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# Building Cost Analysis for a Warehouse

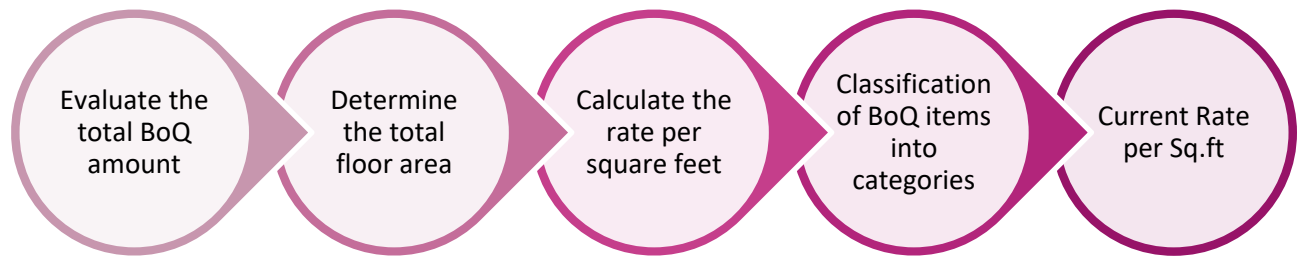
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## Introduction

Construction industry is one of the main sectors that boosts the country's overall economic growth. In Sri Lanka, it is the fourth largest industry which contributes about 6-7% to the Gross Domestic Product (GDP). However, due the current economic crisis, the construction industry has been severely disrupted. During the last fifteen months the prices of all construction materials has been increased unprecedentedly. Therefore, it is extremely difficult to calculate the current square feet rate of the different types buildings. This study presents the current square feet rate of a warehouse in Dankotuwa, North Western province. The calculations were done based on the contractors BoQ and CIDA 2022. The following figure illustrates the process of this study.



## Analysis

In order to get the final outcome, the following steps were followed in the analysis.

### 1. Evaluate the total BoQ amount

**BoQ Amount - 39,891,057.86**

### 2. Determine the total floor area

Floor	Unit
Ground floor	4843.76 sq.ft
Upper floor	3062.33 sq.ft
<b>Total area</b>	<b>7906.0922</b>

### 3. Calculate the rate per square feet

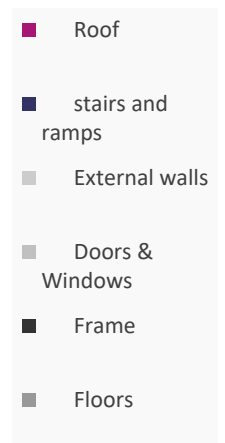
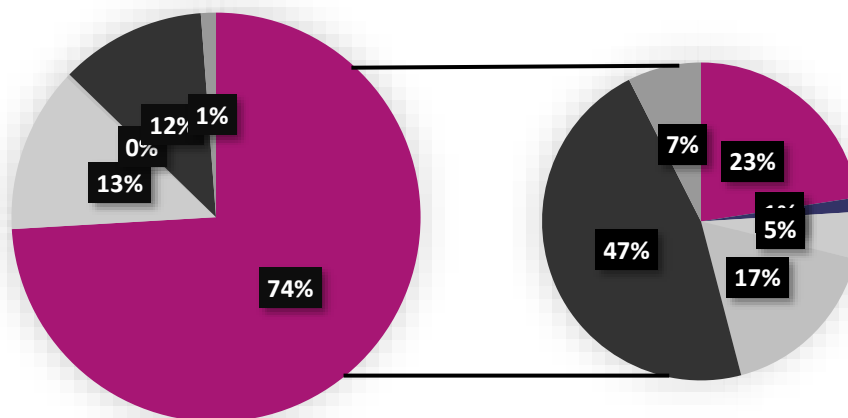
**Rate per 1 sq. ft. - Rs. 5,045.61**

### 4. Classification of BoQ items into categories

In the analysis, the BoQ items were categorized as superstructure, services, internal finishes, external works, substructure and preliminaries. Furthermore, the superstructure was further categorized as roof, stairs & ramp, doors & windows, frame and floors.

