WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Review On Study On Delay Construction Project In India

Md Babar Ali [1], Pushpendra Kumar Kushwaha[2], Mithun Kumar Rana[3]

[1] M. Tech. Research Scholar, Civil Department, RKDF College of Engineering, Bhopal (M. P.),402026 India
[2] Assistant Professor, Civil Department, RKDF College of Engineering, Bhopal (M. P.), 402026 India
[3] Assistant Professor, Civil Department, RKDF College of Engineering, Bhopal (M. P.), 402026 India

ABSTRACT :

Time delay is one of the biggest problems facing in many construction buildings in India. Completing projects on time is the key factor of the project, but the construction process is subject to many variables and unpredictable factors, which result from many sources such as availability of resources, external factors, performance of parties and type of building. If there is a delay in project it leads to loss of productivity, increased cost, contract termination and disputes between contractor and owner. The aim of this project is to examine the causes and effects of delay on building construction project during construction phase and to provide control measures for time overrun in the project. A study carried out on construction schedule delays and various delay analysis techniques and methods in order to evaluate the causes of delay and their impacts in the construction project. Then a questionnaire survey is done to find the major causes of delay faced by Client, Contractor, Consultant and Project manager.

Keyword- — Delay analysis technique, causes of delay, tools to evaluate delay in construction, delay control measure

1. 1 Introduction :

One of the most significant economic sectors that contributes significantly to economic growth is the building sector. But a lot of the projects experienced major setbacks that went above the original budget and schedule projections. The success of the project is measured by the application of construction delay in terms of time, cost, quality, and safety. The construction sector is big, erratic, and capital-intensive. For the economy of developing nations, road construction is a crucial component of the construction industry. This indicates that road construction projects account for a large portion of the national infrastructure development budget. Inflation and pressure from local governments were the primary causes of the road building project's cost increase in the Kurdish region. However, there are also issues with payment delays, contract modifications, economic issues, procurement of materials, draughting modifications, staff shortages, inadequate equipment, oversight, design errors, and unsuitable site customisation. The primary reasons for the delays in planning road construction projects were labour disputes and strikes. Within the construction industry, a delay is characterised as either a timeout that extends beyond the predetermined deadline for project stakeholder delivery until the contract's end date. This project exceeds its original timeline and is seen to be typical of building projects. It refers to production and rentable area that the owner is responsible for in the event of a delay or income loss brought on by a malfunctioning facility. In certain instances, it indicates that the delay is the result of high labour expenses for contractors, high administrative costs related to long working hours, and high material costs as a result of inflation. A project's timely completion is a sign of its efficiency, but there are a lot of unknowns and unanticipated elements that can arise during construction. These sources include the performance of the parties involved, the availability of resources, the state of the environment, and the parties' contractual arrangements with one another.

1. 2 Literature survey & background :

Research was done by Doloi H. et al. (2012) to examine the variables influencing India's construction delays. They selected 45 different qualities. In order to generate predictive models to evaluate the impact of these elements on the delay, their study first identified essential characteristics that influence delays in the Indian construction industry. It also developed correlations between key qualities. I completed it. Their study is based on personal interviews and questionnaires. We employed regression modelling and factor analysis to examine the significance of delay factors. According to the factor analysis, the primary causes of the construction delay were the third-place inadequate site coordination, the subsequent ineffective site management, and the lack of commitment.

According to Ghulam Abbas Niazai and Kassim Gidado (2013), contracts with shorter durations than a year played a role in the delay. They came to the conclusion that "security" and "corruption" were the two causes of the delay between all parties. The most challenging task for a building project's implementation is inadequate security. It caused a delay in the project and raised expenses. The construction industry's progress is seriously threatened by corruption, which has a major effect on construction delays.

According to J. Raj Bharath and Prof. Siddesh K Pai (2013), the conventional Bandra-Worli Ocean Link accurately depicts the status of the nation's project delivery system. Although it was supposed to be a Rs 300 crore project finished by 2004, it actually took five years longer and cost 1600 rupees. According to a case study by Ruth Apolot, Henry Alaitwe, and Dantindiwensi (2013), lobbyists for the construction sector have the greatest influence on cost and schedule overruns, hence we advise minimising workload changes. In order to cut down on payment delays, we moved from the contract type to the design-build type and enhanced client cash flow.

