



Application and Design of U-Boot Slab System in Construction

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Abstract

U-Boot technology is capable of supporting large without beams. U-Boot beton is a farm work made of recycled polypropylene. Voids from work placed in between the top in bottom reinforcements of slab. It is used to create slabs with large span or that are able to support large load without beams. U-boot is fire resistance. It is a recycled polypropylene formwork that was designed to create lightened slab & rafts. U-boot systems can be combined with other technologies pre-fabricated with other techniques such as post tensioned steel and pre-fabricated slabs. The technology of hollow slab with part tensioned steel. It reduces the weight of slab & its thickness.

Keywords: U-Boot foot/needles, spacer, joint, fire, resistance, low-cost material

1. INTRODUCTION

U Boot is a technology that reduced the amount of concrete required. U-boot technology comes to 2001 when Robert-II Grande, an Italian engineer, developed and patented a new system of hollow former to reduce transport vehicles .It is the recycled polypropylene formwork technology used for construction purposes. One of the important barrier with constructions, in instance of horizontal slabs is the soaring weight, which ceiling the span.

It creates lighter economical design for structure. For this reason major developments of reinforcement concrete have focused on enhancing the span. This is used to construct two way slab, large span slab, and mushroom slab and raft foundation in RCC structure. It is suitable for high rise building, hospitals and parking management Residential and industrial buildings. In u-boot automation, slabs are fabricated with large span a contract floor thinner by depleting the weight while keeping the advance of reinforced concrete technology.

1.1 OBJECTIVES

The U-Boot technology is very useful technology for building construction. The main objective is to reduce the dead load of slab and reduced the overall cost of slab. The U-Boot reduce the amount of concrete required. This is especially important for environmentally green and sustainable.

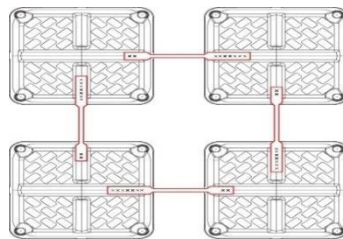
2. HISTORY AND BACKGROUND

U-boot technology comes to 2001 when Robert-II Grande, an Italian engineer, Developed and patented a new system of hollow former to reduce transport vehicles. This is a new technology that has been in operation since 2002.

3. TYPES OF U-BETON

- Single U-Beton
- Double U-Beton

Single U-Beton is available of various up beton height and foot height of dimension (52 cm * 52 cm) And 10, 13,16,20,24 And 28 cm in Height.



3.1 MATERIAL USED

Cement, Steel, Fine aggregate, Course aggregate, Water,
Recycled plastic mould (u-boot Shells)

3.2 SCOPE

This technique will also be used later. As population increases, its demand will also increase as we will need large and economic house in future. It can be used in public as well as residential buildings.





3.3 Details of U-boot and U-boot System

- In association with Dali form Group SRL, Italy, we present I-sects System / U-Boot Beton®, a voided slab technology that allows large spans, efficiently formed as flat plates without beams, for many types of buildings and other structures while using significantly less concrete than if solid. This is the most versatile voided slab system that allows builders to use less material and still maintain structural integrity.
- I-sects / U-Boot Beton is used in all applications that require a structural plate together with the need to use less concrete and therefore for a lighter structure. I-sects / U-Boot Beton are the ideal solution for creating slabs with a large span and/or great load bearing capacity.
- It is particularly suited for structures that require considerable open spaces, such as executive, commercial and industrial buildings as well as public, civil and residential structures.
- It makes it possible to more irregularly distribute the pillars, as beams do not need to be created.
- In the case of yards that are difficult to access or restructuring work, U-Boot Beton, due to its stack ability, modularity, lightness and manoeuvrability, can be used to make horizontal structures without the help of handling and hoisting equipment.

4. ADVANTAGES

- By using U-Boot technology when can increased number of floors.
- By using U-Boot beton we can get large span.
- Using the U-Boot does not place any beam between the poles.
- Therefore there is a decrease in the number of pillars.
- The weight on the poles and foundation results in a decrease in the overall weight of the structure.
- Due to U-Boot Beton reduced foundations – less deep foundation excavation.
- U-Boot technology improved acoustic behaviour.
- By reducing the number of poles, the economic pillars is increased
- Thickness of the slab is reduced

