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Study on Challenges in MRT RTS Link Project

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Abstract: A railway viaduct is a type of bridge that is specifically designed to carry railway tracks over obstacles such as valleys, rivers, or urban areas. It provides a continuous and elevated pathway for trains, allowing them to traverse difficult terrain or cross over existing infrastructure without interruption. Railway viaducts are critical elements of railway infrastructure and require careful engineering and design to ensure the safe passage of trains. As for today, there are no railway project which does not encounter any challenges included for Malaysia Railway Transit System for Rapid Transit System project between Malaysia and Singapore. This study will provide ideas on developing the terrestrial viaduct for Rapid Transit System, RTS Link and to show that the MRT RTS Link project faces a lot of challenges during the construction.

Keywords: Terrestrial Viaduct, Challenges, Railway Viaduct

1. Introduction

The RTS Link project is a commuter train network approximately 4 km long with two stations, one in Bukit Chagar, Johor Bahru, Malaysia and one in Woodlands, Singapore. This network will be a modern Light Rail Transit (LRT) system that will provide a high capacity, fast and efficient transportation system between the two stations. The network will integrate with the public transport systems at both stations, providing an alternative method of transport that will help reduce congestion at immigration checkpoints for both countries[1].

This project will consist of 6 major packages which are depot, station, Immigration, Customs, Quarantine (ICQC), marine viaduct, utilities, and terrestrial viaduct[1]. RTS Link Project is the first Malaysia's metro railway project that link two cities of two countries and crossing Straits of Johor, i.e., Johor Bahru, Malaysia and Woodlands, Singapore. There is no precedence of past project of similar

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The following are the objective of this paper's: -

i. To identify the types of challenges of the terrestrial viaduct as factor affecting in project execution for MRT RTS Link project.
ii. To analyze the challenges of the terrestrial viaduct as factor affecting in project execution for MRT RTS Link project.
iii. To discover impacts of challenges to the terrestrial viaduct of MRT RTS Link project and its solutions.

2. Methodology

2.1 Methodology

Viaducts cross the large railroad yards that are needed for freight trains there and cross the multi-track railroad lines that are needed for heavy rail traffic. These viaducts provide grade separation and keep highway and city street traffic from having to be continually interrupted by the train traffic. Likewise, some viaducts carry railroads over large valleys, or they carry railroads over cities with many cross-streets and avenues 2. There is so much railway viaduct project that has been completed. Each project faces a lot of difficulties and challenges which affect the construction planning in various aspects.

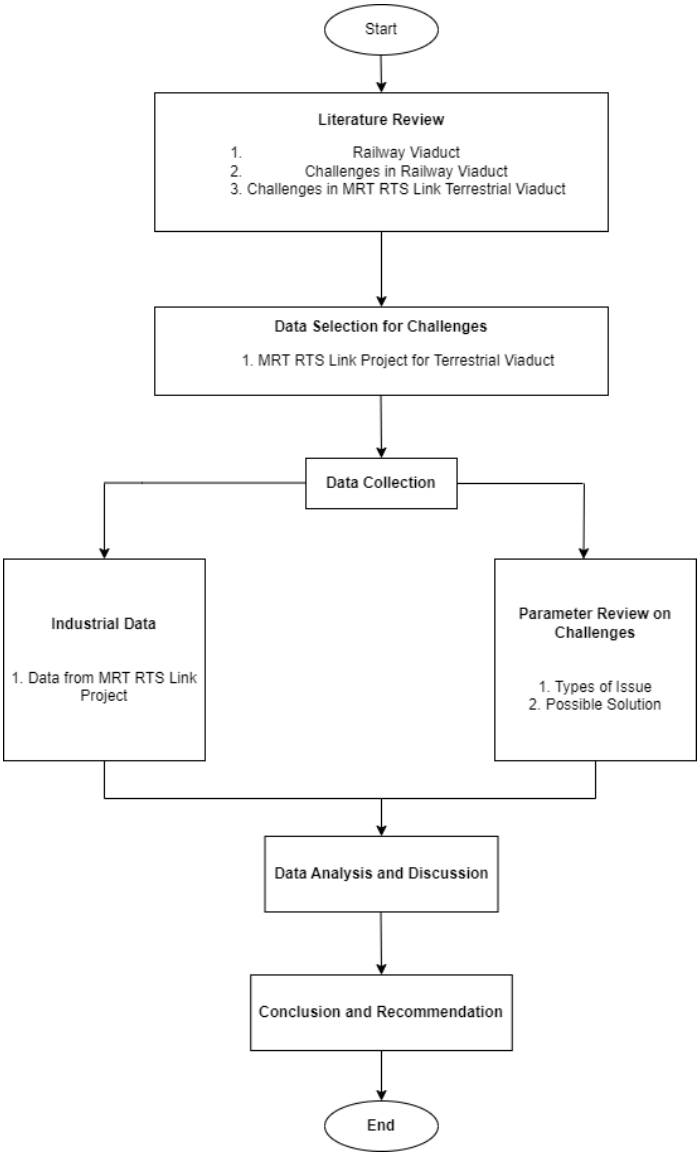


Figure 1: Flow Chart of the Analysis Procedure

2.2 Data Observation

This study employs the data observation approach, which involves gathering actual data from the involved parties to achieve the objectives of the research. The collected data comprises confidential information that focuses on key aspects related to the project execution of the RTS Link terrestrial viaduct. The primary objectives of this approach are to identify the different types of challenges that affect the execution of the project, analyze these challenges as factors influencing project execution, and explore the impacts of these challenges on the overall project execution of the RTS Link terrestrial viaduct. Additionally, this research aims to propose suitable solutions to address these challenges.

