

Delay in Construction Project due to Movement Control Order

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Abstract: Malaysia is one of the countries in the world that is badly affected by the Covid-19 virus. Due to the MCO implemented by government, construction projects were instructed to stop all their works at construction site. All parties that were related with the project were likely to face damaged, especially the contractors. This research identifies the common factors related problems due to MCO and mitigation actions taken to avoid prolonging the delay. Questionnaire survey conducted among G6 contractors revealed that confusion on SOP compliances, escalation and inflation of materials price and lack of construction materials were the highest common delay related problems faced by contractors due to MCO. Survey also found that a proper planning is the most important mitigation action to ensure construction project can be continued and prolonged delay can be avoided. Hopefully, the findings of this study will be useful as a guide for key players in the construction industry especially contractors in making necessary strategy and preparation if similar predicament happens in the future.

Keywords: Construction Delay, Force Majeure, Delay Mitigation

1. Introduction

Malaysia is one of the countries in the world that is badly affected by the Covid-19 virus. Until today, more than 70 thousand cases were recorded in this country that coming from different clusters at different areas (WHO, 2020). The Federal government of Malaysia implemented Movement Control Order (MCO) as a preventive measure in response to the pandemic. In conjunction on the first phase period, all business activities had been shut down including the construction industry. The industry players and all workers were directed to Work-From-Home to minimize human interactions. However, it is impossible for the construction industry to be performed online. Starting from 4 May 2020, the

government allowed some activities including the construction industry to continue operating by following the Standard Operating Procedures (SOP) to recover the economy.

In order to accomplish all construction projects following the time frame, the parties related to the project need to have a proper planning to avoid any problems. Every construction work and maintenance needs to stop operating unless it falls under the essential categories during the period of MCO until March 31 [1]. Regarding to Malaysian Public Works Department, exceptions were only given to the sectors that providing essential services that affect public safety or cause public hazards. Delays in projects were resulted from 95% of employee could not work at any time due to reaction to the pandemic [2].

Without effective mitigation actions taken by contractors and government regarding to the delay in construction project, many effects will be arising and affected various parties. The contractors were likely to face huge impacts on the performance of their duties, particularly on construction sites. Hence, the delay in construction project due to MCO will continue to arise if improper planning were made. Without any action taken, a serious impact may be faced by the contractors in the future. This research aims were to identify the common delay related problems and to mitigate the actions taken by the contractor to minimize the delay. By having appropriate strategies to overcome the issue, any upcoming problems can be solved and control.

2. Common delay related problems and mitigation actions

Construction industry is an important industry in Malaysia. It is one of the major sectors that contribute to national economy in Malaysia. According to Malaysia's annual economic statistics 2018, the value of construction gross input increasing from RM177.9 billion in 2015 to RM204.4 billion in 2017. On 2020, due to the implementation of MCO, all construction activities were slowed down and as the result, the construction sector economy falls steeply by 44.9 percent in the second quarter of 2020 that amounting to RM19.8 billion if compared to the first quarter that worth RM35 billion [3].

The pandemic of Covid-19 causes the government to implement a new Standard Operating Procedure (SOP) during MCO to stop the spreading of virus. Even though construction industry was the first sector to be opened, from the survey, 21% companies were confused over the SOP [4]. New recommendations were given to the employers to resume operations with half of their labours to minimize the physical contact among workers. These actions were also happened in other country as the pandemic caused a decreased of 10 to 15% in labour availability at New York city [5]. This factor worsens the condition as small workforce led to less productivity and poor safety conditions affected workers morale and satisfaction [6]. Regarding to the guideline from National Security Council, the closing of industry's sector affected production construction equipment [7]. China is one of the largest suppliers of construction materials and global lockdown in China decreased the manufacturing product and impacted the construction sector on global scale. In addition, Covid-19 cause escalation of materials price that leads to increase of project costs [8]. The exchange rates from foreign company and increased of demand for supplies worsen the conditions.

Delay in material delivery and material shortage on market or site are the most important causes of delay in construction projects [2]. A study had been done in accordance with the delay and the results shows that delay in payments by owner had been ranked at third place and main reason that cause delay in Kuwait was discovered to be a delay from main contractor delaying the payments to the subcontractors [9]. It is clear that 'contractor financial troubles' is not limited to Malaysia as Burkina Faso, Benin, Egypt, Jordan, Uganda, and Vietnam are among the African and Asian countries that were having financial problems [10]. Besides, according to the same researcher, it stated that incompetent subcontractors, consultants' slowness in supervising work and making decisions, consultants' inefficiency in issuing instructions are a casual delay factor in construction project. Finally, the causes of delay in construction project were because poor site management and supervision as well as poor communication with other parties.