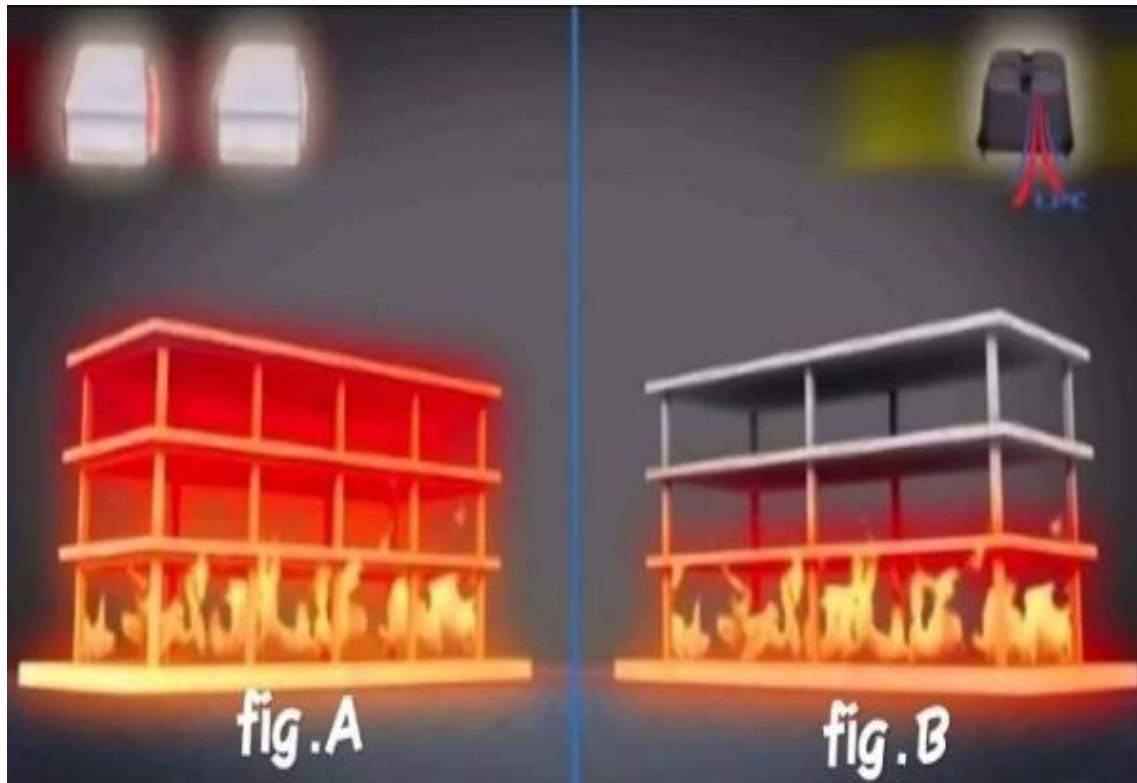


Figure A: Without U-Boot Beton

Figure B: With U-Boot Beton

4.1 APPLICATIONS

- Used in public buildings, hospitals industries, auditoriums, malls, etc.
- Used in raft foundations.
- Used in two-way slabs.

4.2 BENEFITS OF THIS SYSTEM

- ✓ Design freedom
- ✓ Down stand beams and bearing walls eliminated.
- ✓ Reducing overall costs
- ✓ Reduced dead weight
- ✓ Longer spans between columns
- ✓ Construction is less weather dependent.