2.3 Data Analysis

The findings obtained from the selected project, namely the terrestrial viaduct for the RTS Link, were analyzed utilizing the table and chart method for parameter review. This analysis was conducted to fulfill the objectives of analyzing the types of challenges and their corresponding solutions as factors influencing the execution of the MRT RTS Link terrestrial viaduct. By employing the table and chart method, the research aimed to present a comprehensive and visual representation of the

data, enabling a systematic examination of the challenges encountered during the project and the corresponding solutions implemented.

3. Results and Discussion

The results overall present the findings derived from the analysis procedures outlined in Chapter 3. The collected data has been meticulously analyzed and presented through tables and graphs, allowing for a clear visualization of the results. The main objectives of this analysis were to identify the factors that affect the execution of the terrestrial viaduct in the RTS Link project, analyze the types of challenges that impact the project execution, and explore potential solutions to address these challenges. The findings are organized and discussed in a structured manner, providing insights into the various factors influencing project execution for the terrestrial viaduct of the RTS Link.

3.1 Challenges as Factor Affecting to Project Execution for Terrestrial Viaduct of RTS Link

There are various of challenges encounter in this terrestrial viaduct construction such:

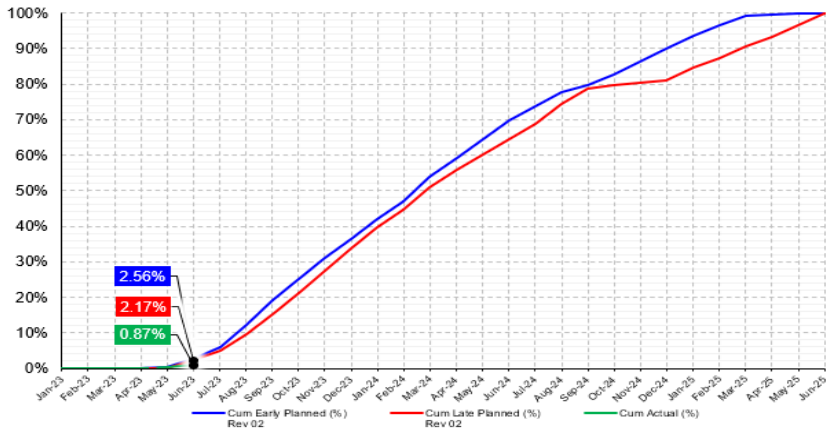
1. PUB Pipelines
2. Telcos, Fiberail and Fibrecom Cable
3. TNB Cable
4. SAJ Water Pipes
5. KTMB Long Span

3.2 Factor that Causes the Challenges

In general, challenges in a project like the RTS Link terrestrial viaduct are often unavoidable and can arise throughout the entire execution process, even from the initial site survey. Despite thorough planning and assessments, the actual site conditions may not be fully determined until excavation and construction work are underway. It is not uncommon for the initial review to overlook certain site circumstances or for conditions to change due to factors such as weather fluctuations or variations in subsoil conditions.

3.3 Solution to The Challenges in RTS Link Terrestrial Viaduct Project

During the execution of the MRT RTS Link terrestrial viaduct project, a range of solutions has been implemented to address the diverse challenges encountered. These solutions have been devised by the parties involved to ensure the smooth progress and successful completion of the project. The solutions implemented for the challenges in the terrestrial viaduct construction of the RTS Link encompass a variety of approaches. These include strategies such as avoidance, demolition, eviction or notice 425, installation of fencing lines or retaining walls, further study of specific issues, leasing of land or facilities, partial road closure and road diversion, relocation of existing infrastructure, removal of obstacles, complete road closures, road closures in conjunction with fencing lines, road diversions, road diversions combined with fencing lines, temporary level crossings, and the construction of additional viaduct sections.



The collected data has been effectively generated and presented in the form of an s-curve, providing a clear visual representation of the real-time situation of the project. This s-curve analysis enables stakeholders and interested parties to easily comprehend and assess the actual progress of the RTS Link project, allowing for a more accurate understanding of the project's status. By utilizing the s-curve, project teams can identify any disparities between the planned and actual progress, enabling them to take timely corrective actions. This analysis serves as a vital tool for project monitoring, facilitating effective decision-making and ensuring that the project stays on track. The use of the s-curve analysis not only enhances transparency but also aids in managing expectations and facilitating communication among project stakeholders. It provides valuable insights into the challenges and potential areas for improvement, allowing for proactive measures to be taken to address any delays or deviations.

4. Conclusion

Pre-construction processes, including feasibility studies, design development, and tender phases, often face delays in railway construction projects. Challenges such as the scope of land acquisition, encroachment issues, and the relocation of utilities frequently arise, often without explicit definition and timely resolution. One critical aspect of client support is to ensure that contractors are provided with possession of land that is free from challenges, enabling them to commence the project promptly. This study offers several key recommendations for the stakeholders involved in the RTS Link project, including the MRTS, consultants, and contractors. Firstly, it is crucial for all parties to prioritize and place significant emphasis on the construction of the terrestrial viaduct, recognizing its pivotal role as the main infrastructure for railway movement from end to end. The successful completion and efficient functioning of the terrestrial viaduct are essential for the overall viability and purpose of the railway system. This study offers several key recommendations for the stakeholders involved in the RTS Link project, including the MRTS, consultants, and contractors.

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