

# Low-Cost Sheep/Goat Shed slab panels construction using waste Pozzolonic materials.

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**Abstract:** Now a days, many youths are shifting to Villages for agricultural activities and many of them are having interested in business. So, as we know that sheep forming is one of the major businesses now a days because it's meet and milk and other usages. As government is providing lot of opportunities and funds for agricultural activities since now a days agricultural sector is growing more. As we consider sheep forming and provide more durable, cost effective, fast and easy construction of sheds for the sheep forming. As provided sheds above the ground level we can adopt the integrating works. Since maintaining form and sheep is difficulty and requires a greater number of labours for the work. Hence, we designed Slab panel with holes and interlocking system with beam to slab and slab to slab as a result easy and fast construction is done. And also, we partially replacing waste Pozzolonic materials with cement it reduces the cost of the precast slab and also increases strength of that more then the normal concrete slab panel. By adopting this type of technology, we can precast huge number of slabs at site also. From this Sheep forming business can be carried very easily.

**Key words:** Pozzolonic Materials.

## 1. INTRODUCTION

**GENERAL:** Goat Any effective commercial goat farming operation depends heavily on the goat barn or housing. We should make plans for goat housing based on the quantity of goats. A straightforward goat shed can be built if we want to start with fewer goats and want to make a less first investment.

- Goat is "Future Animal"
- High demand for Chevon and goat milk
- Shift in rearing system
- Rise in Specialized goat production. Ex, Broiler kid, Dairy goat, Meat goat etc.
- Shelter requirements vary as per production system.

The flooring options include slatted, concrete, or packed earth. For proper drainage, flooring made of packed soil or concrete should slop around 5%. There is a raised platform where the goats may lie above the ground and away

from the waste and urine. beneficial. To make dung and urine collection and cleaning easier, slatted flooring should be raised approximately 1-1.5 metres above the ground. In order to facilitate the simple transit of faeces and ensure the animals' safety, the space between the slats should be between 1.4 and 1.6 cm. On floors with slots, infants and small children should be placed. There are several benefits to having a raised, slatted floor in tropical and subtropical areas.

- Remove a significant source of disease and parasite infestation by allowing dung, urine, and trash to fall through the floor's slits.
- Less effort was needed to maintain and clean.
- A decrease in space requirements
- Allowing air to circulate through the slats increases ventilation and comfort in hot weather. Manure may be readily collected for use as fertiliser or sold.
- keeps itself pretty tidy and dry.
- The high cost of construction is one of the primary drawbacks of elevated slatted flooring.
- Other issues with slatted flooring include leg and foot problems caused by an excessively large gap or inadequate upkeep of already installed slatted floors.

Dung and urine disposal have to be done on a regular basis to maintain animal housing sanitary. The choice of floor type and material was investigated because it affects an animal's conductive heat loss, which is crucial for keeping the animal warm during the winter and dissipating heat load during the summer. Therefore, having an idea of the floor type and material is quite important when building a goat or sheep shed in various agroclimatic conditions and throughout the seasons. The investigation found that Sirohi goat would prefer most slatted wooden floor followed by slatted plastic floor.

## SHEEP / GOAT SHED SLAB PANEL

Goat chunk floor is a recently presented animals flooring framework that is intended for bringing goat and sheep up in ranch sheds/houses. The floor is for the most part in grass green tone to give the animals' better inclination, which is just the main benefits the goat plastic support floor claims.

The high cost of development is the main disadvantage of elevated slatted flooring. Other concerns with slatted flooring include leg and foot problems caused by too big of a hole or poor maintenance of already installed slatted floors.

Regular clean-up of waste and poop is essential to maintaining a clean environment for creatures. Because of this, floor type and material preferences were emphasised. They determine the creature's conductive intensity problem, which is a crucial factor in keeping the creature warm during the winter and helping to disperse heat load during the summer. Thus, consideration of the floor type and material is quite helpful when developing a goat or sheep shed in a variety of agroclimatic conditions and throughout the seasons. According to the review, Sirohi goats like slatted hardwood floors the most, followed by slatted plastic floors.

