

Hollow Vs Solid Slab for your Decking

PREAMBLE/INTRODUCTION

Over the years, design and construction methods of buildings have evolved. These evolution has led to many options of design and construction methods of various structural components or elements of a building; such as floors, wall, and so on. The desire to construct a cost effective and safe building has also created many options for building components. For instant, there are different types of slabs like: solid slabs, hollow/ribbed slab, waffle slab, and flat slab. So how does one choose the best type of slab for a building? what are the criteria one should look out for? Here, we will discuss the two most common floor types in West Africa: Solid floor slab and Hollow blocks on rib reinforcements. We will compare and contrast both slabs and attempt to advice the best to be used out of the two.

WHAT IS A SLAB

A slab is the part of a building known as floor which divides the building into stories, usually horizontal, in building floors, roofs, bridges, and other types of structures. The slab may be supported by walls or by reinforced concrete beams.

A slab can be placed on the ground can be supported by beam and soil strength capacity while a suspended slab is supported by beam, wall and column.

A- SOLID SLAB

Solid slab is constructed with mainly reinforcement and concrete. It can be constructed as precast or cast-insitu (monolithic solid slab construction). The solid slab construction method involves the following:

Formwork construction: Platform to support the slab and other activities during construction.

It can be removed only when the concrete slab attains its maximum strength after 28days according to British standard.

Placement of reinforcement: This is done according to the structural drawing provided

Pouring of concrete: Pouring of workable Concrete and compaction by the use of vibrator.

Curing: Curing of the slab for 28days to attain its design strength.

Advantages of Solid Slab

- It is economical for small span
- It is suitable for heavy loads or dynamic load
- It is easy to repair or strengthen
- It is good to hide services such electrical and mechanical pipes.

Disadvantages of Solid Slab

- It can be very heavy.
- It is not economical for long span.
- Its construction involves much time
- It involves large number of labour work

B- HOLLOW SLAB

This is a type of slab that is constructed with hollow clay pots or blocks. Hollow clay pot slabs are usually constructed with fewer concrete and reinforcement compare with solid slab. Hollow blocks are used to fill portions of the slab thickness; this results in deeper the amount of concrete and hence the weight of the slab.

Hollow floors, which floor system in Office buildings, auditoriums, hotels, commercial buildings, residential dwellings, houses of worship, nursing homes and educational facilities, are all ideal applications. This is because of the advantage it gives in large span and of course its aesthetics cannot be compared to that of the solid slabs. In either way, floor slabs could be fabricated off- site (as pre-fabricated or pre-cast) The eventual on-site assemblage of these slabs will require newer technology and methods

The Hollow slab construction method involves the following:

Formwork construction: This is done either by laying the formwork to cover the floor area and then lay the pots on them, or laying the formwork just directly under the ribs of the pot

Laying and arrangement of hollow blocks: This is done according to the structural drawing

Placing of reinforcement: for ribs and concrete topping

Pouring of concrete: workable Concrete and compaction by the use of vibrator.

Curing: Curing of the slab for 28days to attain its design strength.

Removal of formwork: This is done after 28days of curing

Advantages of Hollow Slab

- Reduced slab weight due to reduced amount of concrete below neutral axis.
- Ease of construction, especially when all beams are hidden beams.
- Economic for spans > 5m with moderate liveload: hospitals, office and residential buildings.
- Attractive soffit appearance if exposed
- Improved insulation for sound and heat

Disadvantages of Hollow Slab

- Not economic for small spans
- Not suitable for heavy loads or dynamic loads.
- Difficult to repair or strengthen
- Requires special or proprietary formwork

Why Should I use hollow pot slab or solid slabs

From the information stated above, hollow slab give a significant advantage over the conventional solid slabs in terms of reduced material usage (reinforcement and concrete), reduced cost, enhance structural efficiency, decrease construction time and it is a new technology in the construction industry.

- **Reduced material usage (reinforcement and concrete)**

The quantities materials require such cement, gravel, sand and reinforcement are minimal. Also, the formwork area is reduced. As a result of this, workmanship force and cost are minimal.

- **Reduced cost of materials**

With the reduced quantity of materials required, the cost of materials and workmanship will be less when compared with solid floor slab system.

- **Decrease in construction time**

As a result of the simplicity of its construction and reduced quantity of materials and labour required, the time require for its construction is less but requires technicality

- **Enhance structural efficiency**

Due to its less weight property, total load of the building on the foundation is reduced thereby reducing the complexity of the foundation at design stage. it also good as fire resistance and sound insulator.