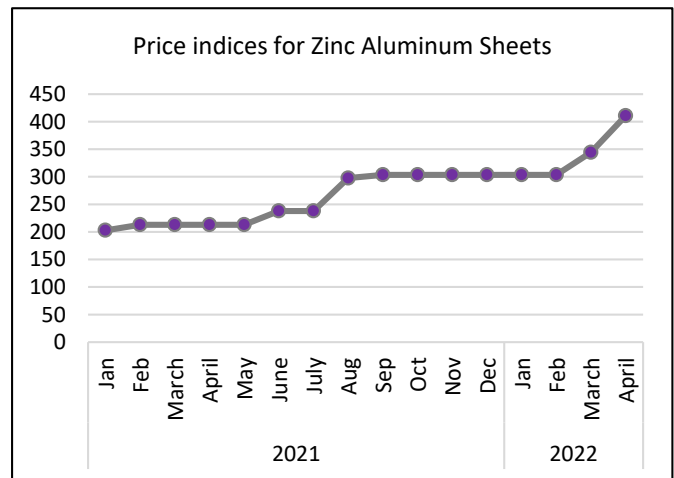
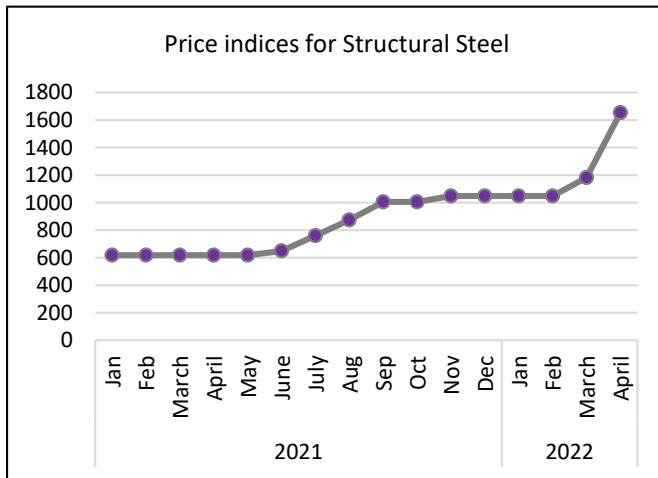
The following table and pie chart shows the proportions of total construction cost of a warehouse building held by different categories.

Element	Percentage	Percentage from Super Structure	Rate per 1 sq. ft.
Super Structure	74%		3737.29
Roof	17%	23%	843.21
Stairs & ramps	1%	1%	54.48
External walls	4%	5%	178.82
Doors & Windows	13%	17%	639.89
Frame	35%	47%	1741.36
Floors	6%	7%	279.53
Services			
Internal finishes	13%		649.99
External works	0.3%		16.70
Substructure	12%		581.55
Preliminaries	1%		60.08
<b>Total</b>	<b>100%</b>		<b>Rs. 5,045.61</b>