## POZZOLANIC MATERIAL

Pozzolans are a large class of siliceous and aluminous materials that, by themselves, have almost no cementations regard but that, when artificially combined with calcium hydroxide ( $\text{Ca}(\text{OH})_2$ ) at standard temperature, will approach compounds with repulsive properties. This reaction occurs in finely divided structure and inside seeing water. By evaluating its pozzolanic development, a pozzolan's limitation to react with calcium hydroxide and water is determined. Pozzolana frequently occur and have a volcanic origin.

n terms of origin, association, and qualities, a great variety of materials fall within the broad definition of a pozzolan. Both typical and fake (man-made) materials show pozzolanic activity and are used as beneficial aggressive materials.

Fake pozzolans can be conveyed deliberately, for instance by warm commencement of kaolin-cays to gain metakaolin or can be gotten as waste or results from high-temperature cycle like fly soot from coal-ended power creation. The most typically used pozzolans today are present day secondary effects, for instance, fly garbage, silica fume from silicon filtering, significantly responsive meta kaolin, and consumed normal matter stores affluent in silica, for instance, rice husk flotsam and jetsam. Their use has been unfalteringly settled and controlled in various countries.



Fig 1.1 Pozzolanic Materials

## 2.OBJECTIVES

1. To provide easy, fast construction and cost-effective goat/sheep shed panels for forming.
2. To use waste pozzolanic materials as an Alternative in construction.
3. To provide more durable concrete goat sheep shed panels rather than plastic goat/Sheep shed slab panels.

## 3. MATERIAL AND METHODOLOGY

### I. Materials with Basic Test results

**A. Cement:** It is cover, substance that sets and hardness autonomously and can tie other material together. The substantial show different properties and characteristics depending on their manufactured synthesis by changing the fineness of pulverizing or the oxide piece. Cement can must be showing impact properties with wide usage of cement, for the most part evolving condition, such substantial that could be made by varying the general degree of oxide piece. The standard results of 0pc-53 grade concrete.

### BASIC TEST ON CEMENT

- Specific Gravity Test - IS 2720 (Part III) – 3.2

- Fineness Test - IS 4031 (Part I) - 98.5%
- Initial Setting Time - IS 4031 (Part IV) - 1hr 50min (31% With Normal Consistency)

**B. Coarse Aggregate:** The substantial show different properties and characteristics depending on their engineered synthesis by changing the fineness of smashing or the oxide piece. Cement can must be showing impact properties with expansive use of cement, for the most part evolving condition, such substantial that could be made by varying the general degree of oxide piece. The standard results of 0pc-53 grade concrete.

#### BASIC TEST ON COARSE AGGREGATE.

Specific Gravity Test - IS 2386 (Part III) – 1963 – 2.662

Sieve Analysis Test - IS 383 - 13.5mm (For graded A) Confining to IS 383-2016 – Table 7.

Water Content Test. - BS 6349 – 1.167%

**C. Fine Aggregate:** Fine aggregates are ordinarily happening granular material which is made from mineral particles and finely isolated material. The course of action of sand shifts depending upon the local stone circumstances and sources, but the most constituent of sand in inland central area settings and non-tropical ocean front region is silica dioxide (sio<sub>2</sub>) in the design quartz.

#### BASIC TEST ON FINE AGGREGATE.

Specific Gravity Test - IS 2386 (Part III) - 1963 – 2.93

Water Content Test - IS 383 – 1.351%

Sieve Analysis Test - BS 6349 - ZONE II Confining to IS 383-2016 – Table 9.

**D. Water:** Water for cement ought to be perfect and free structure oils, acids, antacids, vegetables or other natural contaminations. For legitimate compound activity, how much water required is around 25% of the heaviness of concrete utilized, be that as it may, more water is utilized for appropriate functionality of cement. Water utilized for concrete planning which is liberated from oils, acids,

antacids, salts, natural materials or different substances that might be unsafe to concrete. As indicated by IS 456 - 2000, the pH worth of the water isn't under 6.