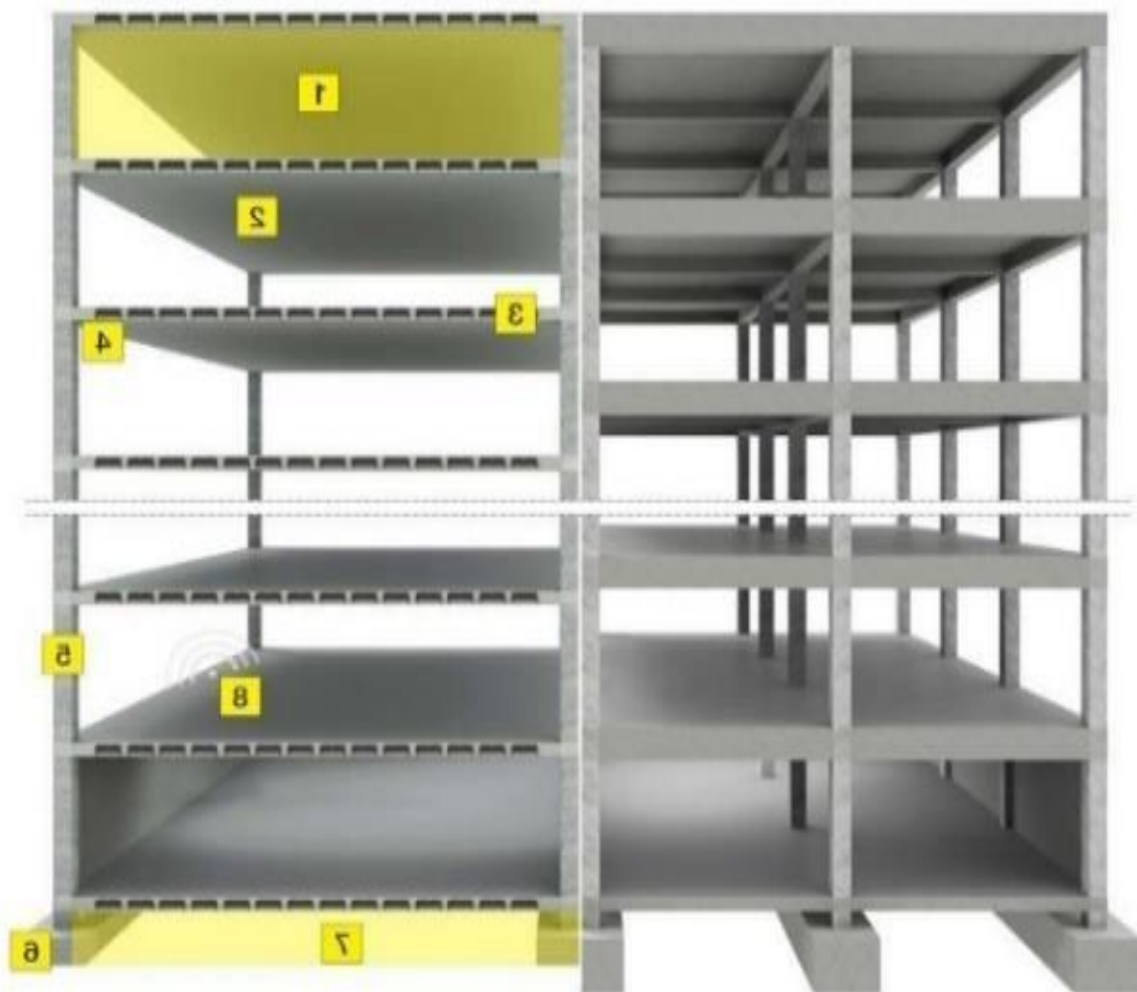


Fig.1.1 With U-boot

Fig.1.1 Without U-boot

5.Project:

Project site: Italy

Year: 2014

Description: Carlo Erba residence

Surface: 12.000 m²

Maximum span: 7 x 8 m

System: Intermediate floor



Località: Milano - Italia
Anno: 2014
Descrizione: Residenza Carlo Erba
Superficie: 12.000 m²
Luci Massime: 7 x 8 m
Sistema: Solai Intermedi

Fig No 1.8 - Carlo Erba residence

6. CONCLUSION

If we want to save more concrete then this technology has to be used, less use of iron in the slabs. Pillars and foundation up to a total of 15%. There are anti-seismic advantages connected to reduced building weight slimmer pillars and foundation, there are low chance of seismic effect on the buildings. Due to the fact, that the structural behaviour of this new kind of monolithic flat slab is the same as for solid slab, excluding slab-edge column connection, we surely can talk appropriateness of use and advantages of the new technology. This technology is very expected in modern construction and perhaps future of civil engineering belongs to this new kind of hollow slab.

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8. REFERENCES

- [1] Dali form group building innovation, creatori, dell iglu.
- [2] International Journal of Management, Technology and Engineering (IJMTE), ISSN NO: 2249-7455, Volume 8, Issue VIII, August 2018.
- [3] B. Vaignam, Dr. B.S.R.K Prasad Analysis of voided deck slab & cellular decks slab using Midias Civil.
- [4] Yogesh Tambe, Prashant Kulkarni, Parametric study of solid slab and voided slab.
- [5] Subramanian K and Bhuvaneshwari P Finite Analysis of Voided Slab with high density Polypropylene Void Formers International Journal of Chem Tech Research, CODEN (USA): IJCRGG ISSN: 0974-4290, Vol.8, No.2, pp. 746-753, 2015.
- [6] Dr.Lalu mangal.Arun Edwin, Dr. S.Suresh, "Studies on fibre reinforced prepacked concrete", The Indian concrete journal published bynACC Limited vol.83 october 2009 no.10.page no.37-43