National University of Science and Technology

Think in Other Terms

INDUSTRIAL TECHNOLOGY: CIVIL AND WATER ENGINEERING

FINAL YEAR PROJECT : STRUCTURAL DESIGN OF A WORKSHOP

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ABSTRACT

The structural design of a building whether of structural steel or reinforced concrete requires the determination of the overall proportions, dimensions and selection of the cross sections. The author used the ultimate limit state design philosophy to select the cross sections that will economically and safely resist the applied loads.

The objective is to choose the lightest (steel) or smallest (concrete) cross sectional shape that will do the job then decide how to use the lightest cross section safely. However the conditions designed for may vary thus the design process caters for variabilities of loads, materials' strength, load combinations, design and detailing procedures, fabrication and erection procedures etc by using partial safety factors.

The author used architectural drawings to design the workshop which consists mostly of steel elements and some reinforced concrete elements. The role of a civil engineer was demonstrated through the structural design of elements shown on calculation sheets, production of structural drawings with layout and reinforcement details and bending schedules.

The workshop was designed based on relevant British Standards for both steel and concrete materials and the author also referred to textbooks and other research materials.