

DESIGN A STEEL STRUCTURE FOR SPORT COMPLEX BY USING THE PORTAL FRAME

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ABSTRACT

On behalf of the project title, *Design a Steel Structure for Sport Complex by using the Portal Frame*, it defines the design of a portal-frame-type steel structure serving as sport complex purposes. The design has to be economical and could be constructed in real life.

The portal frame construction can be divided into 3 categories: three-pinned, pinned-base and fixed-base construction; however the pinned-base construction is adopted because the pinned-base portal frame is the most common type of the portal design due to its greater economy in foundation design over the fixed-base type. Furthermore, the clear internal appearance makes it more appealing than a trussed roof building and is also suitable for the construction of sport complex. Based on its advantages and less maintenance, more and more portal types of buildings are being set up.

Steel is a useful material in construction of buildings and it has become more and more popular nowadays. Due to its ease of erection properties, the development of steel production leads to a faster construction in site. Besides, prefabrication of steel reduces the amount of site work because casting concrete in-situ is very waiting time. Since steel structures are usually connected by bolts, it can be removed and rebuilt at anywhere easily.

The whole implementation of the project consists of the design procedures and the presentations of the end products in the engineering drawings attached in this project report. The main purpose is to design the portal frame structure of the building, so it is first done by the loadings analysis of the portal frame, and is followed by the structural analysis, column design, rafter design, connection design and purlin design accordingly. Details of the connections rafters are also will be attached in this project report through engineering drawings.