

ANALYSIS OF IMPACTS ON AIRPORT CONSTRUCTION DUE TO THE SPREAD OF COVID-19 VIRUS

Worawoot Chetnarong¹, Waranon Kongsong², Chaiwat Pooworakulchai³, Teeradej Snongtaweeporn⁴

1. Ph.D. Student in Engineering Law and Inspection, Faculty of Engineering, Ramkhamhaeng University, Thailand, E-mail: 6519770006@rumail.ru.ac.th
 2. Associate Professor Dr. in Engineering Law and Inspection, Faculty of Engineering, Ramkhamhaeng University, Thailand, E-mail: drwaranon@gmail.com
 3. Lecturer, Dr., Engineering Law and Inspection, Faculty of Engineering, Ramkhamhaeng University, Thailand, E-mail: irrman2002@gmail.com
 4. Lecturer, Dr., Faculty of Business Administration, North Bangkok University, Thailand, E-mail: teeradej.sn@northbkk.ac.th
- Corresponding Author:** Worawoot Chetnarong, Ph.D. Student in Engineering Law and Inspection, Engineering Faculty of Ramkhamhaeng University, Thailand
E-mail: 6519770006@rumail.ru.ac.th

ABSTRACT

This article aims to research factors that affect and control measures including legal measures related to airport construction. That has resulted in delays in airport construction. During the COVID-19 outbreak between 2019 and 2023, it affected airport construction both directly and indirectly. Regardless of whether it affects Workers and Employees (Man), materials and equipment (Material) and construction period (Time Line) of airport construction. In this research, a mixed method was used that used Quantitative Research. and Qualitative Research using data from the field and documents requesting contract extensions that have an impact on airport construction. It was analyzed using the qualitative analysis method of the reasons for requesting contract extension. What factors come from? And use the qualitative data obtained as the number of days required to extend the contract period was analyzed quantitatively by using statistical methods and compiling into statistical results. The research results were found that the spread of the Covid 19 virus has had an impact on airport construction, resulting in the second-highest number of contract extension requests, up to 19%, according to research results. It also indirectly affects workers, employees and experts including materials and equipment, resulting in requests for extensions of airport construction contracts totaling 19% as a result of the country's Lock Down, prevention measures and measures to control the spread of the epidemic. Total is the impact from the spread of the COVID-19 virus, including 38%. Impacts from the spread of the Covid 19 virus if screening measures are in place Prevention measures and epidemic control measures. It will help relieve it. From the most effective to the least effective and able to cope with disease outbreaks that will occur in the future.

Introduction

Currently, construction work is an economic and social impact of that country. Construction of buildings and airports. Subways, expressways, bridges, etc., inevitably demonstrate the socio-economic development in the country.

At the same time in construction work; The progress of the work is important to the goal and success in the construction work, and the key factor in the element of success is that the people,

or as we may call it in our home language, the worker (Man), is one of the factors driving the achievement of the goal. But if something happens to the personnel or workers. The progress of the work will be delayed and interrupted with a direct effect on the construction work that is currently underway, especially the spread of the Covid 19 virus, which directly affects the personnel or workers mentioned in the first place.

Referring to the past in Thailand, there was an outbreak of highly contagious diseases that resulted in the killing of the planet and the population of Thailand. According to the announcement of the Ministry of Public Health (2016, 2018). COVID-19 was a pandemic during B.C. 2019 – 2023. The coronavirus or COVID-19 began spreading in early December 2019. As of May 5, 2023: 765,222,168 people have been infected worldwide, and as of December 31, 2023, there have been 6,962,397 deaths worldwide (Channuwong & Ruksat, 2022; Channuwong et al., 2023) This shows that the mortality rate from this disease is high due to the deadly diseases that have plagued the world. Based on such information, the outbreak of the epidemic initially had a direct impact on construction work. Whether directly or indirectly.

