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AUTOCLAVED AERATED BLOCK WITH INTERLOCK.

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Abstract: Brick is mostly used for building construction. The CO₂ emissions in the brick manufacturing process affects the green environment. so, we are introduced block interlock for eco – friendly solutions for greener environment. AAC block with interlock, an “Eco – friendly material” gives a prospective solution to building construction. In this Project, attempt has been made to replace the red bricks with eco – friendly AAC Interlock blocks. The usage of AAC block reduces the cost as well as waste of construction up to 20% as reduction of dead load of wall on beam makes it a comparatively lighter member. The use of AAC interlock block also reduces the requirement of construction materials like cement and sand up to 50%.

Keywords: AAC Block, behaviour of interlock, compressive strength.

1.INTRODUCTION

Our Project is about Interlocking the AAC Block with the New Construction Technique Methodology . The Main Feature that makes the state of two Mechanisms or Functions are Mutually Dependent . Interlock is used to Prevent from change in

deformation of the required Structures. By Assembling the Member in which the Coordinate in such a way that all parts work Together Effectively and levelled .In this project the waste reduction in construction is minimized.The Dimensions of the Required block is manufactured as 21” x 9” x 8” . The AAC block and the Thermal Setting plastic are fit together without any Kinetic Action of the Non-structural Member .

1.1 AUTOCLAVED AERATED CONCRETE

Compressive strength of AAC blocks is geater than traditional clay brick. It helps in reducing dead load of structure. Cost of construction reduced by AAC interlock block.The AAC interlock block wall are plane, thickness of plaster is very less, and so there is substantial reduction up to 50% in use of cement and sand for plaster work. AAC is manufactured from common and natural raw materials, therefore it is extremely reuse-efficient and eco - friendly. The energy consumed in the interlocking process emits no pollutants and creates no byproducts or toxic waste products. The work of AAC interlock block helps to eliminate waste on the jobsite.

1.2 ADVANTAGES OF AUTOCLAVED AERATED BLOCKS

The advantages of AAC interlock blocks are as follows :

1.2.1 Eco - friendly: AAC interlock block helps to reduce at least 30% of environmental waste as compared to traditional concrete. There is a decrease of 50% of CO₂ gas emissions.

1.2.2 Lightweight: It is 3-4 times lighter than traditional bricks and it easier and cheaper to transport.

1.2.3 Energy Saver: It has an excellent property that makes it is good insulator.

1.2.4 Fire Resistant: ACC interlock block is fire resistant. This material is completely inorganic .

1.2.5 Low Maintenance: AAC interlock block reduces the operating cost by 30% to 40%. It also reduces overall construction cost by 2.5% as it requires less jointing and reduces the amount of cement and steel.

1.2.6 Faster Construction: It reduces construction time by 20%. As these interlock blocks are lighter, it make construction easier and faster.

1.3 ADVANTAGES OF INTERLOCK

Interlocking blocks offer few advantages to other building materials. The materials required for production are widely available, Since the manufacturing process is a simple one . In large construction projects, an interlocking block facility can be set up at the construction site to provide the cost effective solution. It's doesn't required skilled masons, by saving cement and with the speed of construction, the building costs are lower than that for standard masonry construction. Interlocking blocks, which are dry assembled, save a

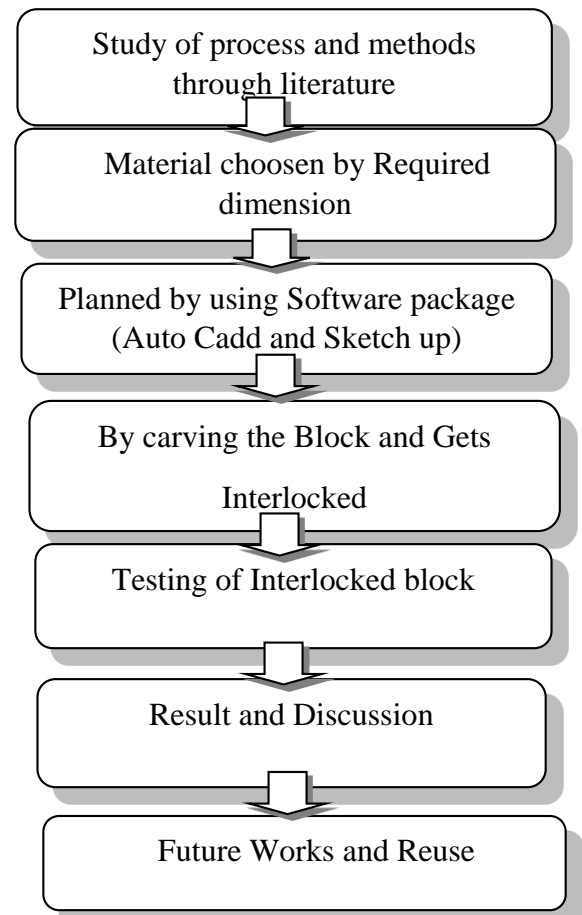
great deal of mortar which is normally used for vertical and horizontal joints, which produces savings in terms of both cost and time. The structural stability and durability of interlocking block construction can be greater than the normal construction.