As to curb and mitigate the delay, some strategies were needed. According to a study, main cause of construction project delays is lack of proper planning and scheduling by contractors. Planners and

schedulers should have backup plans in place in case of a shutdown. Proper communication between workers, clients and contractors has a significant influence on project success. One of the leading factors for construction delay as cited from 37 delay-related studies is lack of coordination [11]. Without proper communication, the coordination process to gather information will be harder. The delay factors on construction projects in Kuwait can be minimized by regular payments for any work done. By making timely payments to contractor by following the completion of work, contractors will not face any cost overruns [12]. Besides, to mitigate the delay on construction work, having skilled workers on site can minimize error and can make sure the works can be completed on time [13]. By using local materials, it can also reduce the delay by bring the supply chain within the border to avoid delay in delivery materials. Next, safety meeting is needed in a team to make sure the project manager or supervisor reminds the worker on SOPs. With safety meeting, workers will comply and follow the guidelines that had been implemented, thus transmission of virus can be avoided. Even though by using face mask is difficult due to increased breathing rates, sweating, fogging of safety glasses, and general discomfort, especially whilst carrying out demanding duties the strict enforcement can make sure the transmission between worker can be avoided [14]. Last but not least, improper production planning and work pressure is made up of stressing the importance of operational planning for building projects mentally exhausted as too many works need to be done. Thus, by doing job rotation, the productivity of workers can be increased and construction works can be done according to schedule.

3. Methodology

3.1 Questionnaire Survey

The purpose of the questionnaire survey was intended to collect the feedbacks on common delay related problems faced by contractors due to Movement Control Order and mitigation actions taken to avoid prolonging the delay. A five-point Likert scale with options ranging from “1 = strongly agree” to “5 = strongly disagree” has been adopted to gain feedbacks from the respondents. This study's respondents were Grade 6 (G6) contractors in Johor. At the moment, there are 126 G6 contractors in Johor that registered with Construction Industry Development Board (CIDB). According to the table of determining sample size for research activities by Krejcie and Morgan (1970), for the size of population, this study required a total of 80 respondents. The questionnaire was distributed via Google Forms and shared on social media platforms such as Facebook, WhatsApp, Telegram and email. The questionnaire forms were distributed to 126 G6 contractors' companies in Johor. 76 responds had been collected that equals to 60% of the population.

3.2 Data Analysis

A reliability test was conducted using Cronbach Alpha on items of the questionnaires. The obtained total Cronbach Alpha values were 0.809 and 0.940 which indicates that the consistency of the data were good and excellent, as the values were more than 0.8 [15]. The data collected through questionnaire survey were analysed using descriptive statistics which it is a brief descriptive coefficients compiling a data set that is either a representation of entire population or a sample [16]. It calculate, score and ranks the responds according to the most common delay and the highest mitigation actions to avoid prolonging the delay. By using the mean value, the patterns of the data set will be analysed. In order to gather level of agreement of the factors, average index (AI) analysis, one of mean variant was adopted [17]. The AI analysis is used to polls all respondents' response together and provides a single conclusive level of agreement. The interpretation for AI values is shown in Table 1.

Table 1: Average Index Values and Interpretations

Average Index (AI)	Level of Agreement
$0.00 \leq AI \leq 1.49$	Strongly Disagree
$1.50 \leq AI \leq 2.49$	Disagree
$2.50 \leq AI \leq 3.49$	Neutral
$3.50 \leq AI \leq 4.49$	Agree
$4.50 \leq AI \leq 5.00$	Strongly Agree

4. Results and Discussion

4.1 Background of the Respondents

The respondents' distribution according to their location (district) is as the following: Johor Bahru (76.3%), Kluang (5.3%), Segamat, Muar and Batu Pahat (4%) respectively, Kulai (2.6%), Pontian, Kota Tinggi and Tangkak (1.3%) respectively. In terms of experiences, 46% respondents have working experiences for more than 10 years (Table 2) and 90% respondents have involved mainly in non-residential type of project (Table 3).

