



# Contract Analysis for Design and Build Lump Sum Price (Case Study: Kuala Tanjung – Inderapura Toll Road Section 2)

Cut Riska Irnanda<sup>(✉)</sup>, Isfenti Sadalia, and Nazaruddin

Universitas Sumatera Utara, Medan, Indonesia  
riskairnanda@gmail.com

**Abstract.** A toll road is one of the National Strategic Projects with complete problems and needs highspeed performance during construction. So, contract construction that is usually applied to these projects is design and build contract. Furthermore, best practice for Design and Build is combined with Lump Sum as an estimation cost aspect, so the type of contract used is Design and Build Lump Sum Price. This study aims to review the implementation of the Design and Build Lump Sum Price Contract based on the terms and conditions in the Indonesian Legislation and FIDIC on the Trans Sumatra Toll Project Kuala Tanjung – Inderapura Section 2 according to the contractor's point of view to mitigating the negative risks that arise especially in the financial aspect. This research is descriptive research with a qualitative data analysis method by comparing the implementation of the contract according to the applicable law. The first step was to collect secondary data in a contractual resume, then make a study based on existing legal standards. Based on the results, it can be stated that the design and build Lump Sum price contract is a construction work contract in order to complete a job within a certain period of time according to the basic design scope as the basis for quotation, which has fixed costs as long as no intervention results in changes contract documents that may give additional payments for the rights. In the construction of the Kuala Tanjung – Inderapura Toll Road Section 2, there was an additional scope of the contract which resulted in additional work due to instructions from the owner and other parties, as well as an intervention to change specifications due to differences in the basic design at the tender which poses negative risks to the financial aspect for the contractor.

**Keywords:** contract construction analysis · design and build · lump sum

## 1 Introduction

Trans Sumatra Toll Road is one of the National Strategic Projects (PSN), with 2,818 km long, and is planned to connect cities on the island of Sumatra. Toll roads are regulated and supervised by the Toll Road Regulatory Agency (Badan Pengatur Jalan Tol/BPJT) through the Toll Road Minimum Service Standards (SPM) in the Government Regulation of the Republic of Indonesia Number 15 of 2005. Moreover, according to Regulation of The Minister of Public Works and People's Housing of The Republic of Indonesia

© The Author(s) 2023

W. R. Murhadi et al. (Eds.): INSYMA 2022, AEBMR 223, pp. 1162–1169, 2023.

[https://doi.org/10.2991/978-94-6463-008-4\\_143](https://doi.org/10.2991/978-94-6463-008-4_143)

Number 392/PRT/M 2005, the minimum service standards of toll roads include several service substances there are toll road conditions, average travel speed, accessibility, mobility, safety, and rescue/rescue units and service assistance, environment and IT & TIP. This is one of the requirements for the final acceptance of the Toll Road Project, so a more stringent assistance process is needed by the Project Management to the Toll Road Regulatory Agency regarding land acquisition, construction design, and others.

Toll road construction is generally required to be completed in a relatively short time with a high level of complexity. Besides accelerating the land acquisition process, the design and build contract is used to accelerate these targets.

The design and build contract is the procurement system with a contract between the owner and the construction team responsible for efficiently carrying out the design and construction process [1]. According to Ministerial Regulation No. 12 of 2017 Article 5, a project is allowed to use a design and build contract if the work is complex, urgent to be utilized immediately, requires high technology, has risks, and is worth more than one hundred billion rupiahs.

Therefore, the construction of toll roads generally uses a design and build contract system. The tender process can be carried out by referring to the basic design. This initial planning drawing serves as an initial reference for determining the route of the existing toll road and crossing structure. In addition, the construction process can be carried out in conjunction with the Detail Engineering Design (DED) process, the detailing of the basic design by accommodating actual conditions in the field by conducting field identification, calculating technical analysis, coordinating with asset owners - if there are assets belonging to other parties affected by the road toll road - to obtain a permit in the form of a recommendation letter, and submit it to the Project Owner and the Toll Road Regulatory Agency (BPJT) as a regulator, so it can save time and reduce the lengthy assistance process by several parties.