II LITERATURE REVIEW

This literature says that AAC interlock block widely used as a gap filling building materials. it carries a both horizontal and vertical load .it mainly used for "REUSE AND EASY DISMANTLE PROPERTY". It reduced the wastage of construction materials.its easy to transport facilities.it doesnot require cement paste and concrete for bonding property . so, it acts as a eco friendly materials.

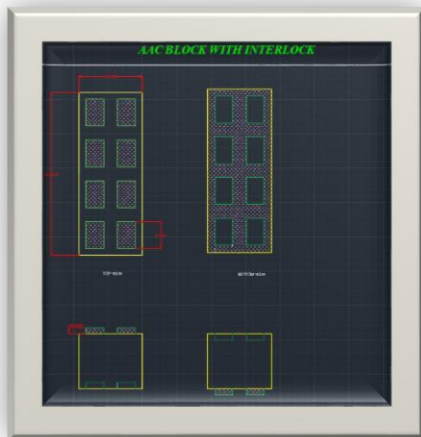
III METHODOLOGY FLOW CHART

The methodology followed in this project is displayed as a flow chart



IV PLANNED BY USING SOFTWARES 4.1 AUTO CADD

Auto Cadd drawing is used to identification of moment of inertia of the block. If the moment of inertia is large, the movement of the material is is very difficult. if it is less, the movement of material is easy. So correct moment of inertia is found out by Auto Cadd in 2D dimensions.

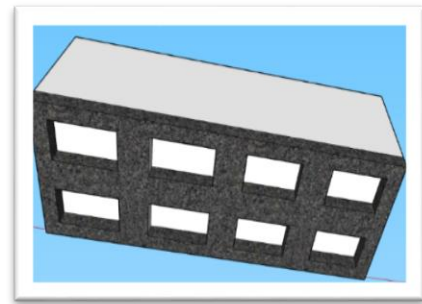


The dimensional size of the AAC block is 21" x 9" x 8". This can be drawn by using auto cadd software package . with the help of various commands the block has been drafted with superior dimensions . This plan has been drafted with specification and required dimensions.

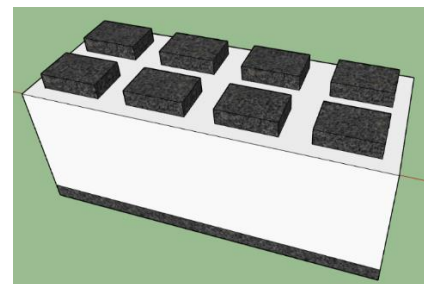
4.2 SKETCH UP

SketchUp is used to found out the carving portion of the blocks . That drafted block with specified dimensions has been established in sketchup , in order to view in 3D model and vice versa . The required dimensions of the block has been drawn and gets exploded. By the reference of using auto cadd software the following dimensions has been drawn as the dimension of 21" x 9" x 8" . The Extrude option had shows as in 3D view .Finally the block has been drawn and sketched up properly .

