Obstacles and Challenges that Leads to Failure in Implementation of 3R Practices in Malaysian Construction Industry

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Abstract
The development of construction project keeps increasing until leads to amount of construction waste issue increasing from year to year. The waste management practice through 3R Practices has recommended to implement towards sustainable waste management and reducing the construction waste issue. The aim of this research is to determine the obstacles and challenges that leads to failure in implementation of 3R Practices in Malaysian construction industry. There are also few research objectives including to explore the importance of 3R Practices and to identify the degree of awareness of construction waste issue and waste management among different construction professionals in Malaysian construction industry. The data collection for this research study is conducted through questionnaire survey and it targeted the construction professionals that works in Selangor's construction firm including architect, engineer and quantity surveyor as respondents. It has successfully get back the feedback from 80 respondents. The data collected is then analysed to determine the level of agreement towards the information related to objectives based on respondent's perception and opinion. Based on questionnaire

survey, the importance that identified as top five include reducing global warming issue, reducing the environmental pollution issue, conserving the natural resources, reducing the activities of extracting raw materials in producing new construction products and discovering the unused materials on the construction's project site. Not only that, the obstacles and challenges in implementation of 3R Practices that evaluated as top five through questionnaire survey are habit of using landfill in settling the construction waste, lack of knowledge towards 3R concept, lack of enforcement towards 3R Practices as compulsory in construction by government, lack of space as well as time constraint for waste segregation process. Therefore, these obstacles and challenges should be take noted by the government and local authority to enhance the implementation of 3R Practices in Malaysian construction industry towards construction waste reduction.

Keywords: Construction Project, 3R Practices, Construction Waste, Waste Generation

Introduction

Construction industry considers as one of the main sectors that contributes to the economic development of our country, Malaysia. According to the statistic from Construction Industry Development Board (CIDB) Malaysia, it shows that the construction industry occupies 4 to 6% of total Gross Domestic Product (GDP) per year since 2011 (CIDB Malaysia, 2017). In a construction industry especially for huge infrastructure project, it normally involves a huge amount of cash flow to cover the complex procedures such as design, planning, construction and inspection process as well as to cover the fees for construction materials, machinery, skilled and unskilled workers.

In fact, the development of the construction project especially residential property gets to increase from time to time since the demand of residential property increase. According to a talk by Mr. Foo Gee Jen in Malaysian Property Summit 2018, who is the previous leader of Association of Valuers, Property Managers, Estate Agents and Property Consultants in the Private Sector, Malaysia (PEPS), he said the demand of the houses is always more than the existing supply of the houses (The Star, 2018). Based on his research, he found that approximately 97500 units of houses is required by average family of 4 people per year, but there is only approximately 78216 units of completed houses was generated per year (The Star, 2018). Besides, it has proved that the demand of the houses is relatively high due to the population of Malaysia smoothly increase from year 2010 until year 2018. Referring to the Malaysia's Population statistics, the population increase from 28,112,289 people in 2010 to 32,042,458 people in 2018 (Worldometers, 2019). Hence, the development of residential property always increases from time to time in order to satisfy the buyer's requirement.

Since the construction development of the house increase, the usage of construction materials for completing every construction project also will increase. Hence, chances to cause the wastage of the materials to be happen also will become very high. In the Malaysia's construction industry, there are many developments waste produced in the nation due to speedy development of the construction project. In another words, the requirement to having many houses as well as infrastructure projects cause the quantity of wastage to be increase in the construction industry (Nasaruddin et al., 2008). In order to overcome the issues, 3R Practices is one of the sustainable construction waste management methods that suggested to be implemented towards reducing the construction wastage. 3R Practices is defined as term of "Reduce", "Reuse" and "Recycle". This strategy was introduced in National Solid

Waste Management Policy since 2006 (Victor et al., 2019). Besides reducing the construction wastage, 3R practice also tends to save the cost of waste disposal and improve the sustainability of the environment at the same times. However, it was found that most of the contractor firms still prefer to use landfill method instead of 3R Practices. Therefore, this research study will identify the obstacles and challenges that causing 3R Practices difficult to be implemented.

State-of-the-Art
3R Practices is considered as an idea of Reduce, Reuse and then followed by Recycle practice in order to minimise the waste generated. Since 2006, 3R Practices has identified as one of the key strategies of National Solid Waste Management Policy towards reduction of the wastage (Victor et al., 2019). In general, term "reduce" is defined as minimise the quantity of the garbage that we produce; term "reuse" is defined as thinking about an alternative way to use back the waste instead of throwing it to the rubbish bin; while term "recycle" is defined as modifying old product and transform it becomes new one, so that they can be retailed again (Green Coast, 2018).

Concept of 3R Practices in Construction Industry
In the recent years, there is a lot of development activities in Malaysian construction industry which leads to a huge amount of construction wastage generated through the construction process. Hence, 3R Practices is important to be implemented by every construction firm especially contractors and developers in order to minimise the wastage that generated during construction phase. In construction industry, term "reduce" is the most effective way to handle the construction debris compare with term "reuse" and "recycle". Reduction can be efficient in minimising the construction waste when an ongoing construction project is under monitoring by a project manager. It is because this action can make sure that the unnecessary error by construction workers will be minimise as well as reducing the amount of construction wastage produced. When express about term "reduce", it not just minimises the quantity of construction waste only, but it also helps to reduce the transportation cost as well as waste disposal cost at the same times (Tan et al., 2017). Furthermore, the function of "reuse" in construction is to adopt the same material for the same purpose more than one times like formwork. "Reuse" practice is considered as a pleasant choice for the construction firm especially contractors since some of the construction waste can be reused in another new development. By doing so, it brings extra advantage to the contractors in saving the construction cost and disposal cost (Tan et al., 2017). At the same times, it also helps them to minimise the construction waste as well as conserve the natural environment.

In addition, "recycle" practice is an alternative way for achieving less construction wastage to be generated. This practice usually will implement as last steps when reduce and reuse practice is unable to carry on. Any item which is not reusable but recyclable will be deliver to the recycling centre since few new materials can be produced through recycling process (Seow et al., 2017). Recycling can be divided into on-site and off-site waste recycling. On-site recycling is known as separation of development waste in term of dry and wet waste and then use as the raw materials in construction development; while off-site recycling is known as separation of construction waste which are then delivered to recycling centre and the waste is acts as a raw material to become a new product (Seow et al., 2017).

Types of Construction Waste

In fact, 7,555 of construction projects, which worth RM142,1 billion were given in 2015; while 8,081 of construction projects, which worth RM254.2 billion were given in 2016 in Malaysia (CIDB, 2018). The increasing in the development of construction project leads to an increasing in the quantity of construction waste produced. There are few types of construction waste that frequently generated during the construction phase such as concrete, timber, bricks, reinforcement, tiles and etc.

Concrete

Concrete is defined as a product which made of cement, sand and rock combined with water. The typical type of cement that used for making some concrete is Portland cement. The function of concrete is as a stability for a building construction. The concrete can be used for development of foundation, column, beam, and slab. There are several kinds of binding substantial not only just cement but also have lime and bitumen for production of lime concrete and asphalt concrete respectively. Asphalt concrete is normally utilised in the work of road construction. It is important to have a good water cement ratio to make sure strength and durability of a concrete is considered strong. If not have a good water cement ratio, the concrete is not able for construction of foundation, column, beam or slab. When cement is combined with water, the process of hydration will be carried out to ensure the ingredient of the concrete can bind together strongly which allows a workable concrete. The concrete can be shaped into different pattern such as square, rectangular and circular mode based on the model that possessed.

Timber

Timber can be defined as wood that get from the trees. Timbers are generally utilised for the making the structural element for a building. The timber usually will build ready in the factory with its standard size or size required by the user. Timber is a product which has a quite high service life for a building which lasting at least 10 years and above. However, the disadvantages are that there might be threat of termite issue, as well as the wood condition might get damaged in the event of fire and in the event of contact with water. Timber is considered as an eco-friendly product since it can be recycled easily compared to other materials like concrete, reinforcement and tiles.

Tiles

The tile is a thin product which usually used after completion of floor slabs and wall slabs. There are few types of tiles including ceramic tile, porcelain tile, marble tile and cement tile. The tiles are challenging in executing of reuse practice as it is hard to extract it for a proper size. The defect tiles normally will be reuse in other way such as making a creative thing. The creative things include special effects in drive ways and pedestrian subways.

Reinforcement

Reinforcement bar can be defined as an object that usually composed of reinforced concrete and reinforced masonry. The reinforcement bar is important to provide a high quality in strength and durability aspect. The reinforcement bar usually found as one of construction waste because there is an unnecessary error made by workers in the activity of reinforcement cutting. The inaccurate cutting which leads to wrong dimension will cause the wastage of

reinforcement. The training is essential to provide to the workers to make sure the unnecessary errors will be avoided.

