

FINAL YEAR PROJECT

STRUCTURAL DESIGN

OF

FACULTY OF APPLIED SCIENCE CHEMISTRY BUILDING

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DATE : MAY 2000

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ABSTRACT

The project aimed to demonstrate the role of the structural engineer through the design and preparation of contract documents of a reinforced building structure. The structure chosen was the Faculty of Applied Science - Chemistry building located on the National university of Science & Technology (N.U.S.T) campus about 6km from Bulawayo City Centre.

The approach to the project adopted by the author consisted of the following :

- (i) Identification of the requirements of the building
- (ii) Structural scheme development
- (iii) Initial member sizing
- (iv) Analysis and final member design
- (v) Preparation of Working Drawings
- (vi) Preparation Contract Documents

(i) **Requirements**

The building will house chemical laboratories, gas cylinder store rooms computer rooms and general office space. Already, the architect, had produced a general layout to meet the functional requirements and fit attractively on the site.

(ii) **Development of structural scheme**

The floor slabs were chosen to be hollow and monolithic beam girder types. The building was not to have any air conditioning, and the hollow slabs were to help in this regard. The isolated base type was chosen.

(iii) **Initial member sizing**

This was done according to the IstructE/ICE MANUAL FOR REINFORCED BUILDING STRUCTURE (October 1985).

For the initial and final design concrete grade 30, and steel grade 460 was used. A two hour fire resistance was used throughout.

(iv) **Analysis and Final Member design**

At this stage, the author verified the adequacy of the initial member sizes and calculated the quantities of reinforcement required in the members (Chapter 3).

(v) **Preparation of Working Drawings**

Working drawings were produced and are to be found attached as Appendix A.

(vi) **Preparation of contract documents**

This was limited to preparation of specifications and a bill of quantities. In practice these documents are read in conjunction with the Architect's specification, the instructions tenders, Form of Tender and Appendix Form of agreement, General and Special conditions of Contract.