

# Planning, Modeling and Drawing of 15acre Township in AutoCAD/ Autodesk Revit2016 Software

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**Abstract**— This paper presents the planning, modeling and drawing of 15Acr Township in AutoCAD /Autodesk Revit 2016 Software. The software gives the better view before construction as compared to the previous design methods in the construction technology. The considered land is first divided into several parts according to the components, like villas, 2bhk, 3bhk, restaurant, playground, parks and roads, placed. Then import the components and the Cad plan into Revit 2016 software. The final view of the designed township drawings are given in the paper.

**Index Terms**— Township, construction technology, AutoCAD, Autodesk Revit 2016 Software.

## I. INTRODUCTION

Since the beginning of human kind up until the second half of the 20th century sketching was a main part of the work of every engineer or architect. Architects used sketches to design and visualize what they were planning to build, while engineers used it to approximate and analyze the physical and mechanical properties of the projects.

Two dimensional (2D) representation provided by a sketch would be substituted first by a Three dimensional (3D) computer model and later even by a Four dimensional (4D) model, showing the processes a model undergoes in time. The software would allow all people involved in a project to make decisions and predict their consequences, starting from the first conception up until the destruction of the building. The emergence of such software would subsequently lead to the creation of a whole new area of engineering and architecture called Building Information Modeling (BIM). Revit by Autodesk Revit is a 4D BIM software that gives architects, engineers, contractors and many others the opportunity to design, build and facilitate a building.

The organization of the paper is as follows. Basic introduction to the concepts of drawings, different dimensional views and Revit2016 Software is discussed in the section I. drawing practices with Revit2016 is given in the Section II. Views of designed 15Acre Township is given in the section III. Finally, conclusion is given in the Section IV.

## II. DRAWING PRACTICES WITH REVIT2016

This section deals with the major components of buildings. The design of each section of components in AutoCAD/ Revit software is discussed by following sub-headings.

### 2.1 Modeling Basics:

Four important elements which are included in any model are the following:

- i. Object Types: Standard objects are the built-in objects that are already defined in the Revit library, accessible through the Revit tools.
- ii. Views: Revit consists of different views in which the user is able to work on the model. The default views are 3D-view, elevations, and plan views. The plan views are aligned to the default levels in the model, allowing the user to evaluate the model either looking upwards or downwards from those levels
- iii. Levels: Before starting the modeling itself, it is useful to analyze the construction documents and identify important elevations at which levels should be placed. Levels are reference planes visible in the elevation views as well as sections and callouts created parallel to the vertical plane. Objects are often required to be attached to specific base and/or top levels.
- iv. Reference Planes: Reference planes are, as the name indicates, a plane used as a reference for objects. They can only be placed in 2D-views as planes parallel to the view direction of that 2Dview, however, as long as they are parallel, the reference planes may be attributed any orientation

### 2.2 Area Reinforcement Tool:

This is a neat tool for quick reinforcement of standard floors, walls and foundation slabs. With a simple click on the tool Revit automatically populates the selected floor, wall or foundation slab with rebars, customizable through the properties palette. Figure 1 shows a floor reinforced with the area reinforcement tool.

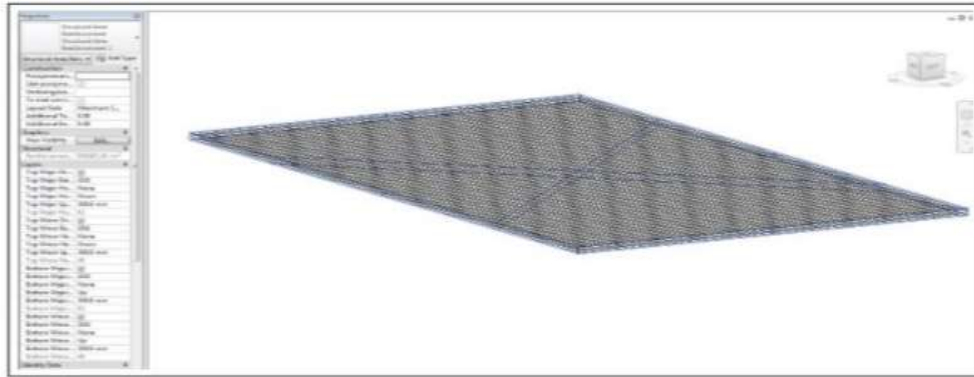


Figure. 1. Area reinforcement of a floor

### 2.3 Grids:

Revit automatically numbers each grid. To change the grid number, click the number, enter the new value, and press ENTER. You can use letters for grid line values. If you change the first grid number to a letter, all subsequent grid lines update appropriately.

### 2.4. Tools of Revit:

As like the other designing software, the Revit itself have some tools to make the work easy. The following are the tools of the Revit.

- i. Mirroring Elements
- ii. Copying Elements
- iii. Rotating Elements
- iv. Columns

Many more tools are available in the Revit software for the better drawings

### III. VIEW OF DESIGNED 15 ACRE TOWNSHIP

This sections converse the MATLAB/Simulink based results of the designed system. Simulation diagram of wind-hydro hybrid system is shown in Fig 4.

In a 15 Acre of land, the alignment of villas, 3bhk, 2bhk, roads, restaurant, play ground etc., are properly assigned to make the use of land effectively and drawn in AutoCAD/Revit 2016. The following Figures represent the components of township.