Factors of Construction Waste Generation
The factors of construction waste generation for every construction project are different depending on the types of construction activities involved in that particular construction project and the size of the project (Intrachooto et al., 2019). Referring to survey made by Gavilan and Bernold, the construction waste produced due to the causes such as design errors, procurement errors, inappropriate storage for materials, materials handling error, operation errors and residual factors such as leftover issues (Gavilan & Bernold, 2013). In term of design errors, the unnecessary construction waste will generate when there is modification in design. In term of operation errors, it could be the labours mistakes during executing construction works as well as bad weather such as heavy rain that leads to the unnecessary construction wastage to be produced. In Malaysia, it was found that poor site management and supervision, improper planning and scheduling, design errors and labours errors during construction are the major causes that leads to construction waste generation (Nagapan et al., 2013). Not only that, but it also involves few minor causes that leads to construction waste generation in Malaysia such as inappropriate storage for materials, materials handling error, and ordering mistakes (Asmi et al., 2012).

Poor Site Management and Supervision
It has been determined that poor site management and supervision leads to generation of construction wastage. Thus, it is essential to have a proper and effective site management and monitoring for every construction development to make sure that the construction waste will be reduced. For example, at least a supervisor should be hired to monitor the progress of construction activities from times to times at the construction site (Ismail et al., 2012). By doing so, it will help to control the quality of the project and make sure that the labours mistakes in executing construction works to be minimise. In addition, inefficiency in waste management at site is also a key factor which leads to creating construction debris. Lack of waste regulations and improper disposal facilities are the sources of unsuccessful waste management (Rahim et al., 2017).

Improper Planning and Scheduling
Poor planning and scheduling have been identified as a factor of generating the construction wastage. It is recommended that before scheduling for the construction activities, every organization needs to consider about the resources that they should have. For example, thinking about how many workforces and supervisor that they need for the development as well as what kind of equipment and machinery required for specific construction activities (Nagapan et al., 2013). This action is dominant since it serves make certain that there are enough construction workers to complete the construction works with good quality within the timeframe. In another words, it is able to reduce the probability of workforce's errors as well as minimise unneeded construction wastage when comes with an effective and efficient site planning.

Changes in Design
In Malaysian construction industry, changes in design are common and it led the construction wastage to be exist. The modifications in design normally happen when there is inadequate

engagement between the architects, client, contractors, and quantity surveyor during the design phase (Nagapan et al., 2013). Hence, it is better to have an inquiry together among different construction players during design phase in order to generate a suitable drawing with details plan, so that the variation order will not happen. When there is a modification in design drawing, it generally will generate unnecessary construction debris. It is because the workforces require to demolish the existing structure and rebuild it referring to new design drawings. Changes in design not just only generate the construction wastage but also tends to improve the overall construction cost in term of material cost and transportation cost for delivering the required materials to the construction site. Consequently, changes in design should be avoided as much as possible to achieve towards reduction in construction wastage.

Labours Error
Labours error is also known as one of the causes for production of construction wastage. The construction workers made mistake during performing the construction works since most of them do not have a good skill. Hence, the training session should provide to the construction workers to make sure that they learn the correct ways in building the structure. The supervisor also requires to monitor the progress of construction works constantly as an alert for the workforces to perform the construction works properly. Besides, poor working attitude by the construction labours will lead to failure in construction works and eventually produce construction waste (Asmi et al., 2012). Therefore, it is important to employ the construction workforces which having a fine working culture as well as responsible to their daily jobs. The lesser the labours error, the lesser the construction waste will be produced.

Inappropriate Storage for Materials
Inappropriate protection for the construction materials can leads to construction waste to be generated. It is crucial to keep every construction material at the right place to make sure that the materials will not disappear and get spoiled. For example, if the workers simply put the cement under the open space rather than put it under the shade, the cement might be spoiled in the event of heavy rain (Ismail et al., 2012). When the construction materials get spoiled, it automatically becomes unnecessary construction waste. Therefore, the construction materials must be kept properly in the right place to prevent any construction wastage made.

Materials Handling Error
In addition, careless in handling materials also can generate the construction wastage. In fact, it was discovered that items such as ceramics, tiles and plastering materials are damaged due to careless handling (Poon et al., 2012). Therefore, it is crucial to handle the construction materials properly to prevent any item get cracked which might eventually become the construction wastage

Ordering Mistake
Making an error in ordering the materials is considered as a minor factor that causes construction waste to be happen. It usually only happens when ordering excess quantity of the materials which will cause the construction waste to be generated (Asmi et al., 2012). Hence, it is significant to check the material list repeatedly for two or three times before ordering to prevent construction waste to be made.

Importance of 3R Practices

3R Practices is known as one of the sustainable construction waste managements since it brings a lot of the benefits towards the construction firm and also environment. First of all, 3R Practices helps the construction firm to save the construction cost. By using 3R Practices in construction industry, it is able to save the waste management cost, waste disposal cost as well as the expenses of purchasing new resources (Goh et al., 2015). It is because 3R Practices tends to separate the construction wastage into different category. The unused materials that discovered on the previous construction project's site through 3R Practices can be further use for new upcoming project. Next, 3R Practices is able to conserve the natural resources. In Malaysia, construction waste disposal rate is considered high due to ineffective in managing the construction wastage. It was found that the excavating activities regularly be conducted to obtain the raw materials for producing new construction products (Said et al., 2015). The daily excavating activities that carried out from underground will spoil the natural environment of flora and fauna. By using 3R Practices, the waste materials will be reused and recycled. As the result, the excavating activities will be reduced and it tends to conserve the natural resources at the same times.

Furthermore, 3R Practices also able to help in energy saving. 3R Practices is crucial to be implemented when it compares to combustion method since it helps to save the energy consumption (Said et al., 2015). In another words, 3R Practices is more energy efficient rather than the combustion approach. For example, the recycling activity can save a huge amount of energy since the process of extraction of raw materials does not require to be implemented through 3R Practices. In addition, the environmental pollution issue will be reduced when implanting 3R Practices in Malaysian construction industry. Through implementation of 3R Practices, it is able to reduce emissions of greenhouse gas. It is also able to prevent the emission of methane from the breakdown of paper and wood. Besides, encouraging in implementation of 3R Practices tends to prevent the landfill method in setting the construction wastage to be occur which generally could lead to soil pollution (Goh et al., 2015). As a short conclusion, 3R Practices will reduce the issue of environmental pollution as well as improve the environmental sustainability.

Obstacles and Challenges in Implementation of 3R Practices in Malaysian Construction Industry

In Malaysian construction industry, there are few obstacles that identified towards implementation of 3R Practices. First and foremost, lack of interest by construction players is one of the barriers in implementation of 3R Practices. It was found that the clients or contractors of most of the construction project are not interested to put effort towards implementation of 3R Practices. They do not prefer 3R Practices as it does not bring physical advantages to them (Jain, 2012). Although 3R Practices is able to reduce the construction wastage as remaining material on site can further utilise for next new construction project and this action eventually have potential to save the construction cost in long-term perspective, but most of the clients or contractors prefer to emphasise on short-term financial benefits (Seow et al., 2018). It is because there is cost required for management of 3R Practices in term of labour and transportation wages. Apart from cost, 3R Practices also take long times due to workforces require to separate the construction wastage into category in order to identify that which materials can be further reuse or recycle.

Next, lack of participation towards 3R Practices makes it difficult to be implemented. It said that because of issues of not attempt or unwilling to participate towards 3R Practices among construction workforces (Ng et al., 2018). It is because the workers usually having habits of settle the construction waste at site by using landfill or burned methods. They prefer to use those methods to settle the construction wastage since they lack knowledge towards benefits of 3R Practices. Furthermore, lack of enforcement in law and regulation identified as obstacles in implementation of 3R Practices. When the law and regulation enforcement is ineffective, it is difficult to move towards the waste management practice like 3R Practices. In Asia, it was observed that there is lack of enforcement in policies towards implementation of 3R Practices (Ng et al., 2018). Hence, it is important to strengthen the law and regulation that participation in waste management practice like 3R Practices is mandatory for every construction project. By doing so, it will be efficient in reducing the amount of construction wastage.

