International Journal of Advance Research in Science and Engineering
Volume No.07, Special Issue No.01, April 2018
www.ijarse.com
IJARSE
ISSN: 2319-8354

ANALYSIS OF DIFFERENT SLAB CONFIGRATIONS USING YIELD LINE "REVIEW"

[1]Amit Kumar Yadav, [2]Madan Chandra Maurya

[1]M.Tech. Structure, Madan Mohan Malviya University of Technology (India)

[2]Assistant Professor, Madan Mohan Malviya University of Technology (India)

ABSTRACT

As we know in the design of concrete structural slabs, we use the conventional method of designing and analysis since it is less complex, tried and tested method of designing but we know about another method of designing of slabs which is yield line analysis of slab.

The yield line theory is an ultimate load method of analysis. Ultimate load design uses the bending moment diagram at the verge of collapse as the basis for design. Yield lines are nothing but basically a crack patterns that propagates as the load increases until the slab breaks into the number of segments. Since this method is basically a manual method hence requires proper knowledge and experience about the crack patterns. In this paper we use the slabs with different configuration and loading combinations and analyze them with the use of yield line theory and compare the design with the normal and conventional design of slab to compare the results of two and move towards any conclusion which may facilitates and encourages the design engineers to look towards the design aspects of the yield line theory and does some future research work over this method to develop it in a more proper , economical and easily applicable for design .

Keywords: - crack patterns, Economy, Slab design, Yield line theory

I.INTRODUCTION

The application of yield line theory is now becoming popular worldwide and though it is accepted in European countries before but now it becomes popular in developing countries as well but it still faces the problem of lack of knowledge about the process and of being it as unconventional process. The main purpose of writing this paper is to aware the structural designer about the yield line method of design. The main aspect that we want to cover in this paper is the practical and economical aspect of the yield line theory in the design of concrete slab. Since we know that the yield line analysis is a well known method in the designing of the reinforced concrete slab. The yield line theory basically works on the principle of ultimate load analysis.

Work Done In Yield Lines Rotating = Work Done In Loads Moving

There are few advantages of yield line theory over conventional design process of reinforced cement concrete like Economy, Simplicity, and Versatility. The yield line designs of slabs are comparatively easy and quick process so as easy to construct. The design is less complex and hence easy to detail and have less calculation which is easily done without use of any computers and the resulting slabs are thin in comparison and have less reinforcement required without having any strength issues that effectively reduces the cost of the slab because it works on ultimate load analysis and hence results economic concrete slab. Since more often than not we come to a conclusion that it is mainly a method which requires higher experience of field and a sound knowledge about the crack pattern because no proper method of its computer based analysis is available so this can be treated as a disadvantage. The automated yield line analysis as proposed by Munro & Francesca 6 is an available method of computer based analysis but it generally used for the analysis of crack patterns it does not helps in other required designing aspects.

II. METHODOLOGY

The methodology that we are used in this paper is very simple and easy to understand. The Main purpose to write this paper is to compare the two design processes on the basis of their Economy, Complexity making strength as constant parameter what we do is basically we design the slabs on the basis of yield line theory and the conventional way of designing and then compare it with on the basis of above mentioned parameter and then analyzing the results that we are up to and then concluding the evidence.

III. CONCLUSION

In slabs, Yield Line Configuration gives minimum weight fortification arrangements combined with slightest difficulty. These focuses were delineated on the in-situ working of the European Concrete Building Task at Cardington [1] where, remarkably, a wide range of techniques for plan an itemizing were completed, built and thought about. Yield Line Configuration was utilized on the fourth floor and required minimal measure of fortification as appeared. This demonstrates for an entire floor, 14.5 tons of support would have been utilized utilizing Yield Line .Hypothesis contrasted with 16.9 tons utilizing more ordinary versatile plan strategies. The Yield Line Outline at Cardington additionally prompted not very many bar marks being required: as it were the overwhelming cover arrangement required less the economy of Yield Line Configuration is additionally outlined in Figure, which demonstrates the fourth floor at Cardington [1] amid development. The steel fixers are laying out the T12@200 B (565 mm2/m) fortification for the yield line half of the section adjoining the T16 @ 175 B (1148 mm2/m) in the flexibly outlined half towards the highest point of the photo. Every 50% of the slab performed well.

Figure: European Concrete Building Project at Cardington - 4th floor during

Construction

Source: The concrete centre

REFRENCES

[1] *EUROPEAN CONCRETE COMMITTEE*. Bulletin D'information No. 35. (Information Bulletin No 35: The application of the yield line theory to calculations of the flexural strength of slabs and flat slab floors) Translated by C. V. Amerongen. London, Cement And Concrete Association, 1962. 180 pp.

[2] *BRITISH STANDARDS INSTITUTION*. Eurocode 2: Design of concrete structures – part 1: general rules and rules for buildings. PrEN 1992-1- (Draft for stage 49) July 2002, London, BSI.

[3] EGAN, J (Chairman). Rethinking construction., London, The Stationary Office, 1998. 40 pp.

[4] JOHANSEN, K. W. Brudlinieteorier. Jul. Gjellerups Forlag, Copenhagen 1943, 191pp. (Yield Line theory, Translated by Cement and Concrete Association, London, 1962. 181 pp.)

[5] JOHANSEN, K. W. Pladeformler. Polyteknisk Forlag, Copenhagen, 1968,pp 240 (Yield line formulae for slabs, Translated by Cement and Concrete Association, London, 1972. Ref 12.044. 106 pp.).

[6] *BRITISH STANDARDS INSTITUTION.* BS 8110: Part 1 1997. Structural use of concrete, Part 1. Code of practice for design and construction, London, BSI.