



RENOVATION OF ROOF HOUSES BY USING PRE-ENGINEERED SECTIONS

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ABSTRACT

Here we convert loadbearing structure to framed structure with the help of steel materials without disturbing the existing load bearing structure. Which consumes lesser the time taken by the completion of rcc structures. Here we required only skilled laboures for the construction of steel structures. As we use steel columns the number of column required for the building will be lesser than the rcc columns. And here we insert the column inside the house which will be placed at the corner of the wall. Here we insert the column without disturbing the loadbearing wall or destroying it. As we use steel structures we can resell in market for half the rate of steel on the market's current rate even after 50 years after we demolish our property.

Key words- renovation, steel, I-Beams, rcc, columns

I. INTRODUCTION

Here in this project, we are going to change the load bearing structure to framed structure with the help of steel columns and steel beams. In this project up to plinth beam the method will be same above plinth the method of construction will be changed. Only skilled labours will be used here for the construction. The reason why we select steel instead of rcc because steel structures take lesser time to finish the project than rcc structure and steel ecofriendly when we compared to rcc structure as the cement contains chemical substances. And one important thing about steel is that it when compared to rcc structures the number of columns required will be lesser in steel structure. Method of construction will be fast in steel structure buildings.

II. WHAT IS THIS ABOUT

This project deals with renovation and construction of higher floors in existing load bearing structure without damaging/removing it. Super structure raised by means of PEB (Pre-Engineered Building or Steel) pattern so as to reduce the no. of skeleton structures and time of construction. Pointing out the importance of Steel structures in this project and in the near future. The life of RCC structure is 50 to 75 years but when we demolish steel structure building, we can resell the steel in the market with 50% of the steel rate in the current market price.

2.1 THE IDEA

Old Load bearing houses-made out of Earth and Stones- More Adherent & Strong. Laid with Strong RR Masonry Foundation. The Renovation implements not touching the strong existing Load bearing wall so as not damaging the structure. The foundation will be laid on the corners of the houses where the column is going to be placed and the plinth beam is laid inside the house nearby wall surface which will be placed near the RR masonry foundation as the steel column cannot be placed on the RR masonry foundation. Here, Steel Sections can be implemented- Reducing Skeleton Structures which reduces cost – Saves time consumption – Stronger Load carrying capacity.

2.2 POINTS TO BE NOTED

I-sections and Channel sections of required cross sections are used. Span width can be of very greater length because of Strong Steel Columns- Hence no of Columns is reduced. Faster Construction by means of Bolted Structure. Excavation of Foundation depends upon various factors. Regain 45% of the investment by means of Scrap in the Future

- 1 Ton Steel – Rs 41,500
- 1 Ton Scrap today's Value – Rs 18,000

III. METHODOLOGY

Foundation of existing Load bearing structure is found and kept undisturbed. Excavation for new columns is done by various factors. Upto Plinth beam, work is carried out as same as traditional RCC method. STEEL BASE PLATE is fixed in the plinth level by means of Anchorage Bolts. I-section Columns are bolted to the Base plate- Similarly all 4 Columns are erected faster. Steel Beams are connected by means of Bolts and Welds to the Column. With the steel beams the columns are connected and partition beam is produced in between to place the deck slab. Here the deck slab will be screwed with the steel beams. And reinforcement will be laid over the deck slab and concrete will be poured over the deck slab. Most commonly used PEB's – High Grade Steel Plate conforming IS:2062 ; ASTM 57250 , Grade 345.