In addition, lack of awareness towards construction waste management is known as major obstacles that cause difficulties in execution of 3R Practices (Seow et al., 2018). The public do not aware that there is a lot of construction debris generated during construction process. They are also not familiar towards benefits of 3R Practices that it helps to reduce the wastage and eventually conserve the environment. They only will implement 3R Practices when the government comes out with related regulations and policies. Besides, the construction players such as contractors, architects and construction workforces do not aware that 3R Practices is able to help them to settle the construction wastage efficiently and eventually reduce the environmental impact as well as reduce the construction cost in long-term perspective. Besides, the difficulties in implementation of 3R Practices in construction industry is also considered as one of the barriers. It is because there might be limited storage to keep the construction wastage since some of the site area is too small. 3R Practices is an application that require a lot of wastage storage since the process of waste segregation is required to be carried on (Ng et al., 2018). Besides, 3R Practices also requires extra time due to process of waste segregation. As the result, most of the contractors prefer to use the landfill method to settle the construction wastage that left on side instead of using 3R Practices. Figure 1 shows theoretical framework of 3R Practices.
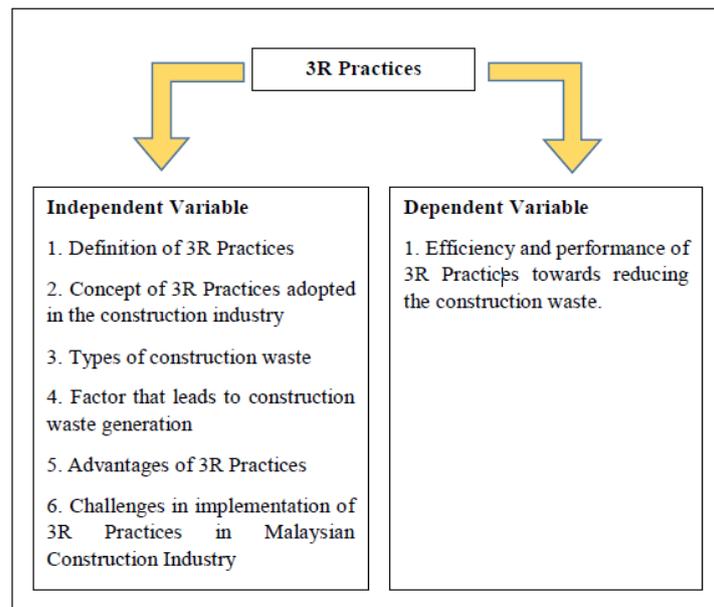
Figure 1. Theoretical Framework of 3R Practices

Not only that, but lack of market competition also known as the minor barrier in implementation of 3R Practices. For example, imagine that if there is a lot of contractor's firms willing to implement 3R Practices, and 3R Practices resulting towards reduction in construction cost and eventually improve their profit margin, others contractor's firm will also commence towards implementation of 3R Practices in their particular construction project. By doing so, the construction wastage will also be reduced. However, in the reality, most of the contractors believe that there is risk associated and additional cost charged if implementing 3R Practices as they mostly focus on short-term profit (Jain, 2012).

Research Methodology
It is significant to obtain the accurate data in order to make sure that the objectives of this research study can be achieved. The sources of data collection will be divided into two groups, which is primary data collection and secondary data collection. The secondary data usually will proceed before going to obtain primary data since the secondary data is the information that readily available regarding the study and it is easily get through the medium such as books, journals, newspapers and online website (Dudovski, 2019). The questionnaire survey will proceed to get the primary data, while literature review related to the topic will be used as secondary data. The questionnaire survey will be conducted to obtain primary data. Furthermore, the sampling choices, the questionnaire design and the data analysis method also will be discussed.

Data Collection
Quantitative Research
The quantitative research is a method which obtain the data in a numerical structure which can be put into classification or in rank structure (McLeod, 2017). In the quantitative research method, the respondents usually answering the question based on the choice given. This data collection method is more organized compare with the qualitative research method. It is because the results that get through quantitative strategy will be conclusive towards the objectives of the research study as well as critically understand the opinions of all respondents

through analysis of the quantitative data since the data is in form of number (SIS, 2018). There are few methods to collect quantitative data such as online surveys, paper surveys, face-to-face interviews and telephone interviews approaches.

Primary Data
Primary data is known as the first-hand sources that collected by the previous study (Victor, 2017). In this research study, the questionnaires survey will be implemented to obtain the primary data. The questionnaire survey will be made in Google form and then the survey form regarding implementation of 3R practices will be sent to the construction parties including clients, contractors, architects and quantity surveyors via e-mail. There will be multiple choices given to answer every question in the questionnaire survey. It is more simple for respondents to answer the questionnaire survey and the data collected is easier to be quantified.

Secondary Data
Secondary data is defined as the data collected by other study previously (Victor, 2017). The literature review will carry out to meet the aim which is identifying the barriers of leading 3R Practices failure to be implemented. Not only that, but the literature review also related to concept, barriers, factors that generating construction waste and other elements related to the topic will be conducted. The outcome of the literature review will be obtained through various methods such as article, journal and website via internet.

Sampling Choices
There will be 150 sets of questionnaire survey will be prepared and sent to the construction parties like clients, contractors, architects and contractors. It is expected to collect the feedback from 100 respondents. They will be selected from the Selangor state to answer the questionnaire survey in order to obtain the quantitative data. The questionnaire survey will be prepared in the form of Google form and then sent to the selected participants via e-mail method.

Questionnaire Design
The question that designed will relate to the research topic which is obstacles and challenges which leads towards failure in implementation of 3R Practices in Malaysian construction industry. Every questionnaire survey will consist of 36 questions and the question will be English version. In this questionnaire survey, there will be divided into three sections and every section will have its own questions regarding with different information. All of the question that set will be related to the objectives of this research study. In Section A, the question regarding demographic background will be designed. The question like the age, gender, race, education level, occupation and monthly income will be asked. There will be 8 questions to be ask. In Section B, the question regarding with the awareness towards construction wastage issue and construction waste management (3R Practices) will be designed. There will be 5-point rating scale in this section which is strongly disagree, disagree, neutral, agree and strongly agree. There will be 6 questions to be ask. In Section C, the question regarding the importance of 3R Practices will be designed. There will be 5-point rating scale in this section which is strongly disagree, disagree, neutral, agree and strongly agree. There will be 11 questions to be ask. In Section D, the question regarding the obstacles and challenges that leads to failure in implementation of 3R Practices in the Malaysian

construction industry will be designed. There will be also 5-point rating scale in this section which is strongly disagree, disagree, neutral, agree and strongly agree. There will be 11 questions to be ask.

Data Analysis
Statistical Package for the Social Sciences (SPSS) Software
After collecting all of the questionnaire surveys from all respondents, the result that obtained will be further analyse in order to get accurate and valid data to support the objectives of this research study. The data that collected from respondents will be analysed through a software called SPSS. SPSS is a statistical software which is able to compile all of the data that collected from a group of respondents and then analyse it to produce a final and conclusive outcome (Foley, 2018). Through SPSS software, the method such as frequency analysis, descriptive analysis and Pearson's correlation will be utilised in analysing the data.

Microsoft Excel Software
Microsoft Excel is a software which helps the user to arrange, format and calculate data with formulas. After using SPSS software to analyse the data, the result of data collected will be copied to Microsoft Excel software in order to make the table or chart nicer. Through Microsoft Excel software, the line will be drawn on the table which shows the outcome of data collected to differentiate each and every element in term of quantity, mean and standard deviation.

Analysis Method
Frequency Analysis
Frequency analysis is a statistical approach which displays the quantity of occurrence of every feedback given by every participant in the questionnaire survey. SPSS software is able to perform frequency analysis. When using frequency analysis, it can also identify the mean, median and mode for analysing the data collected from respondents. The data that analysed can be made in the form of histogram, pie chart and bar chart.

Descriptive Analysis
Descriptive analysis can be defined as analysis which assist in explaining and understanding the attributes of a particular data by providing short brief regarding the measures of the data. Descriptive analysis allows to come out with conclusions based on the data collected that analysed as well as to make comparison among different variables in order to meet the objectives set has made (Lund, 2018). The descriptive statistics can be split into measures of central tendency and variability. The calculation of mean acts as measures of central tendency, while the calculation of standard deviation acts as measures of variability (Kenton, 2019).

Pearson's Correlation
Pearson's correlation is an analysis method that measures the relationship and connection between two continuous variables. It is considered as the best approach of identifying the relationship between two variables. The concept of Pearson's correlation shows as below in equation:

$$-1 \leq r \leq 1 \qquad\qquad [1]$$

Where r = 0.00 – 0.19 as very weak
r = 0.20 - 0.39 as weak
r = 0.40 - 0.59 as moderate
r = 0.60 - 0.79 as strong
r = 0.80 - 1.0 as very strong

Data Analysis
The primary data collection for this research study is questionnaire survey. The survey form is distributed in the form of e-mail to the specific construction professional such as quantity surveyor, architect and engineer that works in the area of Selangor state.

All of the feedback related to the questions that set in questionnaire survey will be analysed using SPSS software and Microsoft Excel in order to get the more precise, detailed and accurate data. The analysis method such as descriptive analysis, frequency analysis, cross-tabulation and etc. will be used to analyse the data. The data collected also will be interpreted in the form of table and chart after conducting the data analysis.

Respondent Feedback
The questionnaire survey has sent out through e-mail to estimated 150 respondents and assumed to get back the outcome from 50 respondents. However, 80 out of 150 sets of questionnaires are successfully collected back. Hence, the outcome that get from 80 respondents will be further analysed and briefly discussed on the following pages.

