF ENGINEERS TO THE COUNTRY

2.1 Impacts on the Future of the Country

The lack of consulting engineers or construction engineers in Malaysia can lead to some negative effects that can affect the development of the country. The following are some of the effects that may occur if Malaysia experiences a shortage of consulting engineers or construction engineers:

1. **Stalled Infrastructure Development**: A shortage of consulting engineers and construction engineers can slow down the development of important infrastructure projects such as roads, bridges, airports, and public transportation systems. This can affect the quality of life of the population and the competitiveness of the country's economy.
2. **Decreasing Quality of the Project**: The lack of consulting and construction engineers can lead to a reduction in the supervision of construction projects. This can result in a reduction in the quality of the project, which in turn can endanger public safety and cause additional costs to fix the problems that arise.
3. **Lack of Innovation and Technological Development**: Consulting and construction engineers play an important role in advancing innovation in the construction and engineering sector. The lack of engineers can hinder the development of new technologies and innovative approaches in construction projects.
4. **Slowed Economic Growth**: The development of infrastructure and construction projects is part of the main driver of the country's economic growth. A shortage of consulting and construction engineers can hamper the overall economic growth.
5. **Loss of Job Opportunities**: The engineering and construction sector is a major contributor to the employment opportunities in Malaysia. The lack of engineers can result in the loss of job opportunities in this sector, which can affect the people's incomes.
6. **Neglect of Maintenance Projects**: The lack of construction engineers may result in the neglect of existing infrastructure maintenance projects. This can

endanger the pass ability of existing infrastructure and may result in more expensive repair works in the future.

7. **Loss of Talents and Experiences**: A shortage of engineers may result in the migration of talents and experiences to other countries where career opportunities are better. This could result in the loss of important capabilities and expertise in the Malaysian engineering sector.

The lack of consulting or construction engineers is a serious problem that needs to be addressed effectively to ensure the continued development and sustainability of the country.

Lately, many engineers are changing professions and students are not interested in entering the engineering field, Malaysia may face some negative effects in the long term. Here are some of the possible effects:

1. The lack of engineers and engineering professionals will result in a shortage of qualified manpower in the sector. This can hinder the development of infrastructure, technology, and industry projects in Malaysia.
2. Without enough engineering workforce, key industries such as manufacturing, electronics, petrochemicals, and information technology may lose competitiveness. Technological advancement and innovation in this industry depends on the presence of quality engineering experts.
3. If the students are not interested in engineering field, Malaysia may risk losing awareness of quality and up-to-date technologies. This can reduce the country's ability to integrate technologies in all economic and social aspects.
4. Malaysia has long-term development goals enshrined in the Malaysian Development Plan. To achieve this goal, the country needs competitive engineers and engineering professionals.

To overcome this potential negative effect, it is important to promote engineering as an attractive and potential field among the younger generation in Malaysia. This includes raising awareness of the opportunities and benefits in engineering, providing quality education in the field, and ensuring that engineers are fairly and competitively rewarded for their works. Engineering is an important element in the

country's development, and a deficiency in this field can harm Malaysia's progress in the future.

2.2 Taskforce Committee's 2023 Survey Review

Referring to the **IEM EMPLOYMENT SURVEY 2019 (pre-Covid 2019 pandemic)**, the findings of the survey stated "*This was reflected in the low minimum monthly basic salary received by **entry level employees with PhD (RM2,800), Master (RM2,000) and Degree (RM1,500) qualifications**. The minimum monthly total salary for entry level employees with PhD, Master and Degree qualification were RM2,800, RM2,000 and RM1,800 respectively. This could be one of the reasons for dissatisfaction among engineers who had invested in education. From the survey, it was found that **72% (447/618)** of the respondents stated that the salary for engineers was not reasonable*".

Compared to the **Taskforce Committee's 2023 survey conducted in September 2023** among ESP firms, our findings indicate that the salary levels for consulting engineers remain relatively low. Our survey reveals that only 47% of ECP firms offer salaries ranging from RM2,000 to RM2,500 for graduate engineers, while approximately 18% of graduate engineers earn less than RM2,000 per month.

The overview summary of the survey is based on the respondents' demographics, business environment, remuneration, and the government's procurement of consultants, as outlined in Appendix 'A'.

Key findings from the Taskforce Committee's review in September 2023 survey:

i. Most of the consultancy firms are SMEs (Small and Medium-sized Entrepreneurs) with less than 50 employees.
ii. Income and profit before tax of the consultancy firms were affected by the Covid epidemic.
iii. Almost **65%** of the firms are only able to offer a salary below RM2,500 per month to graduate engineers.
iv. Firms are forced to provide training and professional development for graduate engineers.

v. The consultancy sector is thought to offer a lower salary package as compared to other engineering sectors. Salary packages are determined by the firm's ability to attract and retain talents with regards to financial ability.
vi. Fierce competitions between firms in bidding have caused the rate of consulting fees to drop.
vii. Firms use cost reduction and price reduction strategies to secure projects.
viii. Enforcement of the Scale of Fees (SOF) is considered important to resolve the salary issue and improve the level of service to the clients.
ix. Client's lack of understanding of the value provided by the consultant leads to reluctance to pay higher fee.
x. A firm's strong reputation will increase its ability to charge higher fee.
xi. The improvement of the Registration of Engineers Act (REA) and the revaluation of the Scale of Fees (SOF) are considered as very important for the well-being and sustainability of consultants.
xii. The Malaysian Government's procurement system and Consultancy Services Agreement (CSA) need to be improved and need to be fair.
xiii. Government intervention and incentives are needed to support the consultants and should be treated like other industrial SMEs in the National SME Development Plan.
xiv. The current Government procurement system is considered unprofitable, less transparent, a waste of resources, biased, and does not provide value comparable to the money and manpower resources spent.
xv. Some of the terms and conditions in CSA2014 are considered unfair and disadvantage to the consultant although last amendment in 2018.
xvi. The Government's procurement system and the CSA2014 have impacted the working relationship between agencies and consultants.

The demographics of the survey respondents are as follows:

- Kelantan & Terengganu - 29.4%
- Klang Valley & Selangor - 26.5%
- Sarawak - 23.5%
- Johor - 8.8%
- Penang - 5.9%
- N. Sembilan & Melaka - 2.9%
- Sabah - 2.9%

Salary statistics for graduate engineers:

1. **47% pay between RM2,000 to RM2,500:** This statistic means that almost half of all graduate engineers in this field receive a monthly salary that is in the range of RM2,000 to RM2,500. These engineers typically earn salaries in this range, which is considered as ordinary and average salary for new graduates starting a career in engineering.
2. **18% pay less than RM2,000:** This figure shows that about 18% of graduate engineers earn a monthly income of less than RM2,000. These individuals are at the lower end of the salary spectrum and may face financial challenges as this level of income may not be sufficient to cover basic expenses, especially in urban areas with a high cost of living.
3. **Only 2.9% pay more than RM3,500:** This statistic shows that only a small number, i.e. 2.9%, of graduate engineers receive a monthly salary above RM3,500. This group represents a more elite segment of the graduate engineering field, and their higher salaries may reflect the expertise or reputation of their more well-known employers and large firms.

In summary, these statistics reveal the range of earnings that graduate engineers can expect when they begin their careers. Most earn a modest salary in the range of RM2,000 to RM2,500, while a smaller number earn less than RM2,000 and may face financial challenges.

For a statistical comparison of salaries for a consulting engineer with 10 years of experience:

1. **17.6% pay less than RM4,000:** A large number, about 17.6%, of consulting engineers with 10 years of experience receive a monthly salary of less than RM4,000. These engineers are on the lower end of the salary spectrum despite having years of experience.
2. **62% pay between RM4,000 to RM6,000:** This statistic shows that the majority of consulting engineers with 10 years of experience receive a monthly salary in the range of RM4,000 to RM6,000.
3. **15% pay between RM6,000 to RM8,000:** About 15% of the consulting engineers in this category earn a higher monthly income, in the range of

RM6,000 to RM8,000. These individuals are among the higher earners in their field and may hold specialised roles or positions with more responsibilities.

Overall, these statistics illustrate the diversity of income levels for consulting engineers with 10 years of experience. A large number of individuals receive a salary of less than RM4,000, indicating that not all consulting engineers with 10 years of experience enjoy high incomes.

The results of the survey show some important findings in the consultancy industry:

1. **Salary Package is Lower as Compared to Other Engineering Sectors:** The survey shows that salary packages in the consultancy sector are considered lower when compared to other fields in engineering. This indicates an imbalance in compensation levels that may affect the attractiveness of the consultancy industry.
2. **Talent Attraction:** A higher salary package is seen as an important factor in attracting the best talents. This suggests that competitive compensation is essential to attract qualified and skilled professionals into the consultancy sector.
3. **Ability to Determine Higher Fee:** The survey found that a firm's ability to command higher consultancy fee directly affects the engineers' pay packages. This shows the relationship between a firm's financial performance and its employees' compensations.
4. **The Challenges of Attracting Qualified Professionals:** The survey underscores the challenges of attracting qualified and skilled professionals into the consultancy industry. The perceived lower level of salary may contribute to this difficulty.
5. **Fierce Competitions:** The majority of consultants agreed in the survey that the level of competitions in the consultancy sector is very high. These fierce competitions have led to a situation where service fees are reduced, creating financial pressure.
6. **The Importance of Scale of Fees (SOF) Enforcement:** 70% of the respondents believe that the implementation and enforcement of Standard Fees (SOF) can solve the problem of compensation packages of consulting engineers. This

standard is seen as a potential solution to overcome wage-related issues in this industry.

7. **Service Quality Improvement with SOF:** The use of SOF is expected to result in a better level of service to the clients. This means that a standardised pricing structure can lead to an improved service delivery.
8. **The Effect of Economic Situations on Salary Levels:** The results of the survey also suggest that the pricing strategies and structures are influenced by the economic situations, which ultimately affect the staff salary levels. The downward pressure on fees due to intense competitions and economic factors can affect the compensations offered to the employees.

Overall, the survey results highlight the complexity of salary packages and the competitive nature of the consultancy sector.

Apart from that, the respondents also think that the government's procurement system and the terms in the CSA2014 need to be further reviewed. Among other things, the survey results show:

- **56%** think that they have had unsatisfactory experiences with the current procurement system.
- **66%** think that there is no transparency in the selection criteria of consultants.
- **60%** think that the current procurement process is wasteful (for participating agencies and companies) for the bidding process in terms of time and manpower resources as compared to the desired benefits in terms of fee cost savings as compared to the overall development costs.
- **53%** think that the price is the determining factor in selecting a consultant.
- **57%** think that the current procurement system does not take into account the creativity and innovation ability of a consultant in determining the selection of consultants.

2.3 The Value of Consulting Engineers and Rewards

Consulting engineers should be paid reasonable fees because their services are important and valuable in many aspects, including the development and progress of

a project as well as public safety. Here are some of the justifications why consulting engineers should be paid reasonable fees:

1. **Specialised Expertise**: Consulting engineers are experts in engineering and project development. They have technical knowledge and deep experience in planning, managing, and executing complex projects. Reasonable fees reflect their level of expertise.
2. **Technical Evaluations**: Consulting engineers are responsible for evaluating the safety and efficiency of construction and infrastructure projects. Their decisions have a major impact on public safety and project quality. Reasonable fees allow them to provide thorough and high-quality evaluations.
3. **Risk Exposure**: Consulting engineers also help in identifying and mitigating the risks in projects. They help avoid problems that may arise during or after the construction. Reasonable fees motivate them to provide thorough and long-sighted consultancy services.
4. **Project Performance**: The quality of consultancy and consulting engineer support can affect the overall performance of the project. Successful projects usually provide benefits that far exceed the cost of consultancy. Reasonable fees ensure that the consulting engineers can provide significant added value to the project.
5. **Overall Cost Savings**: The knowledge and experience of a consulting engineer can assist in identifying more cost-effective alternatives in design and construction. This can help reduce the overall cost of the project's life cycle (Life cycle cost - LCC). The fee according to the existing SOF is generally less than 1% of the LCC of a development. A reasonable fee is worth paying when it helps to reduce the overall cost of construction.
6. **Professional Stability**: Reasonable fees also help in maintaining the integrity of the engineering profession. It enables consulting engineers to run their business effectively and maintain the manpower resources needed to provide high quality services.
7. **Fairness and Equality**: Reasonable fees are important to ensure fairness in the industry and to respect the time and effort that the consulting engineers put into providing their services. Consulting engineers should be paid appropriately for their works.

Overall, reasonable fees are essential to make the consulting engineers' services sustainable and of high quality. It reflects the value given by consulting engineers in the project development and community safety as a whole.

2.3.1 Individual Investment to Become a Professional Engineer

The cost of producing a consulting engineer and achieving professional engineer status is higher than in the non-professional field. This is due to several factors related to the education, training, and professional certification required in the field of engineering. Here are some of the aspects that influence the difference in the costs of education and training in professional and non-professional fields:

1. **High Quality Education**: Consulting engineers need a high-quality education that involves a study programme in the field of engineering. These programmes often require laboratory works, specialised survey materials, and in-depth practical training. The cost of education in engineering, including tuition fees, textbooks, equipment, and teaching materials, is high.
2. **Additional Courses and Qualifications**: After obtaining a degree in engineering, a person who wants to become a consulting engineer needs to further his education by attending additional courses, seminars, and training to acquire specialised knowledge and qualifications in the field of consultancy and project management. These additional costs include registration fees, accommodation, and personal expenses.
1. **Work Experience**: To achieve the status of a professional engineer, one needs to gain sufficient work experience in the field of engineering. This can take years and involve living expenses throughout that period.
2. **Professional Certificate**: To become a professional consulting engineer, individuals need to obtain a professional certificate recognised by professional bodies such as the Board of Engineers Malaysia (BEM), the Energy Commission (ST), the Malaysian Occupational Safety and Health Department (JKKP) and so on. The costs involved in registration and examination to obtain this certificate are high.
3. **Continuous Training**: Consulting engineers are required to undergo continuous training to ensure they always have the latest knowledge and skills

in the field of engineering. This can involve participation in courses, seminars, and professional associations, all of which require fees.

In comparison, non-professional fields only require a shorter education and do not require expensive professional certificates. Therefore, even though education and training in engineering is more expensive, it is an investment that usually gives good returns in the form of better job opportunities and higher salaries in the long run. Professional consulting engineers tend to be better paid than non-professionals, which can help offset the costs incurred in education and training.

The comparison between the cost of students majoring in engineering and business administration at the local private institutes of higher learning (IPTS) is as follows:

Table 1: Cost Comparison for Engineering & Business Administration Students at Private Institutes of Higher Learning (IPTS)

		Engineering (A)	Business Administration (B)
Duration:		48	42
University tuition fees:		92,400	63,000
Cost of living per month:		600	600
Cost of living throughout the study:		28,800	25,200
Cost of hostel/house rental per month:		150	150
Cost of hostel/house rental throughout the study:		7200	6300
Cost of books/equipment per year:		500	200
Cost of books throughout the study:		6000	2100
Subtotal (RM):		**134,400**	**96,600**
Miscellaneous costs:	30%	40,320	28,980
Grand total (RM):		**174,720**	**125,580**

Note: Source from student admission information to IPTS (UTP and UNITEN)

The following is a comparison of education cost versus three starting salary scenarios and annual salary increment.

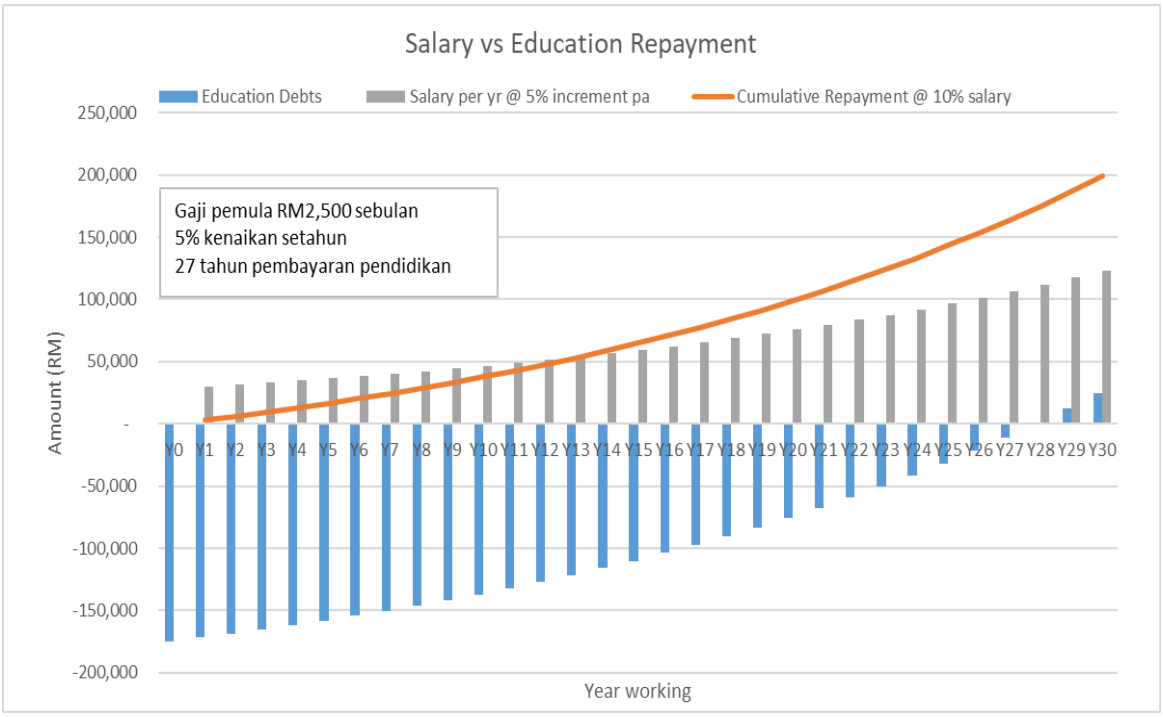


Diagram 3: Case 1A

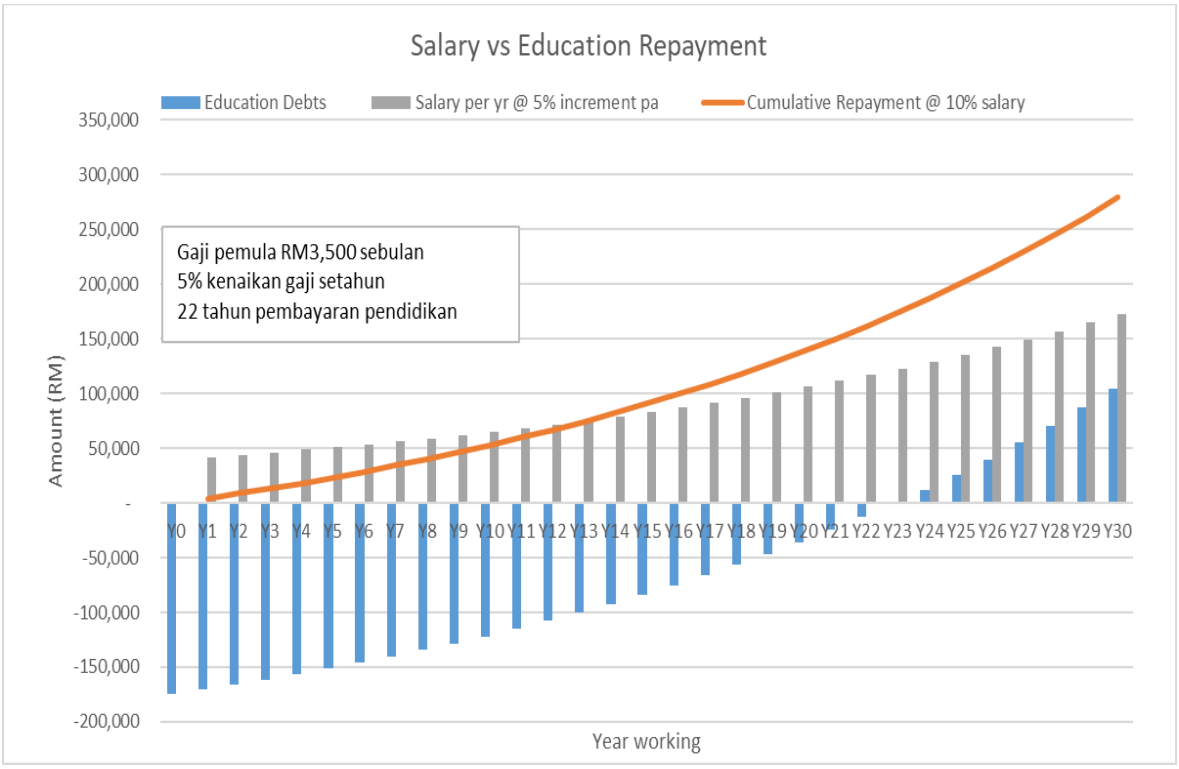


Diagram 4: Case 2A

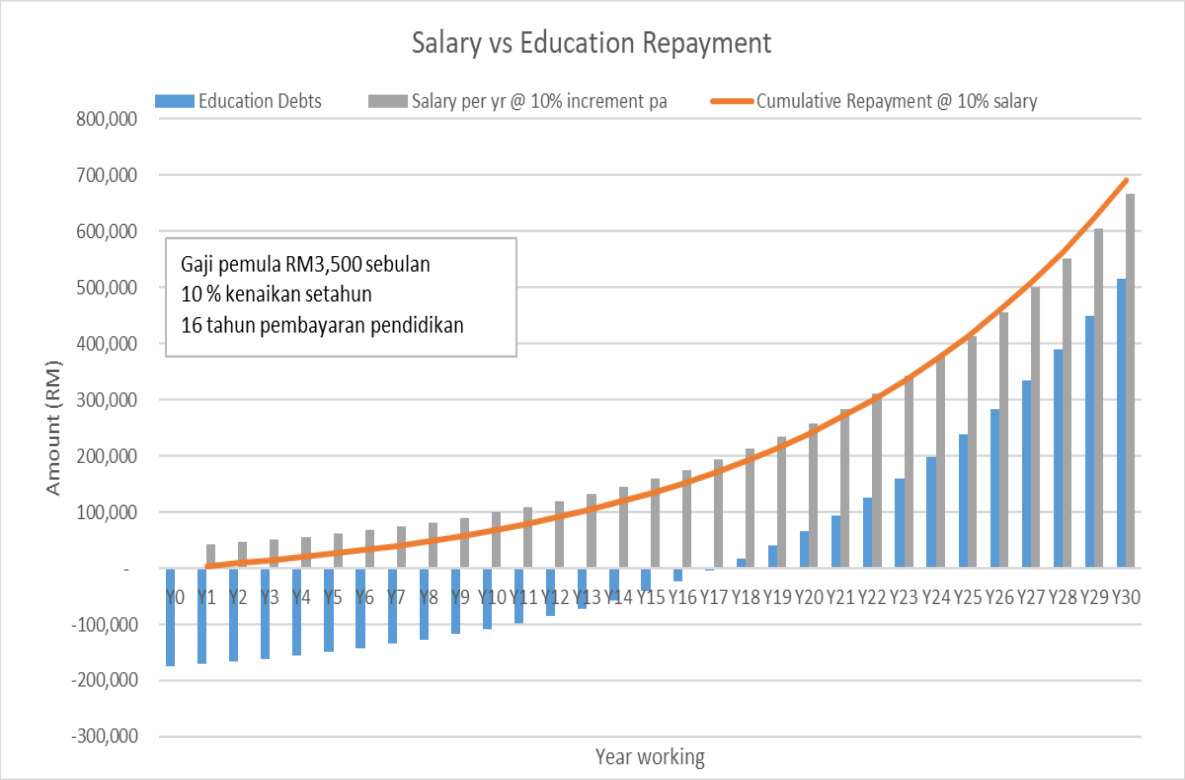


Diagram 5: Case 3A

If this engineer pays 10% of his monthly income for the cost of education, he has to pay in the period as in the table below.

Table 2: Payment Period

Cost of a Degree RM175,000	Case 1A	Case 2A	Case 3A
Starting monthly salary	2,500	3,500	3,500
Annual increase of salary	5%	5%	10%
Education fees payment from income	10%	10%	10%
Payment period until the end	27 years	22 years	16 years

The comparison with business administration graduates is as follows:

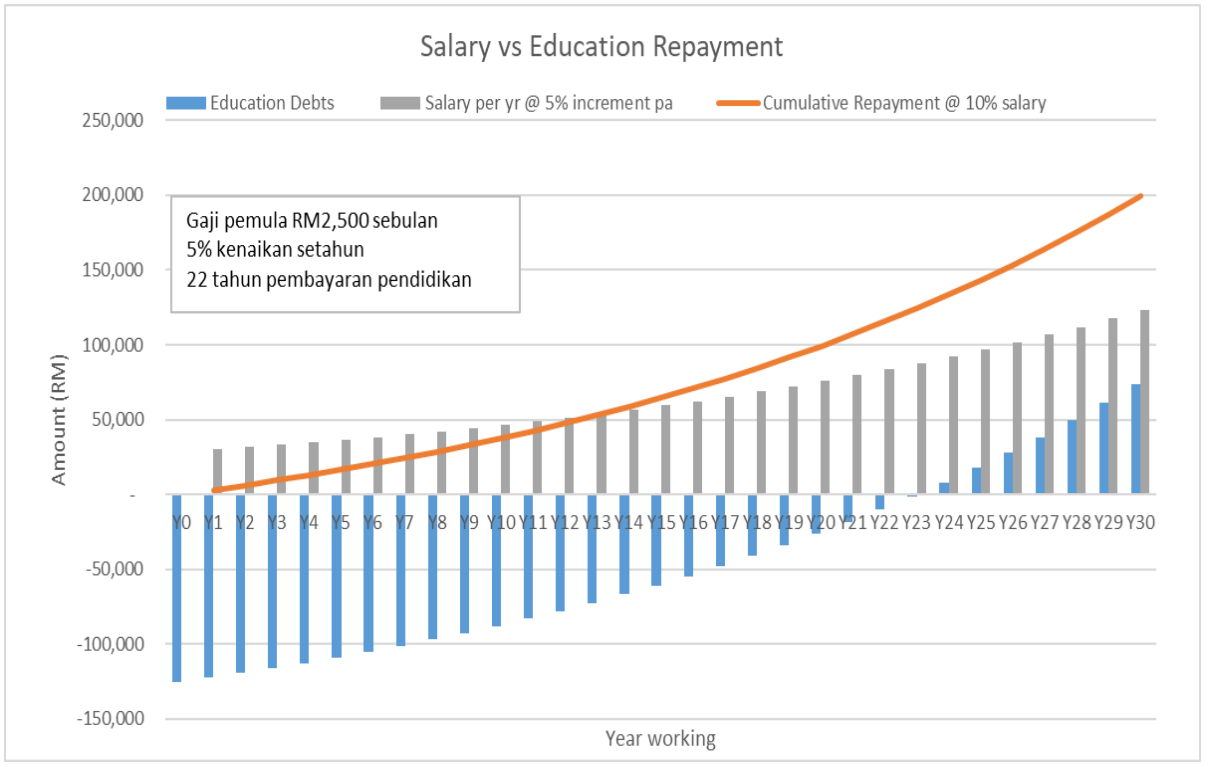


Diagram 6: Case 1B

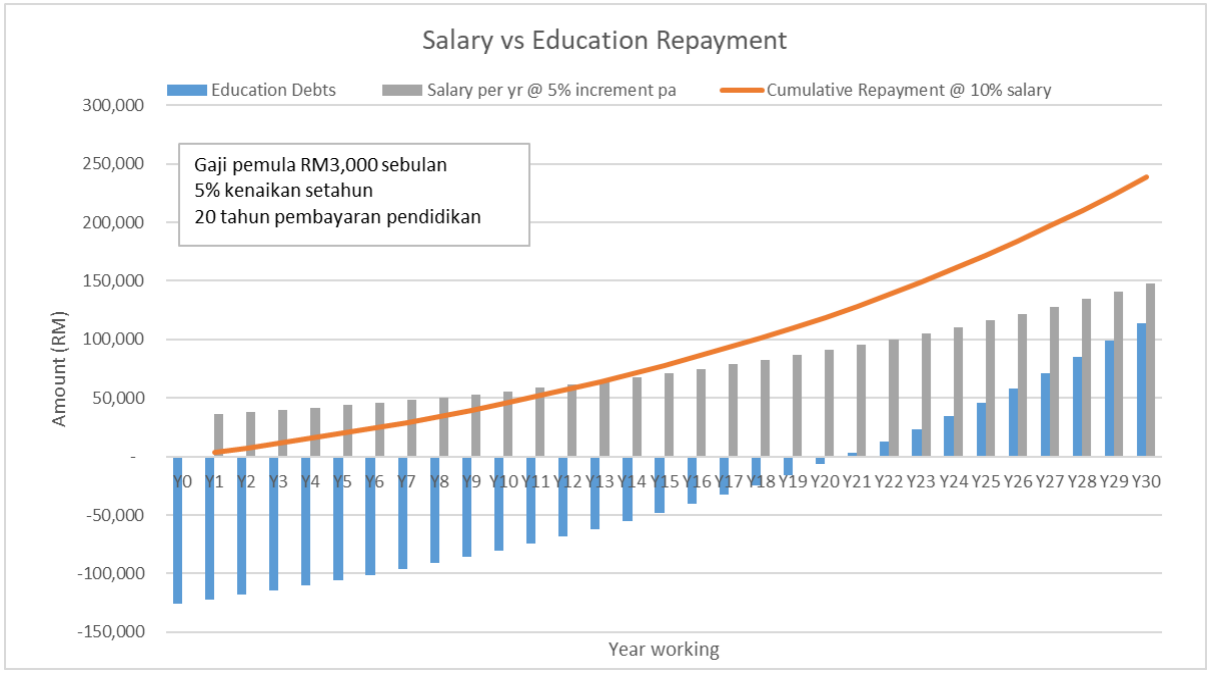


Diagram 7: Case 2B

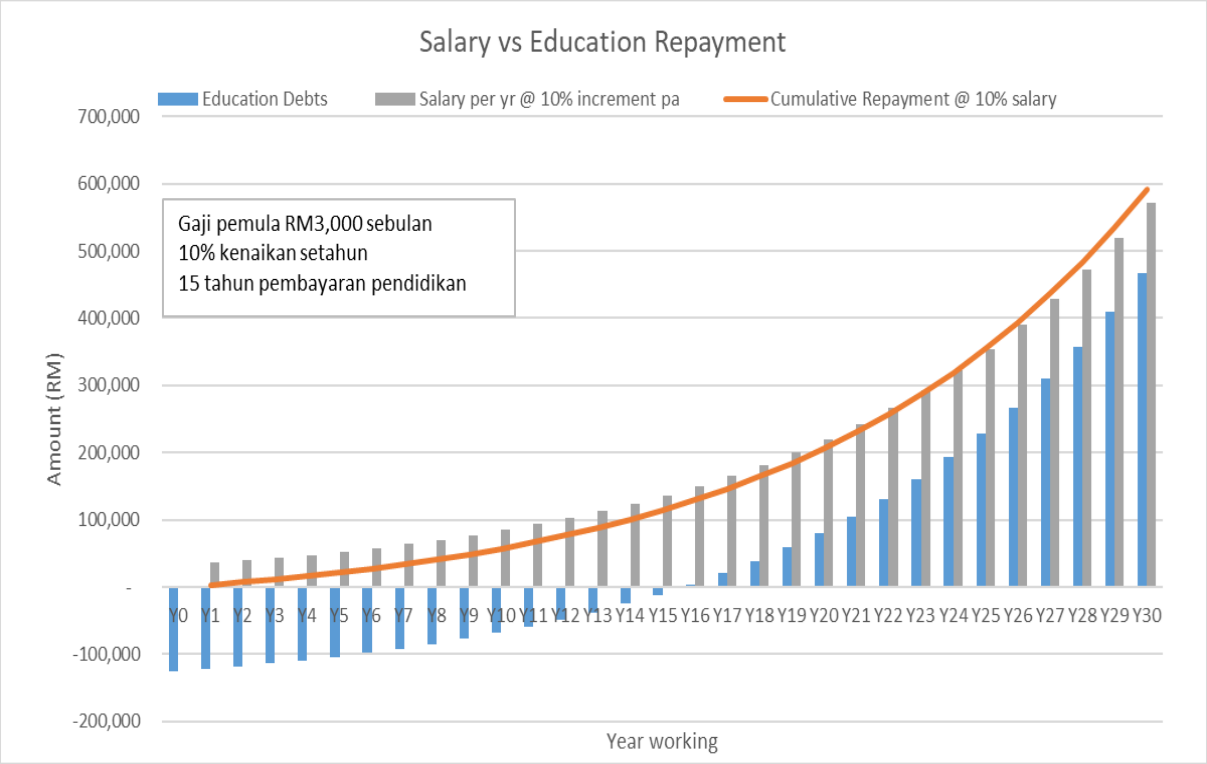


Diagram 8: Case 3B

Table 3: Payment Period

Cost of a Degree RM125,000	Case 1B	Case 2B	Case 3B
Starting monthly salary	2,500	3,000	3,000
Annual increase of salary	5%	5%	10%
Education fees payment from income	10%	10%	10%
Payment period until the end	22 years	20 years	15 years

From the comparison above, it clearly shows that an engineer's career with a salary below RM3,500 per month does not give a good return as compared to other majors. In Case 3A and Case 3B, although the starting salary of a Business Administration graduate (RM3,000) is lower than that of an Engineer (RM3,500), the payback period is still shorter as compared to an engineering major. Therefore, at the current level of young engineers' salaries, it is possible that the next generation will no longer be interested in entering engineering field.

A young engineer begins his professional journey with passion and determination. After graduating from university and getting a job in engineering, he/she realised that to reach the level of a Professional Engineer, he/she needed to invest not only

knowledge, but also large financial resources. So, the income that he wished should exceed the amount invested all this time.

2.3.2 National Investment to Produce an Engineer

Investment by the country in producing an engineer is important and strategic for the development of human resources and the progress of the country. This involves providing quality education in the field of engineering and adequate learning opportunities for individuals who have interest and potential in this field. This investment involves several important aspects:

1. **Quality Education**: The country needs to invest in improving the quality of engineering programmes offered in the universities and higher education institutions. This includes the provision of state-of-the-art infrastructure, equipment, and learning facilities. Quality education will form the foundation of knowledge and skills required by the engineers.
2. **Financial Aid**: The country has provided financial aid to students in the form of educational loans or scholarships, which help to stimulate interest in the engineering field and reduce the financial burden that students have to bear.
3. **Technical Education Support**: The country needs to promote technical and vocational education that includes engineering. These programmes provide an opportunity for individuals who may not be willing or able to continue their studies at the university level to acquire the engineering skills required for technical jobs.
4. **Stimulation of Research and Development**: The country needs to invest in research and development in the engineering field to develop the technology and innovation. This can increase the marketability of engineers and have a positive impact on the country's economic development.
5. **Human Resource Development Programme**: The country needs to organise a human resource development programme that focuses on the production of engineers. This includes training and monitoring the professional development of engineers in the industry.

Through the continued investment in this field, the country ensures that it has a highly trained, competent, and competitive workforce in the engineering field.

This will have a positive impact on the economic growth, innovation, and national progress in the long term.

2.4 Engineering Profession and National Economy

2.4.1 Impacts on the Country

1. **Contribution of Engineering Activities to the National Economy:**

The publication of the Annual Economic Statistics of Professional Services 2022 displays the main statistics for professional services obtained from the Annual Economic Survey 2022 for the reference year of 2021. Based on this report, the professional services recorded a gross output value of RM 44.3 billion in 2021 as compared to RM 45.7 billion in 2020.

Engineering activities are the largest contributor with a gross output value of RM 9.3 billion (21.0%). Engineering activities recorded the highest value added in 2021 with RM 5.7 billion (20.6%).

Engineering activities recorded the highest number of employees which was 64,516 person or 18.6 percent. The second highest contributor is legal activity with 52,485 person or 15.1 percent, followed by other professional activities with 48,661 person or 14.0 percent.

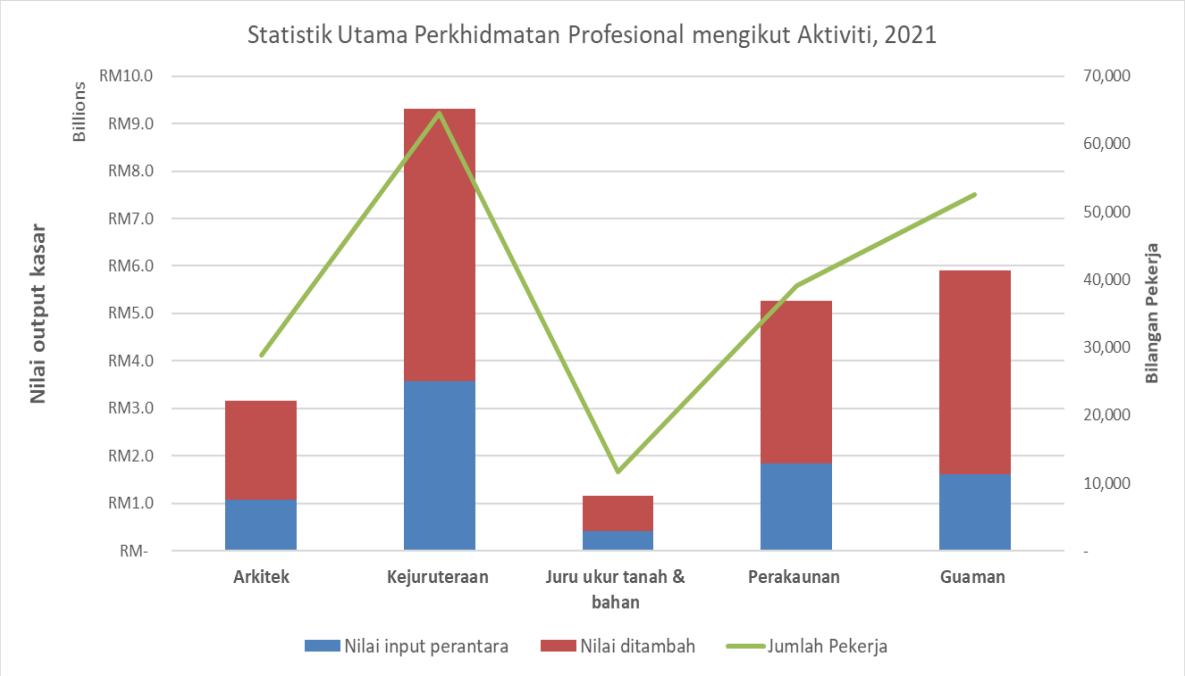


Diagram 9: Key Statistics of Professional Services by Activity, 2021

Engineering activities recorded the highest salaries & wages which was RM 2.1 billion or 17.0 percent of the total salaries & wages paid. On average, the salary & wages received by employees in the professional services is as much as RM 2,944 per month.