This research will refer to a disease that has recently emerged in the period B.C. 2019 – 2023, namely the COVID-19 pandemic, which the World Health Organization (WHO) has declared an international public health emergency. On January 30, 2020 and the Ministry of Public Health (No. 3) B.C. 2020 declared COVID-19 a dangerous contagious disease that can be fatal. Surveillance, prevention and control of dangerous communicable diseases must be carried out. Therefore, the spread of the COVID-19 virus during this period has both direct and indirect impacts on construction. There are many impacts from the COVID-19 towards staff and worker, material, construction Area (Site), residence and time line. Therefore, screening measures, surveillance measures, preventive measures, and control measures have been put in place to enable the construction of the airport to proceed until the target is achieved.

Research Objectives

1. To find factors affecting airport construction delays before and during the COVID-19 pandemic.
2. To find control measures that affect airport construction delays during the COVID-19 pandemic.
3. To find legal measures related to airport construction during the COVID-19 pandemic.

Research Method

This research is a mixed method that combines quantitative and qualitative research based on data from the field and documents for the extension of the contract that affects the construction of the airport. It is analyzed by qualitative analysis of the reasons for requesting an extension of the contract from what factors. The qualitative data obtained is the number of days to request an extension of the contract that is separated into categories of factors for quantitative analysis. Statistical methods and processed into statistical results. From the number of days to apply for an extension of the contract to a percentage of the total extension period, which directly and indirectly affects the construction of the airport. This research researched data from one large airport project. By studying information from the project consultant group and the contract contractor group. In the said project, there are a total of 5 contractors, including the owner. It is divided into research factors that affect airport construction delays both before and during the virus outbreak. COVID-19: Research on control measures affecting airport construction delays during the pandemic COVID-19 and research on legal measures related to airport construction

during the COVID-19 pandemic

Results

1. Analysis of factors affecting airport construction delays before and during the pandemic COVID-19

Factors affecting airport construction delays before and during the pandemic have been identified. The study was conducted on the construction period of this airport project and the extension of the contract period due to various factors. As shown in the project plan graph of the consulting group and the contractor group as follows:

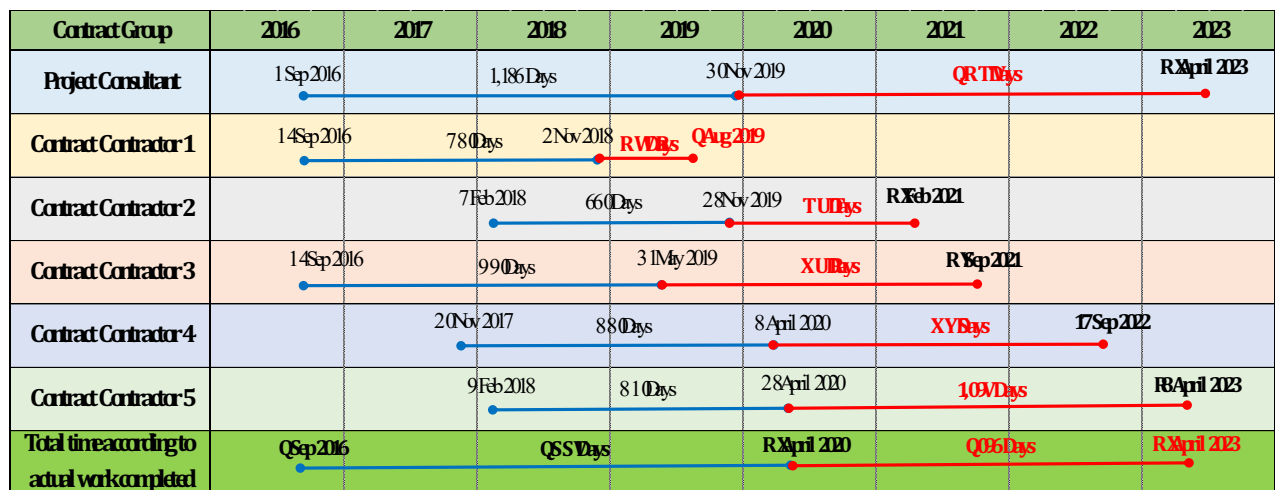


Figure 1 The graph shows the number of construction days of the project and the request for extension of the term of the airport construction contract.