Interpretation and Justification of Results
Demographic Background
In this Section A, the analysis comes out with the question regarding to the respondent's profile such as the age, gender, race, education level, monthly income, occupation sector, types of construction professional and working experience.

i) Gender

Table 1
Respondent's Gender

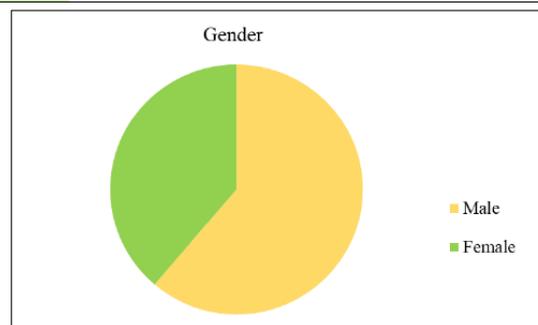|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	49	61.3	61.3	61.3
	Female	31	38.8	38.8	100.0
	Total	80	100.0	100.0	

Figure 2. Respondent's Age

The data in Table 1 and pie chart above shows in Figure 2, the gender of the respondents. Among 80 respondents, the total number for male respondents is 49, while the total number for female respondents is 31. The percentage of male respondents is 61.3%, while the percentage of female respondents is 38.8%. The number of male respondents in participating this questionnaire survey is more than the number of female respondents, which is about difference in 18 number of respondents.

ii) Age

There is age category of below 30 years old, 30 to 39 years old, 40 to 49 years old and 50 years old and above in Table 2. The data collected shows that the number of respondents for range of 30 to 39 years old is the highest, which is about 34 respondents that occupying 42.5% out of 100%. The second highest range is category of below 30 years old, which is about 29 number of respondents that occupying 36.3% out of 100%. In Figure 3, the following highest range is category of 40 to 49 years old, which is about 13 number of respondents that occupying 16.3% out of 100%. The number of respondents for range of 50 years old and above is the lowest, which is only participated by 4 respondents that occupying about 5%.

Table 2
Respondent's Age

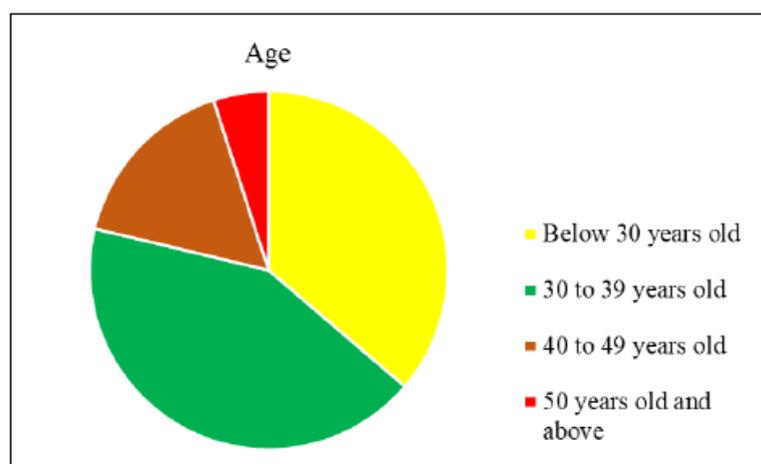|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below 30 years old	29	36.3	36.3	36.3
	30 to 39 years old	34	42.5	42.5	78.8
	40 to 49 years old	13	16.3	16.3	95.0
	50 years old and above	4	5.0	5.0	100.0
	Total	80	100.0	100.0	

Figure 3. Respondent's Age

iii) Race

The number of Chinese respondents is the highest among other races, which is about 46 number in Table 3. Chinese respondents occupy 57.5% out of 100%. The second highest respondent's race is Malay, which is about 23 number of respondents, while the lowest respondent's race is Indian, which is about 11 number of respondents as shows in Figure 4, Malay respondents and Indian respondents occupy 28.7% and 13.8% respectively. There is no Iban, Kadazan, Sikh, or Dusun participate in this questionnaire survey.

Table 3
Respondent's Race

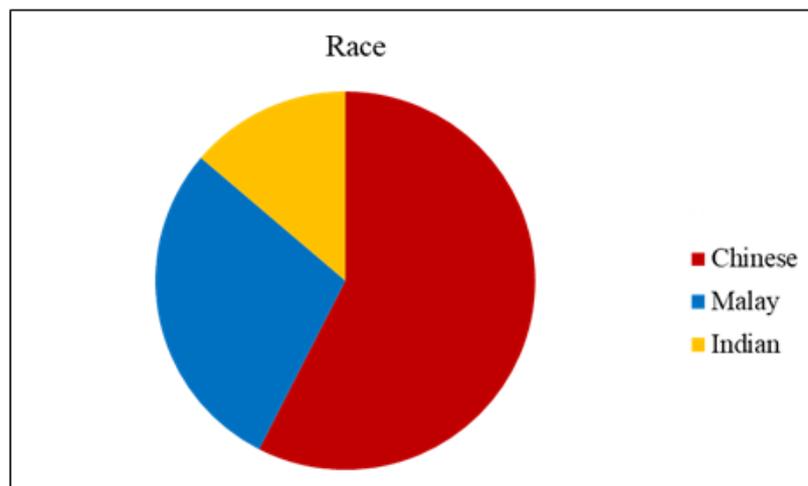|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Chinese	46	57.5	57.5	57.5
	Malay	23	28.7	28.7	86.3
	Indian	11	13.8	13.8	100.0
	Others (Iban,Kadazan, Sikh,Dusun)	0	0.0	0.0	100.0
	Total	80	100.0	100.0	

Figure 4. Respondent's Race

iv) Education Level

For the data of respondent's education level, it is interpreted in Table 4. The highest ranking of the respondent's education level is degree level, which is about 62.5%. The number of respondents for degree holder is 50. The second highest percentage is that 26.3% of respondents are diploma holder, which is about 21 number of diploma holder. The following highest percentage is about 8.8%, which is 7 number of respondents with Master or PhD holder. The lowest ranking for the education level is primary school or secondary school education, which is only about 2 respondents that occupy primary school or secondary school education in Figure 5. In another words, there is only 2.5% of primary school or secondary school education holder.

Table 4
Respondent's Education Level

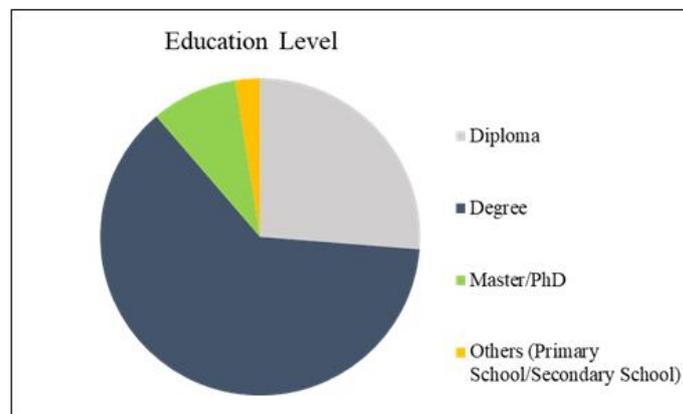|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Diploma	21	26.3	26.3	26.3
	Degree	50	62.5	62.5	88.8
	Master/PhD	7	8.8	8.8	97.5
	Others (Primary School/Secondary School)	2	2.5	2.5	100.0
	Total	80	100.0	100.0	

Figure 5*.* Respondent's Education Level

v) Monthly Income

In Table 5, the highest ranking for respondent's monthly income category is range of RM5,000 to RM7,499, where 25 number of respondents positioned in this monthly income range which occupying about 31.3% out of 100%. The second highest ranking for respondent's monthly income group is range of RM2,500 to RM4,999, where 23 number of respondents positioned in this monthly income range which occupying about 28.7% out of 100%. The third highest ranking for respondent's monthly income category is range of RM7,500 to Rm9,999, where 17 number of respondents positioned in this monthly income range which occupying about 21.3% out of 100%. As in figure 6, the following fourth and fifth in ranking of respondent's monthly income is range of below RM2,500 income category and RM10,000 and above income category with only 10% of respondents and 8.8% of respondents respectively for income group that figured out.

Table 5
Respondent's Monthly Income

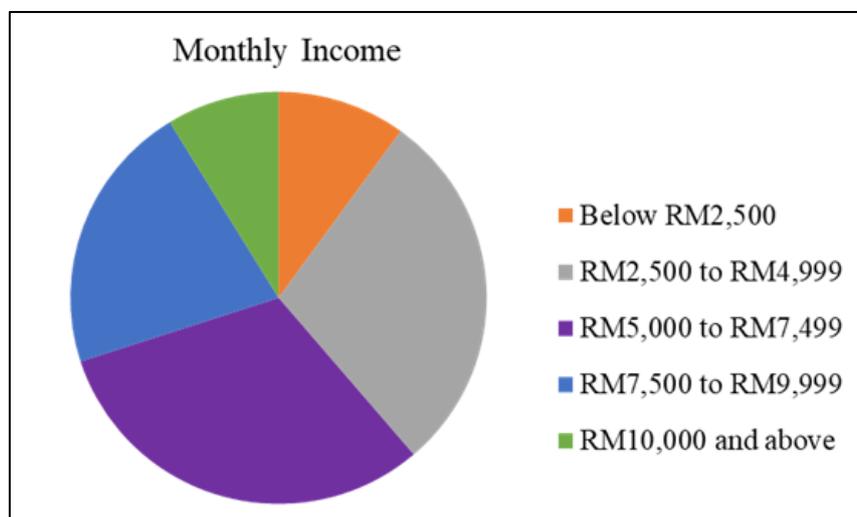|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Below RM2,500	8	10.0	10.0	10.0
	RM2,500 to RM4,999	23	28.7	28.7	38.8
	RM5,000 to RM7,499	25	31.3	31.3	70.0
	RM7,500 to RM9,999	17	21.3	21.3	91.3
	RM10,000 and above	7	8.8	8.8	100.0
	Total	80	100.0	100.0	

Figure 6. Respondent's Monthly Income

vi) Occupation Sector

The total number of respondents that work in the private sector is 55, while the total number of respondents that work in public sector is 25 in Table 6. In another words, the percentage of the respondents which are working in private sector (68.8%) is higher than the percentage of respondents which are working in public sector (31.3%) as shows in Figure 7. The difference between the number of private sector's respondents and the number of public sector's respondents is about 30 number.

