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U BOOT: 'THE CONCRETE SAVER'

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Abstract -*U-Boot technology is capable of supporting large span slabs without beams. U-Boot Beton is recycled formwork. The workspace is placed in the upper centre of the lower reinforcement of the polypropylene slab. It is used to make slabs with large Span or they can support large loads without beams. This is a recycled polypropylene formwork Designed to create lightweight slabs and rafts. The U-Boot system can be combined with other pre-built technologies Techniques such as post-tensioned steel and prefabricated slabs. The technology of hollow slabs with part stretched steel. That Reduces the weight of the slab and cost of the slab.[7]*

***Key Words*: U Boot, Polypropylene, Flat Slab, Weight Reduction, Voided Slab, Concrete.**

1. INTRODUCTION

U-boot is a technology that reduces the volume of Solid required. When U-Boot technology came out in 2001 Robert-II Grande, an Italian engineer, developed and patented a new system of hollow former to reduce traffic Vehicles. This is a recycled polypropylene formwork Technology used for construction. One of these is An important obstacle in construction, for example, The horizontal slab is the increasing weight, which is the ceiling Duration This creates a lightweight economic design for the structure. Reinforcement major development for this reason Concrete emphasizes increasing span. It is used Laying double slabs, large span slabs and mushrooms Slab and raft foundation in RCC structure. Is suitable for Tall buildings, hospitals and parking management Residential and industrial buildings.[4]

2. Materials:

U-boot section is made out of three principal materials; they are steel, plastic and cement

1) Concrete: The concrete use is IS 456-2000 has specified the concrete grades of M20.

2) Steel: For our model we have used the steel reinforcement is Fe500 grade, 3mm diameter steel bar is used.

3) U-boot: We have used HDPE recycled plastic material because to reduce wastage of plastics instead of burning the plastics.

3.Design of Slab

In this test, we used M20 grade concrete. OPC 53 grade cement is used to make concrete and Aggregate of Size 20 mm. The minimum cement contents are equal to 30kg/m3. The water-cement ratio is 0.45 and workability is 50-70 mm. The exposure condition is severe in this casting and the degree of supervision is good. The type of aggregate is crushed angular and there is no use of any chemical admixtures in this casting.

4. LAYOUT OF U-BOOTS

LAYOUT OF U-BOOTS

5 Casting of slabs:

Form work

- Normal form work is laid to this type of Technology
- Steel work 150mm x 150mm x 40mm in size is used
- Two form work created, one for conventional type and another for u boot

Reinforcement

- On the form work the normal reinforcement is provided.
- Size of steel of 3 mm diameter is used.
- Reinforced with 25 mm centre to centre Spacing.

Placing of u-boot shells

- The u-boot is placed in the as per design shown in figure.
- The U Boot shells are place in each grid

Concreting

- In the beginning 20 % slab is casted and settled for few min. After it u boots are placed
- After remaining slab is casted.

6. TEST AND RESULT:

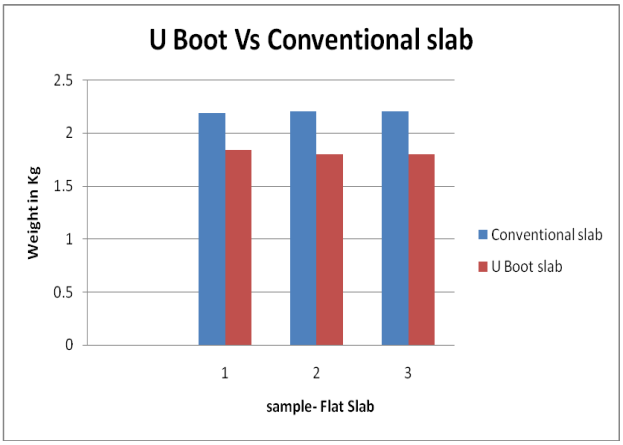
Test conducted on U boot and Conventional Flat slab:

1. **Weight test** - In this test, we compare the weight of a conventional slab to a U Boot slab to find out which is lighter.

1. Weight Comparison

sample	Conventional slab in Kg	U Boot slab in kg
1	2.195	1.845
2	2.210	1.805
2	2.205	1.800

(TABLE 1 weight comparison**)**



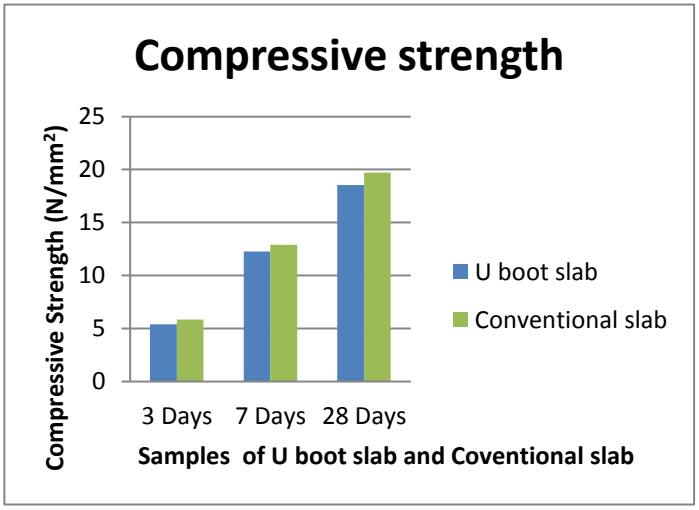
(CHART 1 Weight Comparison**)**

The Average weight difference is nearly 20%.

2. **Compressive test** - In this test we compare the compressive strength of a conventional slab to a U Boot slab.

Sr.no	Age of slab	Compressive strength(N/mm²)	
		Conventional Slab	U Boot slab
1	3 days	5.85	5.38
2	7 days	12.90	12.27
3	28 days	19.70	18.54

(TABLE 2 Compressive strength**)**



(CHART 2 Compressive strength**)**

There is slight difference in the strength of U boot as compare to conventional slab that by 1.16 MPa.

7. ADVANTAGES:

1. U boot is made up of recycled plastics.
2. U boot is used in the floor slab or foundation slab.
3. U boot is used in the floor slab or foundation slab.
4. It is easy to design, easy technical, and economical.
5. Stress is discharged directly to the beam slab and the load is distributed to the column directly.
6. Foundation load is distributed in two directions in the slab and it is discharged to the pillars and foundation.

7. Pillars spacing is increased and the Thickness of the slab is reduced.

8. APPLICATION: U boot technology can be useful in the construction of buildings like Hospital Buildings, Commercial Buildings, and Parking Floor buildings, as they have flat slabs which are suitable for use of U boots technology. It can also be used for the construction of schools and Public Buildings.

9. CONCLUSION:

1. The weight of u boot slab is less than the conventional slab by 20%.

2. There is slight difference in the strength of U boot as compare to conventional slab that by 3 $N/mm^{2.}$

3. The cost of U boot slab is higher as compare to conventional slab as the project was performed in small class. In the real life usage the U boot slab is economical.

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