Experimental Study on reinforcement bar coupler as a cost effective

[1]Babypooja tembhurne, [2]Prof. Rahul Hinge
[1]*Research Scholar, Department of Civil Engineering, G. H. Raisoni Institute of Engineering and Technology, Nagpur, India*
[2]*Assistant Professor, Department of Civil Engineering, G. H. Raisoni Institute of Engineering and Technology, Nagpur, India*

Abstract **- Connection of reinforcing bars by couples is a common form of reinforcement splicing. A coupler with less thickness is being fabricated and Relevant provisions in design codes are reviewed and compared. Laboratory tests are conducted to investigation the slip behavior of couplers. A Section analysis approach based on equivalent stiffness model is proposed to account for the effects of couples, and formulations of cracks width calculation are explored for use in structural design. The primary objective of the project is to use the rebar coupler as a cost effective.**

INTRODUCTION

I. Rebar coupler are used for joining rebar with full tension capacity. the ends of the bar to be joined are provided with threads, and the bars are joined using a coupler sleeve that transfers the force on the rebar across the connections.
II. The coupler system is designed to connect two pieces of reinforcement bar together in the field quickly and easily. The applications include standard bar-to-bar connection, reinforcement bar termination and anchorages, transition splicer's, segmental construction and connections to structural steel They've found that mechanical connections afford a reliability and consistency that can't be found with lap splices.
III. Bond between steel and concrete transfer the load in one bar to the concrete and then from the concrete to the other reinforcement bar.
IV. Reinforcement bar couples have proven to be very cost effective and time saving compared to welding bars.

LITERATURE REVIEW

Singh R, Himanshu S. K and Bhalla N (2013) conducted a case study to check the cost effectiveness of using reinforcement bar couplers in comparison with lap splices.
They carried out case study at Jaypee Greens new undergoing project 'Wish Town Klassic' extended over 40 acres in sector- 129 of Noida, India. The couplers were installed in the columns and the corresponding cost was worked out.

Gary Connah(2013) conducted a study on requirements for the prequalification of mechanical splices for reinforcing bars in Seismic Conditions.
The method for calculation of cracking moment when tensile reinforcement is spliced by couplers was presented
He concluded that the test specifications for mechanical splices vary, depending upon the specifying authority and country and application

VidmantasJokubaitis and LinasJuknevicius (2010) conducted a study to analyze the influence of reinforcement couplers on the appearance of normal cracks in reinforced concrete beams. The method for calculation of cracking moment when tensile reinforcement is spliced by couplers was presented The analysis of experimental and numerical results obtained by calculation method mentioned above has shown that the first normal cracks usually appear at the end of the coupler

(Yoshikazu Kanoh,Hiroshi Imai Yashiro Matsuzaki 1988)
Performance of evaluation of mechanical joints of reinforcing bars evaluation of mechanical joints of reinforcing bars.

Ling Jen Hua.Ahmed Bahuraddin Abd.Rahman Izni 2013
Feasibility grouted splice connector under tensile load. The tensile load under the feasibility of grouted splice

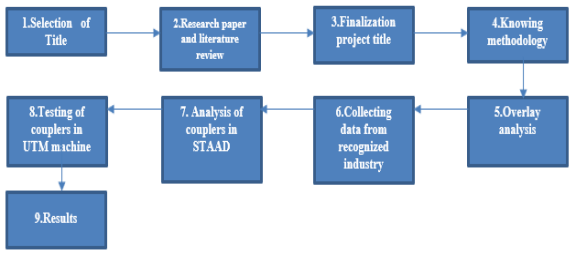
Singh R Himanshu S. K. Bhalla N.2013
Reinforcement couplers as an alternative to lap splice Use of Couplers as compared to lap joints. Comprehensively, the extent of the work is to play out the static examination and flexible plan of the individuals from Pre-engineered Industrial structure and to limit the heaviness of a standard Pre-engineered gateway outline with an accessible PC investigation and plan programming STAADPRO-2006.
The work additionally includes investigation and plan of the Secondary part for example Purlins, Eave Strut and Girts where investigation is finished by utilizing programming STAADPRO-2006 and plan of the individuals is done physically utilizing Cold-framed determinations.
The Parametric investigation is additionally being fused here to reach to the practical answer for the structure overall, The Design aftereffects of Pre-Engineered Industrial structure are contrasted and the Conventional Industrial structure and an examination is made between the weight and Costing of these structures.

Problem Statement

a. There is a possibility of misalignment in the attachment of two shaft which will create an excessive force on the Coupling, shaft and bearing causing them to wear prematurity.
b. Availability of couplers in the local market is very difficult whose diameter is more than 32 mm or more.
c. It may create structural damage if the grade of coupler will not be equivalent to the reinforcement bar.
d. Skilled Masons are required for the assembling process

Justification for Selection of Site

a. In market the minimum thickness of rebar coupler is 8mm.
b. It is our experimental study to fabricate the rebar coupler less than the 8mm thickness and to perform all the necessary tests



EXPECTED RESULT

a. To determine the compressive strength after the reduction in coupler thickness.
b. Strength will be analaysed in STAAD pro software.
c. To perform all the required tests as per IS 16172-2014.

REFERENCES

[1] Singh R., Himanshu S. K., Bhalla N., “Reinforcement Couplers as An Alternative to Lap Splices: A Case Study”, International Journal of Engineering Research & Technology (IJERT), ISSN: 2278-0181, Vol. 2 Issue 2, February- 2013 2.
[2] Gary Connah, “Prequalification of Mechanical Splices for Reinforcing Bars in Seismic Conditions”, Journal of the Structural Engineering Society of New Zealand Inc ,Vol. 26 Issue 2, 2013.

[3] VidmantasJokūbaitis, LinasJuknevičius, “Influence of Reinforcement Couplers on The Cracking of Reinforced Concrete Members”, The 10th international conference, May 19-21, 2010, Vilnius, Lithuania.
[4] M K Hurd, “Mechanical vs.lapsplicing”,Concrete construction magazine, Jan 2008
[5] A. Ruangrassamee, P. Mounnarath, “Monotonic and Cyclic Behaviors of Energy-Dissipating Threaded Mechanical Splices”, The 14th World Conference on Earthquake Engineering October 12-17, 2008, Beijing, China
[6] Russell S. Fling, Practical Design of Reinforced Concrete, John Wiley & Sons, New York, 1987.
[7] Influence of Reinforcement Couplers on the Cracking of Reinforced Concrete Members, Vidmantas Jokbaitis in as Jukneviius