

# Remedies for Limitations of Innovative Construction Techniques

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**Abstract** - In spite of many favorable energy conserving and cost effective techniques for building construction launched by various research laboratories, the usage of such techniques in the construction field is minimal / hardly significant. This paper enunciates some of the practical difficulties faced by construction stake holders in the application of any newer and innovative techniques. To overcome those difficulties the possible remedial measures are also suggested in this paper.

**Keywords**— Key words: Awareness, Proximity, Tax Benefits, Social Acceptance

## Introduction

The following are the influencing factors of an innovative Construction technique in general.

Awareness, Structural limitations, Transfer of Technology, Nature of Materials and Methods, Proximity, Energy required, Labourers, Tax Benefits and Social Acceptance.

## AWARENESS

This is required at all levels of people getting in touch with the transfer of technology from ink to trowel. Hence, the advertising agency like information centre, educational institutions to offer relevant training by suitably modifying and updating the syllabus, curricula, trade centres etc., help in this line. Nowadays local media is popularized to communicate any sort of information to all strata of community. But it is always a point that how effectively and elegantly at the same time in simple form particular information is taken to the society.

## STRUCTURAL LIMITATIONS

The structural limitations of each and every technique must be made available at the rural proximity. People are ready to use thin, brittle asbestos sheet for roofing whereas hesitate to use filler slab. This is not only because of low initial cost but also the lack of knowledge on structural limitations. Similarly, planning and designing criteria of wall openings such as doors, windows, shelves, showcases etc., in the application of Rat-trap bond brick work needs a good knowledge on compressive strength of brick.

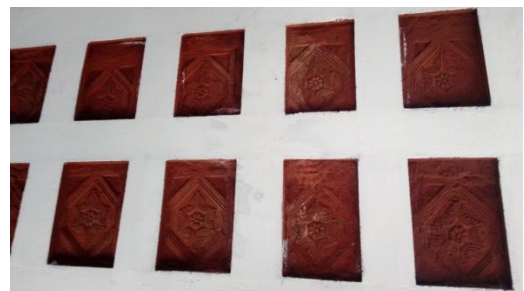
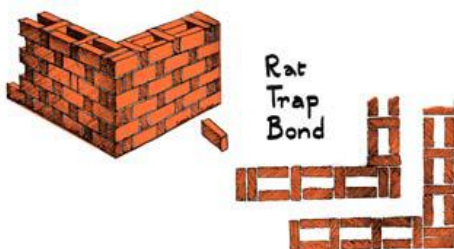


Fig.1 Schematic View of Rat-Trap Bond Brick Wall and Photograph of RCC Filler slab with Flat Tiles as Fillers

The figure 1 shows Schematic View of Rat-Trap Bond Brick wall and Photograph of RCC Filler slab with Flat Tiles as Fillers

Here, the structural limitations of Rat-Trap Bond Brick wall are 1) All bricks must be of full bricks no brick bat is suitable for this bond. 2) For brick satisfying minimum acceptable standards (compressive strength 5 to 7 MPa) the maximum clear spans of 230mm thick walls can be of 3000mm for a two parallel span of residential unit. 3) the middle wall of such two parallel spans of a residential building, can have adjoining doors opening or windows opening or door and window separated by a brick column of 375mm.

As far the RCC filler slab is concerned, 1) the minimum rib thickness is 75mm between two adjoining rows of fillers. 2) The outer most filler row should be spaced at least equal to the effective depth of the floor or roof slab for avoiding, shear failure. 3) Where ever the service lines like concealed wiring or other pipe lines are placed, extra stiffening with additional rods shall be provided for preventing stress concentration. 4) While laying concrete first the surrounding layer of concrete for each filler must be laid before laying concrete over the filler as screed concrete. 5) The performance of the slab can be improved by providing thermal reinforcement in the screed level.

### **TRANSFER OF TECHNOLOGY**

The medium or agency through which technology transfer should take place is not a constant type. It should vary to cater the needs of all people, administrative, technical and non technical. In this stage, it is important to mention the need of interdisciplinary knowledge for all the above three categories of people. Moreover the job of extension workers is of extreme importance to offer all possible information's, suggestions from grass-root level to the administration level. Further use of audio visual aids can also help in this line to a large extent.

### **NATURE OF MATERIALS AND METHODS**

The nature of materials used for the development of innovative technology should be of locally available and should demand fewer investments. The methods used for the development of a technology should be simple easy to understand and apply for a raw hand. To accomplish this, information on the wastes available in the existing agricultural and other industries in a particular locality is to be collected and used for innovations.

### **PROXIMITY**

The site for process or preparation of materials, products, and components should be as far as possible very near to the actual use for the cost reduction. Our father of the nation Mahatma Gandhiji told all the item for construction of a residence must be brought from a maximum distance of 2 km, in view of minimizing the cost, that is maximizing the cost effectiveness. If such principle followed, certainly, a major portion of the cost of construction projects will be saved and in turn the national economy will be well protected.

### **ENERGY REQUIRED**

Costly materials or more energy consuming techniques / materials have to be rejected and a judicious selection of materials is to be used. To satisfy this demand we should strictly adhere to the following order of preferences in selecting construction materials. Naturally available materials which are in direct use. 1) The waste products from other industries. 2) The materials consuming minimum energy for their final shape in the construction site. 3) As a last resort, the energy consuming materials at negligible use or minimal use.

### **LABOURERS**

As far as labourers are concerned, to work on an unfamiliar technology, they are reluctant and demand more rates which in turn binds on uneconomical projects. Ultimately resulting in rejection of technology. To overcome this, suitable incentives / awards can be offered in encouraging the labourers who are taking part in the development and application of low cost technology. The government can issue schemes to apply the innovative techniques for the construction of shelters for labourers involved in construction fields. Free or partial wage agreement in group housing for labourers colony will go a long way to change the present trend of labourers.

## TAX BENEFITS

Attractive tax benefits, supply of building materials at subsidized rates are also much useful in achieving the goal of housing for all. Middle income group and high income group people who are taking up the low cost constructions should be encouraged with higher tax benefits for having cooperated to maintain national economy.

## SOCIAL ACCEPTANCE

This is the most important factor on which the total success of application of any new technique lies. The following are the major requirements of any technique to achieve social acceptance. It should suit to the local labourers and material sources. It should suit the locally available machines and equipments whether hand operated or power operated or by both. It should clear off the common man's doubt, as to whether strong enough etc., It should not offend the religious belief. Beyond all these, while the question of durability consideration strikes, the same could be very well answered by suitable audio visual aids showing the constructions performed under demonstration schemes along with the date of commencement of the structure, date of completion and also with date of last of attempt made to make maintenance etc.,

## CONCLUSION

The various problems on the applications of innovative techniques and strategies to solve them are discussed. With the continuous effort of the Government and Non-Government agencies, many new techniques are coming up now a day. By proficiently using the recent innovations one can have his congenial shelter.

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