



DEPARTMENT OF BUILDING SURVEYING  
FACULTY OF ARCHITECTURE, PLANNING AND SURVEYING  
UNIVERSITI TEKNOLOGI MARA

PYLON: THE STUDY OF CONSTRUCTION METHOD AND  
MAINTENANCE

This academic project is submitted in partial fulfillment of the  
requirement for the Bachelor Of Building Surveying (Hons.)

NOOR FARINA BINTI MALAKI  
(2006800117)

APRIL 2008

## ACKNOWLEDGEMENT

Firstly I would express my greatest gratitude to the One and Only, Allah S.W.T, the one that give me patient and good health, mental and physical so I can experienced all sort of things in life and al last able to finish up this dissertation on time. I also would like to take this opportunity to express my sincere gratitude and appreciation to my supervisor, Pn. Julaida Kaliwon, for her generous support, noble guidance and valuable advices and also the other lecturers, which helping me and fellow classmates through out the progress of completion of this dissertation.

Great thanks to Mr. Khairizal Kamaruddin (Project Manager of TNB Transmission Line), Mr. Mat Yusooif Abdullah (Manager OF Transmission Division comprises of TNB Transmission Network) and En. Hafiz Aiman (the Operations & Maintenance Operator Department) and all staff of the TNB Transmission Department. I really appreciated all of your helps and thank to give a big support.

I am also thankful to my beloved family for their support, understanding and concern during my studies. My warmest gratitude extends to my fellow classmates and friends who have been a great assistance and friends through out the year we spent as a student of Building Survey. Thank you all for everything.

## **ABSTRACT**

Pylon is a structure in transmission line which used for the transfer of electric energy. It can transfer the energy over long or short distances, and at different voltages. It can be seen as the location usually near to the housing scheme and along the highways. What we have seen today is that there are many problem regarding the pylon and the transmission line in term of the planning and location of the pylon site and intruder problems. The aim of this dissertation is to identify the type of maintenance and its works and what kind of construction method and its phrases in building up a pylon. Study area done to identify the type of maintenance and construction work from 3 study case sites located in Putrajaya, Selangor and Kedah. The study is important to give understanding about the construction, maintenance and regulation of pylon to its surrounding to get a better point of view which can help in planning the existing area surrounding the structure and its members.

# TABLE OF CONTENT

*ABSTRACT*

*ACKNOWLEDGEMENT*

*TABLE OF CONTENT*

*LIST OF FIGURES*

*LIST OF TABLES*

*LIST OF PHOTOS*

*LIST OF ACRONYMS*

## **Chapter 1.0 Introduction**

1.1	Introduction	<b>1</b>
1.2	Issues	<b>7</b>
1.3	Objectives of study	<b>9</b>
1.4	Scope of study	<b>10</b>
1.5	Methodology	<b>11</b>
1.6	Summary of chapters	<b>13</b>

## **Chapter 2.0 Construction**

2.1	Introduction	<b>15</b>
2.2	Application	<b>16</b>
2.2.1	Structure configuration and material	<b>17</b>
2.2.2	Constructability	<b>19</b>
2.2.3	Structure families	<b>20</b>
2.3	Load on pylon structure	<b>22</b>
2.3.1	General	<b>22</b>

2.3.2	Special load	22
2.3.3	Security load	23
2.3.4	Construction and maintenance load	23
2.3.5	Load of structure	23
2.3.6	Environmental load	24
2.3.7	Longitudinal loading	25
2.4	Standard and requirement	27
2.4.1	Rentice clearing	27
2.4.2	Foundation	28
2.4.3	Tower erection	30
2.4.4	Stringing work	31
2.5	Design	32
2.5.1	Design methodology used by TNB	36
2.5.1.1	Transmission line design	37
2.5.1.2	Line route	38
2.5.1.3	Transmission voltage	38
2.5.1.4	Climatic condition	39
2.5.1.5	Type of conductor and ground wire	39
2.5.1.6	Span	40
2.5.2	Rentice	42
2.6	Pylon Foundation	44
2.6.1	Geotechnical parameter	44
2.6.2	Foundation types – selection and design	45
2.6.3	Anchorage	48
2.6.4	Construction and other consideration	49
2.6.6	Foundation movement	50
2.7	Erection of pylon	51

## **Chapter 3.0 Maintenance**

3.1	Introduction	56
3.2	Maintenance Consideration	57
3.3	Maintenance Checklist	58
3.4	General information on maintenance for pylon	59