Table 6
Respondent's Occupation Sector

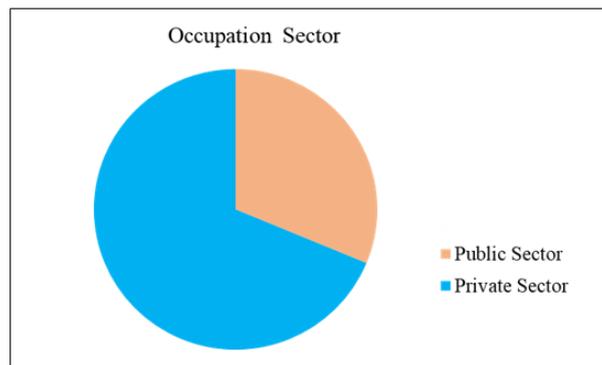|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Public Sector	25	31.3	31.3	31.3
	Private Sector	55	68.8	68.8	100.0
	Total	80	100.0	100.0	

Figure 7. Respondent's Occupation Sector

vii) Working Experience

There are 12 respondents that have a working experience of less than 2 years, 17 respondents that have a working experience of 2 to 5 years, 22 respondents that have a working experience of 6 to 9 years and 29 respondents that have a working experience of 10 years and above exhibit in Table 7. The highest ranking for the respondent's working experience is positioned in 10 years and above group, which occupy about 36.3%. The second highest ranking for the respondent's working experience is positioned in 6 to 9 years' category, which occupy about 27.5% out of 100%. The following highest ranking for the respondent's working experience is positioned in 2 to 5 years' category, which occupy about 21.3% out of 100%. The lowest ranking for respondent's working experience is situated in less than 2 years' group, which occupies about 15% in figure 8.

Table 7
Respondent's Working Experience

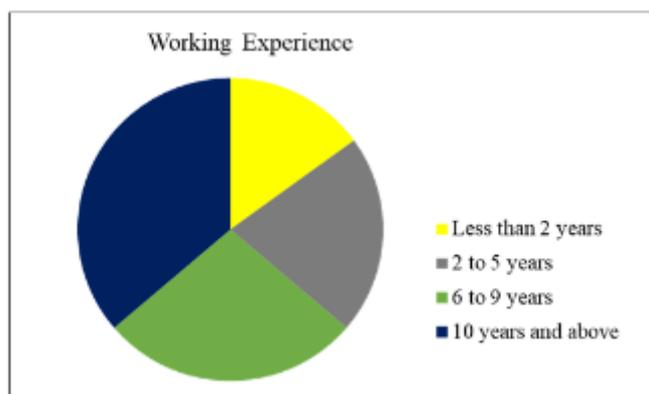|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 2 years	12	15.0	15.0	15.0
	2 to 5 years	17	21.3	21.3	36.3
	6 to 9 years	22	27.5	27.5	63.7
	10 years and above	29	36.3	36.3	100.0
	Total	80	100.0	100.0	

Figure 8. Respondent's Occupation Sector

viii)   Position in Construction Field

For the data of respondent's position in construction field, it is analyzed as in Table 8, there are 22 number of architects, 20 number of engineer and 38 number of quantity surveyor that have participated in this survey form. In another words, there are 47.5% of respondents are quantity surveyor, 27.5% of respondents are architect, and 25% of respondents are engineer. As a short conclusion, the number of quantity surveyor is the highest compared to architect and engineer in giving feedback to the questionnaire survey that sent through e-mail as shows in Figure 9.

Table 8
Respondent's Position in Construction Field

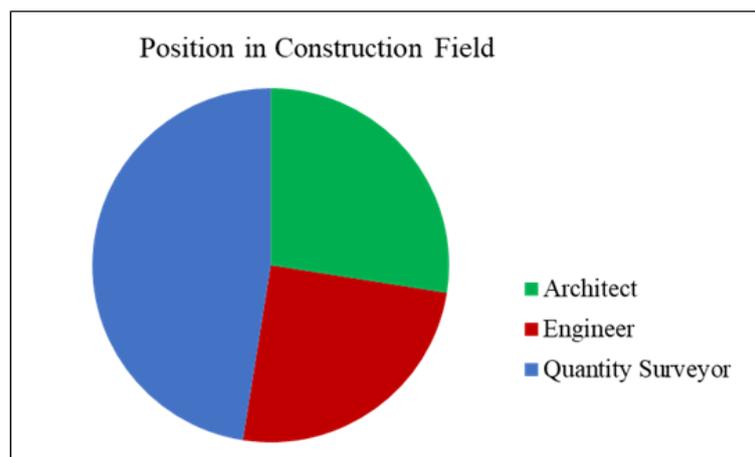|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Architect	22	27.5	27.5	27.5
	Engineer	20	25.0	25.0	52.5
	Quantity Surveyor	38	47.5	47.5	100.0
	Total	80	100.0	100.0	

Figure 9. Respondent's Position in Construction Field

Section B-Degree of Awareness on Construction Waste Issue and Waste Management among Different Construction Professionals

In Section B, the question regarding to degree of awareness on construction waste issue and waste management among different construction professionals will be asked. The respondents are required to rank the level of agreement using Likert scale 1- 5 which is 1 as strongly disagree, 2 as disagree, 3 as neutral, 4 as agree and 5 as strongly agree.

i)   Frequency Analysis

The data in Table 9 and bar chart in Figure 10 shows the level of agreement towards statement of the construction waste will be generated during construction process. There is no respondent strongly disagree the statement of the construction waste will be generated during construction process, while 27 respondents strongly agree the statement of the

construction waste will be generated during construction process. Besides, 1 respondent disagree and 42 respondents agree to this statement. The others 10 respondents stated neutral.

Table 9
Respondent's Perception towards Question for Section B (i)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	0	0.0	0.0	0.0
	Disagree	1	1.3	1.3	1.3
	Neutral	10	12.5	12.5	13.8
	Agree	42	52.5	52.5	66.3
	Strongly Agree	27	33.8	33.8	100
	Total	80	100	100	
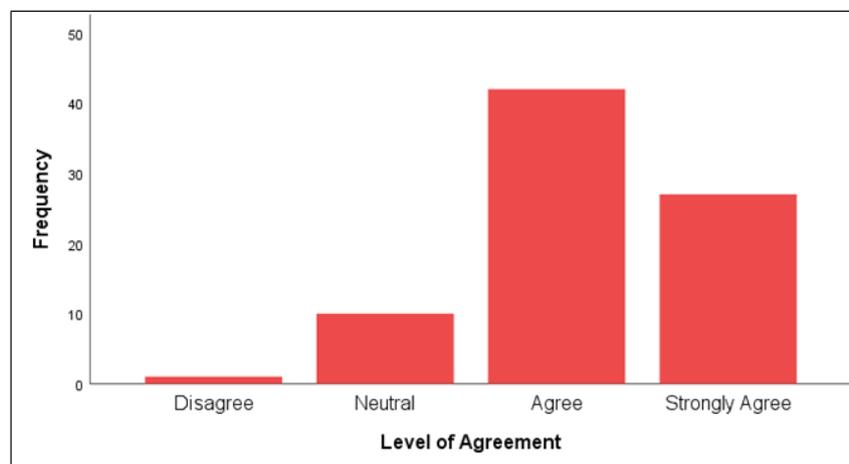
Figure 10. Respondent's Level of Agreement towards Question for Section B (i)

The bar chart in Figure 11 the level of agreement towards the statement of construction waste issue is known as one of the serious issues in Malaysian Construction Industry. Nobody strongly disagree but there are 19 respondents strongly agree to this statement. 2 respondents disagree to the statement of construction waste issue is known as one of the serious issues in Malaysian Construction Industry, 40 respondents agree to the statement of construction waste issue is known as one of the serious issues in Malaysian Construction Industry and remaining 19 respondents expressed neutral exhibit in Table 10.