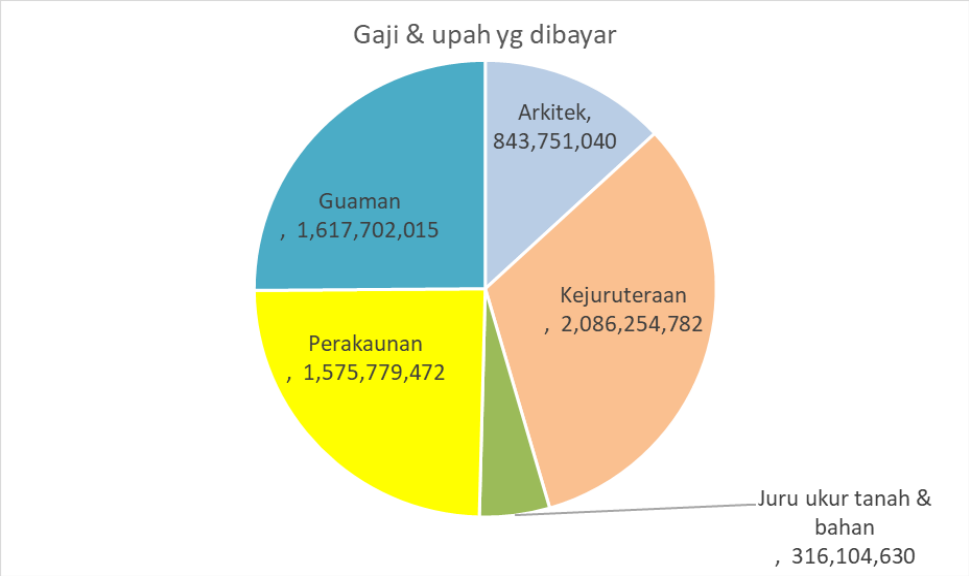


Diagram 10: Salaries & Wages Paid

The graph below shows the trend of salaries and wages paid to employees from 2002 to 2017.

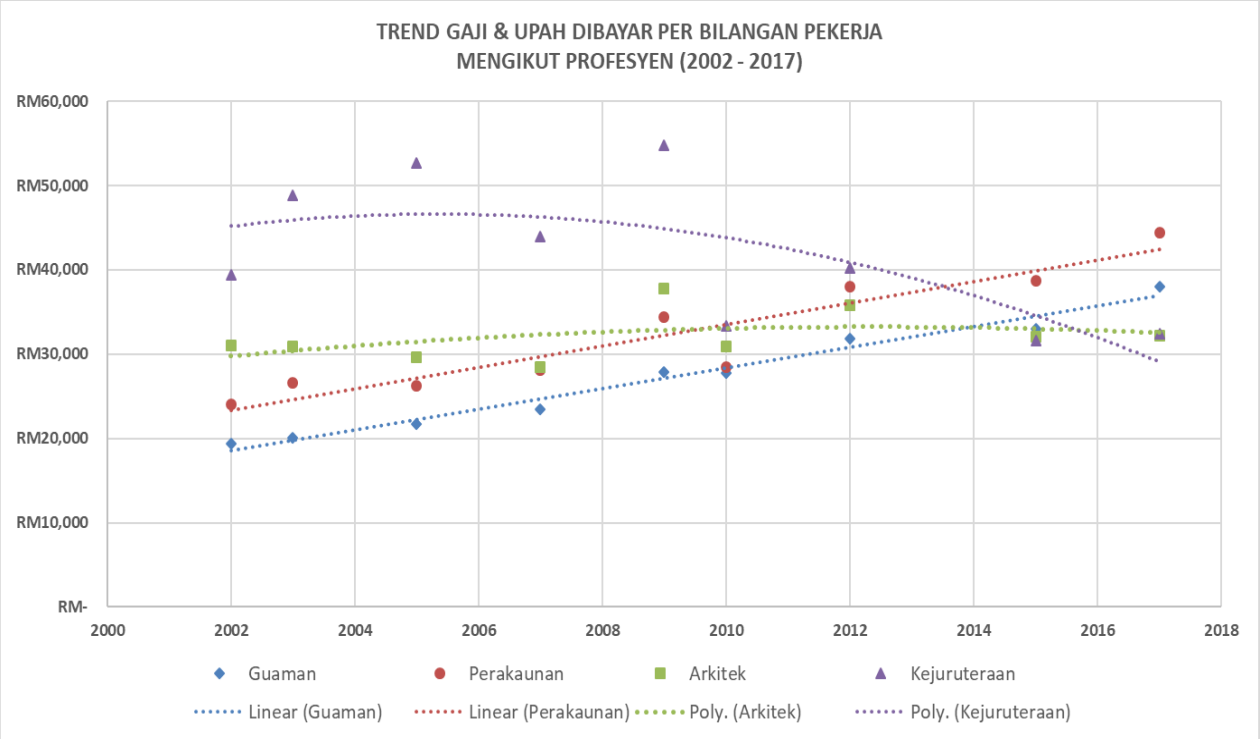


Diagram 11: Graph of Salary & Wages Paid Trend per Number of Employees by Profession (2002-2017)
Source https://www.dosm.gov.my/portal-main/time 1

Engineering activities experienced a contraction starting in 2010 and a downward trend until 2017. Meanwhile, legal and accounting activities showed an upward trend every year at a doubling rate. As for the field of architecture, the trend is horizontal without significant changes.

Based on this 2017 data, the average income of engineering activities is around RM 30 thousand per year or RM 2,500 per month. This value is consistent as compared to the statistics of 2021 which is RM 2,694 per month.

Lack of quality and skilled engineers can result in several negative impacts on the country's economy, including lack of expertise, lack of productivity, and dependence on foreign labour.

2. **Lack of Engineers for the Industry**: The lack of engineers in the industry is one of the main impacts that can damage the country's economy. Engineering is core to the sustainable economic development, especially in the manufacturing and technology sectors. A lack of engineers can result in delays in the development projects, less innovation, and lower the country's competitiveness in the global market.

3. **Loss of Expertise Due to Migration Out of the Country**: When engineers migrate out of the country in search of better job opportunities, it can cause the country to lose valuable expertise. The expertise and knowledge possessed by the engineers is an important asset, and the loss of this expertise can impact the advancement of technology and innovation in the country.

4. **The Cost of Producing an Engineer is High**: The cost of education and training to produce a high-quality engineer is high. The country needs to invest in engineering education to produce skilled engineers. These costs can put pressure on the national budget, especially if the country is facing financial problems.

5. **Low Productivity**: A lack of quality and highly skilled engineers can lead to low productivity in the engineering-dependent sectors. Innovation and the use of the latest technology are important in increasing the productivity, but without quality engineers, this achievement may be difficult to achieve.

6. **Dependence on Foreign Engineers**: When the country depends on foreign engineers who may be cheaper, it can reduce the country's technological sovereignty and make the country more dependent on outside. This can have a negative impact on the country's economy and industry, especially if the price of foreign labour rises.

Therefore, it is important to take steps to educate, attract, and retain talented engineers in the country to ensure sustainable and innovative economic development.

2.4.2 Impact on the Engineering Profession:

1. **The quality of technical workers is low**: One of the biggest impacts of the engineer shortage is the decline in the quality of technical workers. Engineering is a profession that requires in-depth knowledge and high technical skills. A lack of skilled engineers in this field can result in a decline in quality in engineering projects. This can jeopardise the safety and effectiveness of the project, and can also damage the reputation of the engineering profession itself.

2. **Lack of Enrolment of Students in the Engineering Faculty**: A lack of interest in engineering can cause a lack of student entry into the engineering faculty. This may reduce the number of engineering graduates, which may ultimately result in more vacancies in this field. Lack of student enrolment can also reduce the opportunities to build new talents in engineering.

3. **Lack of Student Interest in Entering the STEM Fields (Science, Technology, Engineering, Mathematics)**: A lack of student interest in STEM fields, including engineering, presents a significant challenge. This could be due to a lack of awareness of career opportunities in this field or the perception that STEM subjects are too difficult. Low interest in STEM can lead to a lack of emerging talents in this field, which will ultimately reduce the number of candidates for engineering training.

The lack of engineers can lead to a decline in the quality of technical workers, a lack of student entry into the engineering faculty, and a lack of student interest in STEM fields as a whole. This is an issue that needs to be addressed to ensure the sustainability of the engineering profession and provide a quality workforce in this field.

3. THE PRELIMINARY CHALLENGES CONSTRAINING CONSULTING ENGINEERING FIRMS

3.1 The Origin of Engineer Salary Issue

This report aims to highlight the evolution of this profession starting from the early stages of education, making the issue easier to understand. It also addresses the declining interest among recent students in pursuing careers in science and mathematics, now referred to as Science, Technology, Engineering, and Mathematics (STEM).

It is an undeniable fact that for students to enter the STEM stream, academic achievement must be good and excellent. Less brilliant students will enter the fields of Literature and Social Sciences. At the university level, students who enter the STEM fields are more outstanding students than students who enter the fields of Literature and Social Sciences, not to mention the more rigorous and compact learning schedule.

Unfortunately, upon leaving college or university and entering the workforce, particularly in government services such as the Administrative and Diplomatic Service (PTD – Pegawai Tadbir Diplomatik), many non-technical graduates are offered better opportunities in terms of work environment, promotions, and more lucrative salaries. This group also plays a key role in shaping the future of the engineering profession, influencing both management structures and the employment of professional service groups in the public sector.

Ironically, when this group of professionals found a lack of job opportunities in the public service sector, the decision was taken by this group to look for job opportunities in the private sector or work on their own by opening their own firms either in the fields of consulting engineer services and construction contractors or fields outside the scope of their professional fields. Even so, this group consisting of professionals who continue to seek sustenance and livelihood in this way still need to rely on and need to relate the public sector which is dominated by civil servants who are non-professionals in determining the job opportunities to get projects.

In this level of the public service sector, civil servants from non-professional backgrounds play a significant role in determining salary scales, professional service

promotions, and consultancy fee structures. This includes decisions that affect the consultancy firms within the professional sector.

3.2 Chronology of the Engineering Profession Scenario

In the early 1980s, many students chose to pursue studies in science and engineering, driven by the recognition of the growing demand for skilled professionals in developing countries. These nations including Malaysia, undergoing rapid industrialization and infrastructure development, offered promising job opportunities for graduates in these fields, making science and engineering a key pathway to stable and rewarding careers.

At that time, the demand for engineers was greater in the private sector, driven by rapid development, and it was observed that their incomes were higher than those in the public sector. As a result, there was a significant migration of engineers from the public sector to the private sector.

In the mid-80s after the economic recession, the Government at that time reduced the recruitment of these engineers and most of them were absorbed into the Temporary Service Scheme (SKS) with an allowance of RM 450.00 to RM 600.00 while in the private sector, this group remained being paid between RM 1,200.00 to RM 2,000.00.

This situation did not last long. After the economy began to recover, engineers under the Skim Khidmat Sambilan (SKS) were offered temporary positions with a starting salary of A-18 (RM 1,180), which was higher than the A-20 salary (RM 1,120) received by civil servants in the administrative division.

By the end of 1985 through 1990, the government had frozen all permanent positions in professional services. As a result, engineers under the temporary scheme often spent over five years in these roles before being absorbed into permanent positions. During this period, there was a notable exodus of civil service engineers to the private sector or the start of their own businesses.

In the 1990s, it became evident that engineers working in consultancy firms enjoyed higher salary packages compared to their counterparts in the public service sector. This pay disparity was especially noticeable among engineers with 5 to 10 years of

experience, who found that their skills and expertise were more financially valued in the private sector. As consultancy firms grew in prominence and the demand for specialized engineering services increased, they were able to offer more competitive salaries, which ultimately made the private sector a more attractive career option for experienced engineers.

For example, an engineer with 10 years of service in the public sector (from 1987 to 1997) under the J3 engineer salary scheme would earn around RM 2,000.00 (excluding allowances). In contrast, the same engineer working in a consultancy firm with equivalent experience could earn between RM 6,000.00 and RM 10,000.00.

When the Government introduced the New Remuneration System (SSB) Salary Scheme with J1/J2/J3 salaries for public service (engineering), it was found that there was a large outflow of engineers to the private sector because they found that their promotion opportunities had been denied.

However, starting early 2000s, when the distribution of Government construction projects through a Design & Build Contract (D&B) where the project was awarded directly to the D&B contractors who then appointed a consultant to carry out the design of the project. Here, the dominance of the D&B contractor companies over the consultancy firms began where a partial cut of the consultants' fees to the D&B contractors took place. This situation has caused D&B contractors to use the services of consulting engineers by offering low consulting fees through price negotiation/fee bidding.

And at the same time starting on 1st November 2002 (through Public Service Circular No.4/2002), the civil service scheme for engineers (management and professional) was changed from the SSB Scheme to the Malaysian Remuneration System (SSM) scheme with a salary scale referred as J41/J44/J48/ J52/J54/Jusa 'C'/Jusa 'B'/Jusa 'A'). This SSM Scheme has used skills-based assessment such as changes referring to the performance evaluation system and the Excellent Service Award, increased career opportunities, modification of the salary structure through several MOF Circulars as well as increased service conditions according to MOF guidelines. Here begins the era of a situation where the public service sector salary scheme is better than the private sector salary scheme.

In the middle of year 2000s, the Malaysian Ministry of Finance (MOF) began to introduce a tender system or 'fee bidding' for consultancy firms to acquire projects through the work procurement method by submitting Technical and Financial Proposals (CTK), causing an increase in workload and human resources on the part of consultancy firms to compete to acquire projects.

Here the scenario starts where the principal / managing director of a consultancy firm hires a newly employed engineering graduate with a starting salary of RM 1,500.00 to RM 2,000.00 for employment in the East Coast states and RM 1,800.00 to RM 2,500.00 for employment around the Klang Valley with the ECP firm having to make financial projection based on the revenue of a project. This issue persists to this day, with consulting engineers being the most affected.

In accordance with this timeline, it is noteworthy that the Task Force was established to advise the Government on implementing comprehensive measures. The primary focus is on the thousands of engineers outside the public sector, particularly those in the consulting engineering field, whose service fees do not reflect the scope of work or the associated workload.

Table 4: Chronology of the engineering profession scenario

Duration	Profession's Scenario	Starting Salary Scale (RM)	
		Public (Govt) (Excludes public service allowances and critical allowances)	**Private**
1980 – 1985	▪ Many students entered the fields of science and engineering ▪ The needs of professionals including engineers were urgent at the public/private level ▪ There was a lot of out flow of the engineering profession from the public to the private sector	1,180.00	1,200.00 to 2,000.00
1986 – 1990 ***	▪ There was a national economic recession (Black October) ▪ The Government absorbed engineering graduates into the	450.00 to 600.00	1,200.00 to 2,000.00

Duration	Profession's Scenario	Starting Salary Scale (RM)	
	public sector under Skim Khidmat Sambilan (SKS) ▪ The private sector still maintained the starting salary		
1991 – 2002	▪ The Government introduced the New Remuneration System Scheme (SSB) based on the report of the Special Cabinet Committee (JKK) to replace the A-18 Salary Service Scheme ▪ Outflow of public sector engineers to the private sector for those with more than 5 – 10 years of experience	1,750.87	1,500.00 to 2,500.00
2002 - present	▪ The Government introduced the Malaysian Remuneration System Salary Scheme (SSM) to replace the SSB	2,529.00	1,200.00** to 2,500.00**

*** Private Sector Starting Salary Scale:*

East Coast : RM 1,200 – RM 2,000
West Coast / Klang Valley : RM 1,800 – RM 2,500

Based on Task Force Survey: September 2023

****The **Skim Khidmat Sambilan** (also known as the **Temporary Service Scheme**) was introduced in Malaysia in the mid of 1980s, particularly during the economic challenges of the time. The program aimed to provide temporary employment to help ease unemployment and improve the livelihood of those affected by the economic downturn.*
*In 1986, the Malaysian government introduced various economic relief measures due to the financial difficulties the country was facing. One of these measures was the **Skim Khidmat Sambilan**, where individuals could be employed in temporary, short-term roles within the public sector from all any first-degree graduates. The **RM600 salary** was allocated for participants under this scheme, which was relatively modest at the time, but it offered financial support for many who were struggling due to the economic crisis.*
However, the scheme was not permanent, and the employment provided was typically non-competitive, aimed at providing short-term relief. The temporary positions might have included administrative tasks, manual labor or other roles within various government departments.
*While detailed, specific records of the scheme for this SKS schemes may not be easily accessible without consulting government archives, but it was acknowledged from Parliament Hansard Archieves**** that this initiative was part of the government's broader efforts to address unemployment and assist with the economic challenges of the mid-1980s.*

*****Penyata Rasmi Parlimen (Parliament Debates) on 8th March 1988 page 96, item 30(v): The government has launched Temporary Service Scheme (SKS)in 1986 where as many as 4,000 graduates has been placed in Ministries and Federal departments and State. From this amount a total of 1,178 graduates has resigned from SKS and is understood they have got jobs in the public sector. private and self-employed.*

3.3 Challenges of Engineering Consultancy Firms

Here are some of the challenges affecting the engineering consultancy firm sector today in detail. These are the issues that can threaten the effectiveness and integrity of this industry. The following is a more detailed description of each issue:

1. **Competition and Financial**

During ACEM 2022 Forum in May, a random survey was conducted to measure the profile of firms in the market today. Of the 27 firms, 12 (44%) have responded that they employ less than 50 employees, of which eight (8) have less than 20 employees. About 1/3 of the firms earn between RM 1 to RM 5 million in annual revenue, with most reporting single-digit annual profits (**less than 10%**).

Keep in mind that earnings and profits do not represent the cash flow, as most firms will report that payments are often delayed. For shareholders, the profit/loss chart below is perhaps the most important financial indicator, as it translates into the company's ability to obtain financing or reinvest into the firm; through increased training, use of better technologies and software, dividend payments, employee rewards, and ultimately attracting investors.

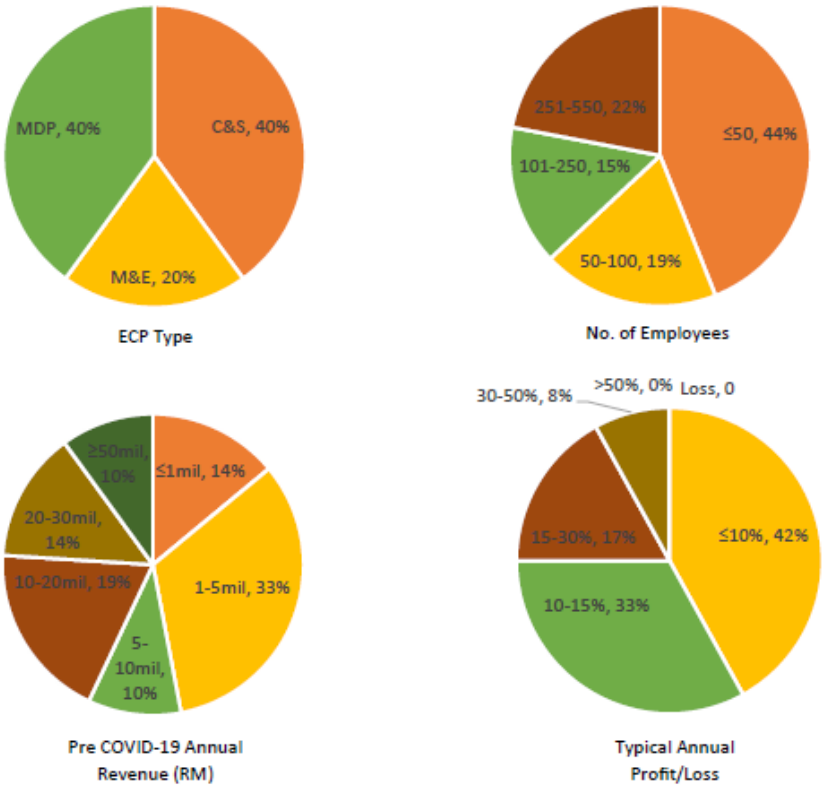


Figure 1: Survey on ECP's profile and financial performance during the ACEM Forum (May 2022)

Diagram 12: Survey on ECP's Profile and Financial Performance during the ACEM Forum (May 2022)

In the context of a service provider, 'undercutting' refers to offering services at a lower price than competitors. In the context of practice according to the guidelines of the Board of Engineers Malaysia (BEM), it can also be argued that 'undercutting' means offering services at a lower price than the set SOF rates.

What is more worrying is that the main reason why firms offer discounts is to (1) ensure that the project is acquired regardless of cost, and (2) forced to lower prices to maintain relationships with their customers. This suggests a 'kamikaze' approach to bidding where firms seem to offer discounts simply to ensure the project is secured; which shows a state of desperation to 'survive' and prioritising lower financial aspects than excessive workload, service quality, and profitability.

The fact is that firms lower their prices to below the break-even point, until they are at a loss, just to 'survive'. Those who have attended tender briefings or events with company owners, increasingly hear the phrase: "What to do, need to survive." Focus on the word 'survival', as it is a concern in the engineering practice. Generally, those who are looking for survival will not prioritise quality; whereas quality and accuracy are something that should be defended by engineers as the top priority.

Payments based on milestones are the norm in the industry that erode a firm's cash flow and ultimately negatively impact their performance. Stages in a typical real estate development project are often controlled by parties outside the firm's control, whether by clients, authorities, architects, surveyors, and even contractors.

The cash flow of a firm is as shown in the following diagram:

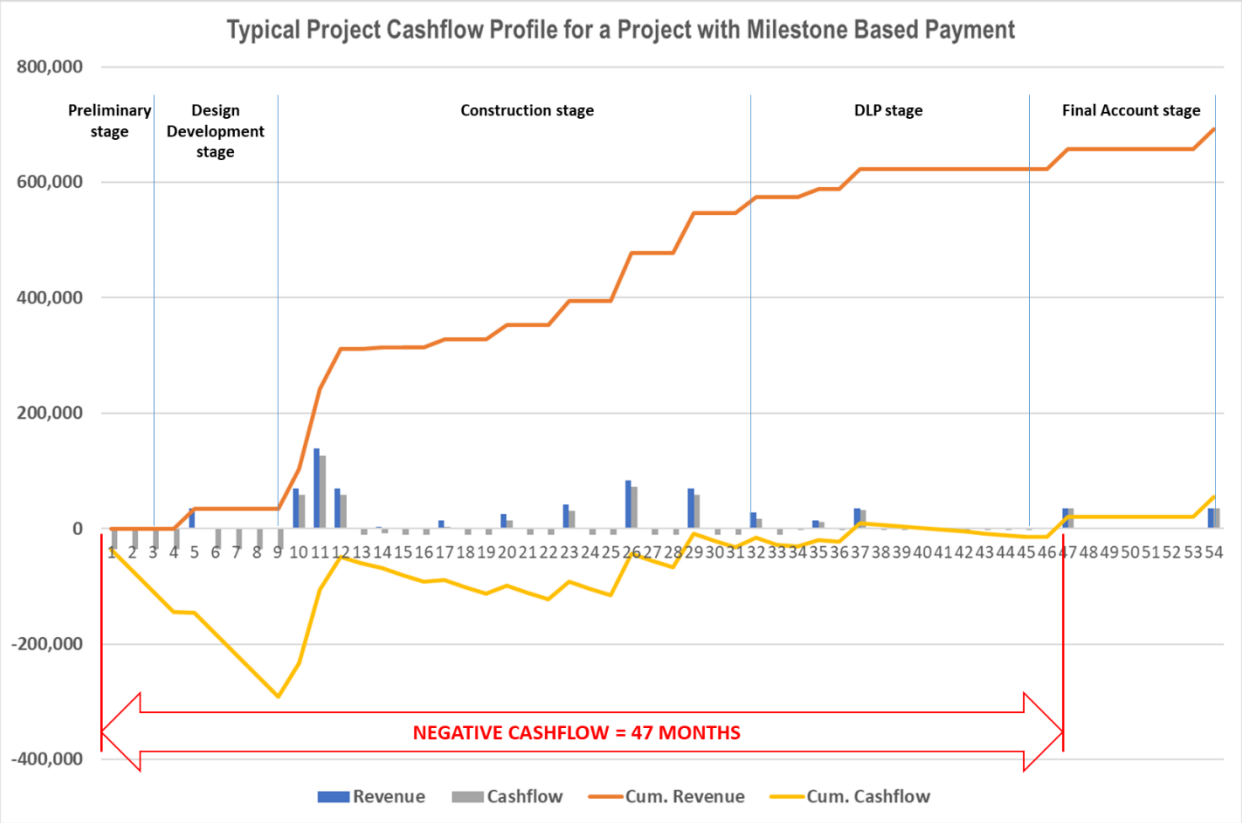


Diagram 13: Typical Project Cash Flow Profile for a Project with Milestone Based Payment

This shows that although the firm's cumulative income increased over the project period, the firm's costs (i.e. salaries and fixed expenses) pushed the firm into negative cash flow for 47 months (i.e. after CMGD). In other words, the profit is not realised until the completion of the defect liability period (DLP) is completed. A firm needs to manage between 7 to 9 projects using the same staff resources to achieve positive cash flow in the first stage, which will obviously put a strain on the staff.

Of course the projects are given at different times and the stages do not usually converge in this way, but in that scenario, the cash flow from one project are then needed to cover the cash flows of the other projects, leading to similarly low returns.

Compared to if the firm invoices the client on a monthly basis (like a contractor, not based on incremental milestones that are often beyond the firm's control), by using time schedules and progress reports, the firm's cash flow capability will be more positive. Client can validate bills based on work progress and allocated resources; similar to how firms charge for site monitoring services but based on the actual time allocated. The project management of the firm can monitor their team's efforts,

productivity and project profitability on a monthly basis, and alert the client of potential scope deviations or additional works.

This will force the client to be stricter in the works of repeating the design and the construction package, and possibly reduce the number of meetings or shorten them, because the time input will become expensive and no longer productive.

Stage	Scope of Works	Stage %	Cumulative %	Milestones By
1	**Schematic Design**			
a	Upon approval of the preliminary design	5%	5%	Architect/Client
2	**Design development**			
a	Upon submission of Building Plan	10%	15%	Architect
b	Upon obtaining Authorities approval	10%	25%	Authorities
c	Upon issuance of tender documents	10%	35%	ECP/QS/Client
3	**Contract Implementation Stage**			
a	Upon appointment of contractor	10%	45%	Client
B	Monthly payment based on contractor's progress	40%	85%	Contractor
c	Upon issuance of CCC	5%	90%	Arch/ECP/Auth
4	**Post Construction Stage**			
a	Upon issuance of CMGD	5%	95%	Arch/ECP
b	Upon closure of Final Accounts	5%	100%	QA/Contractor

ECP has no control over milestones

The impact of negative cash flow due to tiered payments causes the firm to experience a tight cash flow situation, which affects the ability to offer better salary packages to the staff.

3.4 Government Procurement Policy

3.4.1 Unreasonable Terms & Conditions

This issue related to unfairness in the procurement terms and conditions, which also burdens the firms. Unfair terms can hurt the local and small firms. Therefore, it is necessary to review the terms and conditions of the Treasury Circular PK 3.2 to ensure fairness and credibility in the procurement process. Re-evaluation and adjustment of the terms should be done to ensure fairness and equality.

3.4.2 Appointment of Lead Consultant Architect (LC)

The firm's cash flow depends on the LC and the firm's performance depends on other LC teams. This may lead to conflicts of interest and the need for role clarity.

3.4.3 Design & Build Project

In design and build projects, there are problems such as the consultancy firm becoming "subservient" to the contractor in technical matters, the firm becoming a "project financier" before the SST is received by the contractor and the contractor's deduction of the firm's fee. The consultant become less independent and more dependent on the contractor in technical matters. The lack of payment for preliminary design before the SST is issued and the delay in the project completion are problems that need to be resolved.

The firm should be appointed directly from the agency. The consultant is then "novated" to the contractor during the construction. As the best example, this model has been used by Putrajaya Holdings in Putrajaya projects and it can be used for Government projects.

For Design & Build open tenders, the cost of the consultancy firm during the preparation of the bid documents should be paid by the agency as implemented in the developed countries.

3.4.4 Consultancy Services Bidding System

1. **A bidding method that does not give a large return to the Government**: Reducing consultancy firms' fees do not provide sufficient incentives for firms to deliver innovation and better quality. A 10% reduction of the consultancy firm's fee only gives **saving of less than 1% of the total project cost**. For example, for a project worth RM 20 million, the engineering firm's fee is around 3.5% of the project cost which is RM 707,500. A 10% reduction in the firm's fee is only RM 70,750 or only 1.03% of the total project cost.

2. **The cost of preparing the consultant's bid document**: The high cost of preparing the consultant's bid documents is not comparable to the savings obtained. This is a waste of resources and should be reconsidered. A huge waste of manpower for SMEs that failed in their bidding.

For example, if a firm spends RM 10,000 in terms of manpower for one bid, 20 firms will spend RM 200,000. From this bid, 19 firms that failed would have spent RM 190,000 on activities that were not productive for the national economy. These costs do not include the staff costs of the agency handling the bidding process. In terms of macroeconomics, a reduction in firm costs of RM 70,000 (as in the example above) will result in the country spending more than RM 200,000 on non-productive activities excluding the agency's staff costs.

3. **Direct appointment of firm according to the Scale of Fees**: The need to eliminate the financial proposal and focus only on Technical proposal is a good move to increase transparency. If the firm's fee and site monitoring cost are set after the firm selection, it will be a good measure to reduce the cost of unproductive bid preparation.

4. **Unfair assessment procedures**: The firms' services evaluation may need to be revised to place more emphasis on innovation, expertise, and creativity. The price factor is the main criterion as in the example below. Although firm A scored the highest technically, but firm C (lowest technically; lowest price) scored the highest overall in the current evaluation procedures.

Evaluation Criteria	Weightage	Consultant A	Consultant B	Consultant C
Technical	80%	80%	75%	70%
Financial	20%	0%	10%	20%
Total Score	***100%***	***80%***	***85%***	***90%***
Fees amount:		highest	medium	lowest
Cost score		0%	50%	100%
Weightage %		0%	10%	20%

Changes in assessment methods such as 2-envelope system assessment may also be required. 2-envelope system evaluation method where the technical evaluation is opened first, evaluated and short-listed; then only the Financial evaluation of the firm is short-listed. In the current method, both Technical Proposal and Financial Proposal tender envelopes are opened at once causing a "bias" to the bid prices.

3.4.5 Terms of the Consultancy Service Agreement Form CSA2014

Some terms and conditions in the CSA2014 need to be reviewed to ensure fairness and equity in the agreement, so that it is not biased.

3.4.6 Foreign or Giant Project Implementation Policy

Breaking down a giant project into smaller packages is a good step to increase the participation of local consulting engineering firms in large projects.

3.4.7 Contractor Appointment Policy and Project Completion Delays

Studies show that delays in project completion often lead to additional costs for consulting firms. The research found that 79% of government projects fail to be completed according to the original contract. Awarding contracts at excessively low prices can also lead to financial problems for contractors. The "cut-off" method needs to be reassessed to ensure project completion within a reasonable timeframe. Typically, the selection of contractors is not within the consulting firm's jurisdiction. Project delays result in additional costs borne by the consulting firm.

3.5 Governance Policies for Agencies, Statutory Bodies, and GLCs/GOCs

1. Improving governance is crucial to ensure fairness, transparency, and support for local firms. Non-compliance with the REA and imbalances in contracts need to be addressed. It is important to monitor the governance of other agencies by receiving complaints from firms regarding non-compliance with the REA by any party and to oversee unfair contract requirements, such as equating service contracts with contractor work contracts, despite differing terms, scopes, and conditions. A monitoring body should be established to oversee these issues.

2. Competition from university consultancy units or agency subsidiaries should be managed effectively to ensure fairness in the industry. University consultancy units or government agencies should be limited in competing with consulting firms. Their expertise and facilities should

be utilized for niche areas or complex issues beyond the capabilities of consultants.

Overall, these issues may require a reassessment of policies, procedural improvements, and enhanced governance. It is important to ensure that engineering construction firms operate in a fair, effective, and viable environment to deliver high-quality projects.

Policies that impose such pressures increase the operational costs of firms. These costs put pressure on companies to offer better salary packages to employees amidst market uncertainties.

3.6 Organic Growth of Engineering Firms

The organic growth of engineering firms refers to the natural process of their development and expansion, where firms grow gradually while considering funding sources, market needs, and the challenges they face. Several key factors influence the organic development of engineering firms, as outlined below:

1. Limited Investment Funding from Owners

a. **Inability to Make Long-Term Strategic Plans:** Constraints in investment funding may prevent engineering firms from planning and implementing long-term strategic initiatives that require significant investment.

b. **Lack of Fiscal Incentives for the Engineering Consultancy Sector:** The absence of tax benefits or fiscal incentives can restrict engineering firms from obtaining funding support.

c. **Unclear Policies for the Development of Bumiputera Small & Medium Enterprises (SMEs):** Uncertainty in policies for the development of Bumiputera SME consulting firms can negatively impact firms that wish to grow, compared to the support provided to contractors by government agencies such as CIDB for contractors, MARA for contractor entrepreneurs, and others. Engineering consulting firms may need to incur their own expenses to upgrade their technical capabilities.

d. **Limited Regional Competitiveness Due to Financial Constraints:** Financial limitations can hinder a firm's ability to compete at the regional level, where competition may be more intense.

2. Rising Wage Costs Compared to Existing Fee Scales:

a. **Increase in Costs from Wages, Software Subscriptions, and Administrative Expenses:** Rising daily operational costs such as wages, software subscriptions, and administrative expenses can burden engineering firms experiencing organic growth.

b. **Limited Ability to Adopt Latest Technologies Due to High Costs:** Constraints in accessing cutting-edge technology, such as Building Information Modelling (BIM) or simulation software, can cause engineering firms to fall behind in innovation and efficiency.

3. Low Consulting Engineer Salaries Compared to Other Sectors:

a. **Difficulty in Securing Projects Consistently:** Inconsistent project acquisition and unstable markets can make it challenging for engineering firms to generate steady revenue.

b. **Long Project Return Periods:** If project return periods are lengthy, firms may struggle to maintain profitability and offer higher salaries to engineers. For instance, real estate agents might earn a 3% commission with a return period of 6 to 12 months, whereas engineering consultants receive fees of 1-3% over a period of 3 to 4 years.

c. **Employers Hiring Certificate or Diploma Holders as Engineers:** This can lead to a decline in quality within the engineering sector if unqualified individuals are employed. For example, a 10-week competency certificate from the Energy Commission for solar system design is sufficient for designing solar systems, even without a Professional Engineer license, despite the fact that solar system design and installation are engineering services under the REA. Additionally, enforcement by the Board of Engineers is needed to ensure that new graduates are appointed as engineers.

4. Difficulty in Attracting Quality Young Graduates:

a. **Many Engineers Shifting Interests/Professions:** Low salary rates cause potential engineers to move to other professions or the gig economy, which offer better financial rewards.

b. **Lack of Interest from Quality New Graduates in Consulting Professions:** Difficulty in attracting quality graduates can reduce the supply of needed labour in the sector.

c. **Quality of Workers Affected by Hiring Those Who Failed to Enter Other Sectors:** This can result in firms finding that the employees they hire may be of lower quality or lack genuine interest in the profession.

d. **Challenges in Attracting School Students to STEM Fields:** Low salaries and limited appeal in the engineering sector can deter school students from choosing Science, Technology, Engineering, and Mathematics (STEM) fields as their career paths.

4. COMPETITION AND THE CPTPP AGREEMENT

4.1 Competition Requirements and the CPTPP Agreement

The CPTPP (Comprehensive and Progressive Agreement for Trans-Pacific Partnership) is a multilateral trade agreement that covers various issues, including trade in goods and services, intellectual property rights, investment, and more. Annex 15-A is a part of this agreement related to construction services and engineering consultancy services.

Chapter 15 of the CPTPP Agreement discusses services and investment. It covers various aspects related to services and investment within the context of this trade agreement. Among other things, CPTPP member countries provide market access for services to other member countries. This may include commitments to open specific service markets to traders from member countries. It also addresses the protection and rights of foreign investors wishing to invest in CPTPP member countries, including issues such as intellectual property protection and protection against discrimination or unfair treatment. This includes how consultancy services, such as engineering, are managed and accessed within the CPTPP area. The agreement may include specific exceptions for certain sectors or services that might not affect the agreement or sectors requiring special protection.

Generally, the CPTPP Agreement contains key principles such as:
Article 15.4: General Principles
2. With respect to any measure regarding covered procurement, no Party, including its procuring entities, shall:
(a) treat a locally established supplier less favourably than another locally established supplier on the basis of degree of foreign affiliation or ownership; or
(b) discriminate against a locally established supplier on the basis that the good or service offered by that supplier for a particular procurement is a good or service of any other Party.

In this context, if the Malaysian Government wishes to make direct appointments to engineering consultancy firms without violating CPTPP requirements, it must adhere to the provisions outlined in Annex 15-A. Annex 15-A pertains to construction and

engineering consultancy services, thus including guidelines and conditions relevant to the selection of consultants and the provision of these services.

To determine whether direct appointments to engineering consultancy firms by the Malaysian Government comply with CPTPP requirements, it is necessary to refer to the details in Annex 15-A and carefully review the provisions related to engineering consultancy services. This includes conditions concerning the selection process for consultants, transparency, and principles of fairness in the selection of service providers.

Annex 15-A of the CPTPP Agreement contains threshold values outlining the amounts up to which the Malaysian Government can make direct appointments without going through a tender process. This threshold value includes limits for engineering consultancy services or any related construction services.

When the threshold value is established, it typically allows the government to make direct appointments without a tender process if the contract value or required service does not exceed this threshold.

In Annex 15-A of the CPTPP Agreement, Section G addresses the protection of Bumiputera** interests in Malaysian Government procurement. Bumiputera** is a term used in Malaysia to refer to indigenous people and local native communities.

In this context, the provision recognizes Malaysia's intent to promote and protect Bumiputera** interests in government procurement. It allows the Malaysian Government to take measures aimed at providing greater procurement opportunities to Bumiputera** in the engineering consultancy and construction services sectors.

This includes policies such as awarding contracts to Bumiputera**-owned companies or setting specific threshold values below which the tender process is not mandatory; thereby providing opportunities for Bumiputera** firms.

It is important to adhere to these provisions carefully to ensure compliance with the requirements outlined in Annex 15-A and the CPTPP agreement as a whole.

Therefore, the use of fee scales and direct appointments can still be applied in consultancy procurement while adhering to the provisions of the CPTPP agreement.

***** Note: This paper suggests that the term 'Bumiputera' should also include non-Bumiputera SMEs that face similar impacts.***

4.2 Use of Fee Scales (SOF)

4.2.1 Comparison with Other Countries

The use of fee scales for consulting engineering services can vary from one country to another, and it is not a standardized practice globally. However, some countries have established fee scales or guidelines for consulting engineering services. Here are a few countries where fee scales are used:

1. **Germany:** Germany uses "HOAI" (Honorarordnung für Architekten und Ingenieure), which is a fee scale for architectural and engineering services. It specifies how fees are calculated for various types of projects and services. *[https://www.hoai.de/hoai/volltext/hoai-2021/]*
2. **United Kingdom:** In the UK, consulting engineers often refer to guidelines from professional bodies such as the Royal Institution of Chartered Surveyors (RICS) and the Institution of Civil Engineers (ICE) for fee guidance. *[https://www.designingbuildings.co.uk/wiki/Building_design_and_construction_fees#Core_consultant_fees]*
3. **Australia:** The Association of Consulting Architects Australia (ACA) and Consult Australia provide guidelines for consulting engineers' fees. The specific guidelines may vary by state and territory.
4. **Canada:** In Canada, consulting engineers often follow fee guidelines set by associations such as the Association of Consulting Engineering Companies (ACEC) in Canada.
5. **United States:** Although there is no national standard fee scale for consulting engineers in the United States, various professional organizations and individual states provide recommended fee structures or guidelines for engineering services.

