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OPTIMIZATION OF PORTAL STEEL FRAME DESIGN BY COMPUTER METHODS

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ABTRACT

This paper describes the structural design and computational technique adopted in a computer program written for the minimum weight design of a pitched roof portal with haunches (knee braced).

Minimum weight in this case has been obtained by varying the lenght and section of knee brace at a fixed angle, decided on the basis of previous research by, Davies(1) and considering moments produced thereby in the beams and columns.

Program listings and flow charts are included to illustrate each step in the computational sequence. The program is developed in FORTRAN and graphic output is also used to enhance the clarity of the results. The graphic capability depends on the computer used and commands available. This graphic output cannot be run with FORTRAN language and therefore has to be adopted to read by QUICK BASIC language.

SYNOPSIS

A computer program in Quik Basic language has been developed for the optimization of steel portal frame design in accordance with the new code of practice - British Standard BS 5950 : Part 1 : 1985 using IBM - Pc system. The program of steel frame design is also done in Fortran 77 language using mini computer at I.T.M, Shah Alam.

The report includes both manual calculations and use of computer program for verification. Together with these, a user's guide on how to use the program has also been included.

The program could be further modified to include steel Grade 50 and Grade 55 by altering certain statements in the design program.

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