According to Law Number 2 of 2017 Article 1 Paragraph 8 concerning Construction Services, a Contract construction is a contract document that regulates the legal relationship between owners and contractors in construction implementation. Contract construction is distinguished into four aspects: contracts based on cost calculation, service calculation, payment methods, and division of tasks [2]. According to cost calculation, types of contracts are divided into Lump Sum Price and Unit Price contracts.

According to Presidential Regulation no. 29 of 2000 Article 21 paragraph (1), a Lump Sum Contract is a service contract or completion of all work within a certain period of time with a definite and fixed price and all risks that may occur in the process of completing the work which is entirely borne by the service provider, as long as the drawings and specifications do not change. The planning consultant, through the owner, is obligated to provide accurate and accountable data during the tender so that there are no mistakes in risk-taking decisions for both the owner and the contractor.

The Kuala Tanjung – Inderapura (Section 2) Toll Road Project was built by PT. Waskita Karya (Persero) Tbk is one of the national strategic projects spanning 18.05 km, including the Indrapura Interchange and Junction with a Design and Build Lump Sum Price construction contract [3]. Projects with a duration of 720 days which contracted on December 29, 2017, have progressed around 60% in December 2021. A number that can be assessed as late if it is calculated from the duration of the contract. Besides, this

**Table 1.** Budget Deviation

Description	Budget Plan	Budget Revision	Deviation
Revenue (PU)	1,401,372,149,264	1,401,372,149,264	0
Cost (BK)	1,150,564,556,180	1,175,988,648,364	25,424,092,184
BK/PU (%)	82.10	83.92	1.81
Gross Profit	250,807,593,083	225,383,500,900	(25,424,092,184)

project did the mitigation from a financial aspect through the kind of contract from the Table 1.

Based on Table 1, it can be seen that the estimated cost of completing the project in the Budget Plan is IDR 1,150,564,556,180 with a planned gross profit of IDR 250,807,593,083. At 60% progress, with the design conditions being final, the estimated project completion cost in the budget revision proposal was calculated to increase by IDR 25,424,092,184 or equivalent to 1.81% of the contract value. Even though in the Lump Sum Fixed Price Design and Build Contract, the service provider will bear reasonably significant risk, a risk must still have a limit [4].

According to the progress and budget estimation as the background, the authors are interested in conducting a study of contract analysis for Design and Build Lump Sum Price in Kuala Tanjung - Inderapura Tollroad Section 2.

## 2 Research Method

This research is a descriptive study with qualitative data analysis methods by comparing the application of the contract to the implementation according to applicable law. The applicable legal standards used were Indonesian laws and regulations and the Federation Internationale Des Ingenieurs-Conseils (FIDIC), an association of national associations of consultants (Consulting engineers) around the world. The first step was to collect secondary data in a valid contractual resume, then compare it with the appropriate rules.

## 3 Results and Discussion

The Kuala Tanjung – Inderapura (Section 2) Toll Road Project is located in the Batu Bara district, North Sumatra Province. Table 2 exhibits general information about the project.

In this study, the authors discussed three points: the tender process, land handover, and land acquisition, also the scope of work in accordance with the underlying regulations. This contract refers to FIDIC Silver book, where actually kind of FIDIC regulation for design and build contract should refer to Yellow book. Silver book is usually used for Engineering, Procurement, and Construction (EPC) Contract. This is a mistake, both on the part of the owner and the contractor. However, in principle, the contract adheres to the principle of *Pacta Sunt Servanda*, that a third party must respect the substance of the contract made by the two parties who agreed to it. The other reference for this