The findings of the questionnaire study, according to Anu V. Thomas and J. Sudhakumar (2014), caused productivity declines, which in turn caused delays in identifying the factors influencing the labour productivity of project managers, site engineers, inspectors, and artisans in Kerala. Materials are acquired on schedule, deliveries of materials are delayed due to supplier strikes and political party blows, and productivity revisions of drawings and designs occur frequently.

According to Nitin Chaphalkar and KC Iyer (2014), improper handling results in disagreements between the parties over time and money, which can cause stakeholder concerns throughout the building phase and prolong the project's duration. According to Prakash Rao and Joseph Camron-Culas (2014), the three most important things a contractor can do to negatively affect a project's performance are poor project planning and scheduling, on-site transfer delays, and subcontractor work delays. These are followed by delivery delays. elements that changed and approved design papers too late. According to the poll, customers were responsible for 51% of the delays, followed by contractors (36%), and consultants (13%). Construction project delays and timeouts are primarily caused by file management problems, according to research conducted in 2015 by ARC File Solutions.

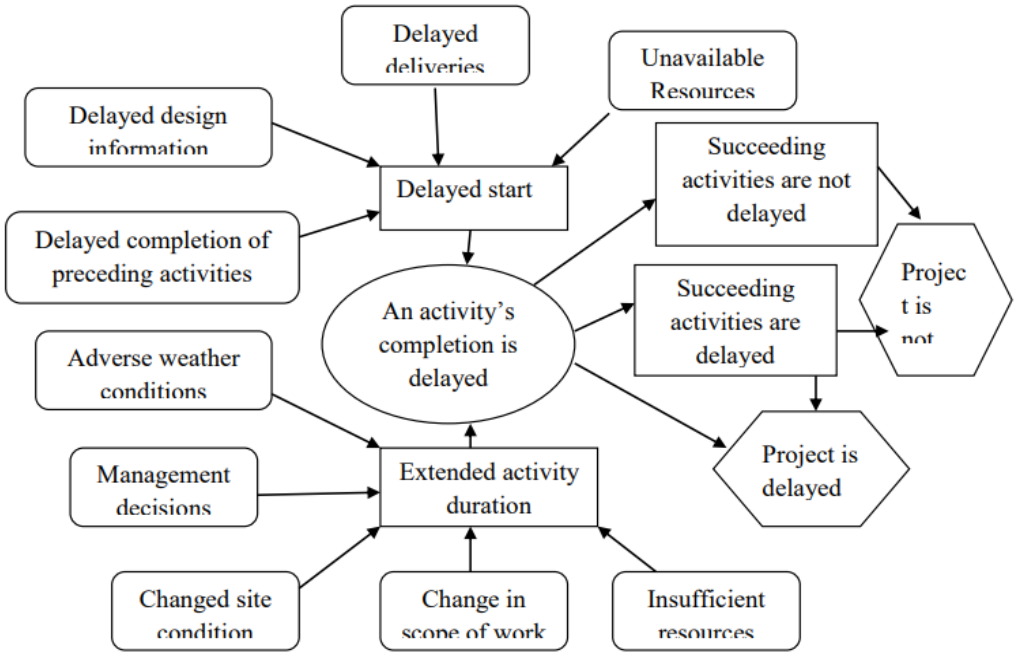
The current approach to handling concurrent delays is concluded in a paper by Zaki M. Kraie and James E. Diekmann, "Concurrent Delay in Construction Projects," which was published in the Journal of Construction Engineering and Management in December 1987. Two or more delays that happen simultaneously are known as concurrent delays, and they have never been easy to fix. The fundamental delay in building is:

Payable, Justifiable, and Inexcusable It is advisable to carefully examine this delay and modify the as-built timeline accordingly. Following then, the as-built timetable will be modified to take into account events that happened throughout the contract's performance.

Construction project delays can be caused by a variety of factors, according to Abdulaziz A. Bubshait and Michael J. Cunninghamon's "Comparison of Delay Analysis Methodologies," which was published in the Journal of Construction Engineering and Management in August 1998. A third party, the owner, the contractor, or an act of God could all be to blame for the delay. Network-based scheduling is a great tool for settling disagreements, adjustments, and delays during the project. The study's findings suggest that delay analysis results are frequently unpredictable and that there may be a strategy that works better than another in every circumstance. The study shows how different methods may be more feasible or economical depending on the time and resources available as well as the accessibility of the project control documentation.