Table 2: Respondents' Working Experiences

Years of Working Experiences	(No. of respondents, %)
Less than 5 years	17, 22%
5 to 10 years	24, 32%
More than 10 years	35, 46%

Table 3: Respondents' Working Experiences in Different Types of Projects

Type of Project	(No. of respondents, %)
Residential	51, 67%
Non-Residential	68, 90%
Infrastructure	27, 36%

4.2 Common delay related problems faced by contractors due to Movement Control Order

Table 4 shows the average value of the overall answers on common delay related problems chosen by the 76 respondents. As shown below, with AI value of 4.95, the contractors were strongly agree that confusion on SOP compliances was the most common delay related problems faced by contractors due to MCO. This is in agreement with a researcher who pointed out that even though construction industry was the first to begin operations, the sector remained halted as most of the companies were confused over the SOP [4]. The factors were followed by escalation and inflation of materials price (ranked 2) and lack of construction materials (ranked 3). Delay in delivery was ranked 4 and these critical delays were mainly due to the effect of Covid-19. By knowing the common problems affecting the construction progress, mitigation actions should be taken to avoid any further delay.

Table 4: Mean Ranking Analysis for Common Delay Related Problems

Common delay related problem	N	Mean	Ranking
Confusion on SOP compliances	76	4.95	1 st
Escalation and inflation of materials price	76	4.93	2 nd
Lack of construction materials	76	4.86	3 rd
Delay in delivery (i.e. materials, equipment and documents)	76	4.84	4 th
Financial problems faced by contractors	76	4.54	5 th
Poor safety conditions	76	4.51	6 th
Low productivity of workers	76	4.50	7 th
Lack of workers	76	4.49	8 th
Delay in revising and approving documents (i.e. design drawing, shop drawing and sample materials)	76	4.43	9 th
Delay in payments to the contractors	76	4.28	10 th
Poor site management and supervision	76	4.21	11 th
Poor communication with other parties	76	4.07	12 th
Delay by consultants in providing instructions	76	4.05	13 th

Delay by subcontractors (i.e. poor performance and poor management)	76	4.01	14 th
Lack of construction equipment	76	3.45	15 th

4.3 Mitigation actions taken to avoid prolonging the delay

Table 5 shows the responses on mitigation actions taken by contractors to avoid prolonging the delay. Respondents were strongly agree that proper planning (AI value of 4.92) and proper coordination (AI value of 4.91) has made to the top two most effective mitigation actions taken to avoid prolonging the delay. This viewpoint of proper planning is the most effective method to reduce delays. This is in agreement with a researcher who pointed out that proper planning can reduce the critical delays in construction project. The actions were followed by proper coordination (ranked 2) and having a safety meeting (ranked 3).

Table 5: Mean Ranking Analysis for Mitigation Actions taken by contractors to avoid prolonging the delay

Mitigation actions taken by contractors to avoid prolonging the delay	N	Mean	Ranking
Proper planning to make sure construction project can be continued	76	4.92	1 st
Proper coordination by the head of contractor to the workers to make sure works can be done accordingly	76	4.91	2 nd
Having a safety meeting to avoid confusion on SOP compliances	76	4.87	3 rd
Do job rotation for the workers to increase work productivity	76	4.86	4 th
Proper communication between the clients and contractors to avoid miscommunication between parties	76	4.84	5 th
Proper communication to keep every worker informed with the problems that arise	76	4.82	6 th
Regular payments to contractor to avoid financial problems	76	4.75	7 th
Get and use local materials	76	4.71	8 th
Make sure most of the workers are skilled workers	76	4.63	9 th

5. Conclusion

The related parties especially contractors need to take proper actions to make sure the delay on construction projects can be minimized in the midst of Covid-19 Pandemic. Confusion on SOP compliances is showing the highest mean value that makes this factor as the major factor of construction delays due to Covid-19. Thus, to curb further delay in construction progress, proper planning needs to be done to make sure it can be continued as smoothly as possible. Further research can be conducted by broaden the population of respondents to other states in Malaysia or other countries to obtain sufficient data for a conclusive findings in a wider context. Future research should explore and investigate in-depth more factors that may cause delay as well as procedures that could be used to minimise the factors causing delays on construction projects in Malaysia and worldwide. It is humbly hoped that actions highlighted in this study will be useful for key players in the construction industry especially contractors in making necessary strategy and preparation if similar predicament happens in the future.

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