Remark:

Blue line = Number of construction days according to the term of the airport construction project contract (days)

Red line = Number of days for extension of airport construction contract (days)

Based on the results of collecting airport construction data until the completion of work from Figure 1, the analysis and synthesis of factors that justified the request for extension of the airport construction contract. There are factors that are divided according to various factors as follows:

No.	Factors affecting delayed airport projects	Number of days (days)	Percent (%)
1	The work is not completed according to the event requirements (Milestone Schedule).	272	8
2	The work was not completed according to the airport construction coordination plan (Key Date).	429	12
3	Imperfections in the design cause work to increase and decrease from the contracted drawings (Variation Order).	1,509	42
4	The use of materials and equipment from abroad (Material) has resulted from the COVID-19 pandemic.	526	15

5	Man, Know-How as a result of the COVID-19 pandemic	152	4
6	COVID-19 pandemic	679	19
Total		3,567	100

Table 1 The table shows the percentages that factors affecting delayed airport projects

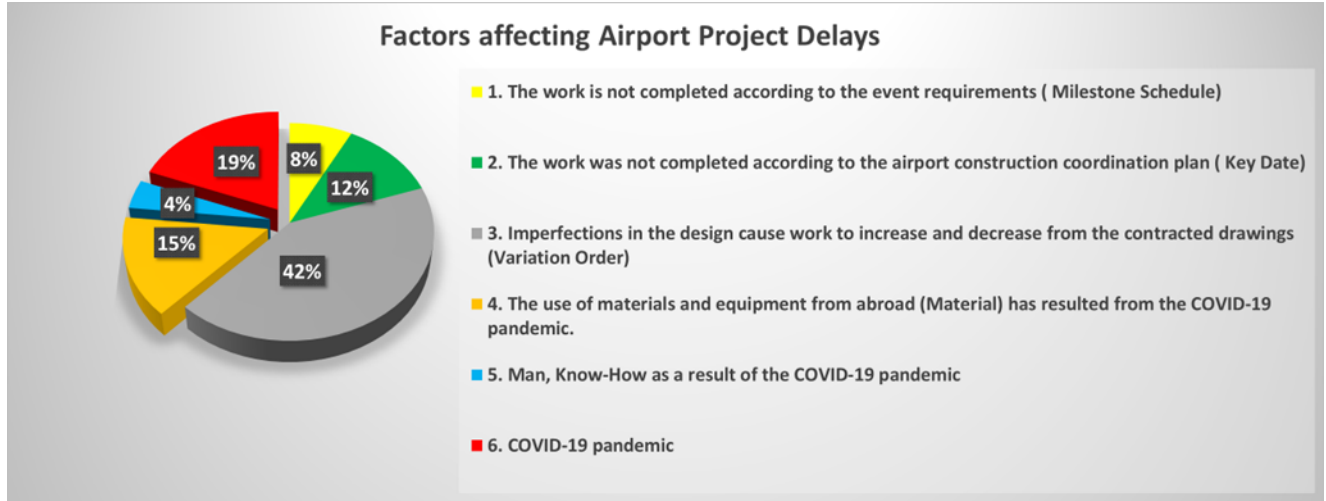


Figure 2 The graph shows the factors that delay the airport project.

Table 1 and Figure 2 are qualitative data analysis and can be analyzed by analyzing quantitative data. If the percentage is 16.67% at standard deviation (SD) 13.47, it can be seen that the COVID-19 pandemic has delayed airport projects by as much as 19%, which is one of the factors in the contract extension application. The COVID-19 pandemic also affected secondary factors that affected the delay of the project, resulting in the cessation of production of materials from overseas factories and the inability to deliver materials as planned by the project. Because of the national lockdown, the shutdown and closure of factories during the epidemic reached 15%, including another secondary factor, the use of manual labor and experts (Man, Know-How) up to 4%, as well as the lockdown of the country and foreign experts. Unable to come to test the system. from products ordered directly from abroad, including domestic workers and employees affected by Announcement of domestic curfews including consideration of public procurement and supply management issues by Comptroller General’s Department. The Comptroller General's Department has taken measures to expedite the implementation of subsidized contracts with a penalty rate of 0% for project delays affected during the COVID-19 pandemic that is in line with the research of Aphichest Gorampai (2023) on Factors Affecting the Management of Government Construction Contracts and Private Contract Recipient After Coronavirus Pandemic 2019 in Minburi District, Bangkok. The results showed that the impact on operators in construction contract management, finance, personnel, materials, equipment and machinery can be interpreted as high level. And Onsutee Suknawa's research (2022) on Factors Affecting the Management of Private Construction Contracts Amidst COVID-19 Pandemic in Wattana Sub-District Bangkok. This research found that various factors affecting the management of construction contracts amidst the COVID-19 pandemic, particularly the four main factors including human resources, raw material, machinery, and finances. These four factors were considered highly affected.