Table 10
Respondent's Perception towards Question for Section B (ii)

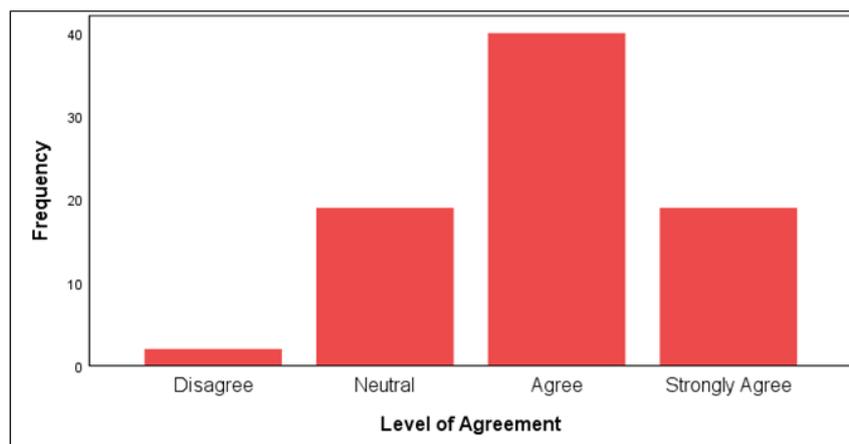|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	0	0.0	0.0	0.0
	Disagree	2	2.5	2.5	2.5
	Neutral	19	23.8	23.8	26.3
	Agree	40	50.0	50.0	76.3
	Strongly Agree	19	23.8	23.8	100.0
	Total	80	100.0	100.0	

Figure 11. Respondent's Level of Agreement towards Question for Section B (ii)

For the statement of the amount of construction waste keep increasing from year to year in Malaysian Construction Industry, in Table 11 no respondents strongly disagree it but there are 23 respondents strongly agree it. 2 respondents disagree that the amount of construction waste keep increasing from year to year in Malaysian Construction Industry, while 47 respondents agree that the amount of construction waste keep increasing from year to year in Malaysian Construction Industry show in Figure 12. The remaining 8 respondents specified neutral.

Table 11
Respondent's Perception towards Question for Section B (iii)

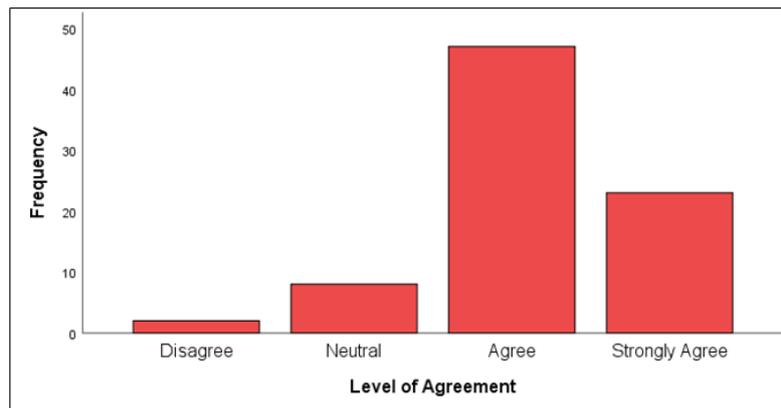|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	0	0.0	0.0	0.0
	Disagree	2	2.5	2.5	2.5
	Neutral	8	10.0	10.0	12.5
	Agree	47	58.8	58.8	71.3
	Strongly Agree	23	28.7	28.7	100.0
	Total	80	100.0	100.0	

Figure 12. Respondent's Level of Agreement towards Question for Section B (iii)

The data in Table 12 and chart in Figure 13 express the level of agreement towards the statement of construction waste management can effectively reducing the construction waste issue. 12 respondents remain neutral to this statement. 1 respondent disagree but 49 respondents agree to this statement. Besides, there is no respondent strongly disagree to the statement of construction waste management can effectively reducing the construction waste issue, while 18 respondents strongly agree to the statement of construction waste management can effectively reducing the construction waste issue.

Table 12
Respondent's Perception towards Question for Section B (iv)

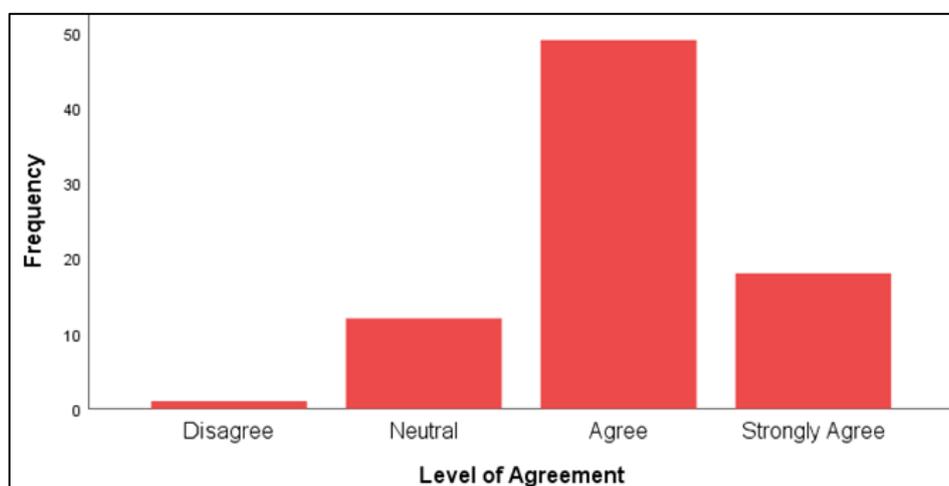|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	0	0.0	0.0	0.0
	Disagree	1	1.3	1.3	1.3
	Neutral	12	15.0	15.0	16.3
	Agree	49	61.3	61.3	77.5
	Strongly Agree	18	22.5	22.5	100.0
	Total	80	100.0	100.0	

Figure 13. Respondent's Level of Agreement towards Question for Section B (iv)

For the statement which indicating 3R Practice (Reduce, Reuse and Recycle) is one of the waste management approaches, 4 respondents disagree it but there are 49 respondents agree to it as show in Table 13, while 13 respondents remain neutral to this statement. Besides, nobody strongly disagrees to the statement of 3R Practice is one of the waste management approaches and 14 respondents strongly agree to the statement of 3R Practice is one of the waste management approaches exhibit in Figure 14.

Table 13
Respondent's Perception towards Question for Section B (v)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	0	0.0	0.0	0.0
	Disagree	4	5.0	5.0	5.0
	Neutral	13	16.3	16.3	21.3
	Agree	49	61.3	61.3	82.5
	Strongly Agree	14	17.5	17.5	100.0
	Total	80	100.0	100.0	
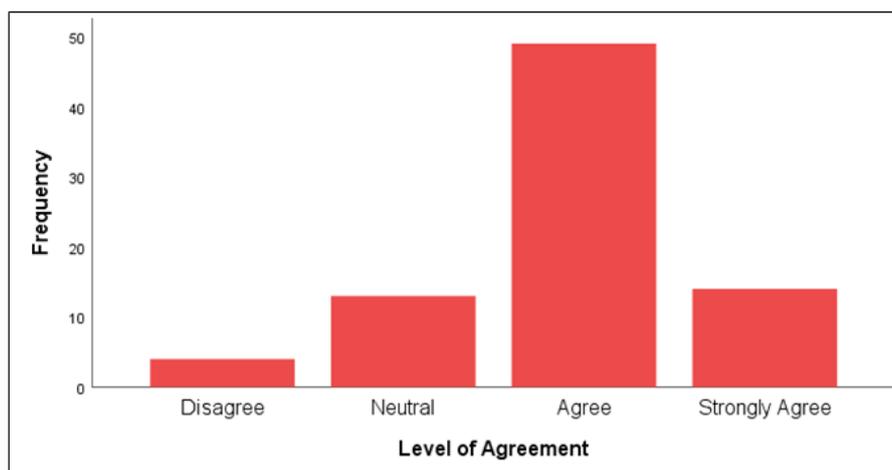
Figure 14. Respondent's Level of Agreement towards Question for Section B (v)

The bar chart in Figure 15 shows the level of agreement towards the statement of 3R Practice is effective in reducing the construction waste issue. There is no respondent strongly disagree to the statement of 3R Practice is effective in reducing the construction waste issue, while 11 respondents strongly agree to the statement of 3R Practice is effective in reducing the construction waste issue. Besides, 6 respondents disagree to this statement but there are 43 respondents agree to this statement. The remaining 20 respondents expressed neutral exhibit in Table 14.

