

# “Structural Design of Reinforced Steel Bar for Coupling”

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**Abstract** - The majority of existing literature on coupling of reinforcement is focused on Coupling by Binding wire, welding and threading, but this paper provides new analytical solution for calculation critical buckling by various action. This paper also provides the coupling provision for various cases. In this paper not only discuss common method Binding wire and welding joint method but there are nine numbers of provisions having different alignment. For making this nine joint has to new and different ideas. This joint can be possible for using construction work. In this joints test conduct the HYSD bars. By experimentally it was observe that the more strength occurs to the structure. The use of this joint are in various conditions. Using of this joints provide high strength and more efficiency. The failure of the structure is depend upon the type of joint used in construction.

The load carrying capacity of clamping joint and binding wire joint are found the various tests. Which type of joint used is decided the condition of the structure (single storage building, pile foundation, multi storage building)

**Key Words:** Coupling, Reinforcement, clamping, welding, threading.

## 1. INTRODUCTION

As we already know that Development length is a amount of reinforcement length needed to be embedded or projected into the column to established the desired bond strength between the concrete and steel and Lap length is As the name suggested lap length is provided for over lapping to rebar in order to safely transfer the load from one bar to another is known as lap length. To provide sufficient bond strength between the reinforcement and concrete .lap length is always greater than development length.as the name suggested lap length is provided for over lapping to rebar in order to safely transfer the load one bar to another bar.

## 2. TERMINOLOGY AND TYPES OF COUPLING

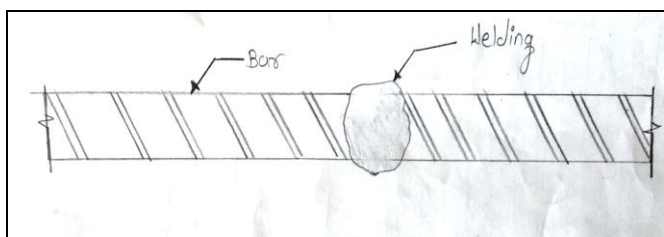


Fig-1: By welding joint

1. for welding joint is easy to fabricate and this joint acquired more strength.
2. This joint is more decent to the binding wire.
3. The welding joint can be used for daily construction.

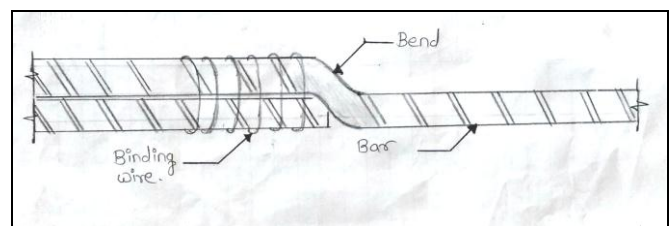


Fig-2: By binding wire method

1. In this method one section of bar is bend and rest on another section.
2. This method is commonly used in all types of construction work.
3. This method is economical.

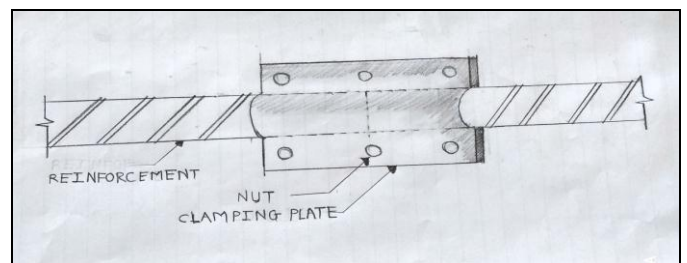


Fig-3: By clamping joint method

1. This method never is used in daily construction, because this is new method.
2. This method is difficult to fabricate, but more efficient to binding wire joint and welding joint method.