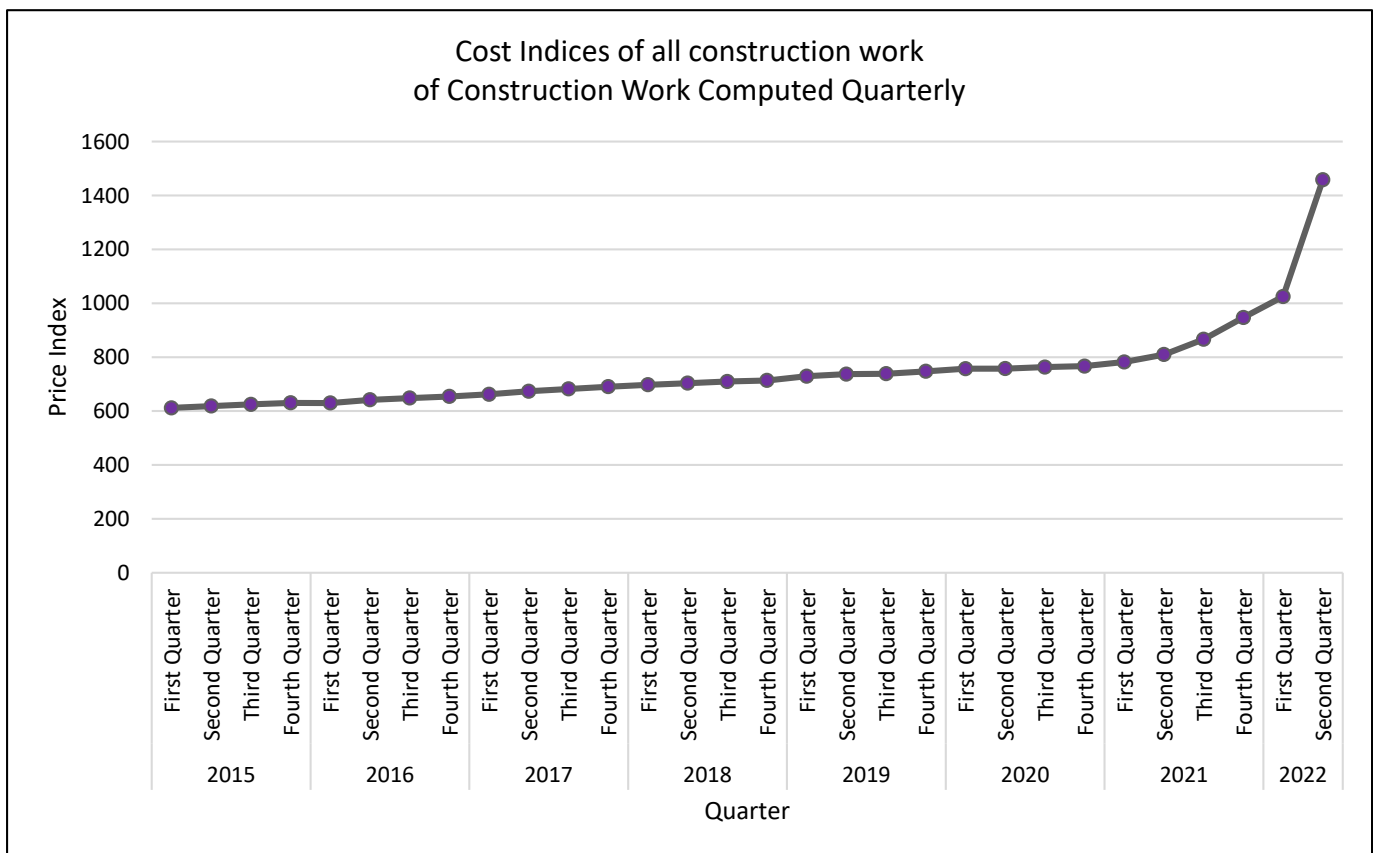


## Price Indices change from January 2021 to April 2022

The following graphs demonstrates how the price indices of structural steel ANF Zinc Aluminum sheets had been changed from January 2021 to April 2022. The graphs were drawn based on CIDA 2022.



Following graph illustrates how the price indices of construction cost had been changed during the previous quarters. According to the graph, it is clear that the construction cost had been drastically changed from the first quarter of 2022 to second quarter of 2022.



## Growth in price index

$$\text{Growth in price index} = \frac{(\text{current index} - \text{base index})}{\text{Base index}}$$

Current index = 1458.6

Base index = 766.8

$$= \frac{(1458.6 - 766.8)}{766.8} \times 100\%$$

$$= 90.22\%$$

## Current square feet rates

Element	Percentage	Percentage from Super Structure	Rate per 1 sq. ft.
Super Structure	74%		7109.08
Roof	17%	23%	1603.96
stairs and ramps	1%	1%	103.64
External walls	4%	5%	340.15
Doors & Windows	13%	17%	1217.19
Frame	35%	47%	3312.42
Floors	6%	7%	531.73
Services			
Internal finishes	13%		1236.41
External works	0.3%		31.76
Substructure	12%		1106.22
Preliminaries	1%		114.28
<b>Total</b>	<b>100%</b>		<b>Rs. 9,597.75</b>

Previous rate	Rs. 5,045.61
Current rate	Rs. 9,597.75
Deference	Rs. 4,552.14

As per the analysis, from 2020 fourth quarter to, 2022 second quarter, the square feet rate of this warehouse had been increased from Rs. 4,552.14.

## Summary

Construction has evolved into a pillar of the national economy as the construction industry in our country has slowly expanded. Building material is an essential component of the building engineering field since it serves as the material basis for all building production operations, including architectural design, building structure, construction, and building economy. The project is greatly impacted by changes in the cost of building materials, so it is important to manage these aspects. As a result of the current economic crisis in Sri Lanka, the construction cost has been changed drastically. This case study overviews the current square feet rate of the selected warehouse which has been changed due to the price incensement of the construction material. The analysis was done based on the information collected from the contractors BoQ and CIDA bulletin 2022. Generally, the current square feet rate has been changed from about 90.22% compare to the date which the BoQ was prepared (2020).

## Limitations

There are several limitations in this study.

- There are only one case was studied.
- This is limited to the warehouse.
- This rate analysis is totally depending on contractors BoQ.

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