

DETERMINATION OR PLACEMENT OF AIR TERMINAL FOR A  
STRUCTURE BY USING ROLLING SPHERE METHOD

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## ABSTRACT

Lightning is a one of the natural events that cannot be predicted when it occurs. When lightning strike any structural buildings or grounded objects can causes miscellaneous damage harm and fatality. In order to protect structure against lightning strikes and reduce the physical damage, properly designed of type and location for Lightning Protection System (LPS) should be carefully considered. The MS\_IEC\_62305\_2007 standard clearly describe about selection and design of Lightning Protection System (LPS) with suggestion methods. So, this thesis that focus on determine the suitable location of air termination system for police station complex at Sri Hartamas, Kuala Lumpur to protect the structure in case of direct lightning strike. This thesis also present a graphical method performed by rolling sphere with specific radius. This is an imaginary sphere which is rolled over structure. In order to get accurate result, all parts of conventional Lightning Protection System (LPS) which is air termination system will be analyzed by using suitable computer software and followed the Malaysia Standard. For down conductor system and earth termination system will be analyzed based on Malaysia Standard. As a result, the structure are located in the radius of this method are protected from lightning strike.

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# CHAPTER 1

## 1.0 INTRODUCTION

### 1.1 INTRODUCTION

Lightning is one of the least understood phenomena, in addition at the same time it was also one of the oldest observed natural phenomena on the earth. Because of the issues, unpredictable characteristics and behavior of the lightning itself makes all the scientists were looking and trying to figure out a long time ago. Development in technology over a few 100 years ago, enable scientists learn and doing research to solve the issue [1]. Unfortunately scientists do not have a complete solution on how it works and interaction that impact the upper atmosphere. Usually lightning most often seen in thunderstorms but, in fact lightning can occur in heavy snowstorms, extremely intense forest fires, and volcanic eruption and also in large hurricanes [7].

From the previous research and data, lightning flashes can happen more than 3 million per day, or more than 30 flashes per second on average [10]. A lightning strike has a temperature of about 54,000 degrees Fahrenheit which can generate heat. It also can produce high voltage and current which is in average 100 million Volts of electricity and current is up to 100,000 Amperes [2]. These numbers shows that human live on the electrified planet and from that it can predict the possibility to human and structure when against lightning strike [4].

Lightning can strike everywhere and can cause extremely damage to life, damage the structure also can cause threat to the environment in short period either