TOP VIEW

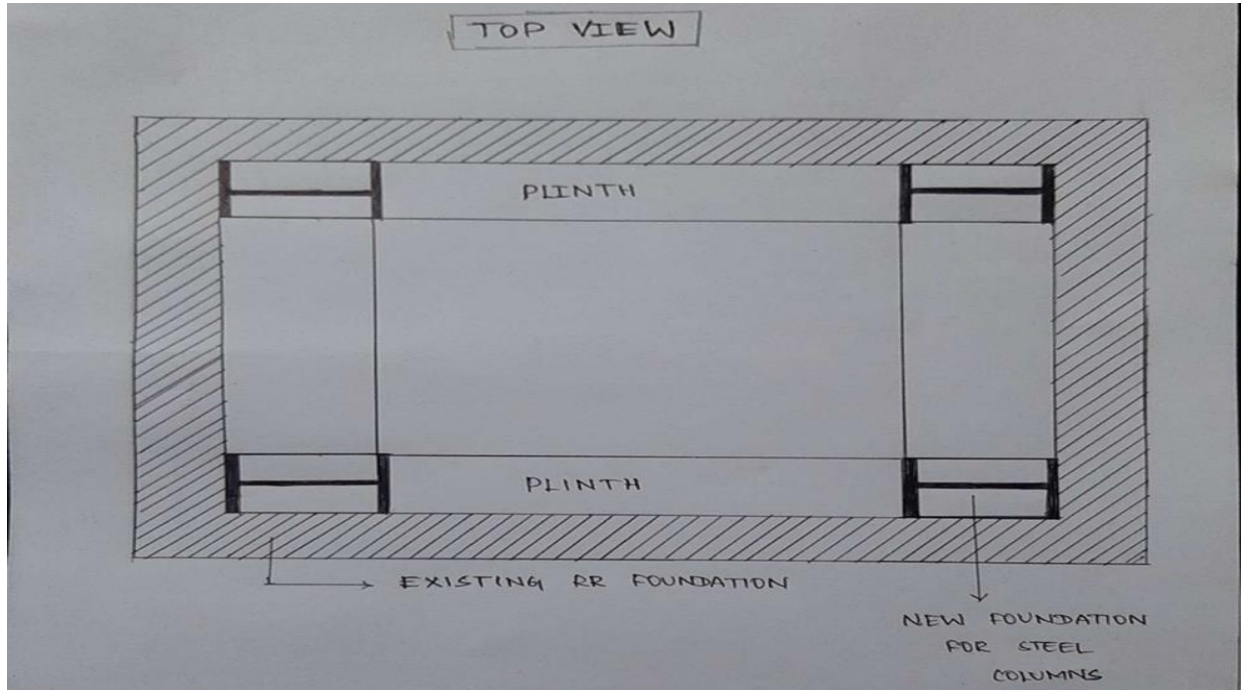


Fig 3.1

SECTIONVIEW

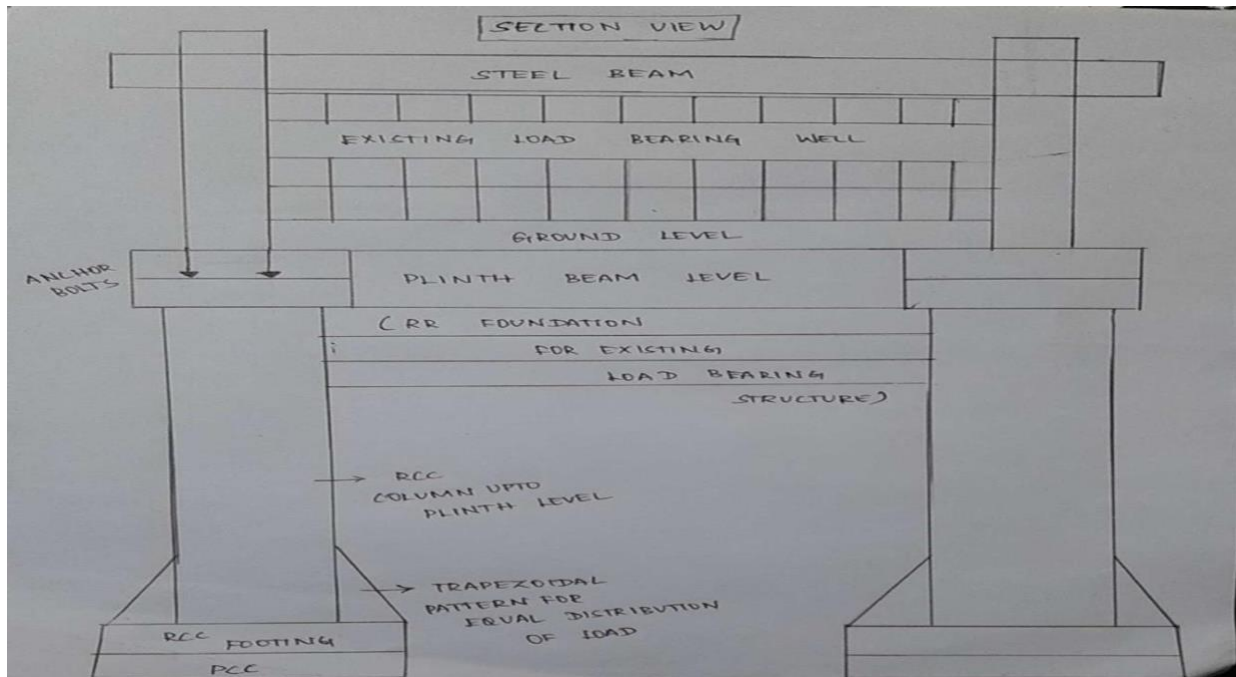


Fig 3.2

IV. SOME OF THE POINTS THAT WHY WE USE STEEL:

The best advantage of a webbed and flanged beam (eg. an I section) is that the material is present where it should be and in the right quantities. This makes the beam more economical and lighter and in turn again making it even more economical. A beam primarily resists bending, shear and torsion. The height of the section is a determinant of stress due to bending in the order of square of itself. The farther the flanges are from each other, the better it is. Shear is resisted by the web and you just put in enough thickness of web that the shear is taken care of. Then comes into picture torsion. Well, in that case I-beams do not provide any significant advantage. Regardless, the consideration from point of view of bending is the most important one.

4.1 WHY WE USE STEEL:

- Speedy Construction & Value for money.
- Skilled & Professional Work
- Minute placement of Structures without lag
- Architecturally Expressive
- Regain cost is higher
- Steel is a natural product and hence it is more safer than chemical substances like Cement, Concrete etc

4.2 WHY I BEAM IS USED:

Span between two steel columns can be 110.ft according to the span the size of the column can be changed. I-BEAM also called as H-BEAM, wide beam, W-BEAM, UNIVERSAL BEAM (UB), and rolled steel joist, is the shape of choice for structural steel builds. The design and structure of the I beam makes it uniquely capable of handling a variety of loads. Engineers use I beams widely in construction, forming columns and beams of many different lengths, sizes and specifications. Understanding the I beam is a basic necessity for the modern civil engineer or construction worker.

V. THE SHAPE AND STRUCTURE OF THE I BEAM:

The I beam consists of two horizontal planes, known as flanges, connected by one vertical component, or the web. The shape of the flanges and the web create an "I" or an "H" cross-section. Most I beams use structural steel, but some are made from aluminum. In metal constructions, such as carbon structural steel and high-strength low-alloy structural steel, have different applications – such as building framing, bridges, and general structural purposes. I beams come in a variety of weights, section depths, flange widths, web thicknesses, and other specifications for different purposes. When ordering I beams, buyers classify them by their material and dimensions. For example, an 11x20 I beam would have an 11-inch depth and a weight of 20 pounds per foot. Builders choose specific sizes of I beams according to the needs of the particular building.

5.1 USE OF I BEAM:

I beam have a variety of important uses in the structural steel construction industry. They are often used as critical support trusses, or the main framework, in buildings. Steel I beam ensure a structure’s integrity with relentless strength and support. The immense power of I beams reduces the need to include numerous support structures, saving time and money, as well as making the structure more stable. The versatility and dependability of I beams make them a coveted resource to every builder. I beams are the choice shape for structural steel builds because of their high functionality. The shape of I beams makes them excellent for unidirectional bending parallel to the web. The horizontal flanges resist the bending movement, while the web resists the shear stress. They can take various types of loads and shear stresses without buckling. They are also cost effective, since the “I” shape is an economic design that doesn’t use excess steel. With a wide variety of I beam types, there is a shape and weight for virtually any requirement. The versatile functionality of the I beam is what gives it the alternate name universal beam, or UB