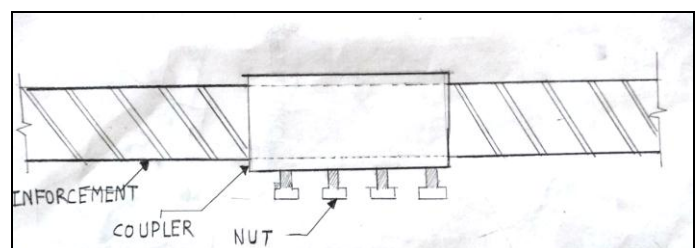


Fig-4: Side nut method

1. This is sub type of coupler joint.
2. This method is suitable for pile foundation and gives the more strength to the structure.
3. This joint is more decent to the clamping joint.

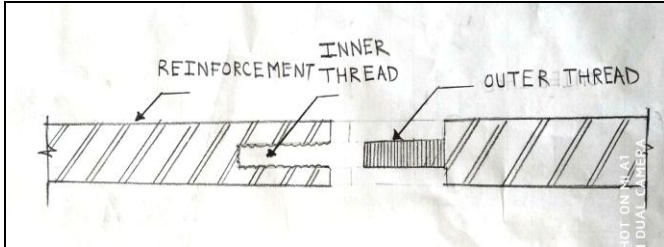


Fig-5: By Interference fit method

1. This is new method and this joint not be practically used.
2. The interference joint method can be suitable for only large diameter of bar.
3. This method is easy to construct and more decent to the binding wire joint method.

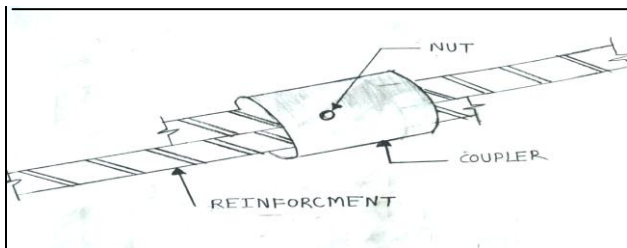


Fig-6: By middle nut method

1. This method is easy to construct as compared to another joint.
2. This joint is dose not acquired more strength then this method is only suitable for small construction.

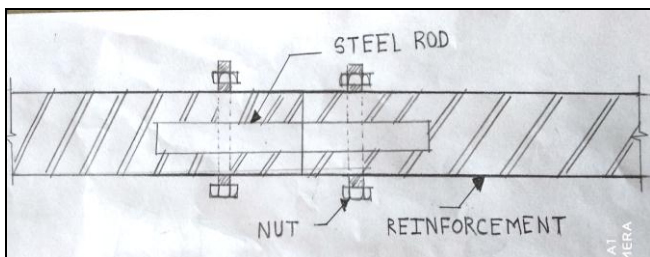


Fig- 7 : By Single Rod double nut method

1. In this type of method the steel rod can be used in inner most portions.
2. For used of this steel portion that purpose occurs more strength.
3. It is new method then it is not practically performed.
4. This method is more decent to another joint.

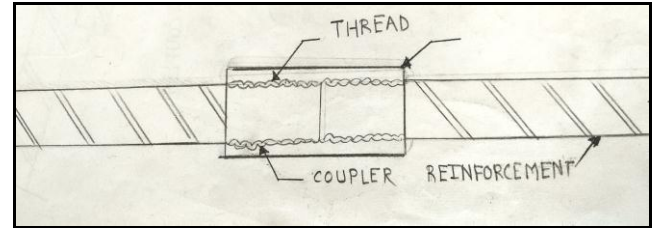


Fig- 8: By threaded method

1. In this method the two bar are joint by coupler.
2. This joint is acquired more strength.
3. This method is more efficient.
4. It is mostly used to pile foundation.

