FINAL YEAR PROJECT

ADVANCED DIPLOMA IN CIVIL ENGINEERING

SCHOOL OF ENGINEERING

INSTITUT TEKNOLOGI MARA

SHAH ALAM

CIVIL WORKS AND HYDRAULIC CONSTRUCTION OF SMALL HYDRO POWER PLANT

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A M I N.

SYNOPSIS

Malaysia has gone to great extend in developing mini hydro projects in rural areas. The design procedures and manuals are yet to be produced. Most of the design are still based on procedures which are not yet standardised.

The aims of this project will be to review the procedures involved into a standard design manual. Emphasis shall be made on Civil Works and Hydraulic Construction of Small Hydro Power Plant. The project will include existing Malaysian practices as well as design procedures and manuals developed by other countries with the cooperation of the National Electricity Board of Malaysia.

An attempt shall be made to show step by step of the procedures involve.

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CHAPTER 1.

Introduction.

1.1 Definition of a Mini Hydro Projects.

There is no formal definition of mini hydro plant but this may generally be taken as those stations which have outputs between 25 kW to 500 kW and heads of which may be classified into three classes as follows:-

i. Low head: 2 metres to 15 metres.

ii. Medium head: 15 metres to 70 metres.

iii. High head: above 70 metres. (1)

The implementation of a mini hydro projects starts from the first stage of feasibility studies that is identifying the sites from the topo sheets and carrying out site visits and survey works and these will be followed by engineering design, preparations of tender documents for civil works and fabrication of electro-mechanical equipments such as turbine, generator and control panel. The last stage is the supervision and construction works and installation of mini hydro systems for supply to the village houses in the vicinity of mini hydro station. (1)

1.2 General Layout of Mini Hydro Project.

Most of the sites which are selected for mini hydro development are of small, confined valleys and moderately steep gradient of the river. The concentration of head is obtained by diverting the river flow by the use of low overflow weir or diversion weir over an economic conveyance