Table 14
Respondent's Perception towards Question for Section B (vi)

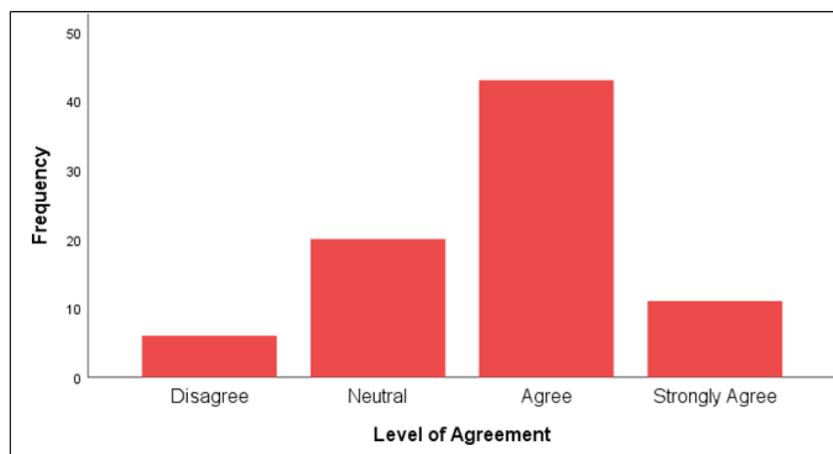|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	0	0.0	0.0	0.0
	Disagree	6	7.5	7.5	7.5
	Neutral	20	25.0	25.0	32.5
	Agree	43	53.8	53.8	86.3
	Strongly Agree	11	13.8	13.8	100.0
	Total	80	100.0	100.0	

Figure 15. Respondent's Level of Agreement towards Question for Section B (v)

Section C – Importance of 3R Practices

In Section B, the question regarding to importance of 3R Practice will be asked. The respondents are required to rank the level of agreement using Likert scale 1-5 which is 1 as strongly disagree, 2 as disagree, 3 as neutral, 4 as agree and 5 as strongly agree.

i)   Descriptive Analysis

The mean and standard deviation has listed out for all importance of 3R practices that asked to the respondents. However, for this research study, mostly mean will be discussed further in order to determine the ranking for importance of 3R practices. The higher the mean, the higher the ranking for specific importance of 3R practices. In another word, the higher the rate of agreement by respondents towards particular importance of 3R practices, consequently the higher the ranking will be.

Based on the respondent's feedback, the highest ranking for importance of 3R Practices is that it is able to reduce the global warming issue with a mean of 4.29 as exhibit in Table 15. There are 48 respondents agree and 28 respondents strongly agree to this important variable. Next, both variable of reduce the environmental pollution issue and conserve the natural resources has ranked number 2 with a mean of 4.18. There are 55 respondents agree and 20 respondents strongly agree to the significant variable of reduce the environmental pollution issue; while there are 47 respondents agree and 24 respondents strongly disagree to the significant variable of conserve the natural resources. According to (Ang et al., 2015), the air

pollution issue can be minimized because the emission of carbon dioxides and methane gas can be reduced. It has considered as most importance of 3R Practices (Ang et al., 2015).

Table 15
Descriptive Analysis for Section C's Question Using SPSS Software

	N	Mean	Std. Deviation
3R Practices is able to reduce the global warming issue.	80	4.29	.599
3R Practices is able to reduce the environmental pollution issue.	80	4.18	.569
3R Practices is able to conserve the natural resources.	80	4.18	.652
3R Practices is able to reduce the activities of extracting raw materials in producing new construction product.	80	4.15	.677
3R Practices is able to discover the unused materials on the construction project's site.	80	4.01	.646
3R Practices is able to help the construction firm to save the waste disposal cost.	80	3.95	.810
3R Practices is able to make sure the unused materials not being thrown away.	80	3.85	.813
3R Practices is able to reduce emissions of carbon dioxide.	80	3.81	.731
3R Practices is able to ensure the unused materials to be utilized on next upcoming construction project.	80	3.63	.862
3R Practices is able to help the construction firm to reduce the expenses of purchasing new resources.	80	3.38	.905
3R Practices is able to help the construction firm to save the construction cost.	80	3.33	.823

The variable of '3R Practices is able to reduce the activities of extracting raw materials in producing new construction product' has ranked as third importance of 3R Practices. The mean is 4.15. There are 45 respondents agree and 24 respondents strongly agree to this significance. In addition, the fourth ranking for the importance of 3R practices is that it is able to discover the unused materials on the construction project's site with a mean of 4.01. 53 respondents agree and 15 respondents strongly agree to this significance. The next ranking for the importance of 3R Practices is help the construction firm to save the waste disposal cost with a mean of 3.95. There are 43 respondents agree and 19 respondents strongly agree to this importance. Besides, the statement of '3R Practices is able to make sure the unused materials not being thrown away' has ranked as sixth with a mean of 3.85. There are 43 respondents agree and 15 respondents strongly agree to this significance. Furthermore, the benefit of 3R Practices which is able to reduce the emission of carbon dioxide and to ensure the unused materials to be utilized on next upcoming construction project has positioned as rank seventh and eighth with a mean of 3.81 and 3.63 respectively. About 38 respondents agree and 14 respondents strongly agree to the important variable of reduce the emission of carbon dioxide, while about 39 respondents agree and 10 respondents strongly agree to the significant variable of ensure the unused materials to be utilized on next upcoming construction project.

Next, the ninth importance that respondents vote is that 3R Practices is able to help the construction firm to reduce the expenses of purchasing new resources with a mean of 3.38 shows in Table 16. There are 34 respondents agree and 6 respondents strongly agree to this importance. It is also found that there are 25 respondents remain neutral, 14 respondents disagree and 1 respondent strongly disagree to this significance. The lowest ranking that respondent vote towards importance of 3R Practices is that 3R Practices is able to help the construction firm to save the construction cost with a mean of 3.33. Only 35 respondents agree and 3 respondents strongly agree to this significance. It is also found that there are 27 respondents remain neutral and 15 respondents disagree to this significance. According to (Ang et al., 2015), the expenses of buying new materials will be minimized through 3R Practices, yet the management cost is still needed. It has considered as least importance of 3R Practices (Ang et al., 2015).

Table 16
Ranking for Section C's Question Based on Descriptive Analysis

Importance	Level of Agreement					N	Mean	Rank
	1	2	3	4	5			
Glo	0	1	3	48	28	80	4.29	1
EnvPol	0	1	4	55	20	80	4.18	2
Natural	0	1	8	47	24	80	4.18	2
Extract	0	1	10	45	24	80	4.15	3
Disco	0	2	10	53	15	80	4.01	4
Dispo	0	5	13	43	19	80	3.95	5
Throw	1	3	18	43	15	80	3.85	6
Car	0	1	27	38	14	80	3.81	7
Utili	1	7	23	39	10	80	3.63	8
Expen	1	14	25	34	6	80	3.38	9
Const	0	15	27	35	3	80	3.33	10

Section D- The Obstacles and Challenges

In Section D, the question regarding to the obstacles and challenges in implementation of 3R Practice will be asked. The respondents are required to rank the level of agreement using Likert scale 1-5 which is 1 as strongly disagree, 2 as disagree, 3 as neutral, 4 as agree and 5 as strongly agree.

i) Pearson's Correlation

A Pearson correlation coefficient close to 1 indicates a strong positive linear relationship, meaning that as one variable increases, the other also increases. A coefficient close to -1 indicates a strong negative linear relationship, where one variable increases as the other decreases. A coefficient around 0 suggests no linear relationship between the variables.

Table 17

Pearson's Correlation for Section D's Question Using SPSS Software

Challenges		Effort	Fin	Will	Kled	Land	Law	Comp	Space	Time	EnvImp	ReCost
Space	Pearson Correlation	.116	(.041)	.046	.175	.047	(.052)	.278*	1	.353**	.190	(.027)
	Sig. (2-tailed)	.304	.717	.688	.121	.679	.647	.013		.001	.092	.810
	N	80	80	80	80	80	80	80	80	80	80	80
Time	Pearson Correlation	.079	.189	(.034)	.192	.332**	.160	.398**	.353**	1	.091	.078
	Sig. (2-tailed)	.485	.093	.764	.089	.003	.156	.000	.000		.423	.493
	N	80	80	80	80	80	80	80	80	80	80	80
EnvImp	Pearson Correlation	.161	.392**	(.164)	(.049)	(.074)	.319**	.238*	.190	.091	1	.147
	Sig. (2-tailed)	.155	.000	.147	.666	.516	.004	.033	.092	.423		.194
	N	80	80	80	80	80	80	80	80	80	80	80
ReCost	Pearson Correlation	.359**	.172	.118	(.182)	.147	.402**	(.153)	(.027)	.078	.147	1
	Sig. (2-tailed)	.001	.127	.296	.107	.193	.000	.175	.810	.493	.194	
	N	80	80	80	80	80	80	80	80	80	80	80
Space	Pearson Correlation	.116	(.041)	.046	.175	.047	(.052)	.278*	1	.353**	.190	(.027)
	Sig. (2-tailed)	.304	.717	.688	.121	.679	.647	.013		.001	.092	.810
	N	80	80	80	80	80	80	80	80	80	80	80
Time	Pearson Correlation	.079	.189	(.034)	.192	.332**	.160	.398**	.353**	1	.091	.078
	Sig. (2-tailed)	.485	.093	.764	.089	.003	.156	.000	.000		.423	.493
	N	80	80	80	80	80	80	80	80	80	80	80
EnvImp	Pearson Correlation	.161	.392**	(.164)	(.049)	(.074)	.319**	.238*	.190	.091	1	.147
	Sig. (2-tailed)	.155	.000	.147	.666	.516	.004	.033	.092	.423		.194
	N	80	80	80	80	80	80	80	80	80	80	80
ReCost	Pearson Correlation	.359**	.172	.118	(.182)	.147	.402**	(.153)	(.027)	.078	.147	1
	Sig. (2-tailed)	.001	.127	.296	.107	.193	.000	.175	.810	.493	.194	
	N	80	80	80	80	80	80	80	80	80	80	80