6. **South Africa:** The South African Institution of Civil Engineering (SAICE) provides fee guidelines for consulting engineers in South Africa. *[https://www.gov.za/sites/default/ files/gcis document/202103/44333bn22.pdf].*

4.2.2 Fee Scales of the Board of Engineers Malaysia

In Malaysia, the Board of Engineers Malaysia (BEM) regulates the engineering profession. BEM provides guidelines on the fees charged by registered professional engineers. BEM offers a fee scale or guidelines for calculating fees for consulting engineering services. Fees for engineering services are typically structured based on the type, size, and complexity of the project. Consulting engineers are expected to adhere to the fee guidelines provided by BEM.

It is important to understand that while BEM provides guidelines, its primary focus is on setting ethical standards and professional conduct guidelines.

Attempting to save costs by reducing fees can be a mistake. Fees represent a small portion of the overall project costs, but poor design can have long-term and costly effects.

Using a fee scale to allocate payments to consulting engineers in Malaysia has both advantages and disadvantages:

Advantages of Fee Scales:

1. **Transparency and Fairness:** Fee scales can ensure that consultants are paid fairly based on their achievements and performance in government projects. This helps ensure transparency in the reward process.
2. **Increased Motivation:** With a clear incentive system, consultants are more motivated to perform their best in government projects, knowing that good performance will result in higher rewards.
3. **Encouraging Quality Work:** Fee scales can encourage consultants to provide high-quality work and adhere to the standards set by the Board of Engineers Malaysia. This can give government agencies confidence that projects will be executed efficiently and to the required standards.

4. **Continuous Improvement:** By linking incentives to improvements and achievements in projects, consultants may be more inclined to seek ways to enhance their processes and add value to government agencies.
5. **Retaining Talent:** With a competitive reward system, high-quality consultants may be more likely to continue working with government agencies, helping to retain talent and experience within the industry.

Disadvantages of Fee Scales;

1. **Rigidity:** Fee scales may be viewed as rigid because they often specify payment calculations based on project type and size. This can limit flexibility in negotiations between consulting engineers and clients.
2. **One-Size-Fits-All:** Fee scales may not always account for unique project conditions, leading to fees that may be excessive or insufficient for certain projects. Some clients may feel that the fee scale does not adequately reflect the value added by the consulting engineer in specific cases.
3. **Price Competition:** Standardization due to fee scales may reduce price competition among consulting engineers.
4. **Industry Changes:** As the industry evolves and new technologies and project delivery methods emerge, fee scales may struggle to keep up with these changes and adapt to new practices.
5. **Complexity:** Calculating fees using a fee scale can be complex and may require a good understanding of guidelines and a thorough assessment of project requirements. This level of complexity can be a drawback for clients who prefer a simpler fee negotiation process.

Factors influencing the fees for design services in a project are complex and depend on several contributing factors. Contributing factors to consider may include, among others:

1. **Project Complexity**: Projects can range from relatively simple projects where the design is based on established practices to more complex projects requiring the application of new, unusual, or untested techniques, designs, systems, or applications.

2. **Financial Value of Work**: This value can range from situations where the work is highly valuable compared to the services provided, to projects where the work value is exceptionally low relative to the services required from the consulting engineer.
3. **Time Frame**: This may involve projects where the work is completed in a shorter or longer period than typically expected for any phase of work.
4. **Level of Responsibility, Liability, and Risk**: This can range from low responsibility and/or risk to projects with exceptionally high responsibility and/or risk expected to be borne by the consulting engineer.
5. **Level of Expertise, Qualifications, Skills, and Experience**: Some work may not require a high level of expertise, while other work may require more specialized skills or substantial experience, leading to higher costs.
6. **Required Technology Level and Technological Changes**: This can affect the cost of the services provided.
7. **Labor-Intensive Aspects**: Whether labour-intensive aspects related to the work need to be considered in the design.
8. **Effort Level**: Some projects may not require significant effort because the design can be done without extensive investigation or field measurements, while others may require extraordinary effort from the consulting engineer, for example, due to required research or integration with existing work or infrastructure improvements where the status quo needs to be investigated in detail.
9. **Potential Value Added**: In some cases, a design, no matter how excellent, may not add significant value to the overall project, while in other cases, greater design optimization can lead to substantial savings in capital, maintenance, or operation costs or add value to the final project.
10. **Client Requirements**: Some clients have minimal requirements and/or many standard details, and the consulting engineer's design is accepted at face value. Other clients may require extensive details to be investigated during design development to meet their much more complex internal processes.
11. **Project Definition**: In some projects, the design concepts and scope are clear and do not require further research or analysis of options. In contrast, other projects may require extensive analysis and testing of various options.

It is crucial to ensure that the fee scale is used effectively and transparently, managed carefully, and that consultant performance evaluations are objective and based on tangible achievements. Additionally, this reward system should align with the goals and standards of government projects to ensure it delivers the desired outcomes.

Overall, reasonable fees are essential to make consulting engineering services sustainable and of high quality. They reflect the value provided by consulting engineers in project development and overall community safety.

5. PROPOSAL AND SOLUTIONS

It is a fact that professional engineer consulting services do not trade in commodities; rather, they are dedicated to delivering expert knowledge and services that serve the public interest and promote universal well-being.

This means that architectural design, engineering, and land surveying are highly specialized services that demand significant qualifications and expertise. Because of this, the client carried out the selection against them based on their experience and qualifications to do the work and not simply because of the consultant fee or know-who factor alone.

The views and analysis from interested parties mainly consulting engineers' companies have been *taken into account* in finding proposed solutions to ensure that the engineering profession can be properly immersed in the cause of the problem, including the experiences faced by the owner of the consulting firm.

This paper is providing proposed suggested solution for the issue of engineer salaries from the professional engineers' perspective and is categorized in two scenarios, namely Main-Value Scenario and Value-Added Scenario.

The Main-Value Scenario brings a direct impact to the consulting firm for the engineering profession while the Value-Added Scenario brings alternative effects to the consulting firm as well as the general perception of the strength of the engineering profession in the construction sector.

1. Main-Value Scenario

1.1 Improvements & Amendments to the Engineers Registration Act 1967 relating to Scale of Fee (SOF).

1.2 Abolition of the Tendering System for Financial Proposals.

1.3 Evaluation and Review of the Consultant Scale of Fees (SOF)

1.4 Revision of CSA:2014 Engineering Consulting Services Agreement

2. Value-Added Scenario

2.1 Methods of Appointing Consulting Firms for Design and Build Projects.

2.2 Involvement of Engineers in CIDB-registered Construction Firms.

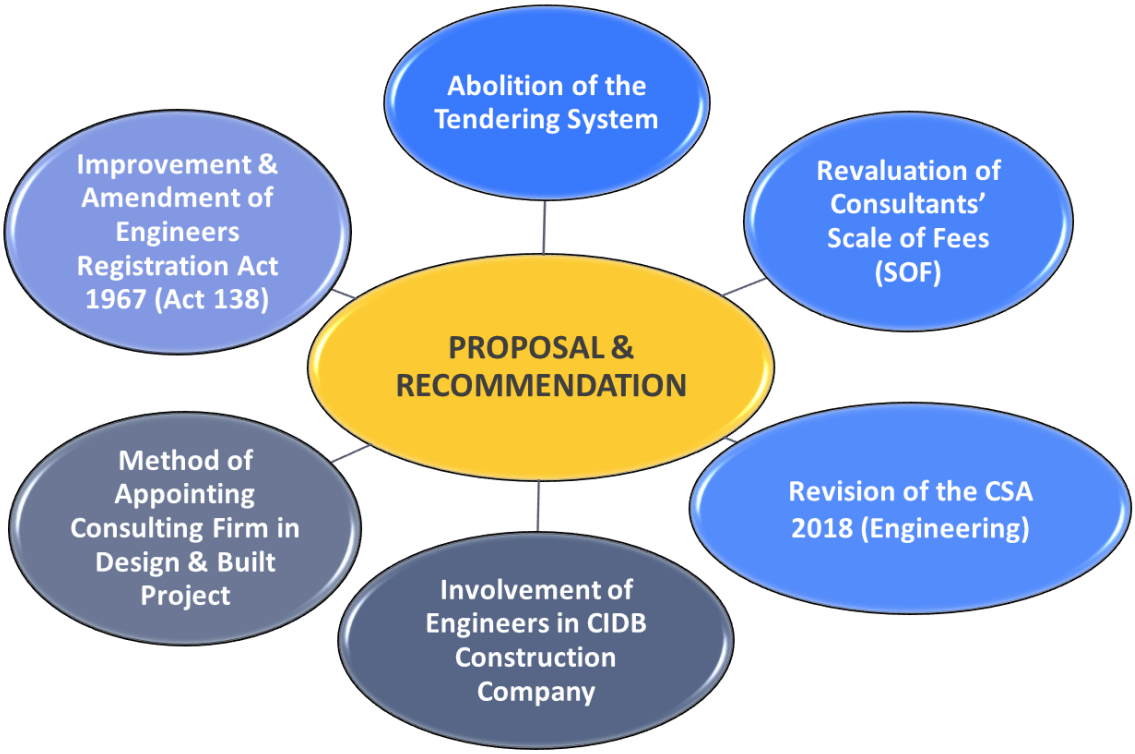


Diagram 14: The Proposal & Solution from Engineering Consulting Firm Perspectives

The brief description of the proposal and solution for the Diagram 14 above as follows;

5.1. MAIN-VALUE SCENARIO

5.1.1 Improvements & Amendments to the Registration of Engineers Act 1967 (Act 138)

Looking back into REA 1967 history, there are six (6) amendments had been made since the Act came into operation in 1972 namely as follows;

1973: Accepts accreditation under others similar Acts eg. FMA 1967 AND allows registered Prof Engineer to use "P.Eng' suffix.

1974: Introduces category for Consulting Engineers and a new category of Graduate Engineers.

1987: Limits registration to Citizens and PRs but includes a “Temporary Engineers” category for foreigners.

2002: Introduces Engineering Consultancy Practices (ECP) including multi-disciplinary practices and new category of “Accredited Checkers”.

2007: Introduces Disciplinary Committee

2015: Incorporates Government policies on Globalisation and Liberalisation as well as introducing several new categories and new names; PEPC, PE, ET & IOW.

Recently this year, eight (8) new amendments had been made on REA 1967 on Composition of the Board, Categories of Registration, Scope of Practice for Professional Engineer, Disciplinary Action by Disciplinary Committee, Investigation and Enforcement Powers, Appeal Board, Review Board and lastly on the Quantum of Fines under REA 1967.

At the same time, BEM had progressively via their WG conducting the review of SOF 2008 getting updated feedback from engineers and other relevant stakeholders. It is understood that the BEM Working Group (BEM WG) on SOF agreed that there is a need to revise the Scale of Fees (SOF) and to make it mandatory and practical.

The said section mentioning scale of fees in Act 138 is in Section 4(1) is as follow particularly item (d):

(1) The functions of the Board (BEM) shall be –

(a) to keep and maintain the Register;

(b) to approve or reject applications for registration under this Act or to approve any such application subject to such conditions or restrictions as it may deem fit to impose;

(c) to order the issuance of a written warning or reprimand, the imposition of a fine, suspension, cancellation, removal or reinstatement in accordance with Parts III and IV;

(d) to fix from time to time with the approval of the Minister <u>the scale of fees</u> to be charged by registered Engineers and Engineering consultancy practices for professional engineering services rendered;

(e) to hear and determine disputes relating to professional conduct or ethics of registered Engineers or to appoint a committee or arbitrator or arbitrators to hear and determine such disputes;

From our professional engineer's perspective in ECP industry, the said Section 4(1)(d) *(in bold above)* shall be re-amended by adding the word *"enforce"*

The suggested proposed Amendment to the existing Section shall be read as:

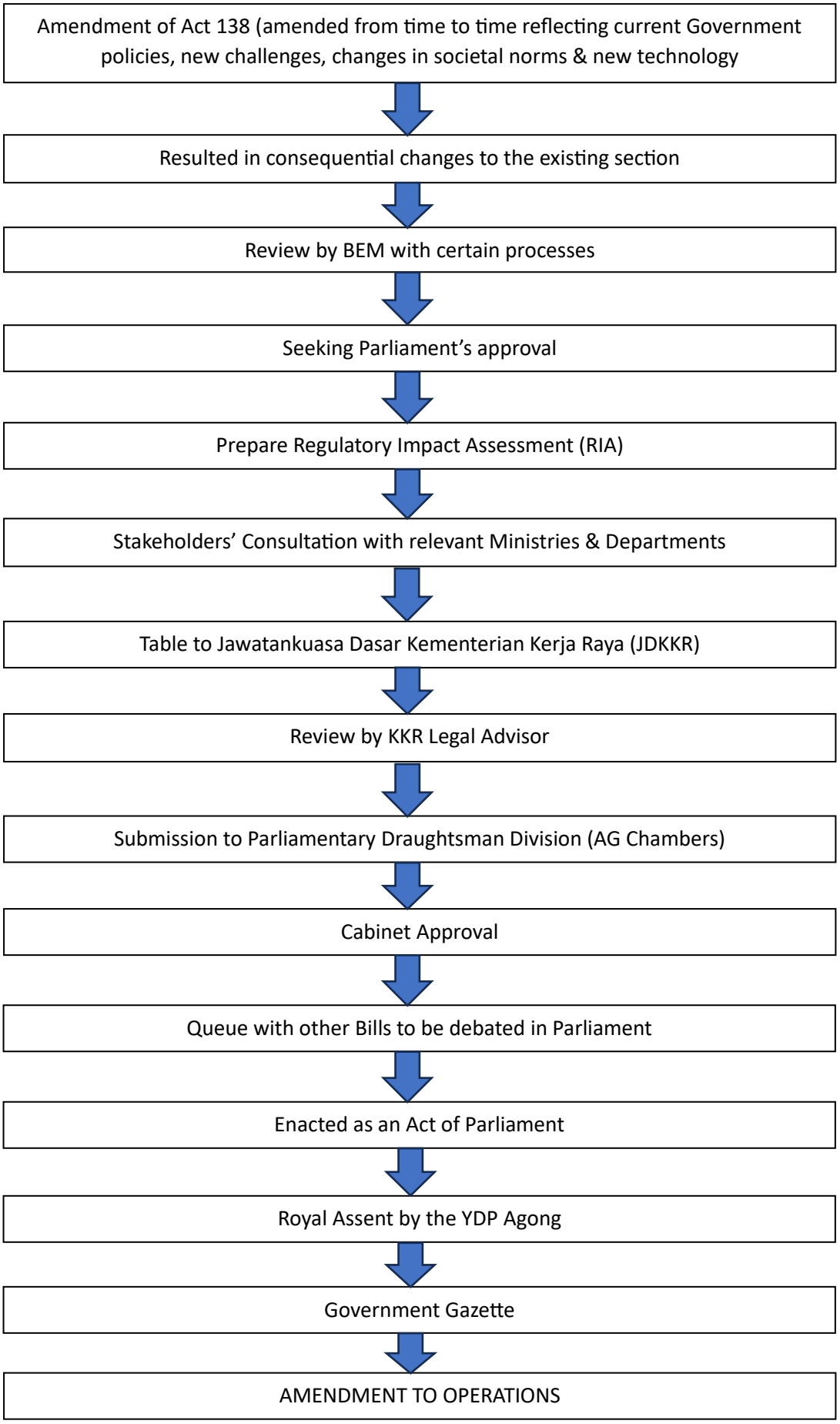
*(d) to **<u>enforce</u>** and to fix from time to time with the approval of the Minister **the scale of fees** to be charged by registered Engineers and Engineering consultancy practices for professional engineering services rendered.*

Justification & Implication: ***To establish and periodically update, with the Minister's approval, a standardized scale of fees for professional engineering services rendered by registered engineers and engineering consultancy practices where the enforcement is necessary to prevent fees undercutting and fees bidding, in accordance with the Board of Engineers' circular, BEM/SOF/01-1 Jld.1(a) dated 7th October 2022.***

Rational: The revision and update of the Registration of Engineers Act 1967 (Act 138) concerning fees shall include the provisions for establishing a minimum salary for engineers and engineering teams. This is important because there is a direct connection between determining the scale of consulting engineering fees and the company owner's ability to set appropriate salaries for engineers.

It is not too late to relook Part II, Section 4(1), although this may lead to consequential amendments to other existing sections. However, it is important to note that this process is lengthy and complex, beginning with the preparation of the Regulatory Impact Assessment (RIA) and consultation with the relevant ministries, followed by review by the Jawatankuasa Dasar Kementerian Kerja Raya (JDKKR) and the KKR Legal Advisor, before being submitted to the Attorney General's Chambers and Parliament.

The Process to Amend REA 1967



5.1.2 Abolition of the Tendering System for Financial Proposals

In the early 80's to the early 90's, most of the consulting engineering projects was offered through direct negotiation according to the rotation as implemented by the Malaysian Ministry of Finance (MOF). This gives the consulting firm especially Small Medium Engineering (SME) firm the opportunity to manage the financial administration especially in evaluating the performance of the staff to match their salary.

Likewise at the private level, consulting engineers obtain projects based on their ability and the assigned fee scale based on fees bidding or direct negotiation not following the standard BEM SOF.

However, when tendering system been imposed on consulting firms by the government, it has had an impact on the chances of securing the project considering the occurrence of 'cost competition' and 'fee bidding' among consulting firms, not to mention the length of time it takes to prepare tender documents that involves time and also involves managing the use of human resources.

The situation has spread to the private sector who also took the same steps by offering a fairly low price in offering projects to consulting engineers to carry out design work including supervision.

Therefore, it is necessary to abolish the Financial Proposal in the tendering system for consulting engineer services covering the review of the SOF as well as using the Direct Appointment System by the government to consulting firms for any project offer with known fixed fees. However, Technical Proposals may be retained to be evaluated on a Qualification-Based-Selection (QBS) basis.

In summary, the abolition of the tendering system is explained below:

Existing Scenario:

- Preparation of Technical Proposal and Financial Proposal *(CTK – Cadangan Teknikal dan Kewangan)* based on Terms of Reference (TOR) to consultants through an open/selective tender system.
- Preparation of Technical Proposal based on TOR for the provision of information data, methodology, work, timeline and human resources to be used.

- Preparation of Financial Proposal need to prepare the lowest fee price to ensure the project is obtained whether the minimum price is focused on SOF, man-month or reimbursable.

Justification:

- *CTK* preparation by consultants requires a period of time, task force and report write up.
- The cost for each *CTK* preparation completed by the consultant can be estimated around RM10,000.00 to RM20,000.00 per tender preparation depending on the size of the project and tendering period.
- Successful consultants based on the evaluation made by the government as follows:
  Technical evaluation: 80%
  Financial evaluation: 20% (The successful bidder still based on the lowest price bidder)
- Unsuccessful bidders will continue to participate in subsequent tenders as usual.

Recommendations:

- Abolition on the preparation of Financial Proposal.
- Consultants only need to provide Technical Proposal.
- The Consultant's Fee price must be set/fixed including reimbursement.
- Consultants are only evaluated on Technical Proposal through QBS method.
- Consultants also need to be given additional fees for project delays caused by third parties according to 'man-month' or 'prorated' from the consultant's original fee.
  In conclusion, the Consultant receives a fee that is fair and commensurate with the scope of work, without the need to undergo a tender process aimed at cost-cutting or fee underbidding.

5.1.3 Evaluation and Review of the Consultant Scale of Fees (SOF)

5.1.3.1 Evaluation of Procurement Manual Clauses

The Consultant Fees, initiated in 1982 under the BEM SOF 1982 (REA 1967), introduced a Scale of Fee (SOF) framework that categorizes fees into three distinct classes: Class 1, Class 2, and Class 3. This system bases fee payments on the consultant's input and the scope of work performed.

The BEM SOF 1998 was subsequently introduced to replace the BEM SOF 1982, establishing a range of fees between P(max) and P(min). The final fee is determined through discussions between the client and the consulting firm.

At the beginning of 2010, an open tender system was implemented for all consulting firms, requiring each firm to submit both a Financial Proposal and a Technical Proposal *(CTK- Cadangan Teknikal dan Kewangan)*. This marked the initiation of fee bidding for consulting firms competing to secure projects.

However, in 2021, BEM appointed a Working Group (WG) to revise the 1998 BEM Scale of Fees, and the revision is still in progress and almost finalized.

In the meantime, the review of PK 3.2 from the 2011 Edition of the Procurement of Consulting Services Manual, which has undergone several amendments and is now titled PK 3.2 (Cost of Consulting Services – *Kos Perkhidmatan Perunding*), also requires further updates and revisions.

The chronology of Government Manual to consulting services are as follows:

2011: PK 3.2 2011 Edition; Consulting Services Procurement Manual

2013: PK 3.2 Procurement of Consulting Services Manual 2011 Edition (Second Amendment 2013): known as PK 3.1 Procurement of Consultants in General

2018: PK 3.2 Cost of Consultant Services, specific to consultant costs only.

2022: PK 3.2 Cost of Consultant Services (Amendment)

As a result of the review, several clauses need to be amended to ensure that the consulting firm is given a comfortable space in implementing the project it manages.

Those clauses involve clause 2.1.1, clause 2.1.2, clause 2.1.3, clause 2.2.3, clause 2.2.5(e), clause 3.1.6 as well as Appendix 5A/5B/5C, which involve remuneration costs and return.

This includes a call to the government to re-evaluate the consultant's service fee to provide additional value to the consultant's fee if a project is delayed due to a third party whether it is a government project or a private project (please refer to clause 2.1.2). this includes not involving any change/reduction in the Multiplier Factor (FP).

Similarly, additional payments are required for project delays caused by third parties, such as delays in survey work, land reclamation processes, land investigation work, local government approvals, consultant report reviews by clients, or force majeure events.

The client should implement a method to compensate the consultant for these delays, such as an additional payment structure based on a man-month estimate for Head Office Support (HOS), similar to what is provided to the site supervision team (SS) with the applicable multiplying factor (MF).

Delays in client payments due to the need for extensive paperwork and documentation, as well as delays in government decisions, can also disrupt the cash flow of consulting firms that rely on one or two projects.

Therefore, several clauses in Manual PK3.2 require refinement to implement the recommended improvements and changes outlined in the justifications related to the section on the PK3.2 Cost of Consulting Services (2018 Edition).

Below is a summary and chronology, along with new recommendations and justifications in PK 3.2, addressing seven (7) issues.

PK 3.2 Clauses that need to be reviewed are as follows:

ISSUE 1:

Clause

• 2.1.1 The government decided that the consultant's fee is fixed throughout the implementation of the project until the project is completed. The agreed consultant fee cannot be changed based on the increase in the value of the final contract (final contract sum).

• 2.1.4 However, if the agreed work contract price (*SST- Surat Setuju Terima*) by the Government is lower than the original project cost estimate used as the basis for determining the Consultant's service fee, the Government reserves the right to adjust the Consultant's service fee. Adjustment of the Consultant's service fee means lowering the fee proportionally according to the price of the work contract that has been agreed upon by the Government.

Implications

• The method of determining fees based on general terms of reference without a definitive scope of work is an unreasonable contract. A quote made with a conceptual plan will not reflect the actual scope of work, which may be higher or lower. It often happens that the design brief issued during the tender is "generic" without identifying the actual scope. Contract price changes can occur due to several things such as value engineering labs, re-measurements for Provisional Sum works or reduction/increase instructions from the Client before the tender is issued.

Justification & Recommendation

• The Government is requested to abolish the Financial Proposal but maintain the Technical Proposal Only with the QBS selection method.

• The consultant's fee should be calculated based on the fixed work contract price and according to the SOF (New) that has been set with only the preparation of the project brief for the Technical Proposal only.

• The preparation of the project brief for the Technical Proposal by the Agency must be complete and clear.

• Setting the Consultant's Fee in advance can avoid fee price competition and fees bidding among consultants.

• In conclusion, the Engineering Profession is no longer to be used as a commodity.

ISSUE 2:

Clause

• 2.1.2. The cost of the consultant that has been agreed in the Letter of Acceptance (SST) which consists of the consultant's fee, site supervision fee and reimbursement cost must be fixed throughout the implementation of the project period that has been set unless there is any Work Change Instruction or Construction Contract Period Extension that has been approved by the Government and not due to the consultant's error.

• For situations where the construction completion period of the project is extended by the Government and involves the extension of the consultant's supervision service period at the construction site, an increase in the supervision fee in terms of time input and reimbursement costs can be considered.

Implications

• Clause 2.1.2 does not specifically mention consultant fees (HOS- Head Office Support costs) but instead only mentions Supervision Fees (site supervision costs for Site Engineers or Site Inspector of Work). The increase in consultant costs due to the extension of the contract period also involves head office support costs apart from site supervision costs.

• Delays that are too long affect the financial flow of the consultant so that some of them are still called by the client (government) for project completion for more than 10 years.

Justification & Recommendation

• The cost of the consultant's head office should be calculated and included when the project experiences an increase in time caused by other parties.

• The number of site meetings will usually increase when the project experiences delays (either due to Time Extension and/or Changes to the Scope of the Work Contract. Any increase/work scope reduction involves drawing amendments, quantity recalculation, Work Change Instructions (APK- Arahan Perubahan Kerja) approval process, price rate negotiation and final account preparation involving an increase in the cost of the consultant's head office unless this additional time is due to the consultant's error.

• The cost of Consultant Fees should be added for additional time with a man-monthly estimate on the person-in-charge only to reduce the financial burden of the employment of the personnel involved by the firm due to third party delays.

ISSUE 3:

Clause

• 2.1.3. The increase in consultant costs caused by changes in the price of the work contract from the original project cost estimate, the payment of the consultant cost increase based on the calculation of the Standard Scale of Fees (SOF) will no longer apply to all Government physical projects from 15th September 2016.

2.1.5 For the calculation of the consultant's fee when the price offer is submitted to the Government, the consultant must determine his fee based on a competitive calculation mechanism other than SOF. However, the SOF (Architect, Engineering, Land Survey and Material Survey) can be used as a guide only and the Government is not bound to make the payment of consultant fees based on compliance with the SOF. The cost of the consultant that has been agreed through the SST is the final price of the Government unless there is an instruction to change the work approved by the Government and is not a mistake of the consultant and there is an extension of the original construction completion period which involves the extension of the consultant's supervision at the construction site.

Implications

• SOF is not used in the determination of consultant fees. As a result, GLCs and the private sector also do not respect SOF.

• Price competition can cause the quality of work to decline. The salary level of engineers that can be offered in the market has become low due to consulting companies having to cut costs. A career as a consultant will be less attractive to new graduates and it will be difficult to retain experienced staff.

Justification & Recommendation

• The consultant's overall fee is only around 8-10% of the total project cost compared to 90% of the work contract price. Professional design services - engineering, architecture or surveying - represent only a small percentage of the construction budget and a much higher percentage of life cycle costs; thus being a strong justification to ensure that the consulting engineer has the necessary experience and qualifications to deliver a high quality design. The impact on the project of fee changes due to project cost adjustments is very small compared to the overall cost of the project.

• Technical Proposal are maintained for the evaluation of the consultant's technical capabilities. The Qualification-Based-Selection (QBS) method should be implemented in the true sense as implemented by international bodies such as the Asian Development Bank or the World Bank.

ISSUE 4:

Clause

• 2.2.3. This time input payment method should be used for the following situations:

(a) All physical and non-physical studies; and

(b) Consultant site supervision (if the original construction period in the contract has changed).

Implications

• Time Input method is no longer used for physical projects; only for STUDY.

Justification & Recommendation

• The time input method is also used for physical projects such as refurbishment projects that require specific expertise and the cost value of the project is not necessarily directly proportional to the consultant's time input.

• The time input method should also be applicable to physical development projects. There are physical projects such as refurbishment that require the calculation of the time input method. For large projects, the appropriate time

input method is used as practiced in developed countries and international tenders such as the Asia Development Bank and the World Bank.

Note:
Physical studies related to engineering works and/or construction projects, including feasibility studies/preliminary engineering studies, flood/slope mitigation studies, local/structural plan studies, EIA studies and others.
Non-physical studies such as feasibility studies, economic studies, privatization studies and other studies; management such as human resource management, finance and accounting, taxation, quality management, legislation, financial audit work, management audit work, information and communication technology and other management fields

ISSUE 5:

Clause

• 2.2.5(e) Renumeration for the Board of Directors/Partners is based on the maximum salary scale approved by the Ministry of Finance as in Appendix 4.

Implications

• Low Base Salary Rates for Board of Directors/Partners; even lower than staff with equivalent experience (example; for professional staff (>30 years) RM16,330; and for Shareholders RM13,800)

Recommendations & justifications

• Basic salary rates for the Board of Directors/Partners and other contract staff need to be re-aligned according to the appropriate current rates.

ISSUE 6:

Clause

• 3.1.6 The agency must ensure that insurance premium claims for Professional Indemnity Insurance (PII) taken by the firm are not included in the reimbursement cost. The cost is borne by the consultant.

Implications

• There are agencies that request project-specific PII. Project-specific PII requirements add cost to the consultant and waste because the Agency requires the policy to cover the design, construction period up to 12 months after the end of the defect liability period. Professional liability is only apparent after the project is completed. PII during the design & construction phase is not required. Defects due to the consultant's negligence/mistakes will only become apparent after the project is completed, not during design and construction. PII is not the same as contractor's work insurance. Insurance requirements during the design and construction period do not have an impact except for increased costs.

Recommendations & justifications

• PII requirements have been specified in Clauses 5.2 and 5.3 of the Memorandum of Agreement SOF (1998). If there is a need to hold PII for project-specific, then the premium cost for this project-specific PII must be borne by the agency. If the cost of PII is borne by the consultant, the PII policy is for general protection and not for project-specific.

ISSUE 7:

Clause

• Staged Design Fee Payment Method for the completion of the Study Project (Master Plan) through the completion of the inception report, interim report, progress report, draft final report and final report methods OR the completion of the Detailed Design Project (Detailed Design) through the Preliminary Stage, Design Stage 1, Design Stage 2, Tender Stage and Construction Stage.

Implications

• Consultants do not get any payment for the tender stage of 5% for Detailed Design projects.

• The consultant cannot receive any payment at the construction stage if the project is not implemented.

• For research projects, the time taken to determine the presentation date exceeds the set time date, causing a loss of time for the consultant.

• Instructions for any changes to the Preliminary Report and Interim Report that need to be corrected in advance of hindering the firm's cash flow

• Consultants may face financial challenges if the contractor's physical progress is delayed, as the consultants' payments are directly tied to the contractor's progress.

Recommendations & Justifications

• Any fees resulting from delays caused by contractors during the Construction Stage must be paid separately, with payment calculated on a man-month basis for both Head Office Support (HOS) and Site Supervision (SS).

• 5% tender stage fee is a fee to be paid during Tender Stage Period.

• Construction fee payments are no longer based on the contractor's physical progress, but instead are made as monthly payments to the consultant throughout the construction period.

• Any instructions for changes in the preparation of the Preliminary and Interim Reports that require correction should be addressed through an addendum, to be included in the subsequent report.

In addition to PK 3.2, it is also discovered that government officials are hesitant to implement PK 3.1, Clause 5.3 (pages 5/29 and 6/29), which explicitly states that physical projects with a value below RM 50 million can be awarded directly to consulting engineering firms without going through the tender process.

Attached below is an excerpt from Section 5.3, PK 3.1, which mentions the direct award for physical projects valued below RM50 million and the direct award for study projects with fees below RM500,000.

5.3. Kaedah perolehan perkhidmatan perunding berdasarkan **had nilai kuasa melulus PBM** adalah seperti berikut:

Kaedah Perolehan	Had Nilai	Pihak Berkuasa Melulus
Lantikan Terus Berserta Kos Siling (LTBKS)	(a) Kos kerja ukur sehingga RM50 ribu; (b) Kos kajian sehingga RM50 ribu; (c) Kos perkhidmatan perunding fizikal sehingga RM50 ribu.	Pegawai Pengawal/ Pegawai yang diturunkan kuasa secara bertulis

Kaedah Perolehan	Had Nilai	Pihak Berkuasa Melulus
	(a) Kos kerja ukur melebihi RM50 ribu sehingga RM500 ribu; (b) Kos kajian melebihi RM50 ribu sehingga RM500 ribu; (c) Kos perkhidmatan perunding fizikal melebihi RM50 ribu sehingga RM500 ribu; (d) Kos projek pembangunan fizikal sehingga RM20 juta.	Jawatankuasa Sebut Harga (JKSH)
	(a) Kos perkhidmatan perunding fizikal melebihi RM500 ribu; dan (b) Kos projek pembangunan fizikal melebihi RM20 juta sehingga RM50 juta.	Lembaga Perolehan (LP) Agensi
Tender Terbuka/ Tender Terbuka Pra Kelayakan	(a) Kos kerja ukur sehingga RM5 juta; (b) Kos kajian sehingga RM5 juta; (c) Kos projek pembangunan fizikal sehingga RM300 juta.	Lembaga Perolehan (LP) Agensi
Tender Terbuka/ Tender Terbuka Pra Kelayakan	(a) Kos kerja ukur melebihi RM5 juta; (b) Kos kajian melebihi RM5 juta; (c) Kos projek pembangunan fizikal melebihi RM300 juta.	Kementerian Kewangan
Rundingan Terus	(a) Kos kerja ukur melebihi RM500 ribu; (b) Kos kajian melebihi RM500 ribu; (c) Kos projek pembangunan	Kementerian Kewangan

5.1.3.2 Assessment of Consultant Fee Scale (SOF) Percentage

As is well known, the consultant fee used in the MOF Procurement Manual is only a reference for the consultant firm to enter the price in the Financial Proposal, even this scale has been used since 1998.

This means that each consulting firm enters the lowest price to ensure that the firm obtains the tender compared to other tenderers. This is contrary to the Circular of the Board of Engineers Malaysia (BEM) which does not allow any fee bidding in obtaining a project.

Our Analysis findings found that there is a relationship between the consulting fees obtained in justifying the employment of engineers in consulting engineering service firms.

It is suggested that the use of SOF for the past 25 years be amended to be increased according to the percentage of project value that needs to be amended and a new scale of SOF is proposed and enforced to avoid fee bidding.

The basis of the employment of engineers depends a lot on the turnover of the work obtained by the consulting firm. Any increase in salary for existing staff or newly employed engineers depends on the amount of work value obtained by the consulting firm and the duration of the project designed and implemented.

This does not include projects that are delayed by third parties that also contribute to a firm's financial management position.

In this report, a comparison is made of scenarios for four project acquisition samples by SME consulting firms with a multiplier factor of 2.0 which has taken into account the increase in annual staff salaries, equipment/software filling and basic office equipment to give a true picture of project handling by small or medium status consulting firms (SME) but does not take into account the following:

i. Project delays caused by third parties

ii. Instructions for design changes that involve an increase in the time period

iii. The desire of the principal/director of the company to improve the ability of his firm.