2. Results of analysis of control measures that affect delays in airport construction during the COVID-19 outbreak.

For employees and workers are working in agencies and offices must comply with there are

procedures and procedures as follows:

Managing to have a screening point check temperature of the agency and the office, including employees, workers, and outsiders who come in contact, has designated alcohol or hand washing gel stations for employees. Workers wear masks set up a distance of 1 - 2 meters between people. Set up online meetings. Avoid meetings where people gather in conference rooms.

In case of finding infected persons, infected groups must stop working immediately, and must be quarantined after receiving treatment and received confirmation from a doctor 14 days before coming to work (Sakhet & Ayuphong, 2021)

Those in direct contact (high-risk groups) must stop working immediately. And be tested for infection 3-5 days after coming into contact with an infected person. If no infection is found, you must stop work and quarantine yourself for 14 days. After quarantine, be tested for infection before returning to work.

Groups of people who are in close contact with people who are directly close to them (high risk group) work from home for 7 days, monitor for symptoms and get tested for infection first before back to work

Establish measures to prevent disease and to control disease [6,7,8]

Bubble and Seal measures for disease prevention by grouping groups that have the same work or activity, doing activities under the same conditions. There is no crossing of work groups or activities. with rapid control measures When an infected person is found in the work group or activity Infected people can be separated and treated. This makes it possible to quickly identify groups at risk of direct contact with infected people and control them. Reduce the time for evaluating and following up with people in contact with at-risk groups. to enter preventative measures quickly Organizing work groups or activities is to reduce the spread so as not to mix and be close to each other across groups. which reduces the spread to other groups and outside (Chuanichaisit, 2021)

Bubble and Seal measures for disease control Disease control management in work areas Agencies and offices When a worker is found infected with COVID-19 which divides the level of infection of workplaces or business establishments into 3 levels as follows:

Low level in cases where the rate of infected persons is < 10% of all workers.

Moderate level: In cases where the rate of infected people is > 10% of all workers.

High level in cases where infected persons meet 2 of the 3 criteria as follows:

The number of infected people is more than 10 percent of all workers.

The number of infected people is more than 100 people.

Infections were found in workers who continued working for more than 14 days out of 28 days.

By main goal to be able to control the spread of disease in the workplace, agencies, offices and communities. without affecting the work or operation of that business So that such establishments can continue to operate without having to close down. By organizing small bubble groups to work or do activities within the group only, not across groups in the case of finding an infected person. Separate infected people for immediate treatment. For the remaining workers in the group to be quarantined. but can still work without crossing groups Workers in other subgroups can work normally.

From the results of qualitative research Measures to control the spread of the COVID-19 virus

were found from documents requesting contract extensions. Reason for requesting contract extension This is due to the infection of workers and employees, which is a direct result of the project being unable to provide Infected people come to work and can work. Because it will spread the virus to Uninfected workers and employees It also has a direct effect on the construction period of the project.