Note: **. Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed)

ii) Descriptive Analysis

There are about 150 sets of questionnaires that have distributed to respondents, but only successfully collected back 80 sets of questionnaires. This questionnaire has used the Likert scale 1-5 as measuring scale which ranging from strongly disagree to strongly agree. The information about data analysis in the form of descriptive analysis has conducted using SPSS software. The data show in Table 18 are interpreted using descriptive analysis. The mean and standard deviation has listed out for all obstacles and challenges in implementation of 3R Practices that asked to the respondents. However, for this research study, mostly mean will be discussed further in order to determine the ranking for obstacles and challenges in implementation of 3R Practices. The higher the mean, the higher the ranking for specific obstacles and challenges in implementation of 3R Practices.

Table 18
Descriptive Analysis for Section D's Question Using SPSS Software

Challenges	N	Mean	Std. Deviation
The construction workers have a habit of using landfill method to settle the construction waste.	80	4.28	.595
The construction workers do not have knowledge towards concept of 3R practice.	80	4.24	.661
The government does not enforce 3R Practices as compulsory for construction project.	80	4.21	.650
Some construction site has limited space for carrying out the waste segregation process.	80	4.08	.612
3R Practices requires extra time to carry out waste segregation process.	80	4.06	.681
The client prefers to emphasize on short-term financial benefit.	80	3.94	.817
The clients are not interested to put effort towards implementation of 3R practice.	80	3.93	.792
The client does not aware that 3R Practice is able to reduce the environmental impact.	80	3.89	.729
The construction workers are not willing to participate towards 3R practice.	80	3.70	.818
The client does not aware that 3R Practice is able to reduce the construction cost in long-term perspective.	80	3.69	.851
The government does not enforce law and policy towards implementation of waste management practice.	80	3.53	.856

For client's interest aspect, the problem where the client prefers to emphasize on short-term financial benefit has ranked number one with a mean of 3.94 exhibit in Table 19. About 42 respondents agree and 19 respondents strongly agree to this problem. Then, 14

respondents remain neutral and 5 respondents disagree. The obstacle that the clients are not interested to put effort towards implementation of 3R practice has ranked second with a mean of 3.93. About 42 respondents agree and 18 respondents strongly agree to this problem. Then, 16 respondents remain neutral and 4 respondents disagree. The difference between both obstacles under a similar aspect is only about mean of 0.01.

Table 19
Ranking for Section D's Question Based on Descriptive Analysis

Challenges	Level of Agreement					N	Mean	Rank
	1	2	3	4	5			
Client's Interest								
Fin	0	5	14	42	19	80	3.94	1
Effort	0	4	16	42	18	80	3.93	2
Lack of Participation								
Land	0	0	6	46	28	80	4.28	1
Kled	0	1	7	44	28	80	4.24	2
Will	1	5	21	43	10	80	3.70	3
Law and Regulation								
Comp	0	2	4	49	25	80	4.21	1
Enfor	1	9	24	39	7	80	3.53	2
Effectiveness on Waste Management								
Space	0	1	9	53	17	80	4.08	1
Time	0	2	10	49	19	80	4.06	2
Lack of Awareness								
EnvImp	0	3	17	46	14	80	3.89	1
ReCost	1	6	21	41	11	80	3.69	2

For the aspect of lack of participation, the statement of the construction workers has a habit of using landfill method to settle the construction waste has ranked number one with a mean of 4.28. There are 46 respondents agree and 28 respondents strongly agree to this statement. The second rank is the problem where the construction workers do not have knowledge towards concept of 3R practice with a mean of 4.24. There are 44 respondents agree and 28 respondents strongly agree to this problem. The last one is the obstacle where the construction workers are not willing to participate towards 3R practice with a mean of 3.70. There are 43 respondents agree and 10 respondents strongly agree to this obstacle. Then, 21 respondents stated neutral, 5 respondents disagree and 1 respondent strongly disagree. According to (Seow, 2018), the contractors will only conduct 3R Practices if it brings benefit to them. From that study, it indicates that 64.3% of the contractors supported that contractors' low participation is one of the barriers in implementation of 3R Practices (Seow, 2018),

Furthermore, the higher ranking under aspect of law and regulation is that challenge where the government does not enforce 3R Practices as compulsory for construction project with a mean of 4.21. About 49 respondents agree and 25 respondents strongly agree to this challenge. The next ranking is the problem where the government does not enforce law and policy towards implementation of waste management practice. The mean is about 3.53.

There are 39 respondents agree and 7 respondents strongly agree to this problem. Then, 24 respondents stated neutral, 9 respondents disagree and 1 respondent strongly disagree. According to (Seow, 2018), the enforcement of law by government is an effective way to improve the participation towards 3R Practices. At that study, about 55% of the contractors agree to importance of law and regulation enforcement (Seow, 2018). Not only that, the higher ranking under aspect of effectiveness on waste management is that challenge where some construction site has limited space for carrying out the waste segregation process with a mean of 4.08. There are 53 respondents agree and 17 respondents strongly agree to this challenge. According to (Goh et al., 2015), timber needed a huge area to keep, but the size of the site is limited and consequently becomes a challenge in implementation of 3R Practices. For that research study, there are about 83% of respondents agree and 17% of respondents disagree to challenge of insufficient space (Goh et al., 2015). The next ranking is the problem where 3R Practices requires extra time to carry out waste segregation process with a mean of 4.06. There are 49 respondents agree and 19 respondents strongly agree to this problem.

In addition, the higher ranking under aspect of lack of awareness is that obstacle where the client does not aware that 3R Practice is able to reduce the environmental impact with a mean of 3.89. There are 46 respondents agree and 14 respondents strongly agree to this obstacle. Then, 17 respondents remain neutral and 3 respondents disagree. The next ranking is the problem where the client does not aware that 3R Practice is able to reduce the construction cost in long-term perspective with a mean of 3.69. There are 41 respondents agree and 11 respondents strongly agree to this problem. Then, 21 respondents remain neutral, 6 respondents disagree and 1 respondent strongly disagree.

Conclusion and Recommendation

According to the findings of this study, the research study has achieved through questionnaire survey in determining the level of awareness on construction waste issues and waste management among different construction professionals. It has six question which related to first objective and the respondents required to answer for all of it. The Likert scale 1-5 has used as measuring scale in answering the question. The information about data analysis in the form of frequency calculation has conducted by using SPSS software. All of the data collected was based on the respondent's self-awareness on construction waste issues and waste management. The information related to second objective from literature review has used as a guideline to set the question for respondents to answer for it. It is required to carry out in order to determine the level of agreement of the respondents towards every question that related to importance of 3R Practices. There are about 150 sets of questionnaires that have distributed to respondents, but only successfully collected back 80 sets of questionnaires. This study has used the Likert scale 1-5 as measuring scale which ranging from strongly disagree to strongly agree. The information about data analysis in the form of descriptive analysis has conducted in using SPSS software. There are few obstacles and challenges in implementation of 3R Practices such as the clients are not interested to put effort towards implementation of 3R practice, the client prefers to emphasize on short-term financial benefit, the construction workers are not willing to participate towards 3R practice, the construction workers do not have knowledge towards concept of 3R practice, the construction workers have a habit of using landfill method to settle the construction waste. Not only that, the challenges where the government does not enforce law and policy towards implementation of waste management practice, the government does not enforce 3R

Practices as compulsory for construction project, some construction site has limited space for carrying out the waste segregation process, 3R Practices requires extra time to carry out waste segregation process, the client does not aware that 3R Practice is able to reduce the environmental impact as well as client does not aware that 3R Practice is able to reduce the construction cost in long-term perspective have explored and achieved.

For the recommendation of research, it is suggested to determine the level of agreement towards the challenges and obstacles that leads to failure in implementation of 3R Practices not only focus in just one state in Malaysia. For example, it is recommended to conduct a survey regarding this topic in Kuala Lumpur area and Johor area. It is because they can make a comparison between the two different states and consequently determine more precise variables that leads to failure in implementation of 3R Practices. Furthermore, suggested to conduct other topic related to 3R Practices not just only about its obstacles and challenges, but also can proceed to the topic about a study which focus on the way towards improvement of 3R Practices in Malaysia. Moreover, regarding to the topic of making a comparison between 3R Practices and other waste management practices that adopted in Malaysia in term of advantages and disadvantages as well as application of it.

Acknowledgements

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