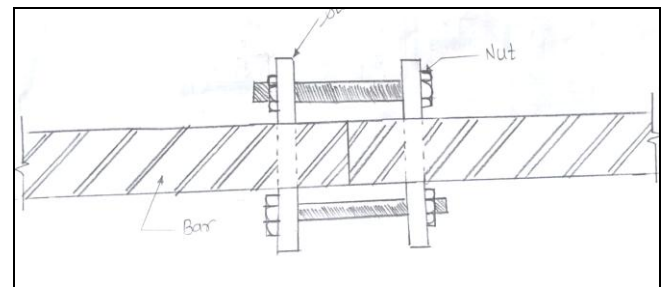


Fig- 9:By Double Rod double nut method

1. In this method two steel rod can be used in different section of bar and this two steel bar can be joint with the help of bolt.
2. For that purpose it occurs more strength.
3. It is economical method, and easy for construction.
4. This is new method does not practically performed.

### 3. FABRICATION PROCESS

#### 3.1 By coupler joint method

1. To fabricate of this joint by used of 25mm diameter of bar and 700mm in length.
2. Firstly to purchase the one solid part this solid part is cut in inner most side and to make the inner threading.
3. This two cut the section of bar are fabricate outer threading.
4. This two bar are lay of this solid part and to fix the threading.
5. All joint manufactured by same process.
6. After completing fabrication following coupler will form



Fig-10: By Interference fit method



Fig-16: By binding wire method



Fig-11: By threaded method

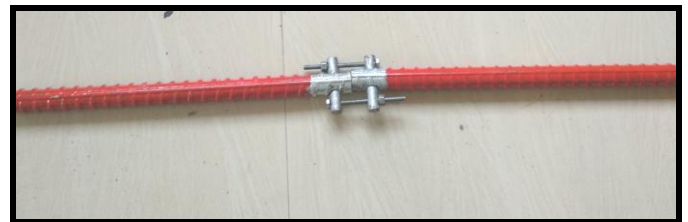


Fig-17: By Double Rod Double Nut method



Fig-12: Side nut method



Fig-13: By welding joint

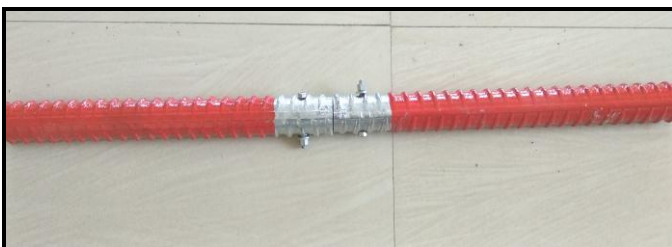


Fig-14: By Single Rod double nut method

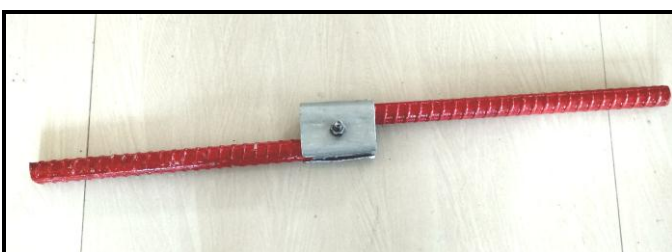


Fig-15: By middle nut method

### 3. OBJECTIVE

Steel reinforcement bar is also known as rebar, reinforcing bar, reinforcing steel and reinforcement.

1. Steel rebar is most commonly used as tensioning device to reinforced concrete to help hold the concrete in a compressed state.
2. Steel rebar may also be used to hold other steel bar in the correct position to accommodate their load.
3. Steel rebar are also employed to confer resistance concentrated load by providing enough localised resistance and stiffness for the load to spread area.
4. The joint of reinforcement steel bars can also be displaced by impact of earthquakes.

### 3. CONCLUSION

By this paper it is prove that not only conventional methods (binding and welding). The load carrying capacity of the structure is depends upon the joint of bar. Then strong bar joint have occurs more strength in the structure. In this nine joint mostly new joint in coupler method and side nut method. This method can be suitable for pile foundation and we increased the stability of structure and to avoid the cracks in structure. The diameter and length of the bar is most important parameter in the section.

### REFERENCES

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