The ―Construction Delay Computation approachl, which was concluded by Jonathan Jing sheng Shi, S. D. Cheung, and David Arditi, was published in the Journal of Construction Engineering and Management in January 2001. The approach involves computing activity delay and evaluating its contribution to project delay. One of the most prevalent issues in the construction sector is delay. The demand is composed of a series of equations that the computer program may quickly code to provide quick access to project delay information and activity contribution. This technique can be used to assess project delays in progress for any intermediate construction stage.

Figure 1.1 Activity delay



Tarek Hegazy and Kehui Zhang on ―Daily Windows Delay Analysis‖ published in Journal of Construction Engineering and Management, May, 2005 which conclude critical path method delay analysis are widely applied in the construction industry, with the windows method being regarded as technologically advantageous. A modified window approach is used in this paper with computerised daily analysis of delay, so that accurate result is obtained. It considers the day by day fluctuation in the critical path along the project duration. It introduces accurate and repeatable results for apportioning project delay among involve parties.

Hyun-Soo Lee, Han-Guk Ryu, Jung-Ho Yu and Jae-Jun Kim on ―Method of Calculating Schedule Delay Considering Lost Productivity‖ published in Journal of Construction Engineering and Management, November, 2005 which propose a practical method for converting lost productivity in to schedule delay. Among the various factors that causes delay thus study focus on the factors that cause loss of productivity. Few kind of productivity are:

- Labour productivity
- Equipment productivity

Youngje Kim, Kyungrai Kim and Dongwoo Shin on ―Daily Analysis Method Using Delay Section‖ published in Journal of Construction Engineering and Management, November, 2005 which conclude the objective of this study is to propose and describe an effective and logical method for evaluating construction delay.

William Ibbs and Long D. Nguyen on ―Schedule Analysis under the effect of Resource Allocation‖ published in Journal of Construction Engineering and Management, February, 2007 which shows that delay analysis without resource allocation practice substantially affects results of schedule analysis. Delays are the acts or events that extend the time necessary to finish activities under the contract. Performing schedule analysis without considering resource allocation may increase the owner and contractor risk of assuming delay responsibility which is not his or her fault. A case study was used to compare the analysis and result of the traditional and enhanced window analysis method.

K.C. Iyer, N.B. Chaphalkar, and G.A. Joshi on ―Understanding time delay disputes in construction contracts‖ published in International Journal of Project Management, May, 2007 which described an attempt to devise a rule based expert system to achieve this objective with a limits scope of dispute arising out of Time Delay and Extension in Indian Construction Contracts. Majority of the construction projects are carried out through contracts. There are reason for inconsistencies and discrepancies in large contract which area beyond the control of the drafter of the contract. Hence better training to the professional can be said to be a great help in better understanding of the contract. It would reduce the occurrence of disputes. A knowledge based expert system was therefore considered as a handy tool for the judiciary and contract administrator to come to a conclusion faster and this being the motivation an attempt is made to develop the system.

y Issaka Ndekugri, Nuhu Braimah and Rod Gameson on ―Delay Analysis within Construction Contracting Organization‖ published in Journal of Construction Engineering and Management, September, 2008 which conclude on an empirical study into the current practice in the use of methodologies in developed countries as part of a wider study aimed at developing framework for improving delay claim analysis. The methodologies most commented upon in the literature are:

As planned versus as-built.

- Impacted as-planned.
- Collapsed as-built.
- Window analysis.
- Time impact analysis.
- Appropriate use of the methodologies requires multidisciplinary knowledge, understanding and skills, particularly in the areas of scheduling, construction method, estimating, costing and information technology tool.

Jyn-Bin Yang and Ming-Kuan Tsai on ―Computerised ICBF Method for Schedule Delay Analysis‖ published in Journal of Construction Engineering and Management, August, 2011 which conclude the reviews to access schedule delay is a common construction dispute. Many construction projects involve numerous complex activities, the procedure of using ICBF method is time consuming. Therefore, this study used Microsoft Visual Basic for Applications (VBA) language and spread sheet technique to 8 develop an Excel based program for rapid delay analysis rather than manual calculation. It involves:

Borvorn Israngkura Na Ayudhya on ―Evaluation of common Delay causes of Construction Projects in Singapore‖ published in Journal of civil engineering and architecture, 2011 which conclude the common delay factor among owner, consultants and contractors in building projects in Singapore. The interview and questionnaire method were used in the research. Randomly distribution questionnaire method were applied to select sample of seventy four various construction practitioners consisting of owner, consultants, main contractors to evaluate the severity of thirty five delay factors. The result found that delay in progress payment by owner adverse weather condition, main contractor financial problem and act of God factor cause delay in construction projects.