3. Results of analysis of legal measures related to airport construction during the COVID-19 outbreak.

Legal control measures

From the announcement of the Ministry of Public Health Announcement of Coronavirus Disease 2019 or COVID-19 as a Dangerous Communicable Disease No. 14 (Issue 3) B.C. 2020 and resulting in the promulgation of the Emergency Decree on Public Administration in Emergency Situations B.C. .2005 with regulations issued in accordance with Section 9 of the Emergency Decree on Public Administration (No. 20) B.C. 2005 by specifying control measures. Measures to prevent infection and measures to support people infected with the COVID-19 virus, regulations issued in accordance with Section 9 of the Emergency Decree on Public Administration (No. 25) B.C.2005 by specifying urgent measures to block specific target areas. Determine the control and prevention of epidemics among construction workers. Labor groups in establishments and factories in Bangkok and surrounding areas including measures to control and prevent the spread of the virus. Integrated COVID-19, regulations issued in accordance with Section 9 of the Emergency Decree on Public Administration (No. 27) B.C. 2005 stipulates the improvement of provincial areas according to the situation of the spread of the Covid virus. -19 Do not leave your home during the specified time. Do not travel across provinces. There are urgent integrated control measures. Only in the Bangkok area and surrounding provinces. In which the airport construction agency is in Samut Prakan Province, therefore, there is an announcement of Samut Prakan Province. Regarding measures to prevent and stop the spread of coronavirus disease 2019, Samut Prakan Province (Issue 9) , with urgent measures to prevent the outbreak in specific target areas. There are measures to control and prevent the spread of infection among construction workers. Group of workers in establishments and factories in Samut Prakan Province with urgent integrated control measures. Measure to control and prevent epidemics in community areas

Control measures that have been announced to enforce various include various laws in emergency situations It has affected airport construction work, including workers, employees, experts, and various materials and equipment used in construction work. The committee judges the problems of procurement and management of government supplies. The Comptroller General's Department therefore considers the direct impact on contractors. Therefore, there was a meeting to discuss according to the letter of the Committee on Procurement and Management of Public Sector Supplies, the Comptroller General's Department, on practicing understanding regarding operations during the period affected by the coronavirus disease 2019 case. Therefore, there are guidelines on how to consider waiving or reducing fines for contracting parties. or extend the working period according to the contract or agreement with the contractor that were signed before the spread of the COVID-19 virus and during the spread of the COVID-19 virus and have measures to assist entrepreneurs during the spread of the coronavirus disease 2019.

After a heavy outbreak and the outbreak has been controlled through COVID-19 vaccination, the Ministry of Public Health Announcement (Issue 3) B.C. 2022 announced that Coronavirus

Disease 2019 or COVID-19 is a contagious disease. that must be carefully observed After that, the committee will decide on the problems of government procurement and supply management. The Comptroller General's Department discussed measures to assist operators during the outbreak of the coronavirus disease 2019 with employers of airport construction projects. Therefore, a summary of measures to expedite the implementation of the contract has been concluded. that received assistance to have a fine rate of 0 percent which the said measure allows the contractor to request an extension of the construction contract with a fine of 0 percent. It will be seen that the above mentioned in the legal measures are Measures to control the spread of the disease and have a direct effect on the duration of airport construction work, workers, employees, specialized personnel, and equipment used in the project.

Conclusion

The spread of the COVID-19 virus is an unprecedented event that has occurred in decades. It has a huge impact on construction work both directly and indirectly. If we have preventive measures, we can cope with it without affecting works or organizations. The research here clearly showed that the COVID-19 has an impact on workers and experts (Man), materials and equipment (Material) and time (Time). Therefore, from the results of this research it has been found that if there are good screening measures, strict infection prevention controls Including strict prevention of epidemics, the COVID-19 can be controlled effectively. This comes from legal measures announced to deal with the spread of the COVID-19 virus or serious diseases in the future that will have less impact than in the past. Or in the future there may be new catastrophic diseases that we cannot predict, but we can provide various construction projects, no matter what project work, we can continue it without stopping work as before if we have a good preventive measure of such pandemic. This will not affect the delay of the construction project.

References

- Announcement of the Ministry of Public Health B.C. 2016. (2016, June 3rd) Royal Gazette, Volume 133, Special Section 128, pages 3-5.
- Announcement of the Ministry of Public Health (No. 2) B.C. 2018. (2018, February 7th) Royal Gazette, Volume 135, Special Section 29.
- Announcement of the Ministry of Public Health (No. 3) B.C. 2020. (2020, February 29th) Royal Gazette, Volume 137, Special Section 48.
- Announcement of Samut Prakan Province Regarding measures to prevent and stop the spread of COVID-19, Samut Prakan Province (No. 9) B.C. 2021 (2021, June 27th)
- Announcement of the Ministry of Public Health (No. 3) B.C. 2022. (2022, September 20th) Royal Gazette, Volume 139, Special Section 223.
- Gorampai, A., Kongsong, W., Snongtaweeporn, T., & Thammapornram, C. (2023). Factors Affecting the Management of Government Construction Contracts and Private Contract Recipient After Coronavirus Pandemic 2019 in Minburi District, Bangkok. *Journal of Dhamma for Life*, Volume 29 Issue 3 (July – September 2023)
- Channuwong, S. & Ruksat, S. (2022). Buddhist teachings for improving mental health during the COVID-19 Pandemic. *The Journal of Behavioral Science*, 17(2), 29-41.
- Channuwong, S., Ladnongkun, V., Siripap, P., Makingrilas, J. & Phetkong, J. (2023). The model of COVID-19 Prevention in the critical situations of Thai society. *Rajapark Journal*, 16(46), 67-80.
- Chuanchaisit, P. (2021). The aftermath of the COVID outbreak in construction camps. *Real estate*