PROJECT FEE ESTIMATE **SENARIO 'A'**

PROJECT 'A'

Project Component Cost	10,000,000				
Pre-Construction	12	months	365	Days / Year	
Construction	12	months	18	Holidays / Year	
DLP	12	months	52	Weeks / Year	
			243	Work Days / Year	
Average Working Days	21	days/month	4.35	Weeks / Month	
			20.23	Work Days / Month	
Company OH Multiplier	2.00	From 2022 Company Cashflows			
Profit Rate	20%				
Effective Project Multilplier	2.20				
Salary increment average	5.00%	per year			
Project duration	3.00	years			
Est. Construction Cost	10,000,000.00				
Effective % Proposed	**7.13%**				

Position / Title	Name	Gross Salary	Charge Rate	Pre-Construction (Design - Tender)			Construction (Fee during Construction)			DLP (DLP - Final Account)			Totals				Project Cost Breakdown
		RM/month	RM/month	%	days	months	%	days	months	%	days	months	%	days	months	RM	%
Leadership/Reviewers																	
Project Director		10,000	22,000	10.0%	*25.20*	1.20	10.0%	*25.20*	1.20	0.0%			20.0%	*50.40*	2.40	52,800	7.4%
Project Manager		8,000	17,600	25.0%	*63.00*	3.00	25.0%	*63.00*	3.00	2.5%	*6.30*	0.30	52.5%	*132.30*	6.30	110,880	15.6%
Design Team																	
Engineer A		8,000	17,600	60.0%	*151.20*	7.20	20.0%	*50.40*	2.40	5.0%	*12.60*	0.60	85.0%	*214.20*	10.20	179,520	25.2%
Engineer B		6,000	13,200	40.0%	*100.80*	4.80	10.0%	*25.20*	1.20	0.0%			50.0%	*126.00*	6.00	79,200	11.1%
Engineer C		5,000	11,000	20.0%	*50.40*	2.40	10.0%	*25.20*	1.20	0.0%			30.0%	*75.60*	3.60	39,600	5.6%
Engineer D (fresh)		3,500	7,700	10.0%	*25.20*	1.20	10.0%	*25.20*	1.20	0.0%			20.0%	*50.40*	2.40	18,480	2.6%
Engineer E		3,500	7,700														
Engineer F		3,500	7,700														
Technical Support																	
Draughtsman A		5,000	11,000	60.0%	*151.20*	7.20	10.0%	*25.20*	1.20	0.0%			70.0%	*176.40*	8.40	92,400	13.0%
Draughtsman B		4,000	8,800	20.0%	*50.40*	2.40	5.0%	*12.60*	0.60	0.0%			25.0%	*63.00*	3.00	26,400	
Draughtsman C		2,500	5,500	25.0%	*63.00*	3.00	0.0%			0.0%			25.0%	*63.00*	3.00	16,500	
															Sub-total	**615,780**	
															With Salary Increments	**712,842**	**64,804 Profit**
															6% SST	42,771	
															GRAND TOTAL	**755,613**	

Notes:

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PROJECT FEE ESTIMATE **SENARIO 'B'**

PROJECT 'B'

Project Component Cost	10,000,000			
Pre-Construction	12	months	365	Days / Year
Construction	12	months	18	Holidays / Year
DLP	12	months	52	Weeks / Year
			243	Work Days / Year
Average Working Days	21	days/month	4.35	Weeks / Month
			20.23	Work Days / Month
Company OH Multiplier	2.00	From 2022 Company Cashflows		
Profit Rate	20%			
Effective Project Multilplier	2.20			
Salary increment average	5.00%	per year		
Project duration	3.00	years		
Est. Construction Cost	10,000,000.00			
Effective % Proposed	**6.93%**			

Position / Title	Name	Gross Salary	Charge Rate	Pre-Construction (Design - Tender)			Construction (Fee during Construction)			DLP (DLP - Final Account)			Totals				Project Cost Breakdown
		RM/month	RM/month	%	days	months	%	days	months	%	days	months	%	days	months	RM	%
Leadership/Reviewers																	
Project Director		10,000	22,000	10.0%	*25.20*	1.20	10.0%	*25.20*	1.20	0.0%			20.0%	*50.40*	2.40	52,800	7.6%
Project Manager		8,000	17,600	25.0%	*63.00*	3.00	20.0%	*50.40*	2.40	2.5%	*6.30*	0.30	47.5%	*119.70*	5.70	100,320	14.5%
Design Team																	
Engineer A		8,000	17,600	20.0%	*50.40*	2.40	10.0%	*25.20*	1.20	0.0%			30.0%	*75.60*	3.60	63,360	9.1%
Engineer B		6,000	13,200	60.0%	*151.20*	7.20	20.0%	*50.40*	2.40	5.0%	*12.60*	0.60	85.0%	*214.20*	10.20	134,640	19.4%
Engineer C		5,000	11,000	30.0%	*75.60*	3.60	25.0%	*63.00*	3.00	0.0%			55.0%	*138.60*	6.60	72,600	10.5%
Engineer D		3,500	7,700	25.0%	*63.00*	3.00	25.0%	*63.00*	3.00	0.0%			50.0%	*126.00*	6.00	46,200	6.7%
Engineer E		3,500	7,700														
Engineer F		3,500	7,700														
Technical Support																	
Draughtsman A		5,000	11,000	60.0%	*151.20*	7.20	10.0%	*25.20*	1.20				70.0%	*176.40*	8.40	92,400	13.3%
Draughtsman B		3,000	6,600	20.0%	*50.40*	2.40	5.0%	*12.60*	0.60				25.0%	*63.00*	3.00	19,800	
Draughtsman C		2,500	5,500	25.0%	*63.00*	3.00	0.0%						25.0%	*63.00*	3.00	16,500	
															Sub-total	**598,620**	
															With Salary Increments	**692,977**	**62,998 Profit**
															6% SST	41,579	
															GRAND TOTAL	**734,556**	

Notes:

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PROJECT FEE ESTIMATE **SENARIO 'C'**

PROJECT 'C'

Project Component Cost	10,000,000				
Pre-Construction	12	months	365	Days / Year	
Construction	12	months	18	Holidays / Year	
DLP	12	months	52	Weeks / Year	
			243	Work Days / Year	
Average Working Days	21	days/month	4.35	Weeks / Month	
			20.23	Work Days / Month	
Company OH Multiplier	2.00	From 2022 Company Cashflows			
Profit Rate	20%				
Effective Project Multilplier	2.20				
Salary increment average	5.00%	per year			
Project duration	3.00	years			
Est. Construction Cost	10,000,000.00				
Effective % Proposed	**6.74%**				

Position / Title	Name	Gross Salary	Charge Rate	Pre-Construction (Design - Tender)			Construction (Fee during Construction)			DLP (DLP - Final Account)			Totals				Project Cost Breakdown
		RM/month	RM/month	%	days	months	%	days	months	%	days	months	%	days	months	RM	%
Leadership/Reviewers																	
Project Director		10,000	22,000	10.0%	*25.20*	1.20	10.0%	*25.20*	1.20	0.0%			20.0%	*50.40*	2.40	52,800	7.8%
Project Manager		8,000	17,600	20.0%	*50.40*	2.40	20.0%	*50.40*	2.40	0.0%			40.0%	*100.80*	4.80	84,480	12.5%
Design Team																	
Engineer A		8,000	17,600	20.0%	*50.40*	2.40	10.0%	*25.20*	1.20	0.0%			30.0%	*75.60*	3.60	63,360	9.4%
Engineer B		6,000	13,200	30.0%	*75.60*	3.60	20.0%	*50.40*	2.40	5.0%	*12.60*	0.60	55.0%	*138.60*	6.60	87,120	12.9%
Engineer C		5,000	11,000	60.0%	*151.20*	7.20	40.0%	*100.80*	4.80	0.0%			100.0%	*252.00*	12.00	132,000	19.6%
Engineer D		3,500	7,700	25.0%	*63.00*	3.00	25.0%	*63.00*	3.00	5.0%	*12.60*	0.60	55.0%	*138.60*	6.60	50,820	7.5%
Engineer E		3,500	7,700														
Engineer F		3,500	7,700														
Technical Support																	
Draughtsman A		5,000	11,000	20.0%	*50.40*	2.40	5.0%	*12.60*	0.60	0.0%			25.0%	*63.00*	3.00	33,000	4.9%
Draughtsman B		3,000	6,600	60.0%	*151.20*	7.20	10.0%	*25.20*	1.20	0.0%			70.0%	*176.40*	8.40	55,440	
Draughtsman C		2,500	5,500	25.0%	*63.00*	3.00	10.0%	*25.20*	1.20	0.0%			35.0%	*88.20*	4.20	23,100	
														Sub-total		**582,120**	
														With Salary Increments		**673,877**	**61,262 Profit**
														6% SST		40,433	
														GRAND TOTAL		**714,309**	

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PROJECT FEE ESTIMATE **SENARIO 'D'**

PROJECT 'D'

Project Component Cost	10,000,000			
Pre-Construction	12	months	365	Days / Year
Construction	12	months	18	Holidays / Year
DLP	12	months	52	Weeks / Year
			243	Work Days / Year
Average Working Days	21	days/month	4.35	Weeks / Month
			20.23	Work Days / Month
Company OH Multiplier	2.00	From 2022 Company Cashflows		
Profit Rate	20%			
Effective Project Multilplier	2.20			
Salary increment average	5.00%	per year		
Project duration	3.00	years		
Est. Construction Cost	10,000,000.00			
Effective % Proposed	**6.73%**			

Position / Title	Name	Gross Salary	Charge Rate	Pre-Construction (Design - Tender)			Construction (Fee during Construction)			DLP (DLP - Final Account)			Totals				Project Cost Breakdown
		RM/month	RM/month	%	days	months	%	days	months	%	days	months	%	days	months	RM	%
Leadership/Reviewers																	
Project Director		10,000	22,000	5.0%	*12.60*	0.60	5.0%	*12.60*	0.60	0.0%			10.0%	*25.20*	1.20	26,400	3.9%
Project Manager		8,000	17,600	20.0%	*50.40*	2.40	20.0%	*50.40*	2.40	0.0%			40.0%	*100.80*	4.80	84,480	12.6%
Design Team																	
Engineer A		8,000	17,600	20.0%	*50.40*	2.40	10.0%	*25.20*	1.20	0.0%			30.0%	*75.60*	3.60	63,360	9.4%
Engineer B		6,000	13,200	30.0%	*75.60*	3.60	20.0%	*50.40*	2.40	0.0%			50.0%	*126.00*	6.00	79,200	11.8%
Engineer C		5,000	11,000	40.0%	*100.80*	4.80	30.0%	*75.60*	3.60	5.0%	*12.60*	0.60	75.0%	*189.00*	9.00	99,000	14.7%
Engineer D (fresh)		3,500	7,700	60.0%	*151.20*	7.20	40.0%	*100.80*	4.80	5.0%	*12.60*	0.60	105.0%	*264.60*	12.60	97,020	14.4%
Engineer E		3,500	7,700														
Engineer F		3,500	7,700														
Technical Support																	
Draughtsman A		5,000	11,000	20.0%	*50.40*	2.40	10.0%	*25.20*	1.20				30.0%	*75.60*	3.60	39,600	5.9%
Draughtsman B		3,000	6,600	60.0%	*151.20*	7.20	15.0%	*37.80*	1.80				75.0%	*189.00*	9.00	59,400	
Draughtsman C		2,500	5,500	25.0%	*63.00*	3.00	25.0%	*63.00*	3.00				50.0%	*126.00*	6.00	33,000	
															Sub-total	**581,460**	
															With Salary Increments	**673,113**	**61,192 Profit**
															6% SST	40,387	
															GRAND TOTAL	**713,499**	

Notes:

1. This sheet is the courtesy from Straits Consulting Engineers Sdn Bhd for their sole internal purpose to estimate the professional fees for a particular project.
2. This sheet is used in this report as a reference for fees calculation and SOF indicator only with the permission of Straits Consulting Engineers Sdn Bhd and any use thereof are hereby prohibited.
3. This sheet may not be circulated to any party within Straits Consulting Engineers without the express permission of the Board of Directors.

In this report, examples are analysed for four scenarios, named Scenario 'A', Scenario 'B', Scenario 'C' and Scenario 'D' on the acquisition of a project by a civil & structural consulting firm (SME) for a project value of RM10 million with fees consultant worth RM500,000.00, taking into account the percentage of Consultant Fee Scale (BEM SOF) referred to is 5%.

The analysis for the four scenarios can be summarized in Table 5 as follows:

Table 5: Comparison of Project Procurement Scenarios by Consulting Engineers (SMEs)

	PROJECT SCENARIO			
	A	**B**	**C**	**D**
Top Management(%)	23.0	22.1	20.3	16.5
Technical Management(%)	57.5	59.0	49.4	56.2
Expected Profit Value(RM)	64,804	62,998	61,262	61,192
Scale Of Fees (SOF) Obtained(%)	5.00	5.00	5.00	5.00
Actual Scale Of Fees(SOF)(%)	7.13	6.93	6.74	6.73
Recommended Scale Of Fees(SOF)(%) (Actual SOF % + 0.5%)	7.63	7.43	7.24	7.23

A comparison of the actual cost of a firm's operation for these four consulting service work scenarios found no difference whether the firm has one project or four projects at once because it clearly shows that the operating costs and expenses of a consulting firm in three years are more than the consultant's fee obtained.

In the comparison presented in Table 5 above, it is observed that, although the Consulting Firm has secured subsequent projects while the initial project is still underway—each with equivalent value, duration, and staffing—it has yet to achieve a corresponding profit to enhance the company's capabilities.

This comparison is based on a preliminary estimate for four projects, each valued at RM10 million. When used as a reference, the required percentage of the Scale of Fee (SOF) ranges from approximately 7.23% to 7.63%. This range offers a degree of assurance for the future management trajectory of the consulting firm.

This report recommends an effective consultant scale of fees derived from the provided comparison. For a benchmark project valued at RM10 million, the recommended Scale of Fee (SOF) is 7.5%, which corresponds to a fixed fee of RM750,000.00 as per graph below (Diagram 15).

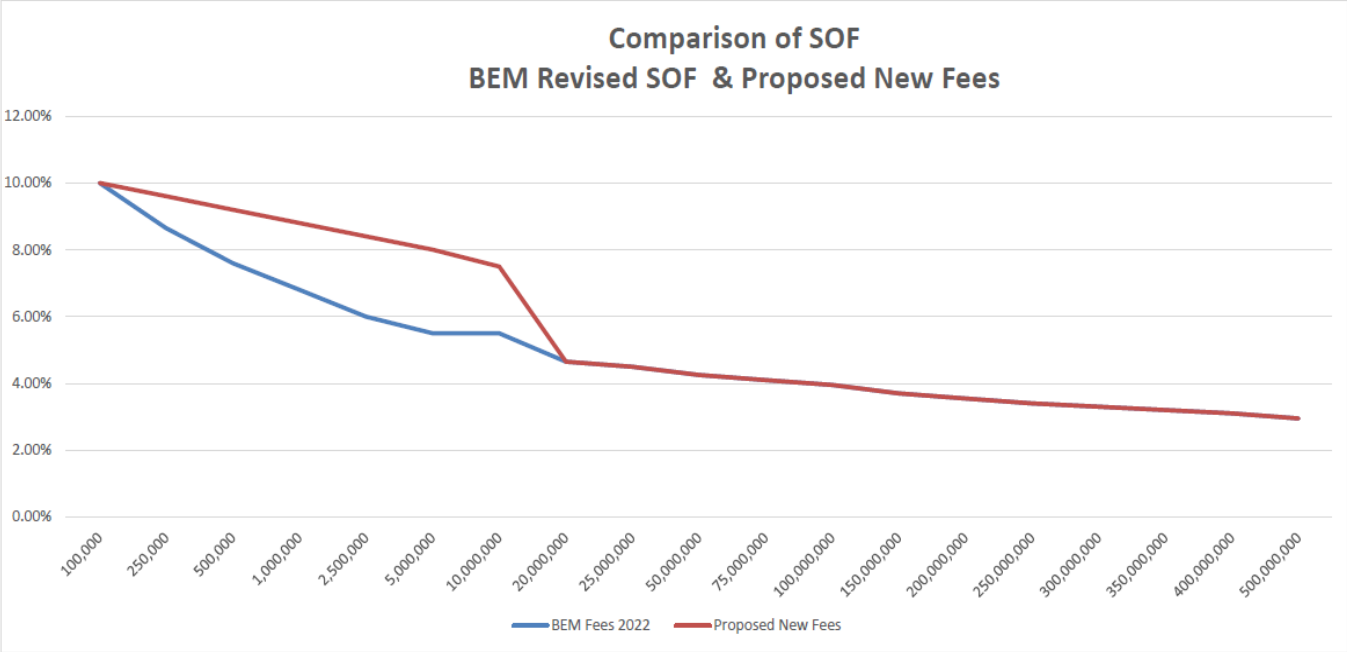

Diagram 15: Comparison of Projections between the proposed BEM SOF 2024 Scale and the Proposed New SOF Scale

Based on the afore-mentioned scenarios, it is essential to propose a significant revision to the Fee Scale, specifically for projects valued at RM10 million and below, which are primarily undertaken by SME consulting firms, as proposed in Table 6 for the Proposed New SOF 2024 attached below.

The consultant's proposed scale (SOF) for these engineering services is aligned with the total actual operating costs incurred by the consultant, as demonstrated in the comparative examples provided.

Table 6: Proposed New SOF (NSOF) from Professional Engineers Perspective

Total Project Cost of the Respective Work RM	Scale of Fees (Proposed BEM Revision SOF)	Proposed New Scale of Fees (NSOF)
100,000 & below	10.00%	**10.00%**
250,000	8.65%	**9.60%**
500,000	7.60%	**9.20%**
1,000,000	6.80%	**8.80%**
2,500,000	6.00%	**8.40%**
5,000,000	5.50%	**8.00%**
10,000,000	**5.00%**	**7.50%**
20,000,000	4.65%	**4.65%**
25,000,000	4.50%	**4.50%**
50,000,000	4.25%	**4.25%**
75,000,000	4.10%	**4.10%**
100,000,000	3.95%	**3.95%**
150,000,000	3.70%	**3.70%**
200,000,000	3.55%	**3.55%**
250,000,000	3.40%	**3.40%**
300,000,000	3.30%	**3.30%**
350,000,000	3.20%	**3.20%**
400,000,000	3.10%	**3.10%**
500,000,000 & above	2.95%	**2.95%**

In reality, if the issue of consultant fees (Consultant Fee Scale) can be resolved, then there will be no salary issue problems for the consulting firm to give an appropriate salary scale to new engineers and other staff, including salary increases for experienced engineers to continue serving with the firm.

This analysis does not account for potential project delays caused by third parties or design change orders that may occur during this timeframe. In Appendix 'B' illustrate using real case projects based on actual events for project delay due to third party.

Table 7: The Monetary Difference between NSOF and BEM SOF

Total Project Cost of the Respective Work	Minimum Scale of Fees (Proposed BEM Revision Fees)		Proposed Minimum Scale of Fees (New Fees Proposal)		Differences (RM)
100,000 & below	10.00%	RM10,000	10.00%	RM10,000	0
250,000	8.65%	RM21,625	9.60%	RM24,000	2,375
500,000	7.60%	RM38,000	9.20%	RM46,000	8,000
1,000,000	6.80%	RM68,000	8.80%	RM88,000	20,000
2,500,000	6.00%	RM150,000	8.40%	RM210,000	60,000
5,000,000	5.50%	RM275,000	8.00%	RM400,000	125,000
10,000,000	5.00%	RM500,000	7.50%	RM750,000	250,000
20,000,000	4.65%	RM930,000	4.65%	RM930,000	0
25,000,000	4.50%	RM1,125,000	4.50%	RM1,125,000	0
50,000,000	4.25%	RM2,125,000	4.25%	RM2,125,000	0
75,000,000	4.10%	RM3,075,000	4.10%	RM3,075,000	0
100,000,000	3.95%	RM3,950,000	3.95%	RM3,950,000	0
150,000,000	3.70%	RM5,550,000	3.70%	RM5,550,000	0
200,000,000	3.55%	RM7,100,000	3.55%	RM7,100,000	0
250,000,000	3.40%	RM8,500,000	3.40%	RM8,500,000	0
300,000,000	3.30%	RM9,900,000	3.30%	RM9,900,000	0
350,000,000	3.20%	RM11,200,000	3.20%	RM11,200,000	0
400,000,000	3.10%	RM12,400,000	3.10%	RM12,400,000	0
500,000,000 & above	2.95%	RM1,475,000	2.95%	RM1,475,000	0

5.1.3.3 Assessment of Real Case Project Due to Third Party Delay.

This assessment examines a real case construction project significantly impacted by third-party delays, compared to the fees inadequately compensated by the client. By analysing the implications of these delays on project timelines and costs, this report aims to highlight the financial burdens borne by the consulting firm and the necessity for a more equitable fee structure that accounts for such unforeseen challenges. Through this analysis, we seek to provide insights that can inform better practices and agreements in future construction projects.

A comparative analysis is been analysed and conducted across seven (7) project scenarios **(Refer Appendix B for detail illustration)** to illustrate the financial outcome if the projects delay with fees still the same.

1. Project Case 1 @ Irrigation Project: Pahang @RM100M

- The project design commenced in September 2017, with design completed on time but the final design on holds due numerous third-party reasons and was

temporarily halted due to costs exceeding the established ceiling. It is set to resume with a revised project budget; however, a decision is still pending following a value assessment session, the date of which is yet to be determined.

Other delays have arisen due to an expanded scope of work, including the need to design additional irrigation systems, as well as bureaucratic procedures in the appointment of a licensed land surveyor and soil investigation contractors.

Appendix 'B' for Project Case 1 illustrates that, during the design phase, the firm earns 50% of the total allocated fee. Despite the first 24-month delay, the firm can cover its management operations and still maintains a 20% surplus for subsequent activities. However, an additional delay of 48 months resulted in the firm incurring a management operating deficit of nearly RM 1 million.

If the project is tendered after the specified delay period, the firm has the potential to recover part of the loss incurred during the delay, provided the construction phase proceeds, and is completed on schedule.

2. Project Case 2 @ Flood Mitigation Project: Perak @RM50M

- The project design commenced in March 2020 but faced design delays due to the late completion of land survey work and the final approval of the report. Furthermore, the tendering process has taken considerable time to tender finalisation and delay in land acquisition process.

Another delay has occurred due to bureaucratic changes, where the individual responsible for the project has been reassigned to other projects and replaced by new personnel, necessitating repeated briefings and updates.

Appendix 'B' for Project Case 2 illustrates that, during the design phase, the firm earns 20% of the total allocated fee. Despite for the first 12-month delay, the firm still can cover its management operations and still maintains a 5% surplus for subsequent activities. Another additional delay of 24 months resulted in the firm incurring a management operating deficit of nearly a quarter million.

However, if the project is tendered after the specified delay period, the firm has the potential to recover part of the loss incurred during the delay, provided the construction phase proceeds, and is completed on schedule.

3. Project Case 3 @ Drainage Project: Terengganu @RM50M

The project design team commenced in April 2015 and design was completed as scheduled. However, delays occurred due to the contractor's tendered project cost via direct negotiation process, which the client deemed excessive. After six years of inactivity and an additional year required to finalize the tender documentation, the project was re-tendered and subsequently awarded. It is currently in the construction phase near completion.

Appendix 'B' for Project Case 3 demonstrates that, during the design phase, the firm earns 50% of the total allocated fee. Following the first 24-month delay, the firm experienced a loss of nearly 10% in its management operations but was able to sustain subsequent activities through other projects. However, an additional delay of over seven (7) years led to the firm incurring a management operating deficit exceeding one million.

Although the project is tendered and constructed without further delay, the firm will still face a deficit and cannot recover part of the losses incurred during the delay, even if the construction phase is completed on schedule.

4. Project Case 4: River Mouth Project @ Terengganu @RM25M

- The project design commenced in September 2021, with the design completed on schedule; however, the tender award process experienced delays. The project is currently in the construction phase.

Appendix 'B' for Project Case 4 illustrates that, during the design phase, the firm earns 30% of the total allocated fee. Despite a 12-month delay, the firm successfully maintained a 10% surplus for its office management operations.

However, even though the project is completed without further delay, the firm still faces a deficit exceeding 10%, despite the construction phase being finished on schedule.

If the Scale of Fees (SOF) is based on the BEM guidelines, the firm ultimately achieves no gain from this project.

5. Project Case 5 @ School Hostel Project: Selangor @RM25M

- The project design commenced in May 2020 and the design was completed as scheduled. However, the consultant's fees were reduced by approximately RM200,000.00 due to the contractor’s submission of a contract price below the RM25 million ceiling set for consultants. As a result of this deduction, the consultant did not receive any fees during the construction stage.

The project is currently delayed by over two years and is now expected to be completed by next year, followed by an additional 16 months for the Defects Liability Period (DLP). This delay has resulted in an additional financial strain on the consultant.

Appendix 'B' for Project Case 5 illustrates that, during the design phase, the firm earns 15% of the total allocated fee, despite a deduction of nearly RM 200,000.00 due to the project cost being awarded to the contractor below the project ceiling.

The project experienced delays in construction, resulting in a deficit exceeding 100% for the firm. To support its design team, the firm relied on financial contributions from other projects to sustain its engineers within the company.

6. Project Case 6 @ Drainage Project: Selangor @RM7.5M

- The project design commenced in July 2022; however, delays have occurred due to land survey work, soil investigation, and significant local authority approvals related to utilities, as well as delays in the consultant report been reviewed by the client. The tender process is currently pending approval for the appropriate budget.

Appendix 'B' for Project Case 6 highlights that, during the design phase, the firm incurred a deficit as the fees received were significantly below the BEM guidelines. Furthermore, due to delays during the design stage, the firm faced an additional deficit of nearly 100% of the allocated fees.

As a result, the project design team was financially supported by other projects, enabling the firm to retain its engineers and sustain operations.

7. Project Case 7 @ Private Housing Project: Terengganu @RM5M

- The project design commenced in October 2022, with the architect acting as the lead consultant. Delays in the design phase were primarily due to the approval process for utility services by the local authority. Also delay in the tendering process. This project is currently in the construction phase.

Appendix 'B' for Project Case 7 indicates that, during the design phase, the firm incurred a huge deficit as the fees received were significantly below the BEM guidelines. Due to delays during the design stage, the firm experienced another substantial deficit in relation to the low allocated fees.

As a result, the project design team was financially supported by other projects, allowing the firm to retain its engineers and maintain operations.

8. Project Case 8 @ Private Housing Project: Terengganu @RM2.5M

- The project design began in April 2018, with the architect as the lead consultant. There were no delays during the design phase, as the project involved a straightforward housing complex on flat land with existing infrastructure. The tendering process was also timely, and the project was completed on schedule.

Appendix 'B' for Project Case 8 shows that despite fees being based on BEM guidelines, the firm incurred a deficit during the design phase and after completion. However, if fees had been based on the proposed new rate (NSOF) of 8.40%, the firm would have made a profit. This case study serves as a valuable example of real outcomes face by the SME firm.

Please refer Appendix 'B' to Tables Project Case 1 through Project Case 8, which illustrate and highlight the actual financial flow and human resources utilized over the time period for each respective project.

Based on the real project scenarios outlined above, the consulting engineer incurred management and staff employment costs during the delays caused by a third-party. This does not include design engineers who resigned and sought other job opportunities during that time.

In conclusion, the following proposed suggestions should be considered as viable solutions to the scenarios outlined above:

1. Revised Fees Scale (SOF) for project below RM10M: A comprehensive revision of the scale of fees for projects valued at less than RM10 million is recommended to ensure fair SOF to the SME consulting engineers.

2. Adjustment of Construction Stage Fees: It is proposed that construction stage fees be assessed and calculated based on the monthly construction period rather than the contractor's physical progress.

3. Additional Design Stage Fees: Provision for additional fees during the design stage should be established and included to accommodate for any extensions of time arising from delays caused by third parties, determined by the individual responsible for the project.

4. Additional Construction Stage Fees: Additional fees should be instituted during the construction stage to address delays attributable to the contractor. These fees can be calculated on a per man-month basis or on a prorated basis.

5. Deductible Design Fees from Ceiling Cost: No fees shall be deductible if the project cost is below the ceiling cost. The fees shall be maintained in accordance with the time already allocated to the same manpower during the designated design period.

6. Reinstatement of Tender Stage Fees: The 5% Tender Stage fees shall be payable as part of the consultancy fees, reflecting the involvement of the consulting engineer in the preparation of tender documentation, including the Bill of Quantities (BQ) and specifications.

The payment stages shall also be reviewed as follows:

- **Preliminary & Design Stage Fees 65%:** To be paid to Design Team and other related parties or any material during the Design Stage period up to final design drawings and documentation.
- **Tender Stage Fees 5%:** To be paid to Design Team and other related parties or any material during the Tender Stage period up to final tender documentation including Table Tender Document.
- **Construction Stage Fees 25%:** To be paid to Design Team and Other Related parties or any material during the Construction Stage, fees to be paid by means of prorating construction period and not fees based on contractor's physical progress.
- **Final Account Period Fees 5%:** To be paid to Design Team and other related parties or any material during the Final Account Stage period.
- **Delay Period Fees Due to Third Party:** Fees based on Man-Month & Reimbursable to be paid to Head Office Support (HOS) and Site Supervision (SS) Team during this Delay Period.

At the same time, a 'SPECIAL UNIT' (either BEM or IEM) needs to be established to monitor the consultant's fee not to be manipulated by certain parties such as the fee-bidding or under-cutting negotiation which is the current method of awarding project to the consulting firm to the lowest bidder.

Likewise, the engineer's salary scheme obtained must also be monitored by the 'SPECIAL UNIT' to ensure that the consulting firm's engineering service salary scheme for the first 10 years can be enforced as per Table 7 on Proposed Minimum Salary for Engineers in Consulting Firm, should the increase in the Fee Scale (SOF) become a reality.

Table 8: Proposed Minimum Salary for Engineers in Consulting Firm

YEAR OF EXPERIENCES	Salary Rate based on 'Manual Perolehan PK3.2' imposed on Site Supervision Engineer (Either 'RE' or 'ARE')	Proposed Engineer Salary for Consulting Firm if revised new SOF is to be implemented
	Monthly Salary (RM) (revised amount since 1st January 2015 as reference only)	Minimum Monthly Salary (RM) exclude any other allowances or perks
Starting Salary	3,335	3,500
1	3,450	3,750
2	3,623	4,000
3	3,795	4,250
4	3,968	4,500
5	4,600	5,000
6	4,830	5,250
7	5,060	5,500
8	5,290	6,000
9	5,520	6,500
10	6,670	Above 7,000

5.1.4 Revision of Consulting Services Agreement Form CSA2014 - Engineering (Amendment 2018)

A comprehensive review and re-evaluation of the rules of the clauses in the Consulting Services Agreement CSA2014 – Engineering (Amendment 2018) where it was found that many clauses were detrimental to the consulting firm and further involved the consulting firm's lack of confidence in maintaining work professionalism and administrative integrity.

The following flaws in the clauses of CSA 2014 have been identified, along with their justifications, implications, and suggested improvements:

Part B: Clause 5.9 (Indemnity): Clause 5.9(b) states that "the CE shall indemnify and keep the Government indemnified from and against all actions, suits, claim or demands, proceedings, losses, damages, compensation, costs (legal cost) charges and expenses whatsoever to which the Government shall or may be or become liable in respect of or arising from ……"

Justification, Implication & Suggestion: It indicates that indemnity assigns responsibility solely to the consulting engineer (CE) and not to the supervising officer (S.O). Furthermore, there are no actions taken in the event of misconduct by the S.O. or their representatives, except for following internal auditing procedures, if necessary. Indemnifying the S.O. too can indeed be a win-win situation if structured effectively. By ensuring shared accountability and promoting collaboration, both the S.O. and CE can work more effectively toward project success while minimizing risks with the CE have the right to claim any losses.

Part C: Clause 6.1 (Appointment of GR) & Part D: Clause 8.1 (Dispute Resolution by Government Representative)- to be read together with clause 6.1: Clause 6.1(a) states that "The Government shall appoint the person under item 5 in Appendix 7 of this Agreement or other persons from time to time as the Government Representative ("GR") to carry out its obligations and to exercise its right under this Agreement, and the GR shall have the power to carry out such obligations and exercise such rights on behalf of the Government ……" and Clauses 8.1(a) (b) & (c) state that "(a) Any dispute between the Parties in respect of any matter under this Agreement (except in relation to the Government exercising its sole discretion under this Agreement) which are not capable of being amicably resolved between the Parties may be referred to the appointed GR. (b) The GR who is appointed for such

purposes shall undertake to resolve such dispute with all fairness and endeavour to achieve the best possible solution for the Parties. (c) If the Consultant: (i) fail to receive a decision from the GR within seven days (7) days after being requested to do so; or (ii) is dissatisfied with any decision of the GR. then such dispute or difference shall be referred to Dispute Resolution Committee within fourteen days (14) days.

Justification, Implication & Suggestion: If the consulting engineer (CE) raises a dispute and does not receive any feedback from the supervising officer (S.O.) within 14 days, no action been taken against the S.O. This indicates that the clauses do not assign any fault to the S.O. for the lack of response regarding the dispute during that period. Additionally, no penalties been imposed on the S.O. for this unresolved dispute. Consequently, the clause shall establish a new mechanism for resolving disputes that may arise between the S.O. and CE, allowing for mediation or arbitration instead of litigation, thereby ensuring that the S.O. is not penalized for an irresponsible attitude.

Part E: Clause 10.4 (Consequences of Termination by the Government) and Part E: Clause 11.1(d) (Consequences of Termination by the CE) to be read together: **Clauses 10.4 (a), (b), (c) & (d)** state that "(a) Upon termination of this Agreement under clause 10.1, 10.2 or 10.3 the powers and rights granted by the Government to the CE and the obligations in this Agreement shall terminate immediately. (b) The CE shall hence forth – (i) – (viii) ……to and the Government shall not be liable in respect of such liabilities, obligations, claims, suits or proceedings; and …… d) For the avoidance of doubt, the Parties hereby agree that **the CE shall not be entitled to any other form of losses including loss of profit, damages, claims or whatsoever other than those stipulated under clause 10.4 (c)(i) (if any).** The Parties further agree that the payment made by the Government under clauses 10.4 (c)(i) shall constitute as a full and final settlement between the Parties" and **Clause 11.1(d)** state that "For the avoidance of doubt, the Parties hereby agree that **the CE shall not be entitled to any other form of losses including loss of profit, damages, claims or whatsoever other than those stipulated under clause 11.1(c)(i) (if any).** The Parties further agree that the payment made by the Government under clause 11.1 (c)(i) shall constitute as a full and final settlement between the Parties."

Justification, Implication & Suggestion: The Supervising Officer (S.O.) is entitled to pursue any claims against the consulting engineer (CE) for losses and damages incurred as a result of termination, and not otherwise on behalf of the CE against the S.O. Even now, the S.O. uses the terms 'postponed' or 'discontinued' in place of 'termination.' Furthermore, the CE has no right to claim profit or loss under any circumstances. It would be unjustified for the S.O.s' project management errors had significantly impacted the CE's ability to secure new projects. The consulting engineer (CE) must have the same right to claim for any losses incurred due to the negligence or fault of the Supervising Officer (S.O.).

A more effective approach to address these issues would be the establishment of a legal committee tasked with evaluating the situation and identifying the best solution that will achieve a win-win outcome for both parties, namely the S.O. and the CE.

5.2. VALUE-ADDED SCENARIO

5.2.1 Methods of Appointing Consulting Firms for Design and Build Projects.

It is recommended that the government appoint a consulting engineer (ECP) before selecting a 'Design & Build' contractor. This ensures that the consulting engineer holds a more prominent role than the contractor in overseeing the project's quality and workmanship.

When the government awards projects to Design & Build contractors, it can result in several issues, including reductions in fees and undisclosed discounts provided by contractors to consulting firms. These practices can undermine the integrity of the bidding process and may lead to compromised quality and accountability in project execution. By prioritizing cost savings, the focus may shift away from the necessary standards of quality and professional ethics that should guide the selection of consulting services.

Additionally, there may come a point when the contractor challenges the engineer's design in an effort to reduce costs and increase profits. This approach, often referred to as "cutting corners," prioritizes financial gain over critical considerations such as safety and the overall success of the project.

Such disputes can lead to compromised safety standards, potentially endangering workers and undermining the project's integrity. The focus on short-term profit can detract from the long-term benefits of a well-executed design, ultimately harming the project's outcome and the interests of all stakeholders involved.

It is recommended that the government establish the consultant's fee before selecting a Design & Build (D&B) contractor. By determining the fee upfront, the government can ensure that the consultant's compensation is fair and reflective of the services provided. Furthermore, it is advised that all fee payments be made directly to the consulting engineer, rather than through the contractor. This approach minimizes the risk of deductions or reductions imposed by the contractor, which could compromise the consultant's remuneration and potentially affect the quality of their work. Direct payment to the consultant helps maintain financial transparency and ensures that the engineer is adequately compensated for their

expertise and contributions throughout the project, ultimately supporting the integrity and success of the overall endeavours.

Diagrams 16 and 17 provide a clear illustration of both the current situation and the proposed solution regarding the role of the consulting engineer in relation to consulting fees charged by the Design & Build contractor.

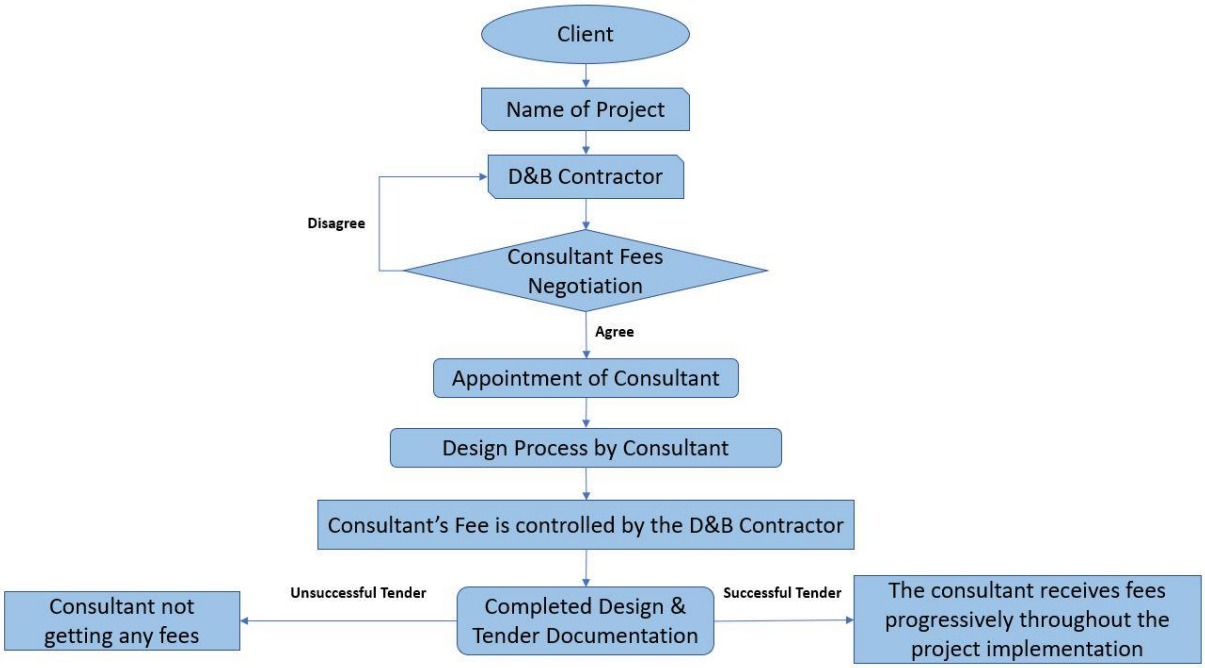

Diagram 16: Existing Scenario on Design & Built Project Awarding Process

The prevailing practice adopted by the government centers around a Design & Build tendering system, in which contractors participate in the bidding process. In this context, many consultants are required to prepare pre-design concepts during the tender period without some immediate fee payment. They typically receive payment only after the project has been awarded to the contractor and following the contractor's receipt of their first payment from the project.

This arrangement often leads to significant delays in fees payment for consulting engineers, who may wait nearly a year to be paid for their services. Such delays can create financial strain, particularly for firms that rely on a limited number of projects for their revenue. In some cases, contractors may choose to offer advance payments to consultants, but this is not the norm.

Overall, this practice underscores the need for a more equitable approach to fee structures that ensures timely fees payment for consulting engineers, thereby promoting better project outcomes and professional sustainability.

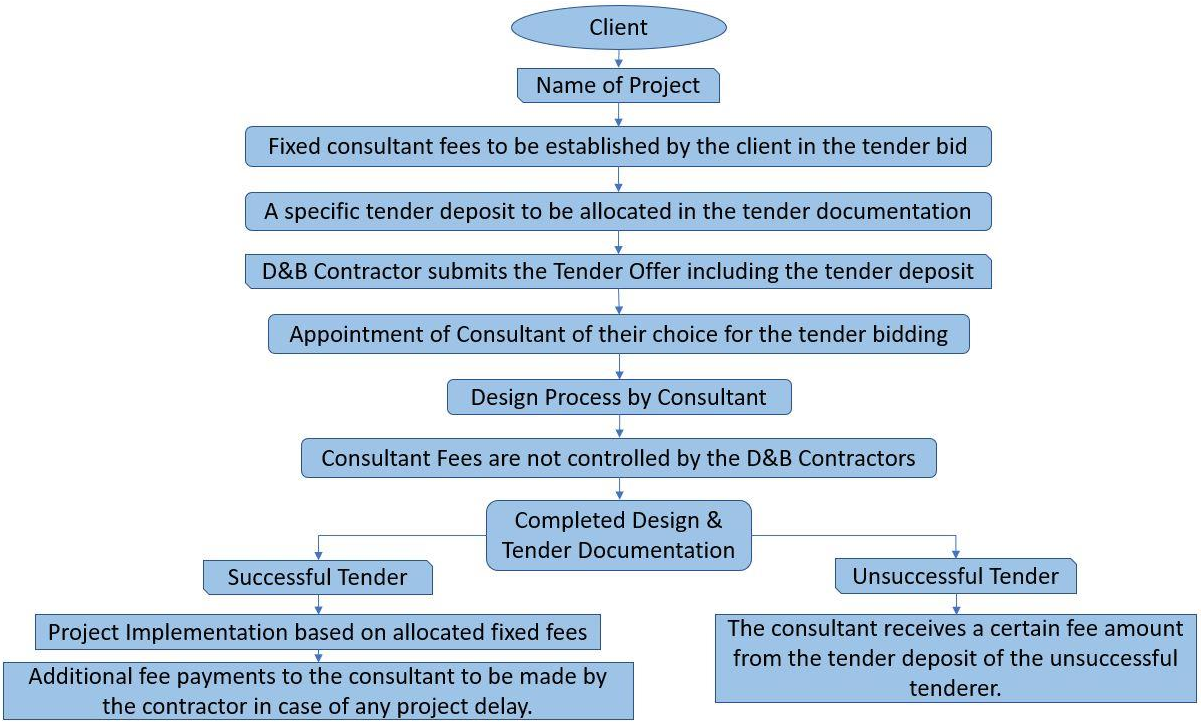

Diagram 17: New Proposal on Design & Built Project Awarding Process

Another recommendation is the requirement for the contractors to provide a deposit, which the client retains during the tendering process. This deposit should be structured so that a specified percentage is returned to the consulting engineers if the contractor is not awarded for that D&B project. Implementing this measure would ensure that consultants are compensated for their time and resources spent on tender preparation, thereby recognizing their contributions even in cases where the project does not materialize.