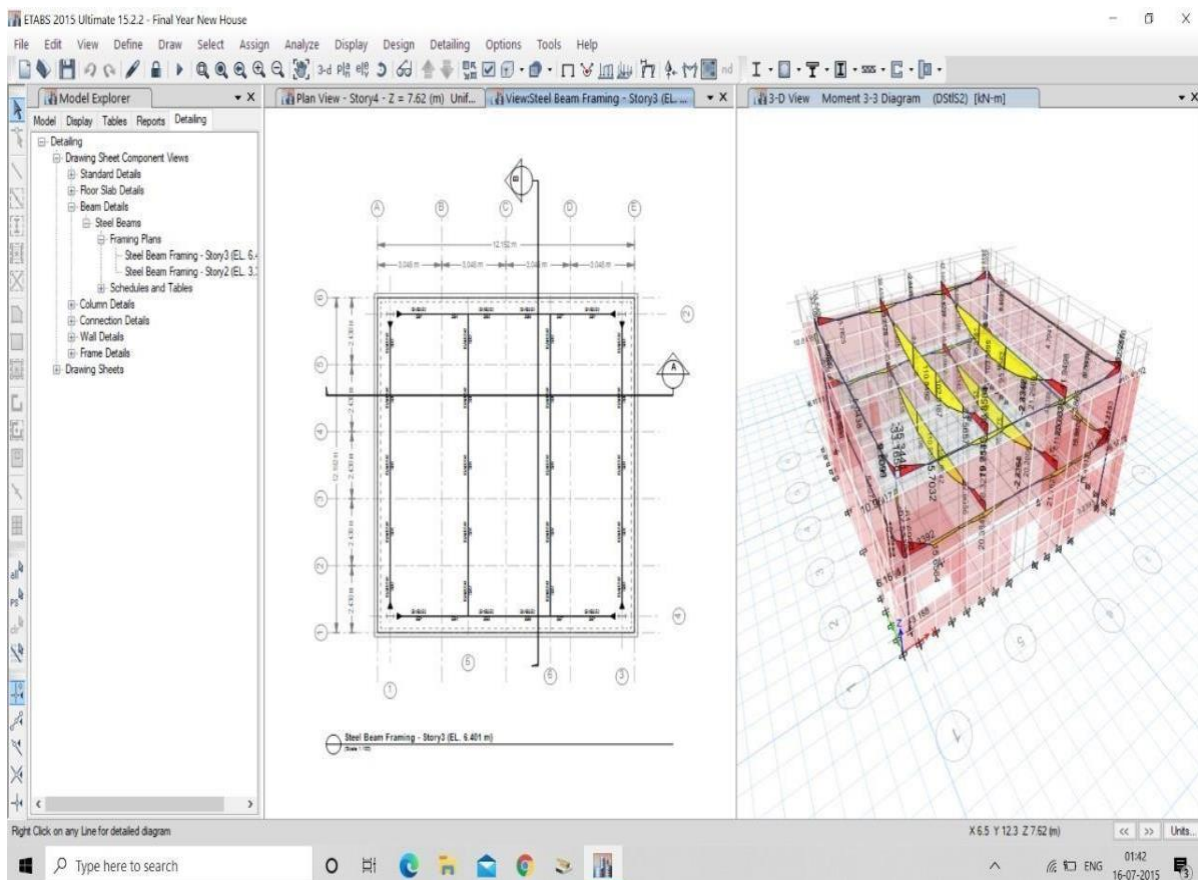


fig 5.1

VI. CONCLUSION

By this way, we are able to extend our old traditional house to many storeyed buildings without damaging it. Usage of PEB helps to finish CONSTRUCTION FASTER & TECHNOLOGICALLY SMARTER Steel Building will be emerging as one of the Demanding sectors in Construction industry in the near Future.

VII. REFERENCES

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