Chidambaram Ramanathan, SP Narayan and Arazi B Idruson ―Construction Delay Causing Risk on Time and Cost- a critical review‖ published in Australian Journal of Construction Economic and Building, 2012 which conclude an increase in the number of construction projects experiencing extensive delays leading to exceeding the initial time and cost budget. This paper reviews 41 studies around the world which has surveyed the delay factors and classified them into groups. Most of the research has been analyzed from questionnaire surveys. The critical review undertaken in this paper covers research studies in the area of construction delay with time and cost risk. Totally 18 categories of causes were identified from the various related studies reported in the literature. Each study has a unique approach and unique results are derived from the questionnaire response data.

Ashwini Arun Salunkhe and Rahul S. Patil on ―Statistical Method for Construction Delay Analysis‖ published in Journal of Mechanical and Civil Engineering, 2013 which helps to avoid or minimize delays in future work. Numerous analytical methods are available for analyzing these impacts and selection of proper method depends upon: statistical data available, time available, limitation of method and money available for analyzing. However, information of activities which are responsible for project delay and their magnitude provides the baseline for investing the cause and assessing the responsibility for project delay. This paper reviews research methodology suggested for assessing construction delay factors by analytical methods as

well as with the help of computerized schedule analysis methods. The purpose of this study is to review various analytical & computerized schedule analysis methods for analysis of construction delay factor.

Nuhu Braimah on ―Construction Delay Analysis Techniques—A Review of Application Issues and Improvement Needs‖ published in Journal of Civil Engineering and Architect, 2013 which conclude issues that are often ignored in the analysis but would also affect delay analysis results are: functionality of the programming software employed for the analysis, resource loading and leveling requirements, resolving concurrent delays, and delay-pacing strategy. As part of a wider research work, this paper seeks to develop such knowledge and understanding via: an evaluation of the most common DATs based on a case study, a discussion of the key relevant issues often not addressed by the techniques and their improvement needs. The evaluation of the techniques confirmed that the various DATs give different allocations of delay responsibilities when applied to the same set of delay claims data, reinforcing the common notion that the most appropriate technique for any claims situation depends on the claims circumstances and the project.

Ashwini Arun Salunkhe and Rahul S. Patil on ―Effect of Construction Delay on Project Time Overrun :Indian Scenario‖ published in International Journal of Research in Engineering and Technology, January,2014 which highlight the type of construction delay due to which project suffer time and cost overrun.

Brief reason for time overrun as reported by various project implementing agencies are:

- Delay in land acquisition.
- Delay in equipment erection.
- Delay in forest clearance.
- Cancellation of tender.
- Law and order problem. Delay in supply of equipment.
- Slow progress of civil works.

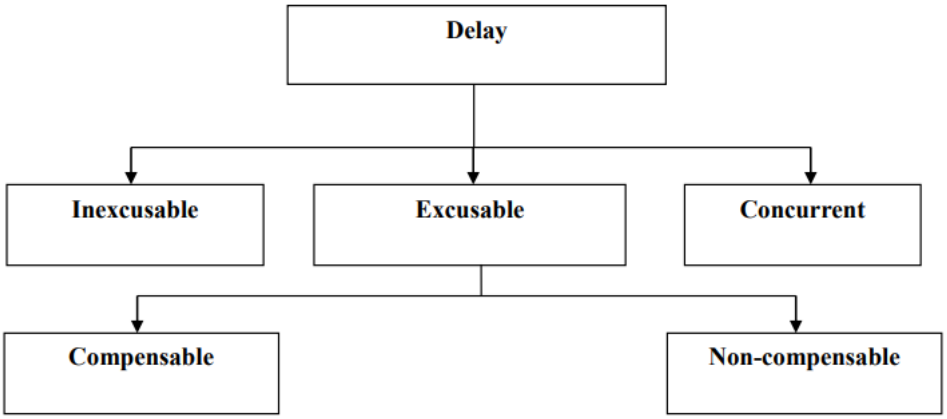


Figure 1.2 Causes of delay

B. Indhu, P. Ajai on ―Study of Delay Management in a Construction Project-A Case Study‖ published in International Journal of Emerging Technology and Advanced Engineering, May, 2014 which identify the delay factors and the effect on the project completion by doing a case study on on-going projects. By analysing the reason for delay possible recommendation are given. The major factor identified in this case study is due to contractor, owner and due to nature act like rain.