**E. Silica-fume:** Silica rage in substantial deals with both the mechanical and durability characteristics of the significant. The long compressive strength of silica-fume concrete has been tended to by specific investigators. This paper reports the delayed consequences of compressive strength data on 4- to 6-year-old focuses got from unquestionable field tests where both silica-rage and non-silica fume significant blends were used. The feasibility of silica-rage concrete in restricting damage achieved by utilization of embedded steel.

A fine-grained (30-100 times better than concrete) sign of silicon-metal formation is silica seethe. Typically, more than 90% of the components of silica-seethe are silicon oxide (SiO<sub>2</sub>). In substantial paste, silica serves primarily three functions: it reacts with free lime, which is produced when cement hydrates; it plugs in pores to improve buried particle arrangement; and it may also promote complete stick holding. In its planned interaction with the free calcium hydroxide, calcium silicate hydrate and water are communicated as a more stable unruly compound.

#### BASIC TEST ON SILICA-FUME

Specific Gravity Test - IS 15388 – 2003 – 1.809

Fineness Test - IS 15388 – 2003 – 100%



**Fig 3.1: Mould for Slab**

**F. Alccofine:** Alccofine is another age, small fine material of particle size significantly better compared to other water driven materials like concrete, fly flotsam and jetsam, ground

granulated influence warmer slag (GGBS), silica seethe, etc being made in India.

Alccofine has uncommon attributes to update the introduction of concrete in the new stage and cemented stage considering its superior atom size spread. Alccofine can be utilized as a reasonable decision for Silica as it has ideal particle size movement not unreasonably better or coarse. Alccofine is conveyed in completely controlled conditions with uncommon sorts of equipment/instruments to deliver smoothed out atom size dispersal which is its unique property.

**BASIC TEST ON ALCCOFINE**

Specific Gravity Test – 1.388

Fineness Test – 98%

**G. Glass fiber:** Glass filaments grant the improvement of incredibly slender components with great elasticity. Glass-supported concrete (GRC) boards diminish the weight and thickness of the significant by up to different times stood out from ordinary steel-developed significant loads up. Uses of glass fibers in concrete is astoundingly confined in light of the fact that they experience extreme harm and loss of solidarity because of scraped area and effect powers produced during development of totals in blender. Impressive consideration has been paid for careful comprehension of the mechanical properties and execution attributes of GFRC in the plan of GFRC parts.

**BASIC TEST ON GLASS-FIBER**

Aspect Ratio.

Mix Design as per Indian Standard 10262-2009:

Cement	FA	CA	W/C
1	2.213	2.285	0.54

**II. Methodology (Experimental Program)**

There are two stages in Preparation of Model which includes.

1. Mould Preparation

2. Model Preparation

**Mould Preparation:** Moulding concrete is simplified for do-it-yourself with wood approaches that make the best shape. As opposed to setting the significant set up, you can project the significant in a supportive region like a deck or parking space. You don't have to worry about scooping the top smooth. The design does a huge piece of the work for you. The significant is projected tops genuinely, so the shape's smooth base transforms into the significant ant's top. Making a significant structure from wood is fundamental and clear. Before readiness of shape, we Made model piece and bars by utilizing thermocol and Compressed wood to check our planned interlocking is appropriately working or not.

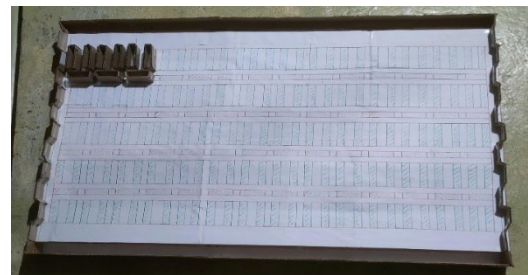


Fig 3.2 Preparation of model and mould model

- For preparation of mould need to purchase materials, cutting and joining by using glue and nuts.