By providing a financial safety net for consultants, this approach not only incentivizes quality and thoroughness in tender submissions but also fosters a more equitable and sustainable working relationship between contractors and consulting engineers. Ultimately, this would help to address the financial risks that consultants face and promote greater accountability within the tendering process.

5.2.2 Involvement of Engineers within CIDB-registered Construction Firms.

In addition to the need for improved oversight and accountability in the construction sector, several key reasons support the government's mandate for all construction firms to have a minimum requirement of engineers or related technical person from architects, quantity surveyors or engineering technologist as a company director and shareholder:

1. **Ensuring Professional Expertise**: Requiring an engineer or related technical person as a director and shareholder guarantees that technical expertise is embedded at the highest level of decision-making within the company, promoting adherence to industry standards and regulations.

2. **Enhancing Accountability**: Having an engineer or any related technical person in a leadership position ensures that there is direct accountability for the technical aspects of construction projects, reducing the risk of sub-standard work and non-compliance with safety and quality standards.

3. **Promoting Sustainable Growth**: Construction firms led by qualified engineers or any competent technical person are more likely to adopt innovative, sustainable practices and invest in the long-term development of both the firm and the industry, contributing to overall sector growth.

4. **Strengthening Public Safety**: Engineers have the knowledge and training to ensure that construction projects are designed and executed safely. This mandate would help protect public safety by ensuring that qualified professionals are at the forefront of all major decisions.

5. **Improving Industry Reputation**: By requiring qualified engineers or any other equivalent professional in leadership roles, the government would enhance the credibility and reputation of the construction sector, helping to build trust with clients, regulatory bodies, and the general public.

6. **Encouraging Ethical Practices**: An engineer’s involvement at the top-level management would foster ethical decision-making, ensuring that the company's practices align with the core values of professionalism, integrity, and public welfare.

7. **Ensuring Compliance with Industry Standards**: An engineer in a director or shareholder role will be more likely to ensure compliance with evolving industry

standards, codes of practice, and regulatory requirements, reducing the risk of legal and regulatory challenges for the company.

These additional reasons highlight the importance of qualified engineers in leadership positions, not only for the benefit of individual firms but for the overall improvement and sustainability of the construction industry.

It is recommended that the government, through the Construction Industry Development Board (CIDB), implement mandatory conditions requiring CIDB G6 contractor companies to employ engineers at the Professional Engineer (PE) level. This ensures that projects are managed by professionals with the requisite qualifications and expertise to uphold industry standards.

Furthermore, it is essential that CIDB G7 contractor companies engage engineers who hold the Certified Professional Engineer (PEPC) designation. This requirement would guarantee that the highest level of technical competency is applied to more complex projects, thereby enhancing overall project quality and safety.

Additionally, it is suggested that a minimum equity requirement be implemented, stipulating that these engineers must hold at least 30% of the shares in their respective companies. These conditions should be incorporated as essential criteria for CIDB license approval, as outlined in Table 9 on Minimum Qualifications in CIDB Construction Firms.

By enforcing these requirements, the government can enhance the quality of engineering services provided by contractors, ensuring that projects are overseen by the owner of qualified professionals with the necessary expertise. This approach will contribute to improved project outcomes and overall safety within the construction industry, while also promoting accountability and integrity among contractors.

Table 9: Minimum Qualification Requirement in CIDB Grade for Construction Firm

CIDBs' Construction Firm Grade	Minimum Qualification as Owner/Principal/CEO/Managing Director & Shareholder
G2	Diploma in Engineering or any other related Technical Discipline
G3	Degree in Engineering or any other related Technical Discipline (*Fresh Graduate*)
G4	Degree in Engineering or any other related Technical Discipline (1 – 5 years of experience)
G5	Degree in Engineering or any other related Technical Discipline (5 – 10 years of experience)
G6	Degree in Engineering or any other related Technical Discipline(10+ years of experience) and with PE
G7	Degree in Engineering or any other related Technical Discipline(15+ years experience) and have PE or PEPC

Additionally, it is also crucial that the owners of CIDB G5, G4, G3, and even G2 contractor companies possess a technical background. This stipulation would ensure that company leadership has a solid understanding of engineering principles and construction practices, which is vital for making informed decisions and overseeing project execution effectively.

By establishing these conditions, the government can foster a more skilled and knowledgeable workforce within the construction industry, ultimately leading to improved project outcomes, greater accountability, and enhanced safety standards across all levels of contracting. This initiative would not only elevate the quality of construction services but also contribute to the long-term sustainability and reputation of the industry as a whole.

6. CONCLUSIONS

If these recommendations can be finalized, professional engineers especially ECP players, will feel that they are valued and recognized by the Government and provide relief and brighter opportunities to serve as an engineer, especially in the service sector of consulting firms for the development of the country according to their qualifications.

Apart from that, the Principal of the Consulting Firm will gain comfort in continuing their responsibilities in addition to being able to guarantee the engineer's position in terms of performance and salary in their respective firms because in the end, they will be able to better manage financial management in their respective firms.

Thus, the conclusion to these recommendations and solutions can be summarized as follows:

1. **Improvement and Amendment of the Engineers Registration Act 1967 (Act 138) in Part II, Section 4(1)(d).**

The suggested proposed Amendment to this Section shall be read as:

*(d) to **enforce** and to fix from time to time with the approval of the Minister **the scale of fees** to be charged by registered Engineers and Engineering consultancy practices for professional engineering services rendered*

Justification & Implication: ***To establish and periodically update, with the Minister's approval, a standardized scale of fees for professional engineering services rendered by registered engineers and engineering consultancy practices where the enforcement is necessary to prevent fees undercutting and fees bidding, in accordance with the Board of Engineers' circular.***

Rational: The revision and update of the Registration of Engineers Act 1967 (Act 138) concerning fees shall include the provisions for establishing a minimum salary for engineers and engineering teams. This is important because there is a direct connection between determining the scale of consulting engineering fees and the company owner's ability to set appropriate salaries for engineers.

Although this may lead to consequential amendments to other existing sections. However, it is important to note that this process is lengthy and complex, beginning

with the preparation of the Regulatory Impact Assessment (RIA) and consultation with the relevant ministries, followed by review by the Jawatankuasa Dasar Kementerian Kerja Raya (JDKKR) and the KKR Legal Advisor, before being submitted to the Attorney General's Chambers and Parliament.

2. **Abolition of the Tendering System for Financial Proposals.**

   - Abolish the Financial Proposal and maintain the Technical Proposal, with assessment based on the Qualification-Based Selection (QBS) system.

   - Establish a stipulation to fix consultant fees in advance, to prevent fee bidding.

   - Enforce the direct appointment of consultant services as outlined in the Malaysian Treasury Circular PK3.1, "Procurement of Consultants in General," p/s 5/29 and p/s 6/29.

   - Revisit and amend certain key issues under PK3.2 that negatively impact ECP stakeholders.

3. Reassessment of Consultant Scale of Fees (SOF).

- Revised Fees Scale (SOF) for project below RM10M: A comprehensive revision of the scale of fees for projects valued at less than RM10 million is recommended to ensure fair SOF to the SME consulting engineers.

- Adjustment of Construction Stage Fees: It is proposed that construction stage fees be assessed and calculated based on the monthly construction period rather than the contractor's physical progress.

- Additional Design Stage Fees: Provision for additional fees during the design stage should be established and included to accommodate for any extensions of time arising from delays caused by third parties, determined by the individual responsible for the project.

- Additional Construction Stage Fees: Additional fees should be instituted during the construction stage to address delays attributable to the contractor. These fees can be calculated on a per man-month basis or on a prorated basis.

- Deductible Design Fees from Ceiling Cost: No fees shall be deductible if the project cost is below the ceiling cost. The fees shall be maintained in accordance

with the time already allocated to the same manpower during the designated design period.

- Reinstatement of Tender Stage Fees: The 5% Tender Stage fees shall be payable as part of the consultancy fees, reflecting the involvement of the consulting engineer in the preparation of tender documentation, including the Bill of Quantities (BQ) and specifications.

- **The proposed new SOF should be considered, as it is based on real case scenarios experienced by ECP stakeholders.**

4. Revision of Consulting Services Agreement Form CSA2014 (Amendment 2018)

Several clauses have been identified for review in a manner that ensures a mutually beneficial outcome for both the clients and the CE. The clauses that have been justified and are proposed for amendment are outlined in section **5.1.4**:

i. Part B: Clause 5.9 (Indemnity)
ii. Part C: Clause 6.1 (Appointment of GR)
iii. Part D: Clause 8.1 (Dispute Resolution by Government Representative)
iv. Part E: Clause 10.4 (Consequences of Termination by the Government)
v. Part E: Clause 11.1(d) (Consequences of Termination by the CE)

5. Methods of Appointing Consulting Firms for Design and Build Projects.

- Ensure that the consultant's fee is set in advance, prior to the project being tendered or handed over to the Design and Build (D&B) contractor, to prevent fee undercutting by the main contractor.
- Ensure that the consultant's fee is paid directly to the consultant, bypassing the D&B contractor, to avoid any deductions.
- Ensure that the consulting engineer holds a more dominant position than the D&B contractor in project management, to maintain strict adherence to the quality of materials and workmanship.

6. Involvement of Engineers in CIDBs' Registered Construction Firms

It is strongly recommended that Engineers or individuals with relevant technical qualifications hold a minimum position as Company Directors or Principals in the management of CIDB-registered Construction Companies.

The suggested proposal for the Minimum Qualification Requirement in CIDB Construction Firm Grade (CIDB Grade) is as follows:

CIDBs' Construction Firm Grade	**Minimum Qualification as Owner/Principal/CEO/Managing Director & Shareholder**
G2	Diploma in Engineering or any other related Technical Discipline
G3	Degree in Engineering or any other related Technical Discipline(*Fresh Graduate*)
G4	Degree in Engineering or any other related Technical Discipline (1 – 5 years of experience)
G5	Degree in Engineering or any other related Technical Discipline (5 – 10 years of experience)
G6	Degree in Engineering or any other related Technical Discipline(10+ years of experience) and with PE
G7	Degree in Engineering or any other related Technical Discipline(15+ years experience) and have PE or PEPC

In conclusion, implementing these conditions will enable the government to cultivate a more skilled and knowledgeable workforce within the construction industry. By requiring that CIDB Grade G6 and Grade G7 contractors employ engineers with recognized professional qualifications, the government will ensure that projects are overseen by individuals with the necessary expertise to uphold high standards of quality and safety.

Furthermore, mandating that owners of CIDB G5, G4, G3, and G2 companies have a technical background will enhance leadership capabilities and promote informed decision-making throughout the construction process. This alignment of expertise at both the engineering and management levels will lead to improved project

outcomes, characterized by higher efficiency, better resource management, and reduced risk of errors.

In addition, fostering greater accountability within contracting firms will promote a culture of responsibility and ethical practices, ultimately benefiting all stakeholders involved. Enhanced safety standards will not only protect workers but also ensure that projects are completed without compromising public safety or environmental considerations.

Overall, this initiative will not only elevate the quality of construction services but also lay the groundwork for the long-term sustainability and positive reputation of the construction industry. By prioritizing professional standards and technical expertise, the government can help create a resilient industry capable of meeting future challenges and contributing to national development goals.

7. ACTION PLANS

These listed Action Plans focus on several key issues in the field of engineering consulting practice. Acknowledging that the majority of engineering graduate starting salaries in the field of consulting are below the dignified salary (less than RM2,000 per month). The following is a description of the actions that need to be taken by the stakeholders:

1. The enforcement of the new Proposed Fee Scale (SOF) is considered important to resolve the salary issue and improve the level of service to customers. The new SOF values being able to set and enforce a reasonable minimum wage for engineering graduates. This will help overcome the issue of low wages and ensure fairness in compensation.
2. Improvements to the Registration of Engineers Act (REA) with regards to the Scale of Fees (SOF) are considered very important for the well-being and sustainability of consultants. Changes to the law need to be made to update the REA and SOF to be more relevant to the current needs of the engineering industry. This will help improve the status and well-being of the consultant.
3. Re-evaluation and adjustment of the terms and conditions of Treasury Circular PK 3.2 need to be reviewed to ensure fairness and equality. A review is needed to ensure the conditions are fair and provide equal opportunities to all parties.
4. Several Transformations of the Government Procurement System need to be considered, including regarding bidding methods, assessment of consultant capabilities, contractor procurement policy, and the appointment of Design and Build (D&B) projects.
5. The purpose is to ensure fairness, reduce waste and increase efficiency in the procurement process.
    a. Existing bidding methods do not provide a return of value comparable to the money and energy resources spent by agencies and private parties in the preparation of tenders by consulting firms. The high cost of preparing the consultant's bid documents is not comparable to the savings obtained. This wastes resources and is necessary reconsidered in addition to the huge waste of energy for SMEs that failed in the bid.

This fierce competition has led to a situation where service fees are reduced, creating financial pressure.

b. The procurement method of the Design and Build project should be reviewed so that the engineering consultant has appropriate autonomy and is not manipulated by the contractor. Existing models from GLC companies can be implemented.
c. The appointment of engineering consultants under the appointment of Lead Consultant (LC) should be stopped because it does not provide much benefit in terms of project completion.
d. Annex 15-A of the CPTPP Agreement contains a threshold value that outlines a certain amount where the Malaysian Government can directly appoint firms without going through a tender process. When a threshold value is determined, it usually allows the government to directly appoint a firm without going through a tender process when the value of the contract or service required does not exceed the threshold value. This includes policies such as awarding contracts to companies owned by SME consultants or setting a certain threshold value where the tender process is not mandatory for contracts below that value; thereby giving opportunities to SME consulting firms.

6. Some of the terms and conditions of the Consultancy Services Agreement CSA2014 are considered unfair and detrimental to the consultant and the CSA needs to be improved and needs to be fair and equitable. The CSA needs to be reviewed and reformed to ensure that it is fair to negotiators and provides them with sufficient protection.
7. Create a development policy for the engineering consultancy sector to enable local firms to develop and improve capabilities as per the contractor development policy or TVET through:
    a. Creating fiscal assistance through the banking system such as assistance to work contractors by various banks and agencies further helping the development of consulting firms.
    b. Create an umbrella system for giant GLC/GOC companies to help SME consultants increase their capabilities & expertise for overseas markets.

c. Require foreign investors and/or international consultants to offer packages to SME companies for multi-million projects
d. Policy emphasis on the development of the consulting sector must be in line with the development of the TVET sector; where TVET is a sub-sector of engineering. The consulting sector is also an end-user for TVET graduates.

8. A monitoring body should be held to monitor issues related to agency governance, Statutory Bodies, and GLC/GOC. Monitoring bodies are important to ensure good governance in agencies, Statutory Bodies, and GLCs/GOCs and to deal with complaints related to non-compliance with laws or contracts.
9. University consulting units or Government agencies are restricted from competing with SME firms. Their expertise/facilities should be utilized for firms in niche areas or complex issues beyond the capabilities of SMEs. This restriction allows the expertise or facilities available in the consulting unit to be used more effectively in specific areas or complex issues.

All of these action plans, whether short-term or long-term, aim to improve the status, compensation, and sustainability of the engineering consulting profession. However, each of these steps requires strong support from various stakeholders, including top government decision-makers, regulatory bodies, and engineering professionals.

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11. IEM EMPLOYMENT SURVEY 2019

12. BEM ROADSHOW 2024

APPENDIX A

Survey On Consultancy Industry Engineers'Salaries &
Government Procurement of Services

SURVEY ON CONSULTANCY INDUSTRY, ENGINEERS' SALARIES & GOVERNMENT'S PROCUREMENT OF SERVICES

IEM TASKFORCE ON ENGINEER'S SALARY FROM CONSULTING ENGINEERS' PERSPECTIVES

SEPT 2023

Overview

- Key Takeaways
- Respondents demography
- Business Environment and Remuneration
- Government's Procurement of Consultants

Key Takeaways (1/2)

ONE:
Most consultancy firms are SMEs with less than 50 staff

TWO:
Consultant firms revenue and pre-tax profit are affected downwards by Covid pandemic

THREE:
Almost 75% firms can only offer entry level engineer not more than RM2.5k per month

FOUR:
Firms provide training & professional development for young engineers

FIVE:
Consultancy sector is deemed to offer lower salary package compared to other sectors. Salary package determines firm's ability to attract & retain talent

SIX:
Intense competition amongst firms lead to depressed fees

SEVEN:
Firms resort to cost-cutting and under-cutting to secure project

EIGHT:
Enforcing SOF is considered paramount to resolve salary issue and will lead to a better level of services to client

Key Takeaways (2/2)

NINE:
Client's lacks of understanding of the value provided by consultants leads to hesitation for paying higher fees

TEN:
Strong *firm's reputation would enhance ability for higher fees*

ELEVEN:
Enhancement in REA and SOF are deemed very important to the well-being and sustainability of consultants

TWELVE:
GOM's procurement system and CSA need to be improved and at arms-length

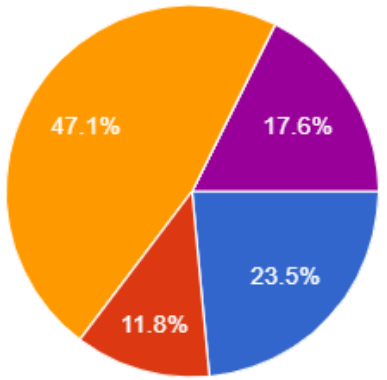
THIRTEEN:
GOM's intervention and incentives are required to support consultants and should be treated similar to other industries' SME in National SME Development Blueprint

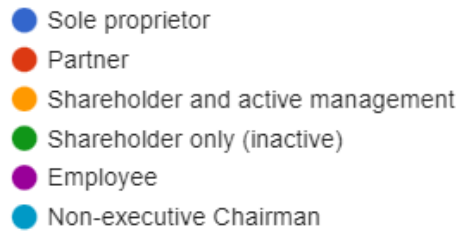
FOURTEEN:
Current GOM's procurement system is viewed as unfavorable, lacking transparency, waste of resources, cost bias and do not give value-for-money.

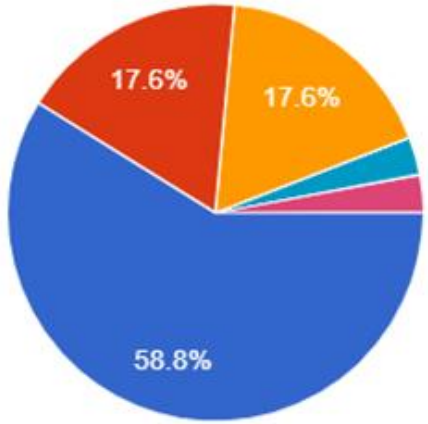
FIFTEEN:
Some *GOM's CSA2014 T&C are deemed to be unfair and put consultants at a disadvantage.*

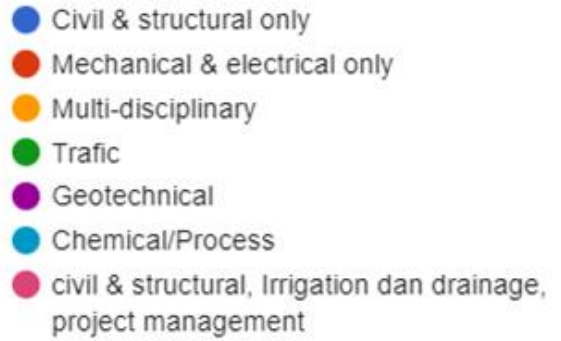
SIXTEEN:
Due to GOM's procurement system and CSA, the working relationship between agency-consultants is negatively affected.

Respondents demography



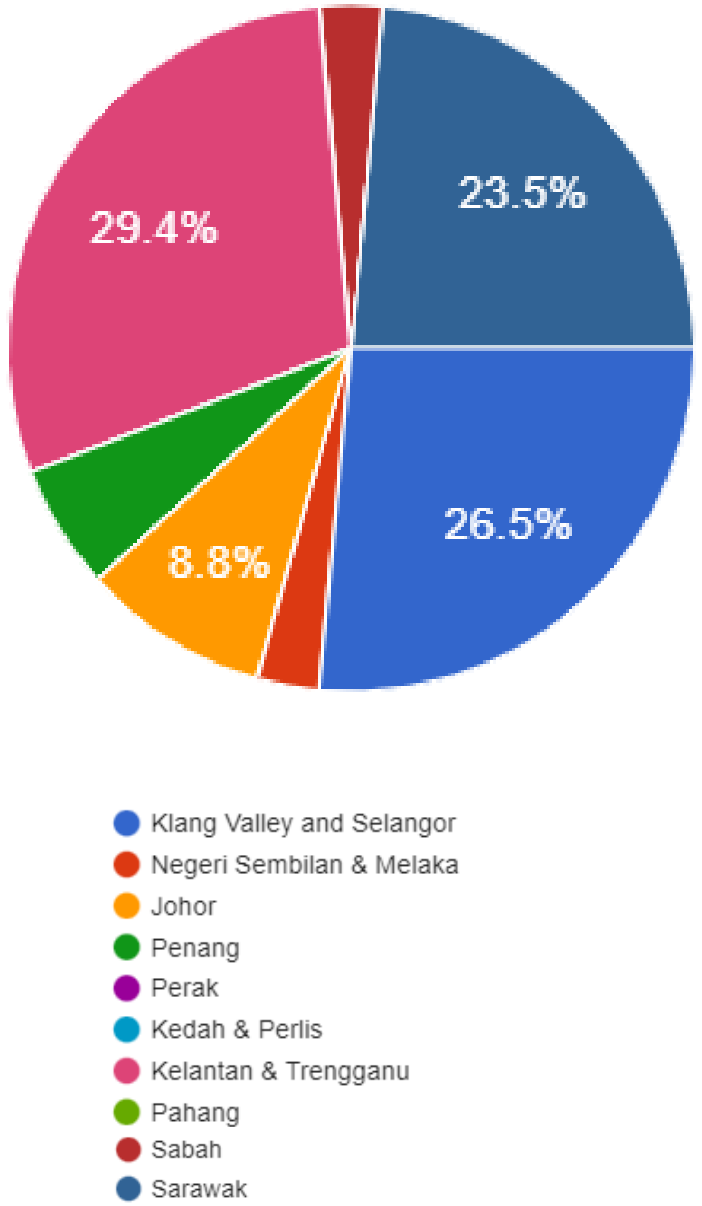






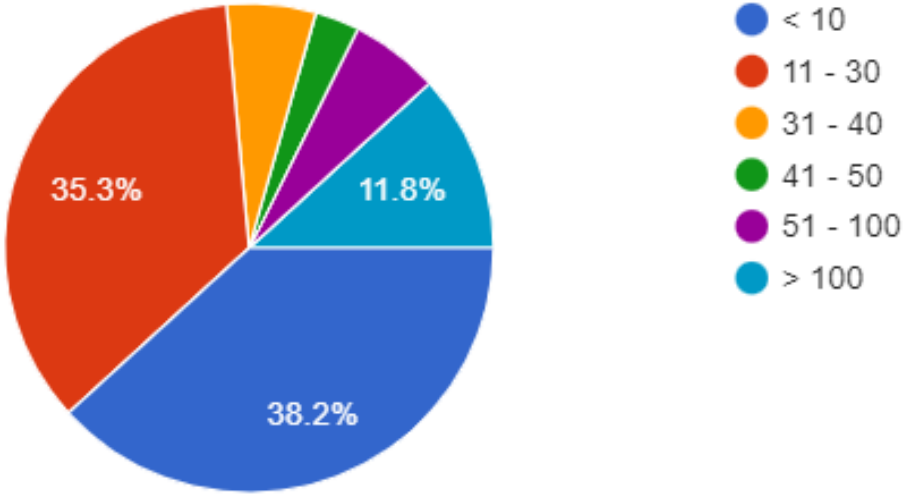
Respondents

Kelantan & Terengganu 29.4%
Klang Valley & Selangor 26.5%
Sarawak 23.5%
Johor 8.8%
Penang 5.9%
N. Sembilan & Melaka 2.9%
Sabah 2.9%

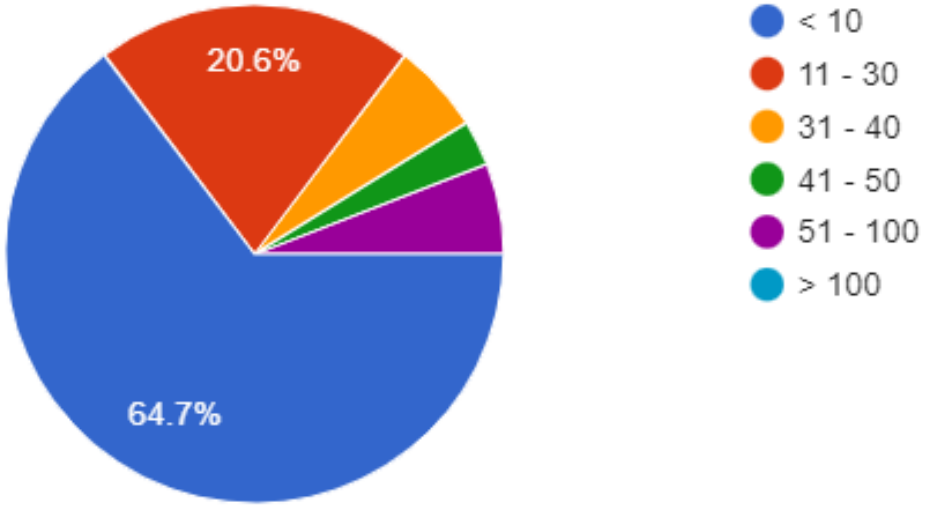


Respondents' firm size & nos of engineers employed

Nos of employees



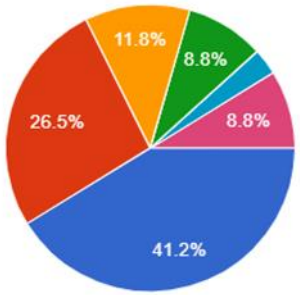
Nos of engineers employed



74% firms with less than 30 employees
84% firms employ less than 30 engineers
Engineers: Overall employees ratio ~ 2:3

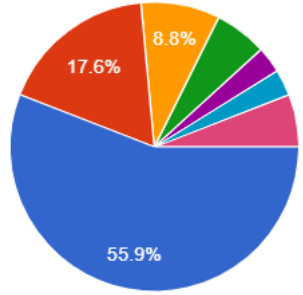
Pre-Covid vs Post-Covid Average Revenues

Pre-Covid



- 66% reported revenue < RM3 mil
- 12% reported revenue between RM3 mil – RM5 mil
- Only 8.8% reported > RM20 mil revenue

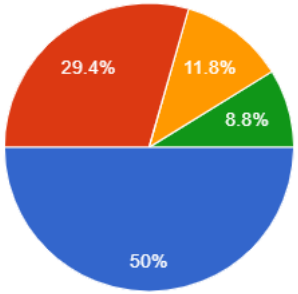
Post-Covid

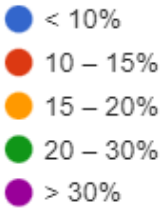


- 74% reported revenue < RM3 mil
- Between RM3 mil – RM5 mil ~ 17.6% ; dropped by 8.9%
- Only 5.9% reported > RM20 mil; dropped by 3%

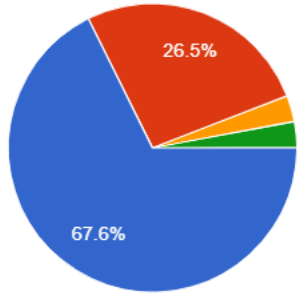
Pre-Covid vs Post-Covid Pre-tax Profit

Pre-Covid





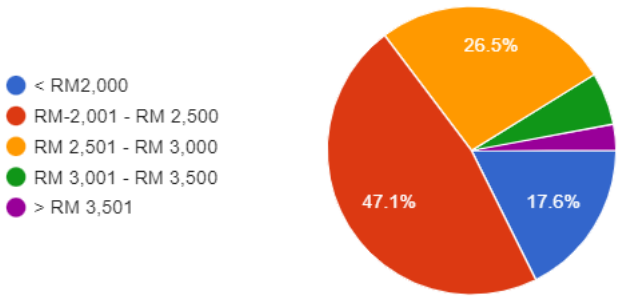
Post-Covid



- **Profit margin drops Pre and Post-Covid**
- **68% reported current profit margin is < 10%**

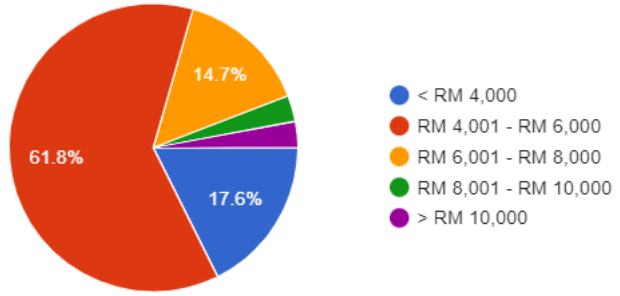
Engineers' Gross Salaries

Entry level



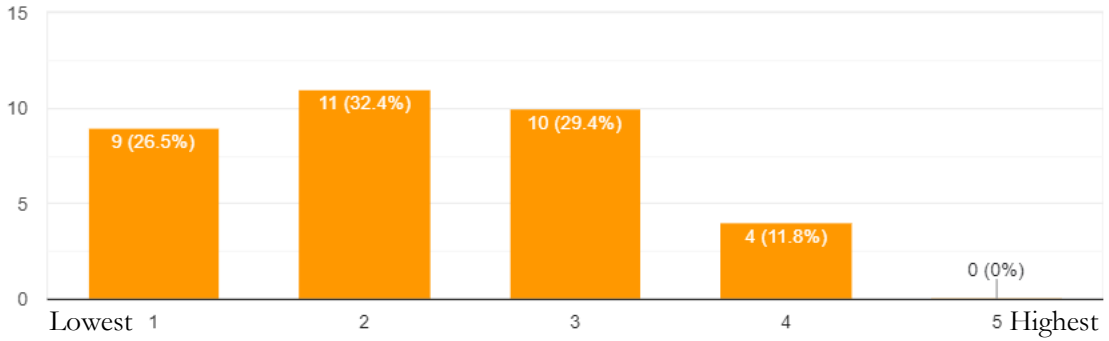
- **47% pays between RM2k to RM2.5k**
- **18% pays < RM2k**
- **Only 2.9% pays > RM3.5k**

10-years experience

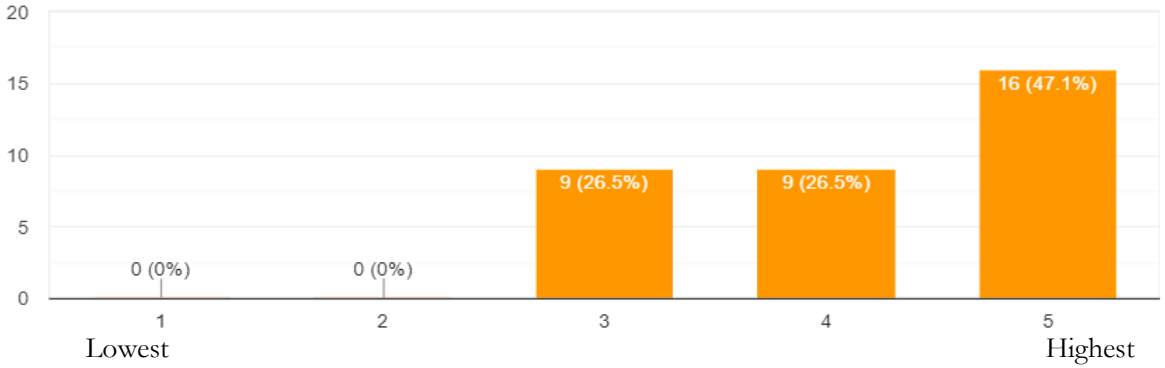


- **62% pays between RM4k to RM6k**
- **15% pays between RM6k to RM8k**
- **17.6% pays < RM4k**

Salary packages offered to engineers in your consultancy firm in relation to OTHER engineering sectors (eg. government, manufacturing, Oil & gas, operation & maintenance)?



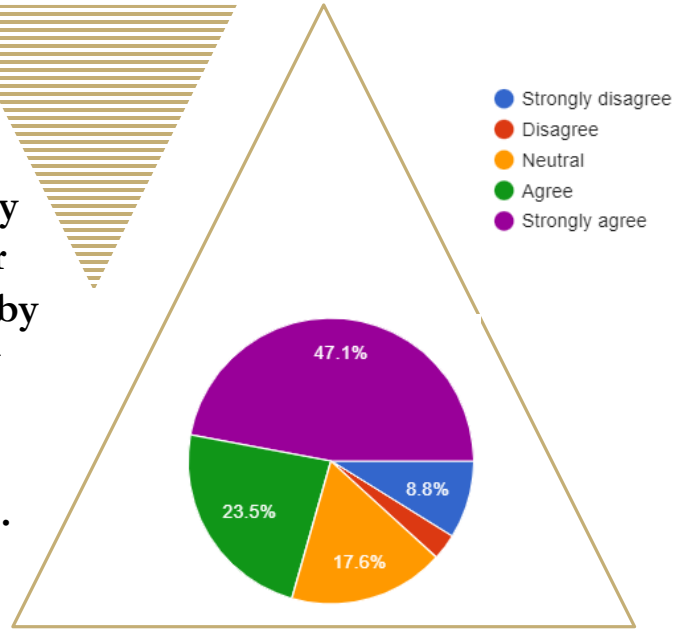
Higher salary packages for engineers contribute to attracting and retaining top talent in your firm



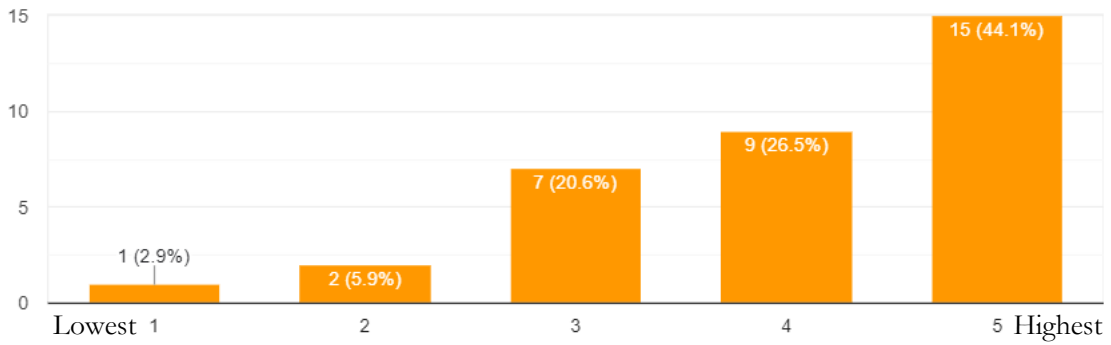
Business Environment and Remuneration

- ✓ **Consulting sector's salaries packages are deemed to be lower than other engineering sectors**
- ✓ **Higher salary packages attract top talent**
- ✓ **Ability to command higher fees influences engineers' salary packages**

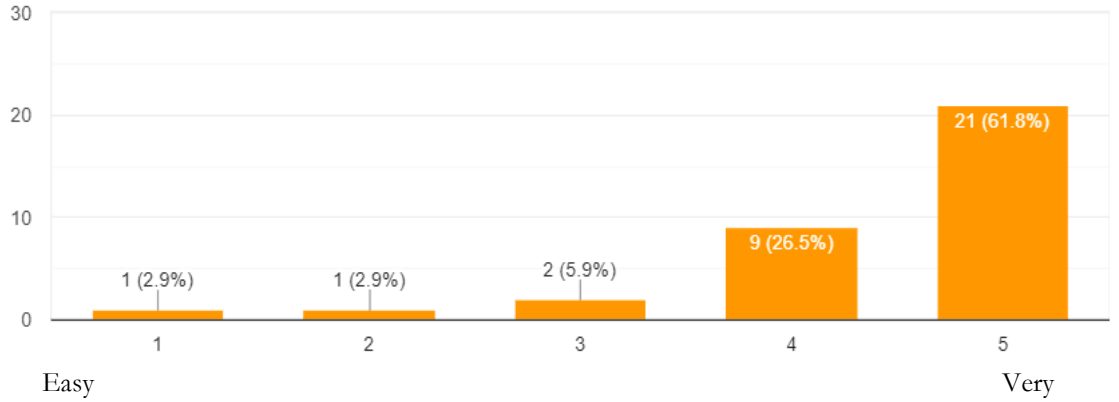
Engineers' salary packages at your firm influenced by the firm's ability to command higher consultancy fees.



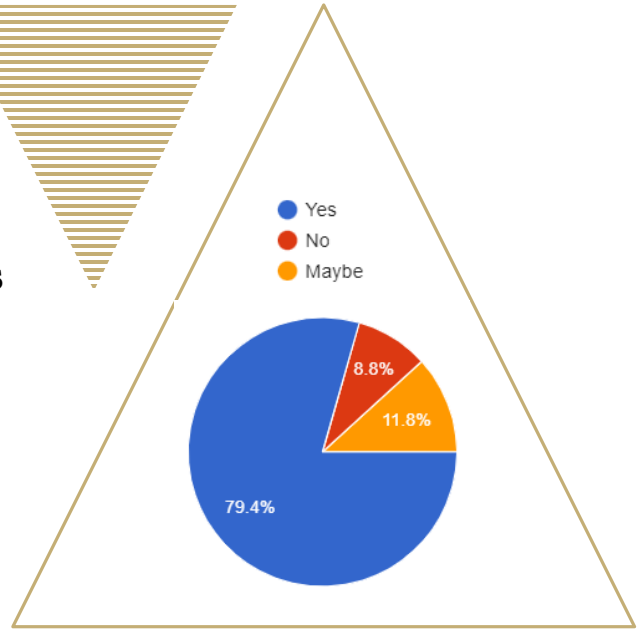
How challenging is it for your consultancy firm to attract skilled and qualified professionals to join your team?