The most important causes identified were: Delay Inexcusable Excusable Concurrent Compensable Non-compensable 11 • Delay in payment by the head office.

- Frequent change of staff.
- Poor site management.
- Improper management of the engineer.
- Delay in supply of material.
- Lack of man power.

Nuhu Braimah on ―Understanding Construction Delay Analysis and the Role of Preconstruction Programming‖ published in Journal of Management Engineering, 2014 which described modern construction projects commonly suffer from delay in their completion. The study result provides a better understanding of key issue that need attention if improvements are to be made in delay claim resolutions. This paper reports on an aspect of the study conducted to throw light on the underlying programming issues affecting delay claim resolutions as demonstrated by an initial large scale survey of the research.

Pablo Gonzalez, Vicente Gonzalez, Keith Molenaar and Francisco Orozco on ―Analysis of Causes of Delay and Time Performance in Construction Projects ‖ published in Journal of Construction Engineering and Management, 2014 which conclude to a methodology to examine the qualitative (delay causes) and quantitative dimensions (time performance) of the delay issue. The paper proposes two indicators:

- Reason for noncompliance (RNC) as an indicator that characterizes scheduling failure. on critical and noncritical activities.
- Delay index (DI) as a time performance indicator that describe the impact of critical and noncritical activities.

M. Talat Birgonul, Irem Dikmen and Sinasi Bektas on ―Integrated Approach to Overcome Shortcoming in Current Delay Analysis practices‖ published in Journal of Construction Engineering and Management, 2015 which conclude many factors, unforeseen able events, financial problem, and insufficient technical capacity of site team of contractor or consultant or so on. Integrated approach is developed which is composed of a set of rules solving all

identified shortcomings and a flow chart guiding the parties until the end of the project. The integrated approach brings a new perspective to delay analysis.

Alenas Vasilyeva-Lyulina, Masamitsu Onishi and Kiyoshi Kobayash on ―Delay Analysis Methods for Construction Projects: Mathematical Modeling ―published in International Journal of Transportation, 2015 which conclude variety of factors contribute to the delay of project completion in the complex interdependencies of a number of tasks. Although academic papers and guides published by authoritative societies introduce the protocol of delay analysis methods, those are described in the natural language. Being tempted by such a motive, this paper formalized typical delay analysis methods including impacted as-planned, time impact analysis and collapsed as-built commonly used in practice.

Rakesh L. Metha and Suraj V. Gaikwad (2017)" Delays and its Analysis: Indian Residential Construction Projects" In this paper A questionnaire survey was carried out in India involving professional stakeholders viz. contractors, consultants, and developers each of which has played crucial roles in their particular projects and had contributed to the industry in some way or the other. A total of 100 professionals from construction industry were involved in this research and had given their expert opinion in the form of responses to the questionnaire survey.

Sneha K. Pawar, S. S.Ambure (2017) "An Assessment of the Factors Causing Delays on Residential Construction Projects in Pune "In this paper A total of 32 delay attributes were identified and categorized into three groups of consultant related delay factors, contractor related delay factors and client related delay factors. The phenomenon of delay adversely affects all the parties related to project such as client, consultant and contractor. Extension of time which leads to extra overheads that leads to increase in the cost of project

Saurabh Thorat, Prof. M.A.Khandare, Prof. A.K.Kanase (2017)" Identifying The Causes And Effects Of Delay In Residential Projects" In this paper main objective of this study was to identify the factors and effects of delays in residential projects in India. This objective is achieved successfully by using relative importance index method. Contractor related factors are the factors which cause more delay in the projects

Nisar Ali Ansari, R. M. Swamy (2015) "Methodology to analyse Delay and its impact on construction project" In this paper A questionnaire survey was carried out targeting 89 respondents from large contractors and 23 respondents from small contractors. The respondents were asked to assess the level of effect the 31 potential delay causes on their projects.The delay factors were grouped into six major groups. The results showed that the large and small contractors generally agree on the importance ranking of the individual delay variables. In relation to the groups of the delay variable, however, the result showed that there is no agreement between the two groups of contractors. The professional management group was ranked the highest and the external groups were ranked the lowest by large contractor.