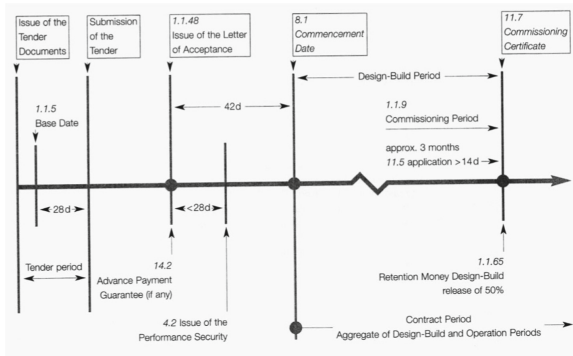
**Table 2.** Projects' Information

	Description
Project Name	Trans Sumatra Toll Road Development Project Section: Kuala Tanjung – Indrapura (sta. 0 + 000 – 15 + 600) Including Junction & Interchange and Main road (sta. 106 + 650 - 109 + 100)
Owner	PT. Hutama Marga Waskita
Source of Funds	PT. Hutama Marga Waskita
Contract Number	007/KONTRAK-HMW/XII/2017
Date of Contract	December 29, 2017
Contract Price	1,541,509,360,000 (inc. VAT 10%)
Road Length	18.05 km
Type of Contract	Design and build (Lump Sum price)
Construction Duration	720 Calendar days
Maintenance Duration	1096 Calendar days
Contractor	PT. Waskita Karya (Persero) Tbk
Designer Consulting	PT. Mitrapasific Consulindo International
Engineer Consulting	PT. Bina Karya - Indra Karya – Eskapindo Matra, JO.

contract refers to the Regulation of The Minister of Public Works and People's Housing of The Republic of Indonesia Number 12/PRT/M/2017 about Standards and Guidelines for Procurement of Integrated Design and Build Construction Works.

First, based on article 7 paragraph 1b of Ministerial Regulation Number 12/PRT/M/2017, the requirement of Design and Build Integrated Construction Work must meet the following requirements:

- a) construction management consultant is responsible for assisting the commissioned officer in quality assurance of the implementation of the work, starting from the planning, procurement, and construction implementation stages to the final handover of the work;
- b) the minimum number of documents available are:
  - i. Basic design document which includes:
    - technical geological map data of the work location;
    - soil investigation/geotechnical data reference for the closest location to work;
    - determination of the scope of work in a clear and detailed manner, design criteria, related work standards/codes, and quality standards, as well as technical provisions for other service users;
    - identification and allocation of project risks;
    - identification and need for land; and.



**Fig. 1.** The Design – Build Period of FIDIC Yellow book

- basic drawings, schematic drawings, section drawings, typical drawings and other drawings that support the scope of work.
- ii. Budget proposal documents are available from budget users.
- c) there is sufficient time allocation for the Provider in preparing the bidding document, which is determined by the commitment officer and outlined in the selected document.

The tender was announced on November 28, 2017, then on the next day was the retrieval of documents and *Aanwijzing*. The deadline for submitting bids was December 8, 2017. So, there were only 10 days to learn about the project before submitting bids.

Meanwhile, according to FIDIC, the minimum tender deadline is 28 working days (see Fig. 1). While the Regulation of The Minister of Public Works and People’s Housing of The Republic of Indonesia Number 12/PRT/M/2017 does not state the number of the day clearly. However, 10 days is a short time to investigate and prepare bids for 18 km toll road works, including interchanges and junctions.

Second, The Kuala Tanjung Toll Road project was contracted on December 29, 2017 with a duration of 720 days calculated from the time of Work Order was signed together. The condition of land acquisition, which is the owner’s responsibility, was still 0% when the tender was held until the contract was signed. The new Start Work Order was issued on October 17, 2019, which is 21 months after the contract was signed in the condition of land acquisition was under 5%. At the time of the *aanwijzing* tender, the answer [by the owner] to the questions asked by the contractor regarding the land acquisition was also unrelated and not answered clearly.

While in the Regulation of The Minister of Public Works and People’s Housing of The Republic of Indonesia Number 12/PRT/M/2017 states that the handover of land can be carried out with a minimum requirement of 30% of the land required. This causes the price of the work in the bidding document, which is the reference for the contract to increase and has the potential to reduce the contractor’s profit plan. The owner should give the extension of time for the contractor. The contractor can also propose a claim of

the overhead because of the claim for the delay in submitting the work location by the owner due to land acquisition constraints.

This is as stipulated in FIDIC Article 1.10, errors in the Employer’s Requirements, notwithstanding the contractor’s obligations to scrutinize the Employer’s Requirements under Sub-Clause 5.1 [General Design Obligations], if the contractor finds an error in the Employer’s Requirements, he shall immediately give written notice to the Employer’s Representative advising him of the nature and details of the error and requesting instruction regarding its rectification.