**Materials Preparation**



Fig 3.3 Mould Preparation

- **Painting to mould for making smooth surface.**



**Fig 3.4 Applying paint**



**Fig 3.5 Prime coat and Colour coating to mould**

- **After preparing mould next is to be casting of model by placing concrete**

**Model Preparation:** Before placing of concrete the mechanical properties of concrete is investigated on Fresh concrete and for hardened concrete.

- **Study on Fresh concrete**

The workability of fresh concrete is defined as ability to diverse requirement of compatibility, mobility, stability, finish ability and place ability during concreting. To measure the workability slump test is carried out, Manu methods to measure the workability but in this project slump test is carried out.

**a) Slump Test**

Slump is to measure the workability or consistency of concrete. It gives an idea of water content to be added for



**Fig: 3.6 Slump Cone Test**

concrete. Vertical settlement of unsupported fresh concrete, flowing horizontally vertical height  $S_t$  which it as settled is know as slump.

**Casting of Model:** Before casting of model reinforcement preparation is most important part in concrete structures.

**Preparation of Reinforcement for Beams and Slabs**

Using 6mm Dia bars and as per Minimum reinforcement for slab and beam, we prepared mat reinforcement for slab and reinforcement for beam end one and middle one.



**Fig 3.7 Applying Oiling to mould.**



**Fig 3.8 Oiling to mould**

Before pouring concrete to mould oiling is most important because to avoid attachment of concrete to the mould and to make easy demould of model after 24hr.

**Concrete preparation**

Concrete preparation is done in lab using designed proportions and calculated quantity of materials with water we used good portable water. Starting with dry mix and after wet mix is done.



**Fig 3.9: Concrete preparation**

**Placing of concrete**

After successful preparation of concrete with Desired concrete proportion then pouring of concrete into the mould is carried out with proper compaction.



**Fig 3.10: Concrete pouring**

**Demould**

After placing of concrete into the mould and waited for 24hr to demould that specimen and with using tools we demoulded that model.



**Fig 3.11 Model after de-mould**

**Giving Skid Resistance for Sheep/Goat**

By providing ruff surface by applying Cement slurry on top with sufficient thick.



**Fig 3.12: Slab Curing**

- **Hardened Concrete Test results.**

**Table 3.1: Compression test on moulds**

Curing Period	Pozzolonic materials Replacement	Compressive Strength N/mm <sup>2</sup>
7	10%+10%	22.09
28	10%+10%	34.52

**Table 3.2: Tensile Strength Test on mould**

Curing Period	Pozzolonic materials Replacement	Tensile strength N/mm <sup>2</sup>
7	10%+10%	2.048
28	10%+10%	3.200

**Table 3.3: Flexural Strength Test on mould**

Curing Period	Pozzolonic materials Replacement	Flexural strength N/mm <sup>2</sup>
7	10%+10%	2.624
28	10%+10%	4.100

**Checking Model by placing slab above beams:**

After successful completion of preparation of model, we checked arrangements of slab and beam. It is successful worked out.



**Fig 3.13: Slab and Beam Arrangements**

**CONCLUSION**

1. The compressive strength of concrete is ideal at 10% somewhat superseding with pozzolanic material as indicated by composing examined.
2. The split unbending nature and flexural strength of the significant also extended at 10% somewhat replacement of pozzolanic material as indicated by composing minded.
3. By somewhat superseding of alccofine pozzolanic material with substantial augmentations Compressive and flexural strength of the significant.
4. By somewhat replacement of silica-fume increases horrendous impediment of steel support and moreover strength of the significant.

5. By somewhat superseding of waste pozzolanic material with substantial downfalls cost of piece board.
6. Embracing this kind of piece board in sheep moulding coordination of work can be taken on.
7. This substantial chunk board is accessible for a minimal price when contrasted with other material.
8. Substantial chunk board is more solid and once venture for sheep framing.
9. By this sort of innovation can decreases labore cost and furthermore support cost.
10. Simple and quick development of sheds, because of given interlocking piece to radiate and chunk to section association with extremely powerful fertilizer.

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