Tiware V.S.,Mane D. M.,Soundattikar N.M.Patil A.R (2018) "Root Cause Analysis Of Delays On Residential Construction Projects In Kolhapur City" In this paper The data was collected from residential buildingsfrom Kolhapur region, Maharashtra, India having suitability mentioned in site selection criteria. These sites were tracked. The data collection was done from the bar chart & muster of actual work which is followed by a set of questionnaires. Four residential site with well-prepared bar chart is taken for the data collection purpose. At the initial stage planned data is compared to actual work data & the number of delays or its magnitude in days is calculated.

Vidya M. Patil, Aniket M. Undale, Govinda M. Singh, Sangram S. Patil Sushant T. Satheand Vaibhav H. Pisal (2017)" Analysis Of Causes Of Delay In Any Construction Project" The research methodology for the present study included the two stages which are primary data collection and secondary data collection. The primary data collection included collection of information from personal investigation, questionnaire survey, interviews of various respondents.In the secondary data collection, the data is collected from already published, analyzed work of other researchers or people. Therefore, this information was used to support the current study or findings

1.3 Conclusion :

The primary causes of delays commonly observed across various projects include external factors, financial challenges, labor shortages, low labor productivity, owner interference, and inadequate planning. An analysis of the data indicates that the contractor's contribution to project delays is the most significant, followed by the client, consultant, and other parties. Effective resource allocation is key in scheduling and planning, helping to assign appropriate durations to each activity in the project, which can significantly reduce delays in construction projects.

REFERENCES :

[1] Samman, T.A.S.A. and Brahemi, R.M.R.A (2014) Fuzzy Pert for Project Management. International Journal of Advances in Engineering and Technology, 7, 1150-1159.

[2] Madhuni, K.U., Siresha, S. and Shamkar, N.R. (2012) A New Approach for Solving Fuzzy Critical Path Problem Using L.L. Fuzzy Numbers. European Journal of Operations Research, 43, 174-183.

[3] Gopalasamy, P. and Mansor, Z. (2013) An Investigation on Project Management Standard Practices in IT Organization. International Journal of Computer Engineering Science, 3, 1-10.

[4] Bagshaw, K.B. (2011) Quantitative Analysis for Business Decisions. Port Harcourt: Nybraide Enterprises, Nigeria.

[5] Singh, S. (2017) Project Management and Strategic Objectives of the Organization. Universal Journal of Industrial and Business Management, 5, 10-11. https://doi.org/10.13189/ujibm.2017.050102

[6] Stuckenbruck, L.C. (1986) Project Management Framework (An Overview of the Project Management Body of Knowledge). Project Management Journal, 17, 25-30.

[7] Heagney, J. (2011) Fundamentals of Project Management. 4th Edition, American Management Association, New York.

[8] Tomomitsu, H.T.A., Carvalha, M.M.D. and Moraes, R.D.O. (2018) The Evaluation of the Relationship Between Project Management and Knowledge Management: A Bibliometric Study. Gestão & Produção, 25, 354-369. https://doi.org/10.1590/0104-530x3150-16

[9] Kumar, V.K. and Ganesh, L.S. (1998) Use of Petri Nets for Resource Allocation in Projects, IEEE Transactions on Engineering Management, 45, 49-56. https://doi.org/10.1109/17.658660

[10] Bagshaw, K.B. (2017) Decision Analysis for Managers: Quantitative Approach. Port Harcourt: Branded Favour Media, Nigeria.

[11] Alaghbari, W., Kadir, M. R. A., Salim, A., & Ernawati. (2007). "The significant factors causing delay of building construction projects in Malaysia." *Engineering, Construction, and Architectural Management*.

[12] Arditi, D., & Pattanakitchamroon, T. (2006). "Selecting a delay analysis method in resolving construction claims." *International Journal of Project Management*.

[13] Trauner, T., Manginelli, W., Lowe, J., Nagata, M., & Furniss, B. (2009). *Construction Delays: Understanding Them Clearly, Analyzing Them Correctly*. Elsevier.