Underneath portion



on



Upper portion

V PROCESS OF AAC BLOCK INTERLOCK

The block has been cleaned without any deformed shapes on it. The dimensions has been marked from the corner point of reference as 2 cm, 7 cm, 2cm , 7cm and 2 cm are splitted to form like a square block . These dimensions Are fit both x and z directions fo perfect interlocking pattern .This can be carved by hand itself or by machine in required shape of the interlocking pattern . If block 1 can be the underneath portion the depth of the interlocking area is 3 cm are carved . The corner of the block that can be subdivided and gets carved like a block with superior dimensions . The block 2 is the upper layer of the interlocking pattern, gets carved in required dimension to fit perfectly without any deviation. Both the block has been carved are fit together it can be interlocked without any gap in it. the upper layer, under

portion and the side portion can get carved with needed dimensions and gets interlocked. this is act as a filling material and can withstand in load action. Without the need of Mortar paste this can be interlocked in good manner. By using mortar this may pollute our environment by expose of carbon dioxide, in spite of using mortar the block can get interlocked. there is no need of plastering in this type of structure due to constant surface of the block. this can get easily transported and gets constructed in simple process. after Interlocking the behaviour of the interlocked blocks gets tested in compressive strength testing machine to determine their behaviour. By assembling the member in which the coordinate in such a way that all parts are work together effectively and gets levelled. The Main function of the project is to lock together by the mechanical action without any lateral force. To bind up the 2 Heterogeneous material in well manner without any presence of Damage to the structure. It is a feature that makes the state of two mechanisms or functions are mutually dependent. With the Help of Software package the modified dimensions of the block are marked and gets carved with the help of carving tool. finally, the Block has been interlocked and the compressive strength has been achieved.

VI EXPERIMENTAL INVESTIGATION

5.1 COMPRESSIVE STRENGTH TEST

Compressive strength is used to measuring the compressive force of a blocks. Measurement of Compressive strength are affected by the specific test method and conditions of measurement. A deformation may be considered as the limit for compressive load. Compressive load is a key value for design of Structures. The compressive strength is usually obtained

experimentally by means of a compressive test.

BLOCK 1 CARVING PROCESS

The block 1 has been carved in required dimension with the help of software Package. The Dimension of the block is 21 “ x 9” x 8”. Based upon their dimensions the block has been drawn with the help of various carving equipment the block has been carved with superior dimensions . The depth of the square block area is 3 cm and vice versa . In right corner the 4 sections are carved and also in left corner too .the following figure shows the block 1 .



BLOCK.1

BLOCK 2 CARVING PROCESS

The block 2 has been marked with the help of software package. The dimensions has been marked on the block 2 and gets carved with the help of carving tools and gets carved .the following figure shows about block 2 .



BLOCK.2

INTERLOCKING PATTERN

The block 1 and block 2 are gets interlocked properly without any presence of gap in it. With proper dimensions ,there is no deviation and gets interlocked perfectly. Interlocking blocks are helps to fix rapidly and quickly because of their less weight property . It is easy to transport and assembling and disassembling are quick process . fixation of blocks are accurate in both the direction .It is act as a filling Material for allocation of the area and also it can behave as a load bearing and non load bearing character too. Finally the two blocks



are interlocked perfectly .

FRONT VIEW

EXPERIMENTAL TEST

TESTING OF BLOCK AT LOAD FRAME SET UP

Under Load Frame set up , the interlocked block has been set at their proper position and the external load has been loaded the block gets cracked at upper portion block . The Main function of this test is to find their behaviour of the interlocked blocks ,this can be achieved at proper strength. The Compressive strength of the block is 6.5 N/mm².



BLOCK AT LOAD FRAME SET UP

In this load frame the compressive strength has been achieved after applied load

Table 4.1 Compressive strength test

| S.No | Description | Compressive Strength |
|------|-----------------------|-----------------------|
| 1 | AAC block | 7 N/mm ² |
| 2 | Interlocked AAC block | 6.5 N/mm ² |

Note : Due to Sudden Immediate Crack the block carries Less Flexural strength.

4.6 RESULTS FROM MATERIAL TEST

Compressive Strength of interlocked block = 6.5 N/mm²

CONCLUSION

This project complies the interlocking of the block which makes the interlock of the block possible. The material study carry over to know the material is suitable for interlocking perfectly. This block which is brought under strong in compression test and also having an optimum flexural strength after interlocking. At last we found the perfect interlocking pattern with the help of software package like Auto Cadd and Sketch Up for accurate design model .

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