Third, the construction work scope should be stated in the contract title and other attachments such as general terms, special terms of contracts, specifications, etc. Even though the design is the contractor’s responsibility in the design and build contract, everything about the scope of work has boundaries. The contractor proposed bids based on the data from the owner when the tender is held, such as the length and area of the project, number of crossing channels, and number of bridges. In addition, the contractor uses the soil and geological data to propose a method that also impacts the price of bids.

If a bridge in the basic design (see Table 3) has a span of 40 m changes to the span of 45 m in Detail Engineering Design (DED), this is a risk for the contractor in the design and build contract. It is the same thing if the box at a certain station is 2 × 2 m in size, then changes to 3 × 3 m; then this is also a design and build risk for the contractor and the owner does not have a responsibility to pay for an additional cost.

In case the addition of the number of crossing channels due to technical recommendations, the addition of frontages at the request of local residents, and changes in the soil embankment to pile slab due to errors in the existing geological data during the tender, this will change the scope of work and cause additional work that can change the contract value. This case is a risk for the owners in financial aspects. The owner may

**Table 3.** The Differences in Design

Design Factor	Basic Design	Detail Engineering Design
Soil Treatment	Hard soil: - Without any treatment 18 km	Hard Soil: - Without treatment 6.3 km Soft Soil: - Geotech 10.10 km - Pileslab 0.435 km - PVD + PHD + Preloading 4.20 km
Bridge	7 Unit	9 Unit
Overpass	7 Unit	1 Unit
Box Traffic	2 Unit	13 Unit
Box Culvert	4 Unit	52 Unit
Tol Gate	2 Unit	2 Unit
Interchange	1 Unit	1 Unit
Junction	2 Ramp	2 Ramp
Frontage	L = 0 km	L = 4,00 km

also claim to the designer engineer for data errors in soil and geological data on the basic design.

This case gives a chance to the contractor to propose additional costs as the additional scope of the contract and counts for Lump Sum technique. For example, if the embankment 400 m long changes to the pile slab, the recognition of additional work is calculated by deducting the cost of the 400 m long embankment in the contract and then adding the 400 m pile slab cost.

Last, all contracts have risks for contracting parties, both the owner and the contractor.

## 4 Conclusion

This study's results show that:

- a. There was not enough time from issuing the document tender to submission of the bids, it should be minimum 28 days in between;
- b. The technical data for tenders must be confirmed correctly;
- c. If the land acquisition is owner's responsibility, it is better to do a tender when the land is ready/ partially free;
- d. Additional work is still permitted on the lumpsum price design and build contract as long as there is an increase in scope or there is an error in the initial data (basic design) and there is a change in specifications.
- e. All types of contracts still have risks to both contracting parties.

## References

1. Sullivan, J., Asmar, M. E., Chalhoub, J., & Obeid, H. (2017). Two decades of performance comparisons for design-build, construction manager at risk, and design-bid-build: Quantitative analysis of the state of knowledge on project cost, schedule, and quality. *Journal of Construction Engineering and Management*, 143(6), 04017009.
2. Prayogo, D. (2012). Melakukan Kajian Potensi Terjadinya Tuntutan Pada Proyek Pembangunan Gedung Hotel Santika Medan. *Tugas Akhir, Fakultas Teknik Sipil, Universitas Sumatra Utara*.
3. W. K. HMW. (2017). Kontrak Jasa Pendorongan Pekerjaan Atas Pembangunan (Design and Build) Akses Pelabuhan Kuala Tanjung Ruas Inderapura - Kuala Tanjung (STA 0+000 s.d. 15+600) Termasuk Junction dan Simpang Susun Inderapura Serta Mainroad Ruas Tebing Tinggi - Inderapura, ed. Medan.
4. Rasyid, M. (2020). *Kontrak Lump Sum Dalam Kontrak Konstruksi Studi Kasus Pelaksanaan Kontrak Jasa Pendorongan Design And Build Paket 1: Pembangunan Jalan Tol Semarang-Batang*. Universitas Gadjah Mada.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