Rate the level of competition among engineering consultancy firms in Malaysia



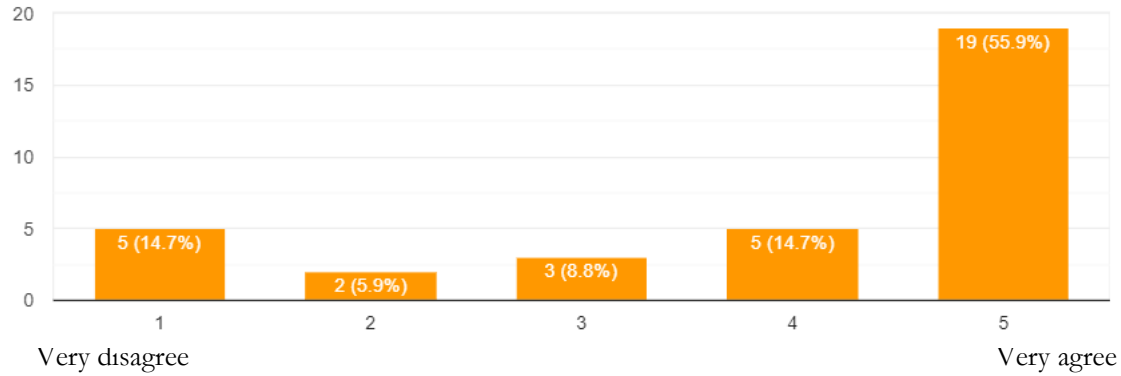
Intense competition affects your firm's ability to charge higher fees for its services



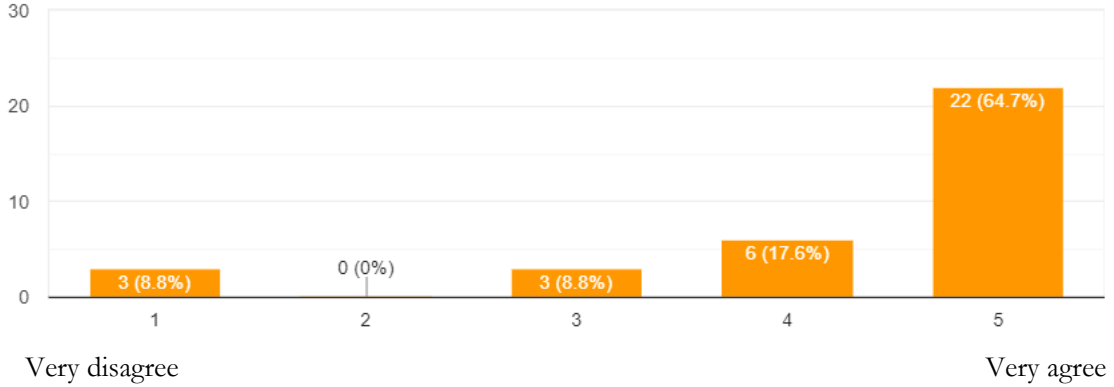
Business Environment and Remuneration

- ✓ It is very challenging to attract skilled and qualified professionals to join consulting industry
- ✓ Overwhelming consultants agree that competition level is very intense.
- ✓ This intense competition created depressed fees

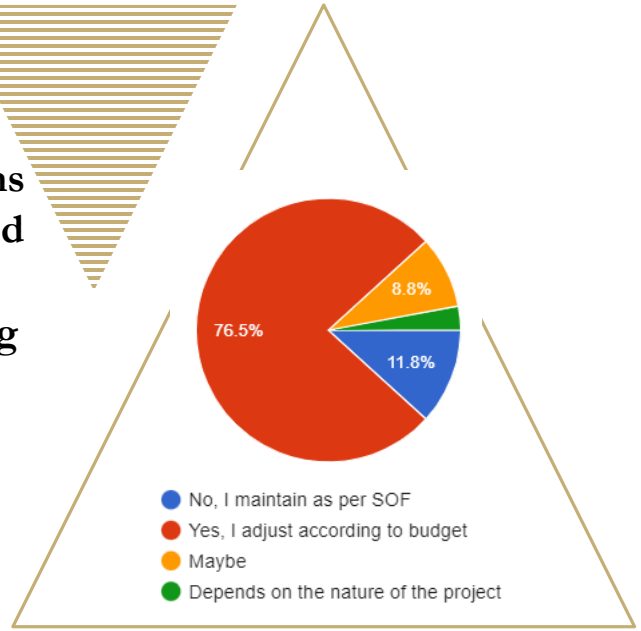
By charging clients according to the SOF, it will solve the issue of consulting engineers' remuneration packages



By charging clients according to the SOF, it will lead to a better level of services to clients



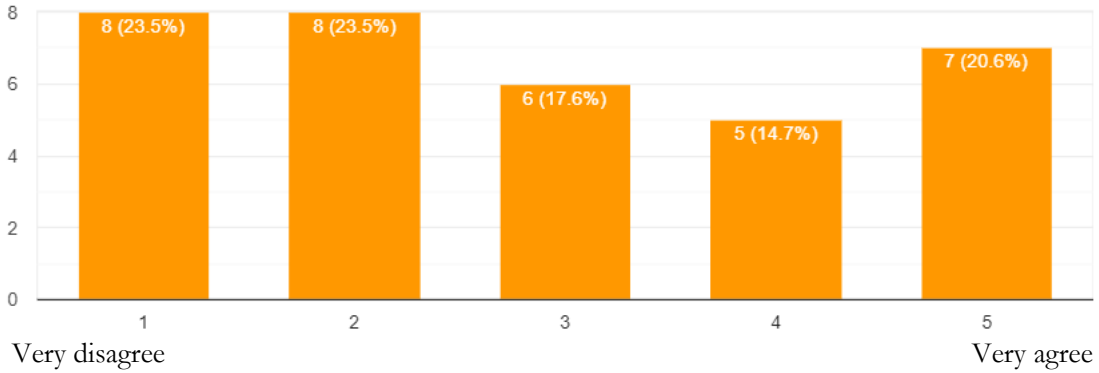
Economic conditions in Malaysia impacted your firm's fee structure and pricing strategy



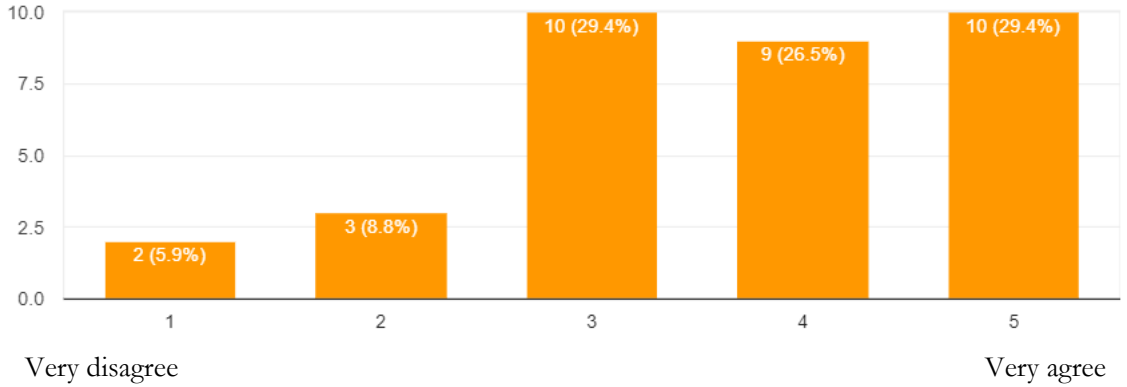
Business Environment and Remuneration

- ✓70% thinks that SOF can solve consulting engineers' remuneration packages
- ✓By using the SOF, the clients will get a better level of services
- ✓Pricing strategy and structure impact by the economic conditions; hence, impact the salary levels of staff due to depressed fees.

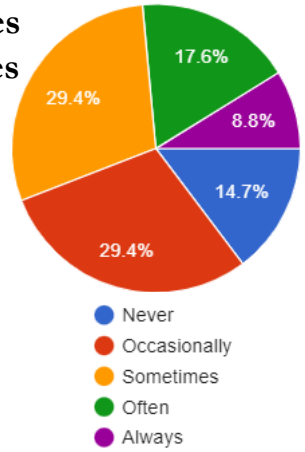
Current rates according to the SOF commensurate & fair with the liability & services provided by consulting engineers



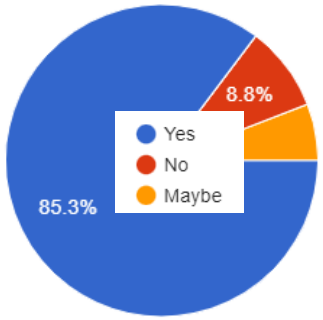
Stronger brand reputation would enable your firm to command higher fees, even in a competitive market



Firm offer additional value-added services or expanded solutions with additional fees beyond the initial project scope



Clients were hesitant to pay higher fees due to a lack of understanding of the value you provide

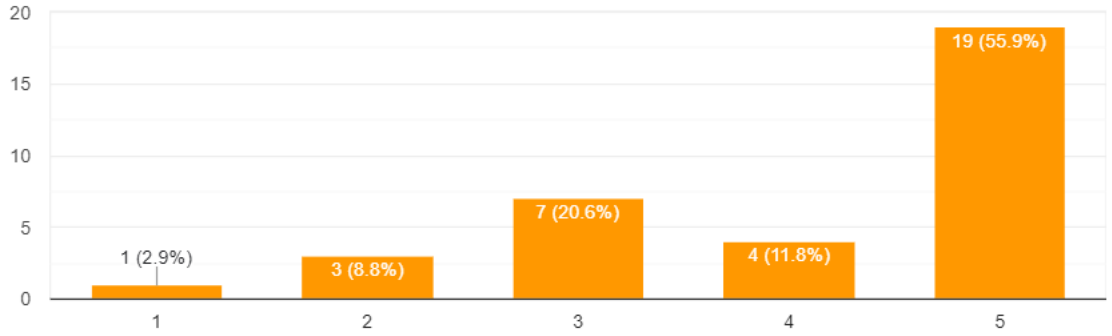


Business Environment and Remuneration

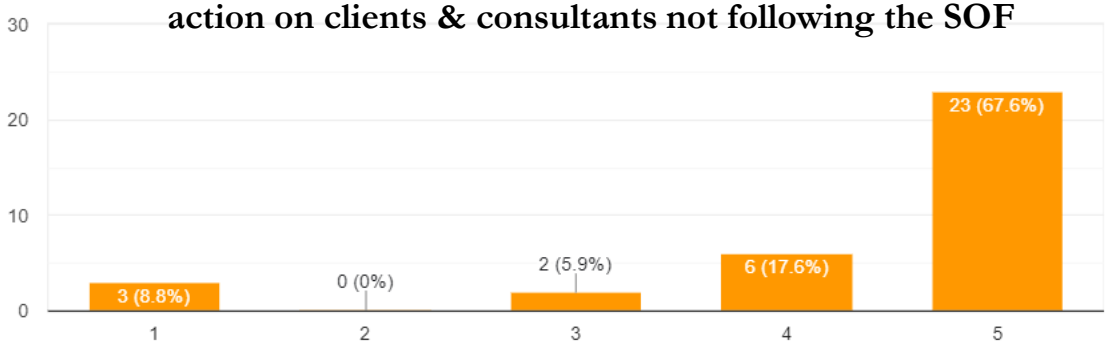
- ✓Consultants are devided whether the SOF commensurate & fair with the liability & services
- ✓Brand reputation could affect the fees
- ✓Consultants' jobs are not well understood by the market; which affect the fees. Value creation by consulting engineers needs to be enhanced
- ✓Most firms offer additional value-added services beyond initial scopes for additional fees

Rate the following issues that you may think have the biggest impact on the salary package for consulting engineers;
1 – very disagree; 5 – very agree

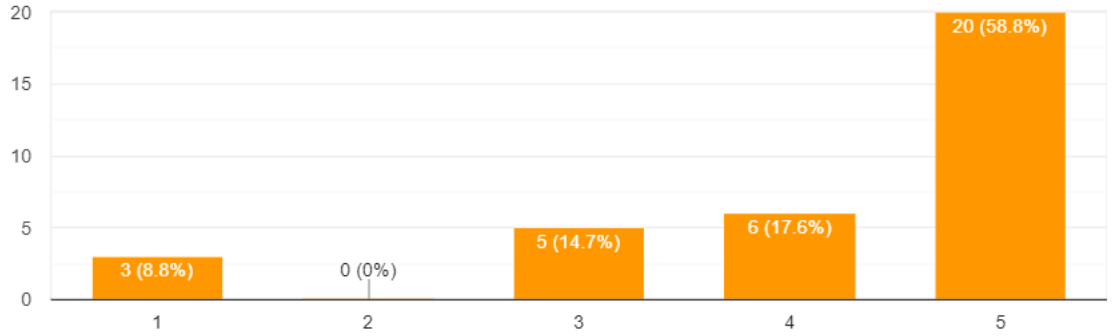
Revision of The Scale of Fees 1998 for better rates



Amendment to the REA Act 138 to empower BEM to take action on clients & consultants not following the SOF

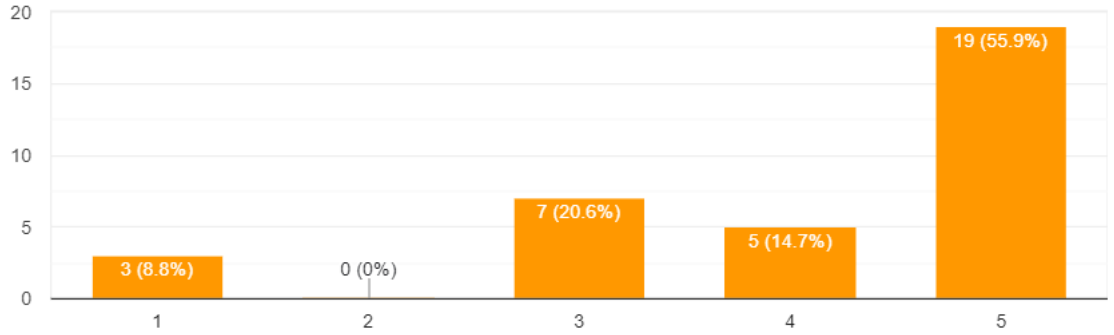


Amendment to the REA Act 138 to empower BEM to become stakeholder in dispute between clients and consultants

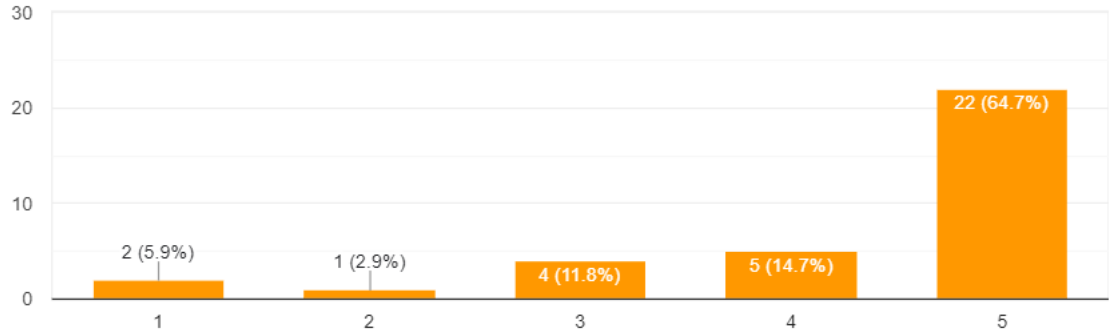


Rate the following issues that you may think have the biggest impact on the salary package for consulting engineers; 1 – very disagree; 5 – very agree

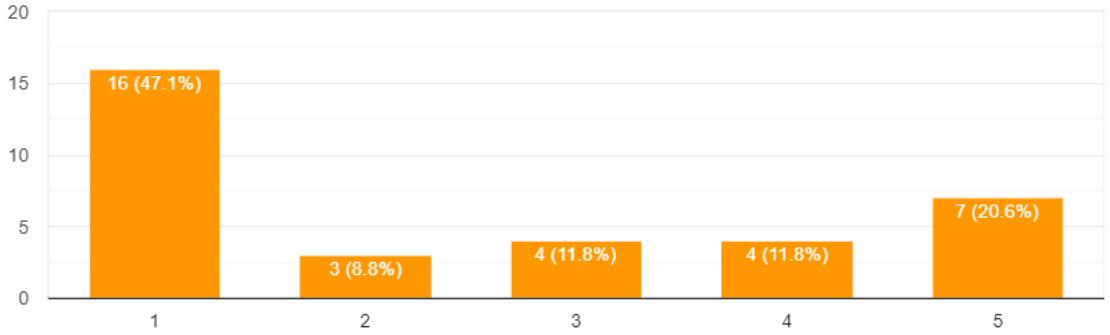
Amendment to the CSA 2014 for government's projects



Abolishment of tender system for government's projects and revert to direct appointment by MOF/Agencies



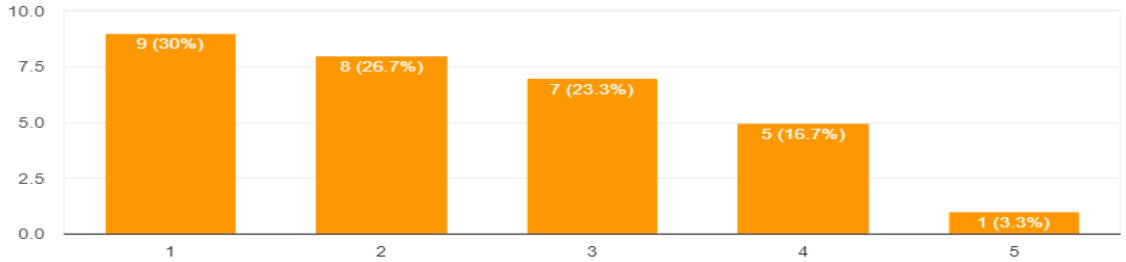
Allow free market to determine consultants' fees



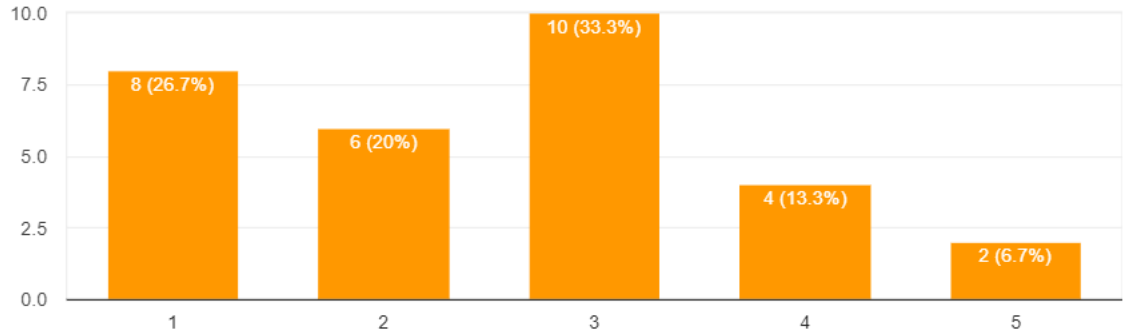
Government's Procurement of Consultants

88% of respondents

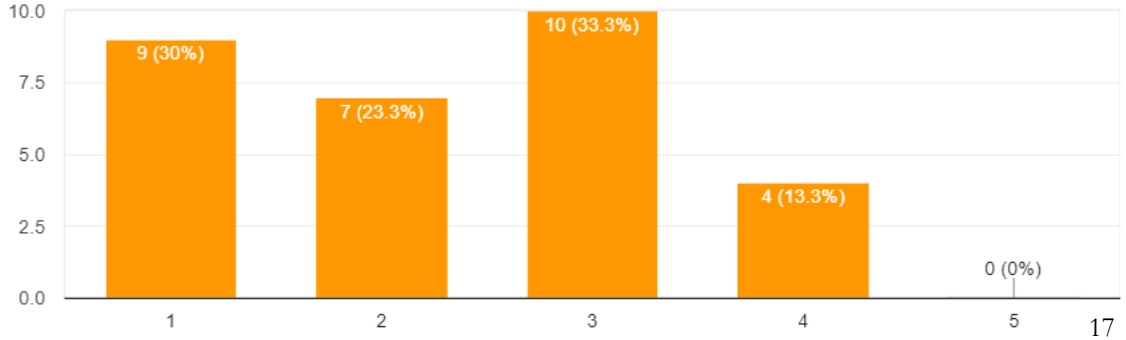
Rate your experience with the procurement process on a scale of 1 (Worst) to 5 (Best)



Government's requests for proposal (Cadangan Teknikal & Kewangan) or tenders for consultancy services easily available and well publicized



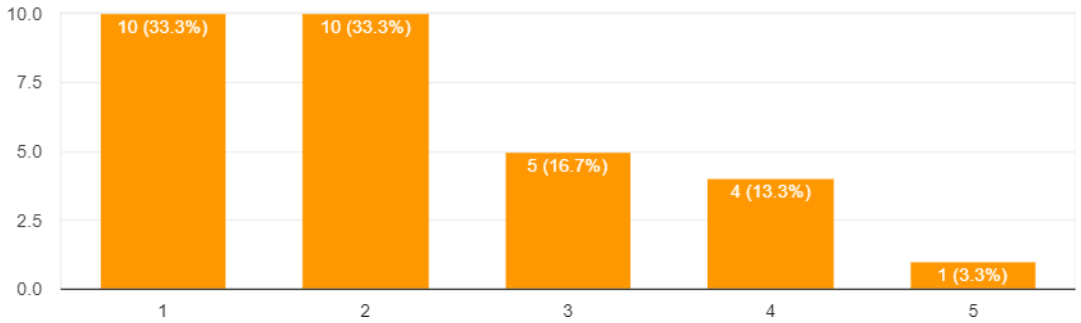
The tendering instructions and RFP documents design brief on the consultants' scopes of services clear with sufficient detail to enable proper costing on the services to be provided



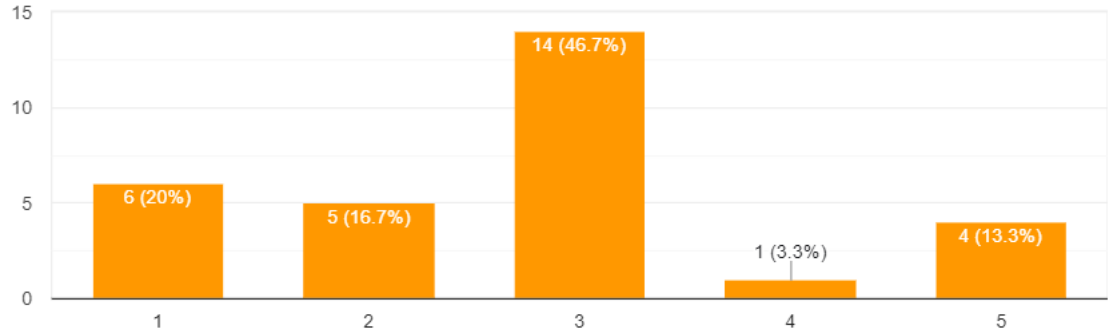
Government's Procurement of Consultants

88% of respondents

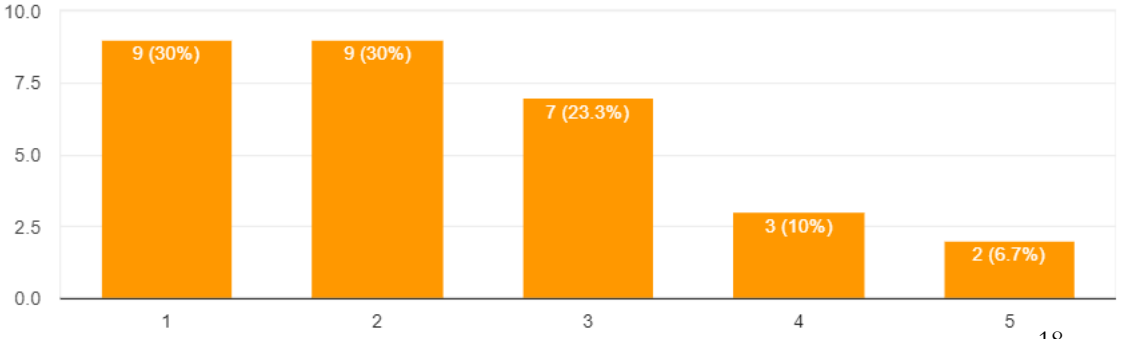
Perception of transparency of the selection criteria for engineering consultants in Malaysia's government procurement



The current TECHNICAL criteria in PK 3.2 are fair in evaluating the competence of engineering consultants and do not reflect the true nature of the firm's capability



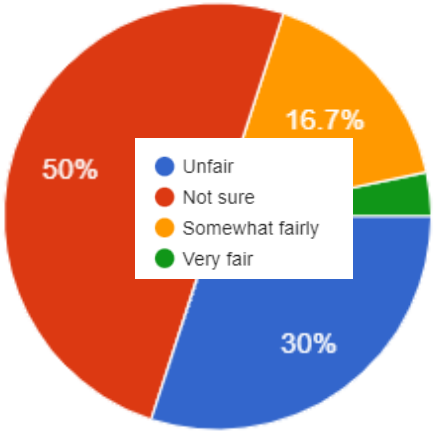
Rate the overall efficiency (for the agency and companies participating) of the procurement process in terms of time and resources commensurate to the perceived benefits (fees' cost savings) to the total development cost



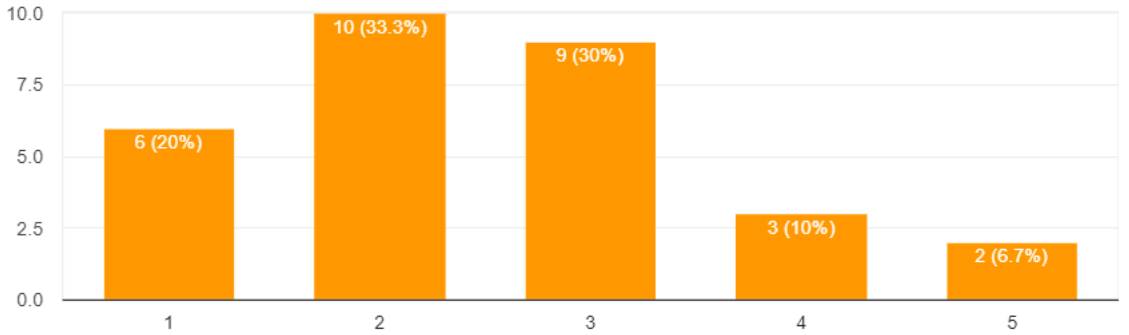
Government's Procurement of Consultants

88% of respondents

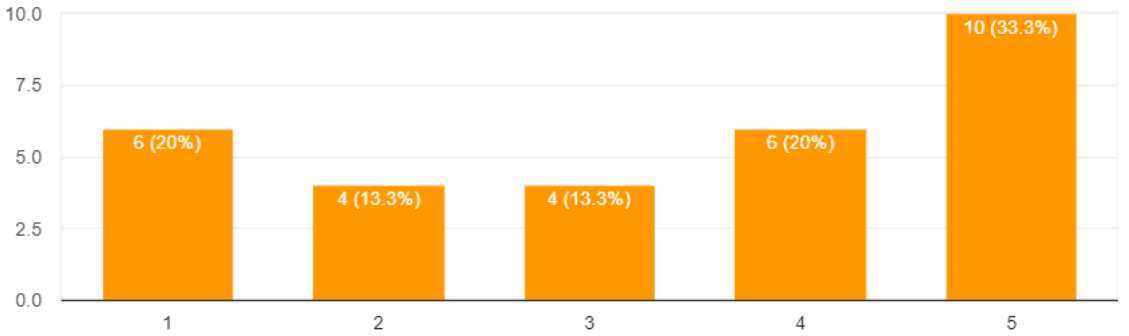
You were treated fairly and equally throughout this evaluation process



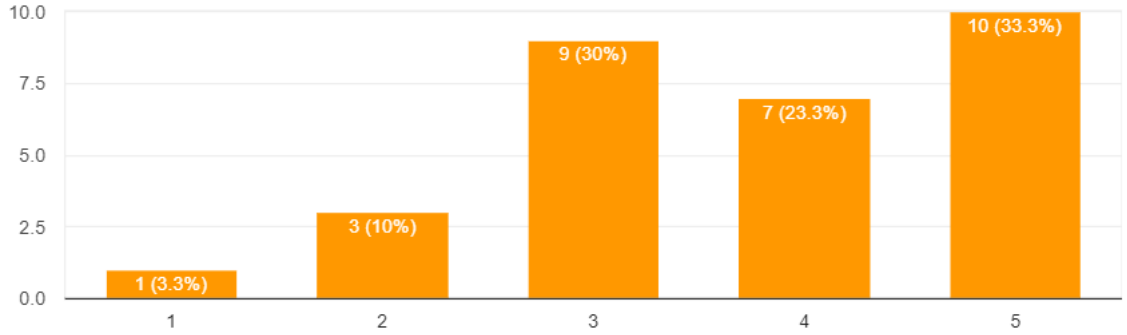
Perception that the current method of Government's consultancy procurement process achieves **best value for money**



Do you think that Financial (Price) is still the decisive factor in awarding the contract.



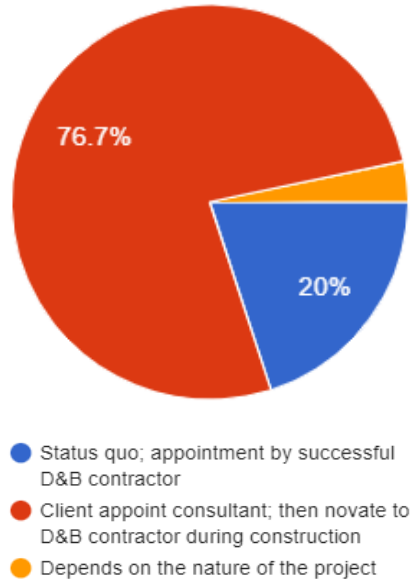
Current procurement method does not reward creativity and innovative solutions in the selection of consultants



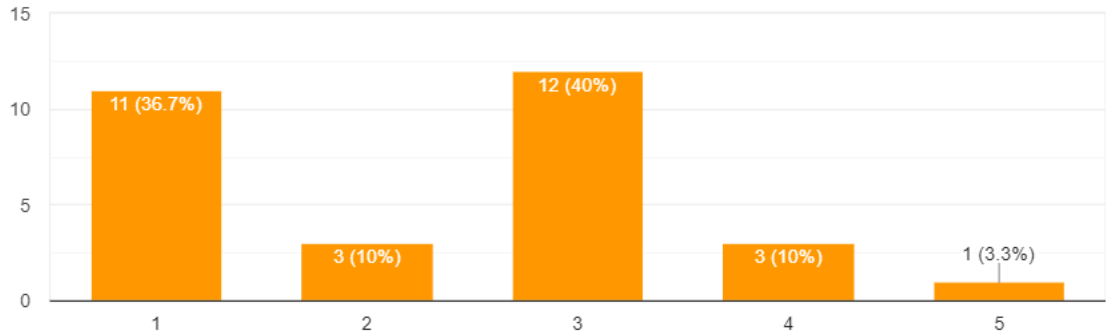
Government's Procurement of Consultants

88% of respondents

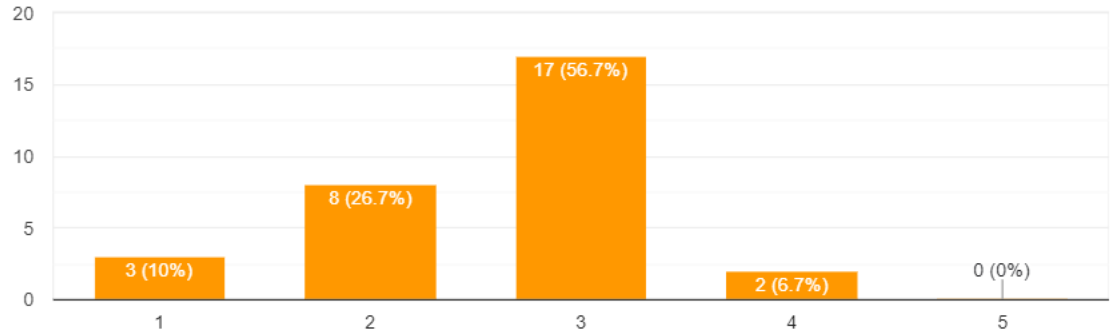
Which is your preferred method for appointment of consultants for government's Design & Built project



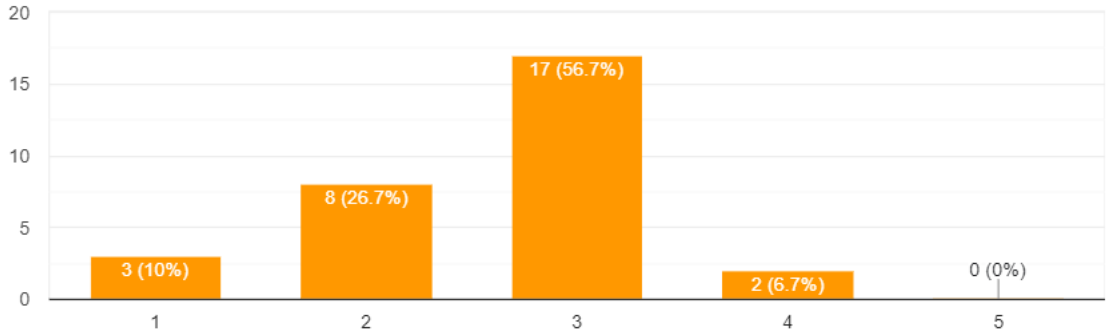
Appointment of architect as Lead Consultant (LC) in a packaged consultancy services contract



Perceive the terms and conditions outlined in the Consultancy Service Agreement 2014 to be for consultants.

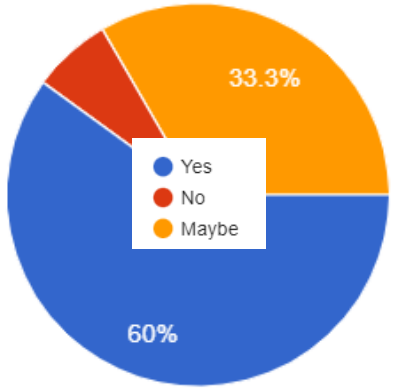


How fair do you perceive the terms and conditions outlined in the Consultancy Service Agreement 2014 to be for consultants?

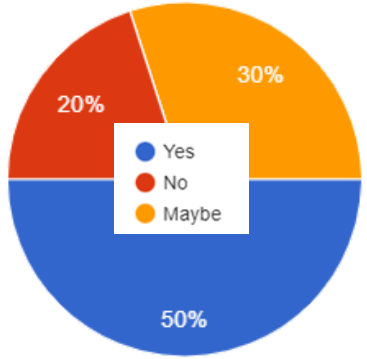


Government's Procurement of Consultants

88% of respondents involve in GOM's projects



You encountered situations where the terms of the agreement have put consultants at a disadvantage or created challenges



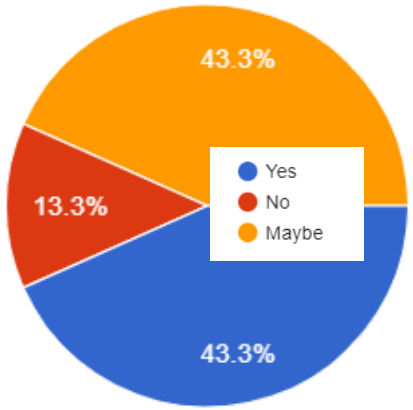
You identified any clauses or conditions in the Consultancy Service Agreement 2014 that you believe are biased in favor of the government and potentially unfair to consultants

1. Exp, now we have time limit, not with MOA before, and fee being cap in tender
2. fi yang dibayar adalah berdasarkan kepada final project sum iaitu jika sebarang pengurangan kos pembinaan akan dikira sebagai potongan kepada final fi perunding. namun fi TIDAK akan bertambah jika sekiranya terdapat penambahan kepada kos pembinaan.
3. Any increase in of construction costs carried out by the contractor should be considered to the increase of consultant fees.
4. LAD for consultan
5. Part C: 6.4 (a) (ii)
6. Max fee cap
7. Fee is based on preliminary estimates by the Government and not on the construction cost. If the tendered construction cost is less than the estimates, fee will be reduced and no increase in fee if it is higher.
8. LAD is imposed to consultants when the delay could be by others. Fees for HQ support during EOT not counted & etc.
9. 6.4.(a) Fixed Ceiling Consulting Fees
10. Yes 6.3
11. (1) The responsibility and liability to the Consultant as Deligated S.O.;) 2) Clause 6.4 on Payment to the CE for Services (b), (c) and (d) (very very late reimbursement for site staffs and Ceiling cost Vs actual Contract cost are very unfair to the Consultant (3) delay in extending the extension of Contract Period during construction period (delay due to non-performance of contractor/s)

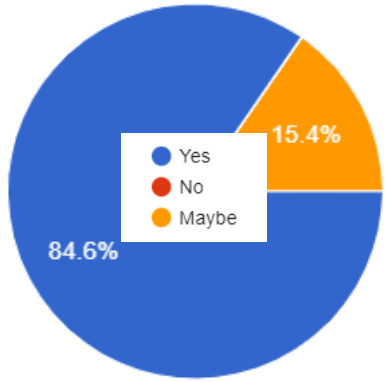
Government's Procurement of Consultants

88% of respondents

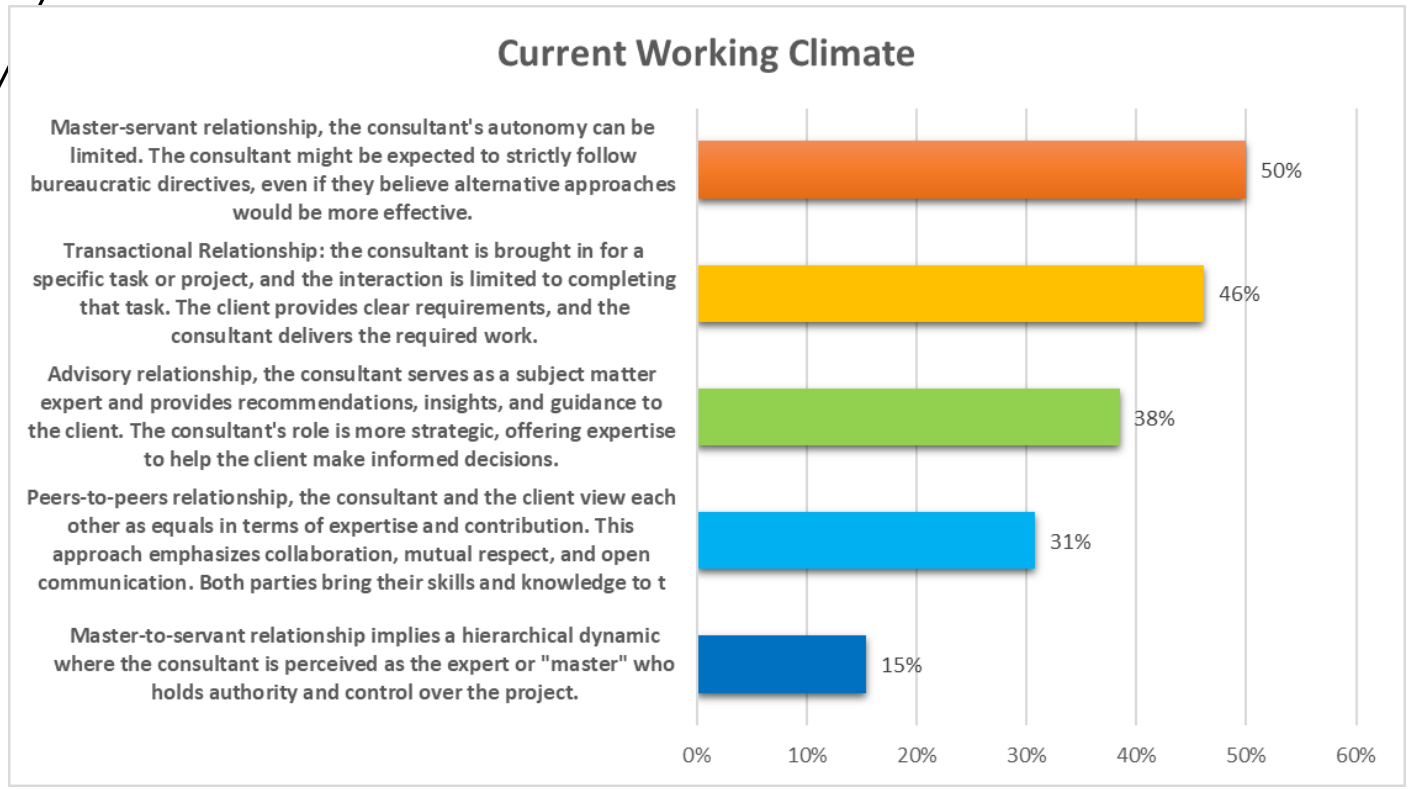
In your experience, have any biased or unfair terms within the Consultancy Service Agreement 2014 affected the working relationship between consultants and the government?



