CHAPTER I
INTRODUCTION

1.1 Background

The steel industry plays a crucial role in the global economy and is a fundamental pillar of industrialization and infrastructure development. Steel, with its exceptional strength, durability, and versatility, serves as the backbone for numerous sectors, including construction, automotive, aerospace, and manufacturing.

The industry involves the production of steel from iron ore through a series of processes, such as smelting and refining, and encompasses various types of steel, from carbon steel to specialty alloys. It also contributes significantly to employment, technological advancements, and economic growth in regions with a strong steel presence. However, the steel industry faces several challenges, including fluctuating raw material costs, environmental concerns related to energy consumption and emissions, and global competition.

Efforts to reduce the industry's environmental footprint have led to the development of more efficient production methods and the use of recycled steel. Additionally, the industry continually adapts to market demands, with innovations in steel production and the development of new grades of steel for emerging technologies like electric vehicles and renewable energy infrastructure.

The steel industry remains a critical component of modern society, and its evolution will be pivotal in addressing sustainability goals and meeting the infrastructure needs of the future. To increase the functionality of steel products from raw materials to end-use products, PT. Krakatau Steel is enhancing its services through its subholding, PT. Krakatau Baja Konstruksi, which primarily focuses on providing services in the construction industry, especially in steel structures and their components. By establishing the new subholding, PT. Krakatau Baja Konstruksi, the mission of the President of the Republic of Indonesia is expected to successfully strengthen national independence in the steel industry.

1.2 Problem Identification

The problem objective of carrying research as follows:

a. How to design the 2nd Tenant Telecommunication BTS SST45M Tower Structure in accordance with TIA/EIA-222-H-2018 Design Standard?
b. How to accurately approximate the Bill of Quantity in the Fabrication Process of the Telecommunication BTS SST45M Tower Structure, considering materials, labor, and other resources?

1.3 Scope

There are several scopes needs to be considered such as:

1.3.1 Internship Scope

The scope of internship activities is to assist the work of Engineering Leader/Manager, Quality Control and Laboratory in carrying out quality standard, Schedule, and Budget Management, consulting method of work, reviewing work so that it conforms to the design.

1.3.2 Research Scope

The scope of research in writing this final assignment is to analyze the self-supporting tower type SST45M BTS transmitting tower referring to the Structural Standard for Antenna Supporting Structures and Antennas TIA-222-H-2018. Design method of this structure using the American Institute of Steel Construction's Specification for Structural Steel Buildings ANSI/AISC 360-16 original version that provides an integrated treatment of allowable strength design (ASD) and load and resistance factor design (LRFD).

Resistance Factored Design AISC 2016 or LRFD-16 method used for the design in Midas Gen Software, so that the output results obtained can be processed to calculate design strength of the structure according to the forces that occur and analyzed.

For the fabrication cost estimation of 3 Leg SST45M Telecommunication Tower refers to Regulations of the Ministry of Public Works and Public Housing Number 1 Year 2022. The scope of the analysis is limited to the structural part, checker plate assembly and galvanize works only.

1.4 Purpose

The Objectives of PT Krakatau Baja Construction implemented with their vision and mission, as follows:

a. Company Vision
   Dominating the steel bars that are considered in the Regional Market
b. Company Mission
   Provider of steel bars for construction, infrastructure, and industrial needs competitive manufacturing.

The objectives of carrying out internship:

a. Complete mandatory courses for undergraduate students of the International Civil Engineering Study Program, Atma Jaya University, Yogyakarta.
b. Get practical knowledge that can only be obtained in the field.
c. Able to implement the knowledge gained in lectures on jobs in the field.

The objective of carrying research as follows:

a. Be able to design the 2nd Tenant Telecommunication BTS SST45M Tower Structure refers to TIA/EIA-222-H-2018.
b. Be able to approximate Bill of Quantity in Fabrication Process of the Telecommunication BTS SST45M Tower Structure.

1.5 Benefit

1.5.1 General Benefit

a. Applying knowledge in the field of steel processing industry and getting benefits that open insights in carrying out a steel construction activity.
b. Be able to create modelling and structure analysis of the steel structure.
c. Be able to decision making and management strategy on the site.
d. Learned to examine the weld connected structure, sandblasting, painting and galvanize based on standard.

1.5.2 Research Benefit

a. Open insights in carrying out a design of Telecommunication BTS SST45M referring to newest design standard TIA/EIA-222-H-2018.
b. Open insights into carrying cost estimation of fabrication management of Telecommunication BTS SST45M.
c. Open insights into steel fabrication processes and standards.
d. Be able to decision making and management strategy on the project.