- contractors are in serious trouble. Retrieved on 16th October 2022, retrieved from <http://www.reic.or.th/News/RealEsatate/453665>.

Letter from the Committee to Determine Public Procurement and Supplies Management Problems, Comptroller General's Department, No. 0405.2/171, dated April 24th, 2020, Subject: Rehearsal of understanding regarding operations during the period Affected by the coronavirus disease 2019 case.

Letter from the Committee to Determine Public Procurement and Supplies Management Problems, the Comptroller General's Department, at 0405.2/423, dated 10th September 2020, regarding guidelines for considering suspensions or reductions. Fines to the contracting party or extend the working period according to the contract or agreement that are affected by the coronavirus disease 2019 case.

Letter from the Committee on Procurement and Management of Public Sector Supplies, Comptroller General's Department, at 0405.2/693, dated 6th August 2021, regarding measures to assist entrepreneurs during the epidemic of coronavirus disease 2019.

Letter from the Committee on Procurement and Public Supplies Management, the Comptroller General's Department, at 0405.2/645, dated 21st June 2022, regarding measures to assist entrepreneurs during the epidemic. of the coronavirus disease 2019 according to the letter of the Committee to Diagnose Procurement and Public Supplies Management Problems, Most Urgent, No. 0405.2/ 693, dated 6th August 2021

Letter from the Committee on Procurement and Management of Public Sector Supplies, the Comptroller General's Department, at 0405.2/43055, dated 3rd November 2022, Subject: Discussion on measures to provide assistance to entrepreneurs during the Spread of coronavirus disease 2019.

Letter from the Committee to Determine Public Procurement and Supplies Management Problems, Comptroller General's Department, at 0405.2/1459, dated 24th November 2022, regarding measures to expedite the implementation of work for contracts awarded. Receive assistance so that the fine rate is 0 percent.

Royal Decree on Public Administration in Emergency Situations B.C. 2005. (2005, July 16th) Royal Gazette, Volume 122, Section 58, Pages 1-9.

Regulations issued in accordance with Section 9 of the Emergency Decree on Public Administration (No. 20) B.C. 2005 (2021, April 16th) Royal Gazette, Volume 138, Special Section 82₃, pages 25-28.

Regulations issued in accordance with Section 9 of the Emergency Decree on Public Administration (No. 25) B.C. 2005 (2021, June 26th) Royal Gazette, Volume 138, Special Section 140₃, pages 1-6.

Regulations issued in accordance with Section 9 of the Emergency Decree on Public Administration (No. 27) B.C. 2005 (2021, July 10th) Royal Gazette, Volume 138, Special Section 154, pages 1-6.

Sakhet, P., & Ayuphong, C. (2021), Impact of the COVID-19 epidemic. That affects the delay of construction work of Irrigation Office No. 1, Royal Irrigation Department. Thesis, Master of Engineering, Chiang Mai University.

Suknawa, O., Kongsong, W., Snongtaweepon, T., Tuprakay, S., Pooworakulchai, C. & Trerutpicharn, S. (2022). Factors Affecting the Management of Private Construction Contracts Amidst COVID-19 Pandemic in Wattana Sub-District Bangkok. 8th National Academic

Conference “Connecting technology in a new way of life”
Wikipedia, the free encyclopedia. “Whole outbreak of COVID-19”.:
<https://th.wikipedia.org/wiki/>