There should be a independent body for consultants to report any unfair/unjust/discriminatory treatment by government's agencies



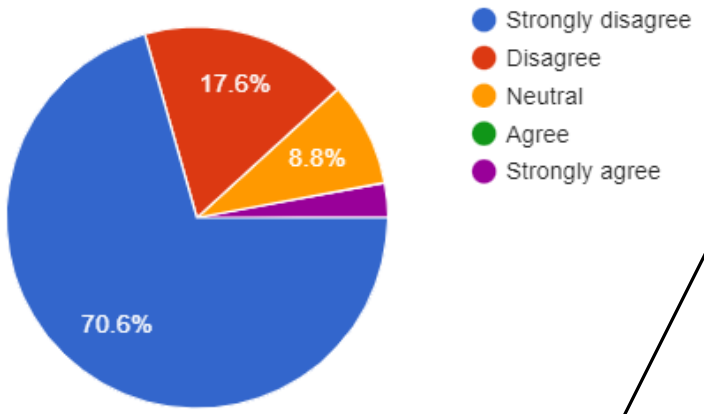
Current working relationship between your firm and government agency compared to the practices in the 10-20 years ago



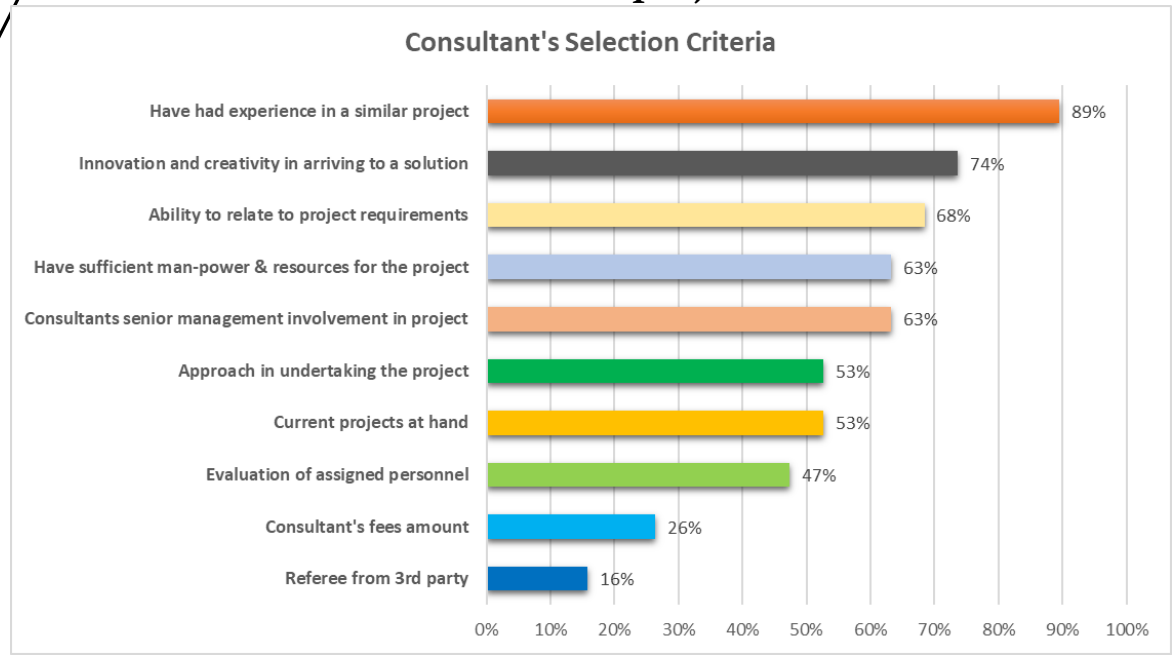
Government's Procurement of Consultants

88% of respondents

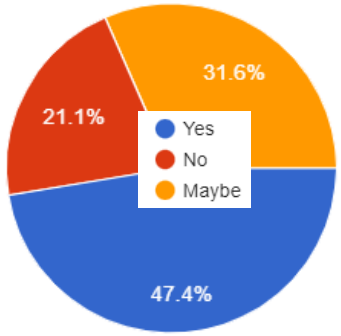
Those unfamiliar with the role of design professionals often ask, "If we buy everything else from the lowest bidder, why shouldn't we select our engineering firm based on low-bid, too?" Do you agree with this statement?



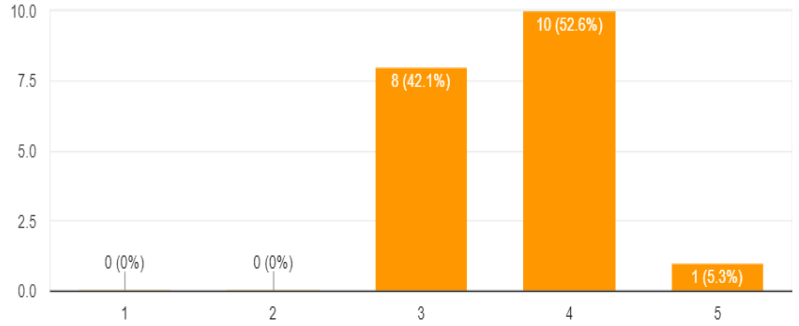
Top five (5) criteria in selecting a consulting firm for a project



Current practice of determining the fees based on percentage of construction cost is a fair method in quantifying the time and resources of a firm in undertaking a project



QBS as an effective way to assess and select engineering consultants on a scale of 1 to 5 (1 being highly ineffective, 5 being highly effective).



APPENDIX B

Project Case 1 @ Irrigation Project: Pahang @RM100m
Project Case 2 @ Flood Mitigation Project: Perak @RM50m
Project Case 3 @ Drainage Project: Terengganu @RM50m
Project Case 4 @ River Mouth Project: Terengganu @RM25m
Project Case 5 @ School Hostel Project: Selangor @RM25m
Project Case 6 @ Drainage Project: Selangor @RM7.5m
Project Case 7 @ Private Housing Project: Terengganu @RM5m
Project Case 8 @ Private Housing Project: Terengganu @RM2.5m

CONSULTANT PROFESSIONAL FEES - Project Case 1 @ Irrigation Project: Pahang DESIGN STAGE

Project Cost		**100,000,000**		
Original Professional Fees	**3.76%**	**3,759,000**	**5% for Tender Stage**	
Design Stage Fees	**60%**	**2,255,400**	**5%**	**187,950**
Estimated Fees (Based on BEM SOF)	**3.95%**	**3,950,000**	**3.75%**	**3,752,500**
Total Actual Cost During Design Stage	**3.04%**	**3,038,900**		
Total Actual Cost (Upon Completion)	**4.03%**	**4,028,000**		

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1.0	Original Professional Fees				2,255,400
2.0	Original Design Period	Month		**22**	
B	**Expenses (09/17-1/19)**				
1.0	Project Director	Month	1,500	22	33,000
2.0	Project Manager	Month	7,500	**22**	165,000
3.0	Senior Engineer 1 @ Head Designer	Month	7,500	**22**	165,000
4.0	Senior Engineer 2 @ Irrigation Expert	Month	3,500	**22**	77,000
5.0	Senior Engineer 3 @ Civil & Structural	Month	2,000	**22**	44,000
6.0	Senior Engineer 4 @ Mechanical	Month	4,000	**22**	88,000
7.0	Senior Engineer 5 @ Electrical	Month	2,000	**22**	44,000
8.0	Engineer 1 @Design Engineer	Month	2,250	**22**	49,500
9.0	Engineer 2 @ Design Engineer	Month	2,000	**22**	44,000
10.0	Engineer 3 @ Design Engineer	Month	2,000	**22**	44,000
11.0	Engineer 4 Desk Officer	Month	2,000	**22**	44,000
12.0	Draftperson 1	Month	1,125	**22**	24,750
13.0	Draftperson 2	Month	875	**22**	19,250
14.0	Admin Finance Cost & Operation Cost	Month	5,000	**22**	110,000
				Total Expenses	951,500
				GROSS PROFIT	1,303,900

Distribution Factor	Monthly Salary	Monthly Rates
0.10	15,000	1,500
0.50	15,000	7,500
0.50	15,000	7,500
0.35	10,000	3,500
0.25	8,000	2,000
0.50	8,000	4,000
0.25	8,000	2,000
0.50	4,500	2,250
0.50	4,000	2,000
0.50	4,000	2,000
0.50	4,000	2,000
0.25	4,500	1,125
0.25	3,500	875
0.25	20,000	5,000

Notes:

CONSULTANT PROFESSIONAL FEES - Project Case 1 @ Irrigation Project: Pahang
DESIGN STAGE

C	**Expenses (EOT 1: 01/19 - 12/20)**	Month		24				
1.0	Project Director	Month	1,500	24	36,000	0.10	15,000	1,500
2.0	Project Manager	Month	7,500	24	180,000	0.50	15,000	7,500
3.0	Senior Engineer 1 @ Head Designer	Month	7,500	24	180,000	0.50	15,000	7,500
4.0	Senior Engineer 2 @ Irrigation Expert	Month	3,500	24	84,000	0.35	10,000	3,500
5.0	Senior Engineer 3 @ Civil & Structural	Month	2,000	24	48,000	0.25	8,000	2,000
6.0	Senior Engineer 4 @ Mechanical	Month	4,000	24	96,000	0.50	8,000	4,000
7.0	Senior Engineer 5 @ Electrical	Month	2,000	24	48,000	0.25	8,000	2,000
8.0	Engineer 1 @Design Engineer	Month	1,125	24	27,000	0.25	4,500	1,125
9.0	Engineer 2 @ Design Engineer	Month	1,000	24	24,000	0.25	4,000	1,000
10.0	Engineer 3 @ Design Engineer	Month	1,000	24	24,000	0.25	4,000	1,000
11.0	Engineer 4 Desk Officer	Month	2,000	24	48,000	0.50	4,000	2,000
12.0	Draftperson 1	Month	1,125	24	27,000	0.25	4,500	1,125
13.0	Draftperson 2	Month	875	24	21,000	0.25	3,500	875
14.0	Admin Finance Cost & Operation Cost	Month	5,000	24	120,000	0.25	20,000	5,000
					Total Expenses			
					963,000			
					NEW GROSS PROFIT/LOSS			
					340,900			

Notes:

C	**Expenses (EOT 2: 1/21 - 12/23)**	Month		36				
1.0	Project Director	Month	1,500	36	54,000	0.10	15,000	1,500
2.0	Project Manager	Month	3,750	36	135,000	0.25	15,000	3,750
3.0	Senior Engineer 1 @ Head Designer	Month	3,750	36	135,000	0.25	15,000	3,750
4.0	Senior Engineer 2 @ Irrigation Expert	Month	3,500	36	126,000	0.35	10,000	3,500
5.0	Senior Engineer 3 @ Civil & Structural	Month	800	36	28,800	0.10	8,000	800
6.0	Senior Engineer 4 @ Mechanical	Month	2,000	36	72,000	0.25	8,000	2,000
7.0	Senior Engineer 5 @ Electrical	Month	800	36	28,800	0.10	8,000	800
8.0	Engineer 1 @Design Engineer	Month	450	36	16,200	0.10	4,500	450
9.0	Engineer 2 @ Design Engineer	Month	400	36	14,400	0.10	4,000	400
10.0	Engineer 3 @ Design Engineer	Month	400	36	14,400	0.10	4,000	400
11.0	Engineer 4 Desk Officer	Month	2,000	36	72,000	0.50	4,000	2,000
12.0	Draftperson 1	Month	1,125	36	40,500	0.25	4,500	1,125
13.0	Draftperson 2	Month	875	36	31,500	0.25	3,500	875
14.0	Admin Finance Cost & Operation Cost	Month	5,000	36	180,000	0.25	20,000	5,000
					Total Expenses			
					948,600			
					NEW GROSS PROFIT/LOSS			
					-607,700			

Notes:

CONSULTANT PROFESSIONAL FEES - Project Case 1 @ Irrigation Project: Pahang
DESIGN STAGE

C	**Expenses (EOT 3: 1/24 -12/24)**	Month		12				
1.0	Project Director	Month	1,500	12	18,000	0.10	15,000	1,500
2.0	Project Manager	Month	1,500	12	18,000	0.10	15,000	1,500
3.0	Senior Engineer 1 @ Head Designer	Month	0	12	0	0.00	15,000	0
4.0	Senior Engineer 2 @ Irrigation Expert	Month	2,000	12	24,000	0.20	10,000	2,000
5.0	Senior Engineer 3 @ Civil & Structural	Month	800	12	9,600	0.10	8,000	800
6.0	Senior Engineer 4 @ Mechanical	Month	800	12	9,600	0.10	8,000	800
7.0	Senior Engineer 5 @ Electrical	Month	800	12	9,600	0.10	8,000	800
8.0	Engineer 1 @Design Engineer	Month	450	12	5,400	0.10	4,500	450
9.0	Engineer 2 @ Design Engineer	Month	0	12	0	0.00	4,000	0
10.0	Engineer 3 @ Design Engineer	Month	0	12	0	0.00	4,000	0
11.0	Engineer 4 Desk Officer	Month	1,000	12	12,000	0.25	4,000	1,000
12.0	Draftperson 1	Month	450	12	5,400	0.10	4,500	450
13.0	Draftperson 2	Month	350	12	4,200	0.10	3,500	350
14.0	Admin Finance Cost & Operation Cost	Month	5,000	12	60,000	0.25	20,000	5,000
				Total Expenses	175,800			
				NEW GROSS PROFIT/LOSS	-783,500			

Notes:

CONSULTANT PROFESSIONAL FEES - Project Case 1 @ Irrigation Project: Pahang
CONSTRUCTION STAGE

Project Cost **100,000,000**

Construction Stage Fees **35%** **1,315,650**

Total Actual Cost During Construction Stage **0.99%** **989,100**

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1	Original Professional Fees				1,315,650
2	Original Supervision Period	Month		**36**	
B	**Expenses (As Planned)**				
1	Project Director	Month	1,500	36	54,000
2	Project Manager	Month	3,750	36	135,000
3	Senior Engineer 1 @ Head Designer	Month	0	36	0
4	Senior Engineer 2 @ Irrigation Expert	Month	1,000	36	36,000
5	Senior Engineer 3 @ Civil & Structural	Month	2,000	36	72,000
6	Senior Engineer 4 @ Mechanical	Month	2,000	36	72,000
7	Senior Engineer 5 @ Electrical	Month	2,000	36	72,000
8	Engineer 1 @Design Engineer	Month	450	36	16,200
9	Engineer 2 @ Design Engineer	Month	400	36	14,400
10	Engineer 3 @ Design Engineer	Month	0	36	0
11	Engineer 4 Desk Officer	Month	2,000	36	72,000
12	Draftperson 1	Month	450	36	16,200
13	Draftperson 2	Month	350	36	12,600
14	Admin Finance Cost & Operation Cost	Month	5,000	36	180,000
				Total Expenses	752,400
				GROSS PROFIT	563,250

Distribution Factor	Monthly Salary	Monthly Rates
0.10	15,000	1,500
0.25	15,000	3,750
0.00	15,000	0
0.10	10,000	1,000
0.25	8,000	2,000
0.25	8,000	2,000
0.25	8,000	2,000
0.10	4,500	450
0.10	4,000	400
0.00	4,000	0
0.50	4,000	2,000
0.10	4,500	450
0.10	3,500	350
0.25	20,000	5,000

CONSULTANT PROFESSIONAL FEES - Project Case 1 @ Irrigation Project: Pahang
CONSTRUCTION STAGE

C	Expenses (Project Extended) - DLP	Month		18	
1	Project Director	Month	0	18	0
2	Project Manager	Month	1,500	18	27,000
3	Senior Engineer 1 @ Head Designer	Month	0	18	0
4	Senior Engineer 2 @ Irrigation Expert	Month	1,000	18	18,000
5	Senior Engineer 3 @ Civil & Structural	Month	1,600	18	28,800
6	Senior Engineer 4 @ Mechanical	Month	800	18	14,400
7	Senior Engineer 5 @ Electrical	Month	800	18	14,400
8	Engineer 1 @Design Engineer	Month	450	18	8,100
9	Engineer 2 @ Design Engineer	Month	0	18	0
10	Engineer 3 @ Design Engineer	Month	0	18	0
11	Engineer 4 Desk Officer	Month	2,000	18	36,000
12	Draftperson 1	Month	0	18	0
13	Draftperson 2	Month	0	18	0
14	Admin Finance Cost & Operation Cost	Month	5,000	18	90,000
				Total Expenses	236,700
				NEW GROSS PROFIT/LOSS	326,550

0.00	15,000	0
0.10	15,000	1,500
0.00	15,000	0
0.10	10,000	1,000
0.20	8,000	1,600
0.10	8,000	800
0.10	8,000	800
0.10	4,500	450
0.00	4,000	0
0.00	4,000	0
0.50	4,000	2,000
0.00	4,500	0
0.00	3,500	0
0.25	20,000	5,000

TOTAL COST (Design Stage)	**3,038,900**	**3.04%**
TOTAL COST (Construction Stage)	**989,100**	**0.99%**
TOTAL OVERALL COST	**4,028,000**	**4.03%**
TOTAL FEES	**3,571,050**	**3.57%**
TOTAL PROFIT / LOSS (Upon Completion)	**-456,950**	**-0.46%**

-456,950

CONSULTANT PROFESSIONAL FEES - Project Case 2 @ Flood Mitigation: Perak

DESIGN STAGE

Project Cost		**50,000,000**		
Original Professional Fees	**3.90%**	**1,950,000**	**5% for Tender Stage**	
Design Stage Fees	**60%**	**1,170,000**	**5%**	**97,500**
Estimated Fees (Based on BEM SOF)	**4.25%**	**2,125,000**	**4.04%**	**2,018,750**
Total Actual Cost During Design Stage	**2.67%**	**1,333,825**		
Total Actual Cost (Upon Completion)	**3.94%**	**1,971,775**		

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1.0	Original Professional Fees				**1,170,000**
2.0	Original Design Period	Month		**22**	
B	**Expenses (03/20 -01/22)**				
1.0	Project Director	Month	1,500	22	33,000
2.0	Project Manager	Month	3,750	22	82,500
3.0	Senior Engineer 1 @ Head Designer	Month	7,500	22	165,000
4.0	Senior Engineer 2 @ H&H	Month	5,000	22	110,000
5.0	Senior Engineer 3 @ Civil	Month	2,000	22	44,000
6.0	Senior Engineer 4 @ Mechanical	Month	1,500	22	33,000
7.0	Senior Engineer 5 @ Electrical	Month	1,250	22	27,500
8.0	Senior Engineer 6 @ Structural	Month	1,125	22	24,750
9.0	Senior Engineer 7 @ Geotechnical	Month	1,000	22	22,000
10.0	Engineer 2 @ Costing Engineer	Month	1,000	22	22,000
11.0	Engineer 1 @ Desk Officer	Month	2,000	22	44,000
12.0	Draftperson 1	Month	1,125	22	24,750
13.0	Draftperson 2	Month	875	22	19,250
14.0	Admin Finance Cost & Operation Cost	Month	4,000	22	88,000
				Total Expenses	739,750
				GROSS PROFIT	430,250

Distribution Factor	Monthly Salary	Monthly Rates
0.10	15,000	1,500
0.25	15,000	3,750
0.50	15,000	7,500
0.50	10,000	5,000
0.25	8,000	2,000
0.25	6,000	1,500
0.25	5,000	1,250
0.25	4,500	1,125
0.25	4,000	1,000
0.25	4,000	1,000
0.50	4,000	2,000
0.25	4,500	1,125
0.25	3,500	875
0.20	20,000	4,000

Notes:

CONSULTANT PROFESSIONAL FEES - Project Case 2 @ Flood Mitigation: Perak

DESIGN STAGE

C	**Expenses (EOT 1: 02/22- 12/22)**	Month		11				
1.0	Project Director	Month	3,750	11	41,250	0.25	15,000	3,750
2.0	Project Manager	Month	3,750	11	41,250	0.25	15,000	3,750
3.0	Senior Engineer 1 @ Head Designer	Month	3,750	11	41,250	0.25	15,000	3,750
4.0	Senior Engineer 2 @ H&H	Month	2,500	11	27,500	0.25	10,000	2,500
5.0	Senior Engineer 3 @ Civil	Month	2,000	11	22,000	0.25	8,000	2,000
6.0	Senior Engineer 4 @ Mechanical	Month	1,500	11	16,500	0.25	6,000	1,500
7.0	Senior Engineer 5 @ Electrical	Month	1,250	11	13,750	0.25	5,000	1,250
8.0	Senior Engineer 6 @ Structural	Month	1,125	11	12,375	0.25	4,500	1,125
9.0	Senior Engineer 7 @ Geotechnical	Month	1,000	11	11,000	0.25	4,000	1,000
10.0	Engineer 2 @ Costing Engineer	Month	1,000	11	11,000	0.25	4,000	1,000
11.0	Engineer 1 @ Desk Officer	Month	2,000	11	22,000	0.50	4,000	2,000
12.0	Draftperson 1	Month	1,125	11	12,375	0.25	4,500	1,125
13.0	Draftperson 2	Month	875	11	9,625	0.25	3,500	875
14.0	Admin Finance Cost & Operation Cost	Month	4,000	11	44,000	0.20	20,000	4,000
					Total Expenses			
					325,875			
					NEW GROSS PROFIT/LOSS			
					104,375			

Notes:

C	**Expenses (EOT 2: 01/23 -12/23)**	Month		12				
1.0	Project Director	Month	750	12	9,000	0.05	15,000	750
2.0	Project Manager	Month	1,500	12	18,000	0.10	15,000	1,500
3.0	Senior Engineer 1 @ Head Designer	Month	1,500	12	18,000	0.10	15,000	1,500
4.0	Senior Engineer 2 @ H&H	Month	1,000	12	12,000	0.10	10,000	1,000
5.0	Senior Engineer 3 @ Civil	Month	800	12	9,600	0.10	8,000	800
6.0	Senior Engineer 4 @ Mechanical	Month	600	12	7,200	0.10	6,000	600
7.0	Senior Engineer 5 @ Electrical	Month	500	12	6,000	0.10	5,000	500
8.0	Senior Engineer 6 @ Structural	Month	450	12	5,400	0.10	4,500	450
9.0	Senior Engineer 7 @ Geotechnical	Month	400	12	4,800	0.10	4,000	400
10.0	Engineer 2 @ Costing Engineer	Month	400	12	4,800	0.10	4,000	400
11.0	Engineer 1 @ Desk Officer	Month	400	12	4,800	0.10	4,000	400
12.0	Draftperson 1	Month	450	12	5,400	0.10	4,500	450
13.0	Draftperson 2	Month	350	12	4,200	0.10	3,500	350
14.0	Admin Finance Cost & Operation Cost	Month	4,000	12	48,000	0.20	20,000	4,000
					Total Expenses			
					157,200			
					NEW GROSS PROFIT/LOSS			
					-52,825			

Notes:

CONSULTANT PROFESSIONAL FEES - Project Case 2 @ Flood Mitigation: Perak

DESIGN STAGE

C	Expenses (EOT 3: 01/24 -10/24)	Month		10	
1.0	Project Director	Month	750	10	7,500
2.0	Project Manager	Month	1,500	10	15,000
3.0	Senior Engineer 1 @ Head Designer	Month	1,500	10	15,000
4.0	Senior Engineer 2 @ H&H	Month	1,000	10	10,000
5.0	Senior Engineer 3 @ Civil	Month	800	10	8,000
6.0	Senior Engineer 4 @ Mechanical	Month	600	10	6,000
7.0	Senior Engineer 5 @ Electrical	Month	500	10	5,000
8.0	Senior Engineer 6 @ Structural	Month	450	10	4,500
9.0	Senior Engineer 7 @ Geotechnical	Month	400	10	4,000
10.0	Engineer 2 @ Costing Engineer	Month	400	10	4,000
11.0	Engineer 1 @ Desk Officer	Month	400	10	4,000
12.0	Draftperson 1	Month	450	10	4,500
13.0	Draftperson 2	Month	350	10	3,500
14.0	Admin Finance Cost & Operation Cost	Month	2,000	10	20,000
				Total Expenses	111,000
				NEW GROSS PROFIT/LOSS	-163,825

Notes:

0.05	15,000	750
0.10	15,000	1,500
0.10	15,000	1,500
0.10	10,000	1,000
0.10	8,000	800
0.10	6,000	600
0.10	5,000	500
0.10	4,500	450
0.10	4,000	400
0.10	4,000	400
0.10	4,000	400
0.10	4,500	450
0.10	3,500	350
0.10	20,000	2,000

CONSULTANT PROFESSIONAL FEES - Project Case 2 @ Flood Mitigation: Perak

CONSTRUCTION STAGE

Project Cost **50,000,000**

Construction Stage Fees **35%** **682,500**

Total Actual Cost During Construction Stage **1.28%** **637,950**

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1	Original Professional Fees				**682,500**
2	Original Supervision Period	Month		**30**	
B	**Expenses (As Planned)**				
1	Project Director	Month	1,500	30	45,000
2	Project Manager	Month	3,750	30	112,500
3	Senior Engineer 1 @ Head Designer	Month	0	30	0
4	Senior Engineer 2 @ H&H	Month	1,000	30	30,000
5	Senior Engineer 3 @ Civil	Month	2,000	30	60,000
6	Senior Engineer 4 @ Mechanical	Month	1,500	30	45,000
7	Senior Engineer 5 @ Electrical	Month	1,250	30	37,500
8	Senior Engineer 6 @ Structural	Month	1,125	30	33,750
9	Senior Engineer 7 @ Geotechnical	Month	1,000	30	30,000
10	Engineer 2 @ Costing Engineer	Month	1,000	30	30,000
11	Engineer 1 @ Desk Officer	Month	2,000	30	60,000
12	Draftperson 1	Month	450	30	13,500
13	Draftperson 2	Month	350	30	10,500
14	Admin Finance Cost & Operation Cost	Month	2,000	30	60,000
				Total Expenses	567,750
				GROSS PROFIT	114,750

Distribution Factor	Monthly Salary	Monthly Rates
0.10	15,000	1,500
0.25	15,000	3,750
0.00	15,000	0
0.10	10,000	1,000
0.25	8,000	2,000
0.25	6,000	1,500
0.25	5,000	1,250
0.25	4,500	1,125
0.25	4,000	1,000
0.25	4,000	1,000
0.50	4,000	2,000
0.10	4,500	450
0.10	3,500	350
0.10	20,000	2,000

CONSULTANT PROFESSIONAL FEES - Project Case 2 @ Flood Mitigation: Perak

CONSTRUCTION STAGE

C	Expenses (Project Extended) - DLP	Month		12	
1	Project Director	Month	0	12	0
2	Project Manager	Month	1,500	12	18,000
3	Senior Engineer 1 @ Head Designer	Month	0	12	0
4	Senior Engineer 2 @ H&H	Month	0	12	0
5	Senior Engineer 3 @ Civil	Month	800	12	9,600
6	Senior Engineer 4 @ Mechanical	Month	600	12	7,200
7	Senior Engineer 5 @ Electrical	Month	500	12	6,000
8	Senior Engineer 6 @ Structural	Month	450	12	5,400
9	Senior Engineer 7 @ Geotechnical	Month	0	12	0
10	Engineer 2 @ Costing Engineer	Month	0	12	0
11	Engineer 1 @ Desk Officer	Month	2,000	12	24,000
12	Draftperson 1	Month	0	12	0
13	Draftperson 2	Month	0	12	0
14	Admin Finance Cost & Operation Cost	Month	0	12	0
				Total Expenses	70,200
				NEW GROSS PROFIT/LOSS	44,550

0.00	15,000	0
0.10	15,000	1,500
0.00	15,000	0
0.00	10,000	0
0.10	8,000	800
0.10	6,000	600
0.10	5,000	500
0.10	4,500	450
0.00	4,000	0
0.00	4,000	0
0.50	4,000	2,000
0.00	4,500	0
0.00	3,500	0
0.00	20,000	0

TOTAL COST (Design Stage)	**1,333,825**	**2.67%**
TOTAL COST (Construction Stage)	**637,950**	**1.28%**
TOTAL OVERALL COST	**1,971,775**	**3.94%**
TOTAL FEES	**1,852,500**	**3.71%**
TOTAL PROFIT / LOSS (Upon Completion)	**-119,275**	**-0.24%**

-119,275

CONSULTANT PROFESSIONAL FEES - Project Case 3 @ Drainage Project : Terengganu
DESIGN STAGE

Project Cost		**50,000,000**		
Original Professional Fees	**3.55%**	**1,775,000**	**5% for Tender Stage**	
Design Stage Fees	**60%**	**1,065,000**	**5%**	**88,750**
Estimated Fees (Based on BEM SOF)	**4.25%**	**2,125,000**	**4.04%**	**2,018,750**
Total Actual Cost During Design Stage	**4.19%**	**2,097,225**		
Total Actual Cost (Upon Completion)	**5.40%**	**2,698,725**		

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1.0	Original Professional Fees				1,065,000
2.0	Original Design Period	Month		**12**	
B	**Expenses (04/15 - 01/16)**				
1.0	Project Director	Month	1,500	12	18,000
2.0	Project Manager	Month	7,500	12	90,000
3.0	Senior Engineer 1 @ Head Designer	Month	7,500	12	90,000
4.0	Senior Engineer 2 @ H&H	Month	5,000	12	60,000
5.0	Senior Engineer 3 @ Civil & Structural	Month	4,000	12	48,000
6.0	Senior Engineer 4 @ Mechanical	Month	1,250	12	15,000
7.0	Senior Engineer 5 @ Electrical	Month	1,250	12	15,000
8.0	Engineer 1 Road Safety Audit	Month	1,125	12	13,500
9.0	Engineer 2 Desk Officer	Month	1,750	12	21,000
10.0	Engineer 3	Month	1,000	12	12,000
11.0	Engineer 4	Month	1,000	12	12,000
12.0	Draftperson 1	Month	1,125	12	13,500
13.0	Draftperson 2	Month	875	12	10,500
14.0	Admin Finance Cost & Operation Cost	Month	5,000	12	60,000
				Total Expenses	478,500
				GROSS PROFIT	586,500

Distribution Factor	Monthly Salary	Monthly Rates
0.10	15,000	1,500
0.50	15,000	7,500
0.50	15,000	7,500
0.50	10,000	5,000
0.50	8,000	4,000
0.25	5,000	1,250
0.25	5,000	1,250
0.25	4,500	1,125
0.50	3,500	1,750
0.25	4,000	1,000
0.25	4,000	1,000
0.25	4,500	1,125
0.25	3,500	875
0.25	20,000	5,000

Notes:

CONSULTANT PROFESSIONAL FEES - Project Case 3 @ Drainage Project : Terengganu
DESIGN STAGE

C	**Expenses (EOT 1: 01/16-12/17)**	Month		24	
1.0	Project Director	Month	1,500	24	36,000
2.0	Project Manager	Month	3,750	24	90,000
3.0	Senior Engineer 1 @ Head Designer	Month	3,750	24	90,000
4.0	Senior Engineer 2 @ H&H	Month	2,500	24	60,000
5.0	Senior Engineer 3 @ Civil & Structural	Month	2,000	24	48,000
6.0	Senior Engineer 4 @ Mechanical	Month	1,250	24	30,000
7.0	Senior Engineer 5 @ Electrical	Month	1,250	24	30,000
8.0	Engineer 1 Road Safety Audit	Month	2,000	24	48,000
9.0	Engineer 2 Desk Officer	Month	875	24	21,000
10.0	Engineer 3	Month	1,000	24	24,000
11.0	Engineer 4	Month	1,000	24	24,000
12.0	Draftperson 1	Month	1,125	24	27,000
13.0	Draftperson 2	Month	875	24	21,000
14.0	Admin Finance Cost & Operation Cost	Month	5,000	24	120,000
				Total Expenses	669,000
				NEW GROSS PROFIT/LOSS	-82,500

Notes:

0.10	15,000	1,500
0.25	15,000	3,750
0.25	15,000	3,750
0.25	10,000	2,500
0.25	8,000	2,000
0.25	5,000	1,250
0.25	5,000	1,250
0.25	8,000	2,000
0.25	3,500	875
0.25	4,000	1,000
0.25	4,000	1,000
0.25	4,500	1,125
0.25	3,500	875
0.25	20,000	5,000

C	**Expenses (EOT 2: 1/17 - 12/21)**	Month		60	
1.0	Project Director	Month	1,500	60	90,000
2.0	Project Manager	Month	1,500	60	90,000
3.0	Senior Engineer 1 @ Head Designer	Month	1,500	60	90,000
4.0	Senior Engineer 2 @ H&H	Month	1,000	60	60,000
5.0	Senior Engineer 3 @ Civil & Structural	Month	800	60	48,000
6.0	Senior Engineer 4 @ Mechanical	Month	500	60	30,000
7.0	Senior Engineer 5 @ Electrical	Month	500	60	30,000
8.0	Engineer 1 Road Safety Audit	Month	800	60	48,000
9.0	Engineer 2 Desk Officer	Month	350	60	21,000
10.0	Engineer 3	Month	400	60	24,000
11.0	Engineer 4	Month	400	60	24,000
12.0	Draftperson 1	Month	450	60	27,000
13.0	Draftperson 2	Month	350	60	21,000
14.0	Admin Finance Cost & Operation Cost	Month	5,000	60	300,000
				Total Expenses	903,000
				NEW GROSS PROFIT/LOSS	-985,500

Notes:

0.10	15,000	1,500
0.10	15,000	1,500
0.10	15,000	1,500
0.10	10,000	1,000
0.10	8,000	800
0.10	5,000	500
0.10	5,000	500
0.10	8,000	800
0.10	3,500	350
0.10	4,000	400
0.10	4,000	400
0.10	4,500	450
0.10	3,500	350
0.25	20,000	5,000

CONSULTANT PROFESSIONAL FEES - Project Case 3 @ Drainage Project : Terengganu
DESIGN STAGE

C	Expenses (EOT 3:1/22-3/22)	Month		3	
1.0	Project Director	Month	1,500	3	4,500
2.0	Project Manager	Month	1,500	3	4,500
3.0	Senior Engineer 1 @ Head Designer	Month	1,500	3	4,500
4.0	Senior Engineer 2 @ H&H	Month	1,000	3	3,000
5.0	Senior Engineer 3 @ Civil & Structural	Month	800	3	2,400
6.0	Senior Engineer 4 @ Mechanical	Month	500	3	1,500
7.0	Senior Engineer 5 @ Electrical	Month	500	3	1,500
8.0	Engineer 1 Road Safety Audit	Month	800	3	2,400
9.0	Engineer 2 Desk Officer	Month	875	3	2,625
10.0	Engineer 3	Month	400	3	1,200
11.0	Engineer 4	Month	400	3	1,200
12.0	Draftperson 1	Month	450	3	1,350
13.0	Draftperson 2	Month	350	3	1,050
14.0	Admin Finance Cost & Operation Cost	Month	5,000	3	15,000
				Total Expenses	46,725
				NEW GROSS PROFIT/LOSS	-1,032,225

Notes:

0.10	15,000	1,500
0.10	15,000	1,500
0.10	15,000	1,500
0.10	10,000	1,000
0.10	8,000	800
0.10	5,000	500
0.10	5,000	500
0.10	8,000	800
0.25	3,500	875
0.10	4,000	400
0.10	4,000	400
0.10	4,500	450
0.10	3,500	350
0.25	20,000	5,000

CONSULTANT PROFESSIONAL FEES - Project Case 3 @ Drainage Project : Terengganu
CONSTRUCTION STAGE

Project Cost **50,000,000**

Construction Stage Fees **35%** **621,250**

Total Actual Cost During Construction Stage **1.20%** **601,500**

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1	Original Professional Fees				621,250
2	Original Supervision Period	Month		**36**	
B	**Expenses (3/22 - 3/25)**				
1	Project Director	Month	1,500	36	54,000
2	Project Manager	Month	1,500	36	54,000
3	Senior Engineer 1 @ Head Designer	Month	1,500	36	54,000
4	Senior Engineer 2 @ H&H	Month	1,000	36	36,000
5	Senior Engineer 3 @ Civil & Structural	Month	800	36	28,800
6	Senior Engineer 4 @ Mechanical	Month	500	36	18,000
7	Senior Engineer 5 @ Electrical	Month	500	36	18,000
8	Engineer 1 Road Safety Audit	Month	450	36	16,200
9	Engineer 2 Desk Officer	Month	875	36	31,500
10	Engineer 3	Month	0	36	0
11	Engineer 4	Month	0	36	0
12	Draftperson 1	Month	450	36	16,200
13	Draftperson 2	Month	350	36	12,600
14	Admin Finance Cost & Operation Cost	Month	5,000	36	180,000
				Total Expenses	519,300
				GROSS PROFIT	101,950

Distribution Factor	Monthly Salary	Monthly Rates
0.10	15,000	1,500
0.10	15,000	1,500
0.10	15,000	1,500
0.10	10,000	1,000
0.10	8,000	800
0.10	5,000	500
0.10	5,000	500
0.10	4,500	450
0.25	3,500	875
0.00	4,000	0
0.00	4,000	0
0.10	4,500	450
0.10	3,500	350
0.25	20,000	5,000

CONSULTANT PROFESSIONAL FEES - Project Case 3 @ Drainage Project : Terengganu
CONSTRUCTION STAGE

C	**Expenses (Project Extended) - DLP**	Month		12	
1	Project Director	Month	0	12	0
2	Project Manager	Month	1,500	12	18,000
3	Senior Engineer 1 @ Head Designer	Month	0	12	0
4	Senior Engineer 2 @ H&H	Month	0	12	0
5	Senior Engineer 3 @ Civil & Structural	Month	0	12	0
6	Senior Engineer 4 @ Mechanical	Month	0	12	0
7	Senior Engineer 5 @ Electrical	Month	0	12	0
8	Engineer 1 Road Safety Audit	Month	0	12	0
9	Engineer 2 Desk Officer	Month	350	12	4,200
10	Engineer 3	Month	0	12	0
11	Engineer 4	Month	0	12	0
12	Draftperson 1	Month	0	12	0
13	Draftperson 2	Month	0	12	0
14	Admin Finance Cost & Operation Cost	Month	5,000	12	60,000
				Total Expenses	82,200
				NEW GROSS PROFIT/LOSS	19,750

0.00	15,000	0
0.10	15,000	1,500
0.00	15,000	0
0.00	10,000	0
0.00	8,000	0
0.00	5,000	0
0.00	5,000	0
0.00	8,000	0
0.10	3,500	350
0.00	4,000	0
0.00	4,000	0
0.00	4,500	0
0.00	3,500	0
0.25	20,000	5,000

TOTAL COST (Design Stage)	**2,097,225**	**4.19%**
TOTAL COST (Construction Stage)	**601,500**	**1.20%**
TOTAL OVERALL COST	**2,698,725**	**5.40%**
TOTAL FEES	**1,686,250**	**3.37%**
TOTAL PROFIT / LOSS (Upon Completion)	**-1,012,475**	**-2.02%**

-1,012,475

CONSULTANT PROFESSIONAL FEES - Project Case 4: River Mouth Project @ Terengganu
DESIGN STAGE

Project Cost		**25,000,000**		
Original Professional Fees	**3.96%**	**990,000**	**5% for Tender Stage**	
Design Stage Fees	**60%**	**594,000**	**5%**	**49,500**
Estimated Fees (Based on BEM SOF)	**4.50%**	**1,125,000**	**4.28%**	**1,068,750**
Total Actual Cost During Design Stage	**1.95%**	**488,325**		
Total Actual Cost (Upon Completion)	**3.70%**	**924,875**		

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1.0	Original Professional Fees				594,000
2.0	Original Design Period	Month		**12**	
B	**Expenses (09/21-08/22)**				
1.0	Project Director	Month	1,500	12	18,000
2.0	Project Manager	Month	3,750	12	45,000
3.0	Senior Engineer 1 @ Head Designer	Month	3,750	12	45,000
4.0	Senior Engineer 2 @ Modeller	Month	2,500	12	30,000
5.0	Senior Engineer 3 @ Civil & Structural	Month	2,000	12	24,000
6.0	Senior Engineer 4 @ H & H	Month	1,500	12	18,000
7.0	Senior Engineer 5 @ Enviromental	Month	1,250	12	15,000
8.0	Engineer 1 @ Desk Officer	Month	2,250	12	27,000
9.0	Engineer 2	Month	0	12	0
10.0	Engineer 3	Month	0	12	0
11.0	Engineer 4	Month	0	12	0
12.0	Draftperson 1	Month	1,125	12	13,500
13.0	Draftperson 2	Month	875	12	10,500
14.0	Admin Finance Cost & Operation Cost	Month	5,000	12	60,000
				Total Expenses	306,000
				GROSS PROFIT	288,000

Distribution Factor	Monthly Salary	Monthly Rates
0.10	15,000	1,500
0.25	15,000	3,750
0.25	15,000	3,750
0.25	10,000	2,500
0.25	8,000	2,000
0.25	6,000	1,500
0.25	5,000	1,250
0.50	4,500	2,250
0.00	4,000	0
0.00	4,000	0
0.00	4,000	0
0.25	4,500	1,125
0.25	3,500	875
0.25	20,000	5,000

Notes:

CONSULTANT PROFESSIONAL FEES - Project Case 4: River Mouth Project @ Terengganu
DESIGN STAGE

C	**Expenses (EOT 1: 09/22 -7/23)**	Month		**11**	
1.0	Project Director	Month	1,500	11	16,500
2.0	Project Manager	Month	3,750	11	41,250
3.0	Senior Engineer 1 @ Head Designer	Month	1,500	11	16,500
4.0	Senior Engineer 2 @ Modeller	Month	0	11	0
5.0	Senior Engineer 3 @ Civil & Structural	Month	800	11	8,800
6.0	Senior Engineer 4 @ H & H	Month	600	11	6,600
7.0	Senior Engineer 5 @ Enviromental	Month	500	11	5,500
8.0	Engineer 1 @ Desk Officer	Month	1,125	11	12,375
9.0	Engineer 2	Month	1,000	11	11,000
10.0	Engineer 3	Month	0	11	0
11.0	Engineer 4	Month	0	11	0
12.0	Draftperson 1	Month	450	11	4,950
13.0	Draftperson 2	Month	350	11	3,850
14.0	Admin Finance Cost & Operation Cost	Month	5,000	11	55,000
				Total Expenses	182,325
				NEW GROSS PROFIT/LOSS	105,675

Notes:

0.10	15,000	1,500
0.25	15,000	3,750
0.10	15,000	1,500
0.00	10,000	0
0.10	8,000	800
0.10	6,000	600
0.10	5,000	500
0.25	4,500	1,125
0.25	4,000	1,000
0.00	4,000	0
0.00	4,000	0
0.10	4,500	450
0.10	3,500	350
0.25	20,000	5,000

CONSULTANT PROFESSIONAL FEES - Project Case 4: River Mouth Project @ Terengganu
CONSTRUCTION STAGE

Project Cost **25,000,000**

Construction Stage Fees **35%** **346,500**

Total Actual Cost During Construction Stage **1.75%** **436,550**

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1	Original Professional Fees				346,500
2	Original Supervision Period	Month		16	
B	**Expenses (As Planned)**				
1	Project Director	Month	1,500	16	24,000
2	Project Manager	Month	3,750	16	60,000
3	Senior Engineer 1 @ Head Designer	Month	3,750	16	60,000
4	Senior Engineer 2 @ Modeller	Month	0	16	0
5	Senior Engineer 3 @ Civil & Structural	Month	800	16	12,800
6	Senior Engineer 4 @ H & H	Month	600	16	9,600
7	Senior Engineer 5 @ Enviromental	Month	500	16	8,000
8	Engineer 1 @ Desk Officer	Month	1,125	16	18,000
9	Engineer 2	Month	0	16	0
10	Engineer 3	Month	0	16	0
11	Engineer 4	Month	0	16	0
12	Draftperson 1	Month	450	16	7,200
13	Draftperson 2	Month	350	16	5,600
14	Admin Finance Cost & Operation Cost	Month	5,000	16	80,000
				Total Expenses	285,200
				GROSS PROFIT	61,300

Distribution Factor	Monthly Salary	Monthly Rates
0.10	15,000	1,500
0.25	15,000	3,750
0.25	15,000	3,750
0.00	10,000	0
0.10	8,000	800
0.10	6,000	600
0.10	5,000	500
0.25	4,500	1,125
0.00	4,000	0
0.00	4,000	0
0.00	4,000	0
0.10	4,500	450
0.10	3,500	350
0.25	20,000	5,000

CONSULTANT PROFESSIONAL FEES - Project Case 4: River Mouth Project @ Terengganu
CONSTRUCTION STAGE

C	**Expenses (EOT1)**	Month		3	
1	Project Director	Month	1,500	3	4,500
2	Project Manager	Month	3,750	3	11,250
3	Senior Engineer 1 @ Head Designer	Month	3,750	3	11,250
4	Senior Engineer 2 @ Modeller	Month	1,000	3	3,000
5	Senior Engineer 3 @ Civil & Structural	Month	800	3	2,400
6	Senior Engineer 4 @ H & H	Month	600	3	1,800
7	Senior Engineer 5 @ Enviromental	Month	500	3	1,500
8	Engineer 1 @ Desk Officer	Month	2,250	3	6,750
9	Engineer 2	Month	0	3	0
10	Engineer 3	Month	0	3	0
11	Engineer 4	Month	0	3	0
12	Draftperson 1	Month	450	3	1,350
13	Draftperson 2	Month	350	3	1,050
14	Admin Finance Cost & Operation Cost	Month	5,000	3	15,000
				Total Expenses	59,850
				NEW GROSS PROFIT/LOSS	1,450

0.10	15,000	1,500
0.25	15,000	3,750
0.25	15,000	3,750
0.10	10,000	1,000
0.10	8,000	800
0.10	6,000	600
0.10	5,000	500
0.50	4,500	2,250
0.00	4,000	0
0.00	4,000	0
0.00	4,000	0
0.10	4,500	450
0.10	3,500	350
0.25	20,000	5,000

CONSULTANT PROFESSIONAL FEES - Project Case 4: River Mouth Project @ Terengganu
CONSTRUCTION STAGE

C	Expenses (Project Extended) - DLP	Month		12	
1	Project Director	Month	0	12	0
2	Project Manager	Month	1,500	12	18,000
3	Senior Engineer 1 @ Head Designer	Month	0	12	0
4	Senior Engineer 2 @ Modeller	Month	0	12	0
5	Senior Engineer 3 @ Civil & Structural	Month	0	12	0
6	Senior Engineer 4 @ H & H	Month	0	12	0
7	Senior Engineer 5 @ Enviromental	Month	0	12	0
8	Engineer 1 @ Desk Officer	Month	1,125	12	13,500
9	Engineer 2	Month	0	12	0
10	Engineer 3	Month	0	12	0
11	Engineer 4	Month	0	12	0
12	Draftperson 1	Month	0	12	0
13	Draftperson 2	Month	0	12	0
14	Admin Finance Cost & Operation Cost	Month	5,000	12	60,000
				Total Expenses	91,500
				NEW GROSS PROFIT/LOSS	-90,050

0.00	15,000	0
0.10	15,000	1,500
0.00	15,000	0
0.00	10,000	0
0.00	8,000	0
0.00	6,000	0
0.00	5,000	0
0.25	4,500	1,125
0.00	4,000	0
0.00	4,000	0
0.00	4,000	0
0.00	4,500	0
0.00	3,500	0
0.25	20,000	5,000

TOTAL COST (Design Stage)	**488,325**	**1.95%**
TOTAL COST (Construction Stage)	**436,550**	**1.75%**
TOTAL OVERALL COST	**924,875**	**3.70%**
TOTAL FEES	**940,500**	**3.76%**
TOTAL PROFIT / LOSS (Upon Completion)	**15,625**	**0.06%**

15,625

CONSULTANT PROFESSIONAL FEES - Project Case 5 @ School Hostel: Selangor
DESIGN STAGE

Project Cost		**25,000,000**		
Original Professional Fees (revised:RM425,000-00)	**case 4**	**540,000**	**5% for Tender Stage**	
Design Stage Fees	**60%**	**324,000**	**5%**	**27,000**
Estimated Fees (Based on BEM SOF)	**4.65%**	**1,162,500**	**4.42%**	**1,104,375**
Total Actual Cost During Design Stage	**1.06%**	**266,000**		
Total Actual Cost (Upon Completion)	**3.44%**	**860,675**		

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT	Distribution Factor	Monthly Salary	Monthly Rates
A	**Revenue**							
1.0	Original Professional Fees				324,000			
2.0	Original Design Period	Month		**14**				
B	**Expenses (04/20 - 06/21)**							
1.0	Project Director	Month	0	14	0	0.00	15,000	0
2.0	Project Manager	Month	3,750	14	52,500	0.25	15,000	3,750
3.0	Senior Engineer 1 @ Head Designer	Month	0	14	0	0.00	15,000	0
4.0	Senior Engineer @ Infra	Month	2,000	14	28,000	0.25	8,000	2,000
5.0	Senior Engineer 3 @ Structural	Month	2,000	14	28,000	0.25	8,000	2,000
6.0	Senior Engineer 4 @ Mechanical	Month	0	14	0	0.00	6,000	0
7.0	Senior Engineer 5 @ Electrical	Month	0	14	0	0.00	5,000	0
8.0	Engineer 2 : C&S	Month	2,250	14	31,500	0.50	4,500	2,250
9.0	Engineer 3 Desk Officer	Month	2,000	14	28,000	0.50	4,000	2,000
10.0	Engineer 4	Month	0	14	0	0.00	4,000	0
11.0	Engineer 5	Month	0	14	0	0.00	4,000	0
12.0	Draftperson 1	Month	1,125	14	15,750	0.25	4,500	1,125
13.0	Draftperson 2	Month	875	14	12,250	0.25	3,500	875
14.0	Admin Finance Cost & Operation Cost	Month	5,000	14	70,000	0.25	20,000	5,000
				Total Expenses	266,000			
				GROSS PROFIT	58,000			

Notes:

CONSULTANT PROFESSIONAL FEES - Project Case 5 @ School Hostel: Selangor
CONSTRUCTION STAGE

Project Cost **25,000,000**

Construction Stage Fees **35%** **189,000**

Total Actual Cost During Construction Stage **2.38%** **594,675**

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1	Original Professional Fees				189,000
2	Original Supervision Period	Month		**26**	
B	**Expenses (06/21-05/23)**				
1	Project Director	Month	0	26	0
2	Project Manager	Month	1,500	26	39,000
3	Senior Engineer 1 @ Head Designer	Month	0	26	0
4	Senior Engineer @ Infra	Month	0	26	0
5	Senior Engineer 3 @ Structural	Month	2,000	26	52,000
6	Senior Engineer 4 @ Mechanical	Month	0	26	0
7	Senior Engineer 5 @ Electrical	Month	0	26	0
8	Engineer 2 : C&S	Month	0	26	0
9	Engineer 3 Desk Officer	Month	1,000	26	26,000
10	Engineer 4	Month	0	26	0
11	Engineer 5	Month	0	26	0
12	Draftperson 1	Month	1,125	26	29,250
13	Draftperson 2	Month	0	26	0
14	Admin Finance Cost & Operation Cost	Month	5,000	26	130,000
				Total Expenses	276,250
				GROSS PROFIT	-87,250

Notes:

Distribution Factor	Monthly Salary	Monthly Rates
0.00	15,000	0
0.10	15,000	1,500
0.00	15,000	0
0.00	8,000	0
0.25	8,000	2,000
0.00	6,000	0
0.00	5,000	0
0.00	4,500	0
0.25	4,000	1,000
0.00	4,000	0
0.00	4,000	0
0.25	4,500	1,125
0.00	3,500	0
0.25	20,000	5,000

CONSULTANT PROFESSIONAL FEES - Project Case 5 @ School Hostel: Selangor
CONSTRUCTION STAGE

C	**Expenses (EOT1: 06/23 -12/23)**	Month		7				
1	Project Director	Month	0	7	0	0.00	15,000	0
2	Project Manager	Month	3,750	7	26,250	0.25	15,000	3,750
3	Senior Engineer 1 @ Head Designer	Month	0	7	0	0.00	15,000	0
4	Senior Engineer @ Infra	Month	1,600	7	11,200	0.20	8,000	1,600
5	Senior Engineer 3 @ Structural	Month	0	7	0	0.00	8,000	0
6	Senior Engineer 4 @ Mechanical	Month	0	7	0	0.00	6,000	0
7	Senior Engineer 5 @ Electrical	Month	1,000	7	7,000	0.20	5,000	1,000
8	Engineer 2 : C&S	Month	0	7	0	0.00	4,500	0
9	Engineer 3 Desk Officer	Month	1,000	7	7,000	0.25	4,000	1,000
10	Engineer 4	Month	0	7	0	0.00	4,000	0
11	Engineer 5	Month	0	7	0	0.00	4,000	0
12	Draftperson 1	Month	1,125	7	7,875	0.25	4,500	1,125
13	Draftperson 2	Month	0	7	0	0.00	3,500	0
14	Admin Finance Cost & Operation Cost	Month	5,000	7	35,000	0.25	20,000	5,000
				Total Expenses	94,325			
				NEW GROSS PROFIT/LOSS	-181,575			

C	**Expenses (EOT2: 01/24 -12/24)**	Month		12				
1	Project Director	Month	0	12	0	0.00	15,000	0
2	Project Manager	Month	3,750	12	45,000	0.25	15,000	3,750
3	Senior Engineer 1 @ Head Designer	Month	0	12	0	0.00	15,000	0
4	Senior Engineer @ Infra	Month	0	12	0	0.00	8,000	0
5	Senior Engineer 3 @ Structural	Month	0	12	0	0.00	8,000	0
6	Senior Engineer 4 @ Mechanical	Month	0	12	0	0.00	6,000	0
7	Senior Engineer 5 @ Electrical	Month	0	12	0	0.00	5,000	0
8	Engineer 2 : C&S	Month	0	12	0	0.00	4,500	0
9	Engineer 3 Desk Officer	Month	1,000	12	12,000	0.25	4,000	1,000
10	Engineer 4	Month	0	12	0	0.00	4,000	0
11	Engineer 5	Month	1,000	12	12,000	0.25	4,000	1,000
12	Draftperson 1	Month	1,125	12	13,500	0.25	4,500	1,125
13	Draftperson 2	Month	0	12	0	0.00	3,500	0
14	Admin Finance Cost & Operation Cost	Month	5,000	12	60,000	0.25	20,000	5,000
				Total Expenses	142,500			
				NEW GROSS PROFIT/LOSS	-324,075			

CONSULTANT PROFESSIONAL FEES - Project Case 5 @ School Hostel: Selangor
CONSTRUCTION STAGE

C	**Expenses (DLP)**	Month		12				
1	Project Director	Month	0	12	0	0.00	15,000	0
2	Project Manager	Month	0	12	0	0.00	15,000	0
3	Senior Engineer 1 @ Head Designer	Month	0	12	0	0.00	15,000	0
4	Senior Engineer @ Infra	Month	0	12	0	0.00	8,000	0
5	Senior Engineer 3 @ Structural	Month	800	12	9,600	0.10	8,000	800
6	Senior Engineer 4 @ Mechanical	Month	0	12	0	0.00	6,000	0
7	Senior Engineer 5 @ Electrical	Month	0	12	0	0.00	5,000	0
8	Engineer 2 : C&S	Month	0	12	0	0.00	4,500	0
9	Engineer 3 Desk Officer	Month	1,000	12	12,000	0.25	4,000	1,000
10	Engineer 4	Month	0	12	0	0.00	4,000	0
11	Engineer 5	Month	0	12	0	0.00	4,000	0
12	Draftperson 1	Month	0	12	0	0.00	4,500	0
13	Draftperson 2	Month	0	12	0	0.00	3,500	0
14	Admin Finance Cost & Operation Cost	Month	5,000	12	60,000	0.25	20,000	5,000
				Total Expenses	81,600			
				NEW GROSS PROFIT/LOSS	-405,675			

TOTAL COST (Design Stage)	**266,000**	**1.06%**
TOTAL COST (Construction Stage)	**594,675**	**2.38%**
TOTAL OVERALL COST	**860,675**	**3.44%**
TOTAL FEES	**513,000**	**2.05%**
TOTAL PROFIT / LOSS (Upon Completion)	**-347,675**	**-1.39%**

-347,675

CONSULTANT PROFESSIONAL FEES - Project Case 6 @ Drainage Project: Selangor
DESIGN STAGE

Project Cost		7,500,000		
Original Fees Agreed (New SOF:581,250@7.75%)	4.04%	303,000	5% for Tender Stage	
Design Stage Fees	60%	181,800	5%	15,150
Estimated Fees (Based on BEM SOF)	5.25%	393,750	4.99%	374,063
Total Actual Cost During Design Stage	5.76%	431,860		
Total Actual Cost (Upon Completion)	7.69%	576,860		

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1.0	Original Professional Fees				181,800
2.0	Original Design Period	Month		9	
B	**Expenses (07/22 - 03/23)**				
1.0	Project Director	Month	0	9	0
2.0	Project Manager	Month	3,750	9	33,750
3.0	Hydrologist	Month	1,000	9	9,000
4.0	Hydraulic Specialist	Month	1,000	9	9,000
5.0	Mechanical & Electrical Engineer	Month	3,000	9	27,000
6.0	Quantity Surveyor	Month	1,250	9	11,250
7.0	Structural Design Engineer	Month	1,250	9	11,250
8.0	Geotechnical Engineer	Month	1,000	9	9,000
9.0	GIS Specialist	Month	800	9	7,200
10.0	Engineer 1 @ Desk Officer	Month	1,000	9	9,000
11.0	Engineer 2@Civil Engineer	Month	750	9	6,750
12.0	Draftperson 1	Month	2,250	9	20,250
13.0	Draftperson 2	Month	0	9	0
14.0	Admin Finance Cost & Operation Cost	Month	4,000	9	36,000
				Total Expenses	189,450
				GROSS PROFIT	-7,650

Notes:

Distribution Factor	Monthly Salary	Monthly Rates
0.00	15,000	0
0.25	15,000	3,750
0.10	10,000	1,000
0.10	10,000	1,000
0.50	6,000	3,000
0.25	5,000	1,250
0.25	5,000	1,250
0.25	4,000	1,000
0.20	4,000	800
0.25	4,000	1,000
0.25	3,000	750
0.50	4,500	2,250
0.00	3,500	0
0.20	20,000	4,000

CONSULTANT PROFESSIONAL FEES - Project Case 6 @ Drainage Project: Selangor
DESIGN STAGE

C	**Expenses (EOT1: 04/23 - 12/23)**	Month		9	
1.0	Project Director	Month	0	9	0
2.0	Project Manager	Month	3,750	9	33,750
3.0	Hydrologist	Month	1,000	9	9,000
4.0	Hydraulic Specialist	Month	1,000	9	9,000
5.0	Mechanical & Electrical Engineer	Month	1,500	9	13,500
6.0	Quantity Surveyor	Month	500	9	4,500
7.0	Structural Design Engineer	Month	50	9	450
8.0	Geotechnical Engineer	Month	200	9	1,800
9.0	GIS Specialist	Month	40	9	360
10.0	Engineer 1 @ Desk Officer	Month	1,000	9	9,000
11.0	Engineer 2@Civil Engineer	Month	0	9	0
12.0	Draftperson 1	Month	450	9	4,050
13.0	Draftperson 2	Month	0	9	0
14.0	Admin Finance Cost & Operation Cost	Month	4,000	9	36,000
				Total Expenses	121,410
				NEW GROSS PROFIT/LOSS	-129,060

Notes:

0.00	15,000	0
0.25	15,000	3,750
0.10	10,000	1,000
0.10	10,000	1,000
0.25	6,000	1,500
0.10	5,000	500
0.01	5,000	50
0.05	4,000	200
0.01	4,000	40
0.25	4,000	1,000
0.00	3,000	0
0.10	4,500	450
0.00	3,500	0
0.20	20,000	4,000

C	**Expenses (EOT 2 :01/24 - 10/24)**	Month		10	
1.0	Project Director	Month	0	10	0
2.0	Project Manager	Month	3,750	10	37,500
3.0	Hydrologist	Month	100	10	1,000
4.0	Hydraulic Specialist	Month	100	10	1,000
5.0	Mechanical & Electrical Engineer	Month	1,500	10	15,000
6.0	Quantity Surveyor	Month	500	10	5,000
7.0	Structural Design Engineer	Month	500	10	5,000
8.0	Geotechnical Engineer	Month	200	10	2,000
9.0	GIS Specialist	Month	0	10	0
10.0	Engineer 1 @ Desk Officer	Month	1,000	10	10,000
11.0	Engineer 2@Civil Engineer	Month	0	10	0
12.0	Draftperson 1	Month	450	10	4,500
13.0	Draftperson 2	Month	0	10	0
14.0	Admin Finance Cost & Operation Cost	Month	4,000	10	40,000
				Total Expenses	121,000
				NEW GROSS PROFIT/LOSS	-250,060

Notes:

0.00	15,000	0
0.25	15,000	3,750
0.01	10,000	100
0.01	10,000	100
0.25	6,000	1,500
0.10	5,000	500
0.10	5,000	500
0.05	4,000	200
0.00	4,000	0
0.25	4,000	1,000
0.00	3,000	0
0.10	4,500	450
0.00	3,500	0
0.20	20,000	4,000

CONSULTANT PROFESSIONAL FEES - Project Case 6 @ Drainage Project: Selangor
CONSTRUCTION STAGE

Project Cost **7,500,000**

Construction Stage Fees **35%** **106,050**

Total Actual Cost During Construction Stage **1.93%** **145,000**

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1	Original Professional Fees				106,050
2	Original Supervision Period	Month		**20**	
B	**Expenses (As Planned)**				
1	Project Director	Month	0	20	0
2	Project Manager	Month	1,500	20	30,000
3	Hydrologist	Month	0	20	0
4	Hydraulic Specialist	Month	0	20	0
5	Mechanical & Electrical Engineer	Month	600	20	12,000
6	Quantity Surveyor	Month	1,000	20	20,000
7	Structural Design Engineer	Month	500	20	10,000
8	Geotechnical Engineer	Month	40	20	800
9	GIS Specialist	Month	0	20	0
10	Engineer 1 @ Desk Officer	Month	800	20	16,000
11	Engineer 2@Civil Engineer	Month	0	20	0
12	Draftperson 1	Month	450	20	9,000
13	Draftperson 2	Month	0	20	0
14	Admin Finance Cost & Operation Cost	Month	2,000	20	40,000
				Total Expenses	137,800
				GROSS PROFIT	-31,750

Distribution Factor	Monthly Salary	Monthly Rates
0.00	15,000	0
0.10	15,000	1,500
0.00	10,000	0
0.00	10,000	0
0.10	6,000	600
0.20	5,000	1,000
0.10	5,000	500
0.01	4,000	40
0.00	4,000	0
0.20	4,000	800
0.00	3,000	0
0.10	4,500	450
0.00	3,500	0
0.10	20,000	2,000

CONSULTANT PROFESSIONAL FEES - Project Case 6 @ Drainage Project: Selangor
CONSTRUCTION STAGE

C	**Expenses (Project Extended) - DLP**	Month		12	
1	Project Director	Month	0	12	0
2	Project Manager	Month	0	12	0
3	Hydrologist	Month	0	12	0
4	Hydraulic Specialist	Month	0	12	0
5	Mechanical & Electrical Engineer	Month	0	12	0
6	Quantity Surveyor	Month	0	12	0
7	Structural Design Engineer	Month	0	12	0
8	Geotechnical Engineer	Month	0	12	0
9	GIS Specialist	Month	0	12	0
10	Engineer 1 @ Desk Officer	Month	400	12	4,800
11	Engineer 2@Civil Engineer	Month	0	12	0
12	Draftperson 1	Month	0	12	0
13	Draftperson 2	Month	0	12	0
14	Admin Finance Cost & Operation Cost	Month	200	12	2,400
				Total Expenses	7,200
				NEW GROSS PROFIT/LOSS	-38,950

0.00	15,000	0
0.00	15,000	0
0.00	10,000	0
0.00	10,000	0
0.00	6,000	0
0.00	5,000	0
0.00	5,000	0
0.00	4,000	0
0.00	4,000	0
0.10	4,000	400
0.00	3,000	0
0.00	4,500	0
0.00	3,500	0
0.01	20,000	200

TOTAL COST (Design Stage)	**431,860**	**5.76%**
TOTAL COST (Construction Stage)	**145,000**	**1.93%**
TOTAL OVERALL COST	**576,860**	**7.69%**
TOTAL FEES	**287,850**	**3.84%**
TOTAL PROFIT / LOSS (Upon Completion)	**-289,010**	**-3.85%**
	-289,010	

CONSULTANT PROFESSIONAL FEES - Project Case 7 @ Housing Project: Terengganu
DESIGN STAGE

Project Cost		5,000,000		
Original Professional Fees	0.80%	40,000	5% for Tender Stage	
Design Stage Fees	60%	24,000	5%	2,000
Estimated Fees (Based on BEM SOF)	5.50%	275,000	5.23%	261,250
Total Actual Cost During Design Stage	4.59%	229,500		
Total Actual Cost (Upon Completion)	7.51%	375,300		

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1.0	Original Professional Fees				24,000
2.0	Original Design Period	Month		12	
B	**Expenses (10/22 - 09/23)**				
1.0	Project Director	Month	0	12	0
2.0	Project Manager	Month	1,500	12	18,000
3.0	Senior Engineer 1 @ Head Designer	Month	0	12	0
4.0	Senior Engineer 2 @ H&H	Month	0	12	0
5.0	Senior Engineer 3 @ Civil	Month	2,000	12	24,000
6.0	Senior Engineer 4 @Structural	Month	1,500	12	18,000
7.0	Senior Engineer 5	Month	0	12	0
8.0	Engineer 1 @ Desk Officer	Month	1,125	12	13,500
9.0	Engineer 3	Month	0	12	0
10.0	Engineer 4	Month	0	12	0
11.0	Engineer 5	Month	0	12	0
12.0	Draftperson 1	Month	0	12	0
13.0	Draftperson 2	Month	875	12	10,500
14.0	Admin Finance Cost & Operation Cost	Month	4,000	12	48,000
				Total Expenses	132,000
				GROSS PROFIT	-108,000

Distribution Factor	Monthly Salary	Monthly Rates
0.00	15,000	0
0.10	15,000	1,500
0.00	15,000	0
0.00	10,000	0
0.25	8,000	2,000
0.25	6,000	1,500
0.00	5,000	0
0.25	4,500	1,125
0.00	4,000	0
0.00	4,000	0
0.00	4,000	0
0.00	4,500	0
0.25	3,500	875
0.20	20,000	4,000

Notes:

CONSULTANT PROFESSIONAL FEES - Project Case 7 @ Housing Project: Terengganu
DESIGN STAGE

C	**Expenses (10/23-7/24)**	Month		10				
1.0	Project Director	Month	0	10	0	0.00	15,000	0
2.0	Project Manager	Month	0	10	0	0.00	15,000	0
3.0	Senior Engineer 1 @ Head Designer	Month	0	10	0	0.00	15,000	0
4.0	Senior Engineer 2 @ H&H	Month	0	10	0	0.00	10,000	0
5.0	Senior Engineer 3 @ Civil	Month	2,000	10	20,000	0.25	8,000	2,000
6.0	Senior Engineer 4 @Structural	Month	1,500	10	15,000	0.25	6,000	1,500
7.0	Senior Engineer 5	Month	0	10	0	0.00	5,000	0
8.0	Engineer 1 @ Desk Officer	Month	1,125	10	11,250	0.25	4,500	1,125
9.0	Engineer 3	Month	0	10	0	0.00	4,000	0
10.0	Engineer 4	Month	0	10	0	0.00	4,000	0
11.0	Engineer 5	Month	0	10	0	0.00	4,000	0
12.0	Draftperson 1	Month	1,125	10	11,250	0.25	4,500	1,125
13.0	Draftperson 2	Month	0	10	0	0.00	3,500	0
14.0	Admin Finance Cost & Operation Cost	Month	4,000	10	40,000	0.20	20,000	4,000
				Total Expenses	97,500			
				NEW GROSS PROFIT/LOSS	-205,500			

Notes:

CONSULTANT PROFESSIONAL FEES - Project Case 7 @ Housing Project: Terengganu
CONSTRUCTION STAGE

Project Cost 5,000,000

Construction Stage Fees 35% 14,000

Total Actual Cost During Construction Stage 2.92% 145,800

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1	Original Professional Fees				14,000
2	Original Supervision Period	Month		12	
B	**Expenses (7/24-7/25)**				
1	Project Director	Month	0	12	0
2	Project Manager	Month	0	12	0
3	Senior Engineer 1 @ Head Designer	Month	0	12	0
4	Senior Engineer 2 @ H&H	Month	0	12	0
5	Senior Engineer 3 @ Civil	Month	800	12	9,600
6	Senior Engineer 4 @Structural	Month	600	12	7,200
7	Senior Engineer 5	Month	0	12	0
8	Engineer 1 @ Desk Officer	Month	450	12	5,400
9	Engineer 3	Month	0	12	0
10	Engineer 4	Month	0	12	0
11	Engineer 5	Month	0	12	0
12	Draftperson 1	Month	0	12	0
13	Draftperson 2	Month	350	12	4,200
14	Admin Finance Cost & Operation Cost	Month	4,000	12	48,000
				Total Expenses	74,400
				GROSS PROFIT	-60,400

Distribution Factor	Monthly Salary	Monthly Rates
0.00	15,000	0
0.00	15,000	0
0.00	15,000	0
0.00	10,000	0
0.10	8,000	800
0.10	6,000	600
0.00	5,000	0
0.10	4,500	450
0.00	4,000	0
0.00	4,000	0
0.00	4,000	0
0.00	4,500	0
0.10	3,500	350
0.20	20,000	4,000

CONSULTANT PROFESSIONAL FEES - Project Case 7 @ Housing Project: Terengganu
CONSTRUCTION STAGE

C	**Expenses (DLP:7/25-11/26)**	Month		**12**	
1	Project Director	Month	0	12	0
2	Project Manager	Month	1,500	12	18,000
3	Senior Engineer 1 @ Head Designer	Month	0	12	0
4	Senior Engineer 2 @ H&H	Month	0	12	0
5	Senior Engineer 3 @ Civil	Month	0	12	0
6	Senior Engineer 4 @Structural	Month	0	12	0
7	Senior Engineer 5	Month	0	12	0
8	Engineer 1 @ Desk Officer	Month	450	12	5,400
9	Engineer 3	Month	0	12	0
10	Engineer 4	Month	0	12	0
11	Engineer 5	Month	0	12	0
12	Draftperson 1	Month	0	12	0
13	Draftperson 2	Month	0	12	0
14	Admin Finance Cost & Operation Cost	Month	4,000	12	48,000
				Total Expenses	71,400
				NEW GROSS PROFIT/LOSS	-131,800

0.00	15,000	0
0.10	15,000	1,500
0.00	15,000	0
0.00	10,000	0
0.00	8,000	0
0.00	6,000	0
0.00	5,000	0
0.10	4,500	450
0.00	4,000	0
0.00	4,000	0
0.00	4,000	0
0.00	4,500	0
0.00	3,500	0
0.20	20,000	4,000

TOTAL COST (Design Stage)	**229,500**	**4.59%**
TOTAL COST (Construction Stage)	**145,800**	**2.92%**
TOTAL OVERALL COST	**375,300**	**7.51%**
TOTAL FEES	**38,000**	**0.76%**
TOTAL PROFIT / LOSS (Upon Completion)	**-337,300**	**-6.75%**
	-337,300	

CONSULTANT PROFESSIONAL FEES - Project Case 8@ Housing Project: Terengganu
DESIGN STAGE

Project Cost		**2,500,000**		
BEM SOF	**6.00%**	**150,000**	**5% for Tender Stage**	
Design Stage Fees	**60%**	**90,000**	**5%**	**7,500**
Estimated Fees (Based on proposed New SOF)	**8.40%**	**210,000**	**7.98%**	**199,500**
Total Actual Cost During Design Stage	**4.68%**	**117,000**		
Total Actual Cost (Upon Completion)	**8.35%**	**208,740**		

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1.0	Original Professional Fees				90,000
2.0	Original Design Period	Month		**12**	
B	**Expenses (04/2017 - 03/18)**				
1.0	Project Director	Month	0	12	0
2.0	Project Manager	Month	1,500	12	18,000
3.0	Senior Engineer 1 @ Head Designer	Month	0	12	0
4.0	Senior Engineer 2 @ H&H	Month	0	12	0
5.0	Senior Engineer 3 @ Civil	Month	2,000	12	24,000
6.0	Senior Engineer 4 @Structural	Month	1,500	12	18,000
7.0	Senior Engineer 5	Month	0	12	0
8.0	Engineer 1 @ Desk Officer	Month	0	12	0
9.0	Engineer 3	Month	0	12	0
10.0	Engineer 4	Month	0	12	0
11.0	Engineer 5	Month	0	12	0
12.0	Draftperson 1	Month	0	12	0
13.0	Draftperson 2	Month	750	12	9,000
14.0	Admin Finance Cost & Operation Cost	Month	4,000	12	48,000
				Total Expenses	117,000
				GROSS PROFIT	-27,000

Distribution Factor	Monthly Salary	Monthly Rates
0.00	15,000	0
0.10	15,000	1,500
0.00	15,000	0
0.00	10,000	0
0.25	8,000	2,000
0.25	6,000	1,500
0.00	5,000	0
0.00	4,500	0
0.00	4,000	0
0.00	4,000	0
0.00	4,000	0
0.00	4,500	0
0.25	3,000	750
0.20	20,000	4,000

Notes:

CONSULTANT PROFESSIONAL FEES - Project Case 8@ Housing Project: Terengganu
CONSTRUCTION STAGE

Project Cost **2,500,000**

Construction Stage Fees **35%** **52,500**

Total Actual Cost During Construction Stage **3.67%** **91,740**

	DESCRIPTION	UNITS	RATES	QUANTITY	AMOUNT
A	**Revenue**				
1	Original Professional Fees				52,500
2	Original Supervision Period	Month		**12**	
B	**Expenses (04/18 - 03/19)**				
1	Project Director	Month	0	12	0
2	Project Manager	Month	150	12	1,800
3	Senior Engineer 1 @ Head Designer	Month	0	12	0
4	Senior Engineer 2 @ H&H	Month	0	12	0
5	Senior Engineer 3 @ Civil	Month	400	12	4,800
6	Senior Engineer 4 @Structural	Month	300	12	3,600
7	Senior Engineer 5	Month	0	12	0
8	Engineer 1 @ Desk Officer	Month	450	12	5,400
9	Engineer 3	Month	0	12	0
10	Engineer 4	Month	0	12	0
11	Engineer 5	Month	0	12	0
12	Draftperson 1	Month	0	12	0
13	Draftperson 2	Month	300	12	3,600
14	Admin Finance Cost & Operation Cost	Month	4,000	12	48,000
				Total Expenses	67,200
				GROSS PROFIT	-14,700

Distribution Factor	Monthly Salary	Monthly Rates
0.00	15,000	0
0.01	15,000	150
0.00	15,000	0
0.00	10,000	0
0.05	8,000	400
0.05	6,000	300
0.00	5,000	0
0.10	4,500	450
0.00	4,000	0
0.00	4,000	0
0.00	4,000	0
0.00	4,500	0
0.10	3,000	300
0.20	20,000	4,000

CONSULTANT PROFESSIONAL FEES - Project Case 8@ Housing Project: Terengganu
CONSTRUCTION STAGE

C	**Expenses (DLP: 04/19 - 03/20)**	Month		12				
1	Project Director	Month	0	12	0	0.00	15,000	0
2	Project Manager	Month	0	12	0	0.00	15,000	0
3	Senior Engineer 1 @ Head Designer	Month	0	12	0	0.00	15,000	0
4	Senior Engineer 2 @ H&H	Month	0	12	0	0.00	10,000	0
5	Senior Engineer 3 @ Civil	Month	0	12	0	0.00	8,000	0
6	Senior Engineer 4 @Structural	Month	0	12	0	0.00	6,000	0
7	Senior Engineer 5	Month	0	12	0	0.00	5,000	0
8	Engineer 1 @ Desk Officer	Month	45	12	540	0.01	4,500	45
9	Engineer 3	Month	0	12	0	0.00	4,000	0
10	Engineer 4	Month	0	12	0	0.00	4,000	0
11	Engineer 5	Month	0	12	0	0.00	4,000	0
12	Draftperson 1	Month	0	12	0	0.00	4,500	0
13	Draftperson 2	Month	0	12	0	0.00	3,000	0
14	Admin Finance Cost & Operation Cost	Month	2,000	12	24,000	0.10	20,000	2,000
				Total Expenses	24,540			
				NEW GROSS PROFIT/LOSS	-39,240			

TOTAL COST (Design Stage)	**117,000**	**4.68%**
TOTAL COST (Construction Stage)	**91,740**	**3.67%**
TOTAL OVERALL COST	**208,740**	**8.35%**
TOTAL FEES	**142,500**	**5.70%**
TOTAL PROFIT / LOSS (Upon Completion)	**-66,240**	**-2.65%**
	-66,240	