#### 3.1 Township Modeling Components:

**A) Design and Drawing Villas-1:** Figure. 2 shows the ground floor plan of villas-1. It is a residential building type; it consists of 3-floor's including ground floor, each floor of height 3m. The Figure. 3 show the 3D view of villa-1. Total number of villas-1 is ten in the whole township. This is of approximate area 210m<sup>2</sup>.

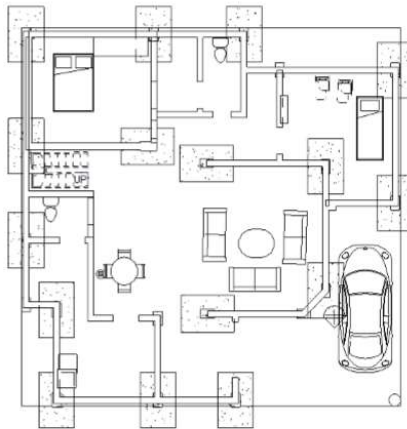


Figure. 2. Revit Software based Ground floor view diagram of villa-1



Figure 3. Revit software based 3D view of villa-1

**B) Design and Drawing Villas-2:** Figure. 4 shows the ground floor plan of villas-2. This is of approximate area  $210\text{m}^2$ . It is a residential building type, it's a 3-floor building including ground floor. Height of the each floor is 3m. The Figure.5 shows the 3D view of villa-2. Total number of villas-2 is ten in the whole township.

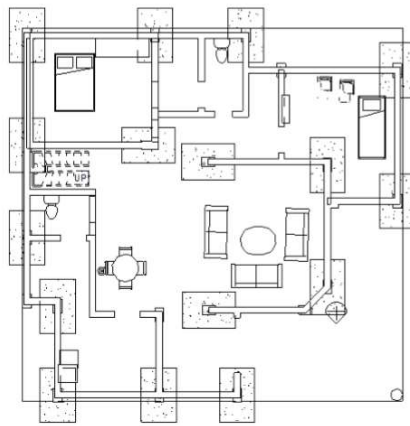


Figure. 4. Revit Software based Ground floor view diagram of villa-2.

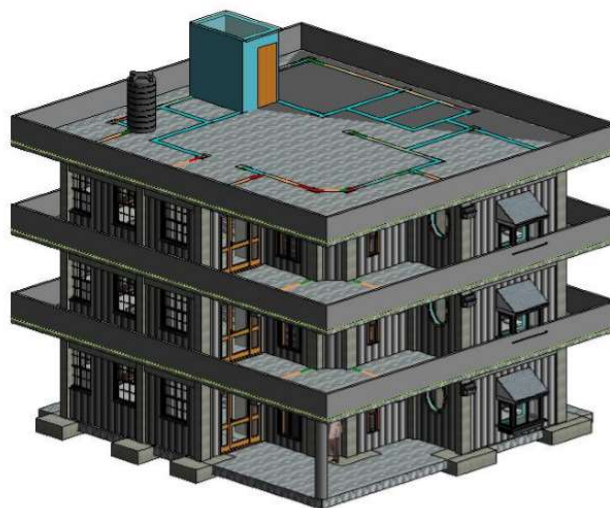


Figure 5. Revit software based 3D view of villa-2

**C) Design and Drawing Triple bed room flats:** Figure. 6 shows the ground floor plan of Triple bed room Flats and its area is approximately  $1137.5\text{m}^2$ . It is a residential building type; it consists of 4-floor's including ground floor. Each floor of height is 3.5m. Figure. 7 shows the 3D view of Triple bed room Flats (3bhk). Total number of triple bed room Flats are five in the whole township.

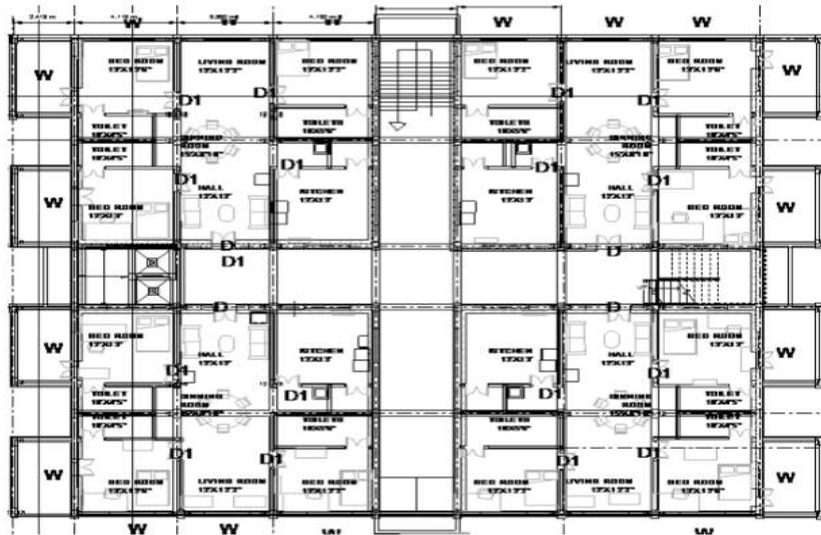


Figure 6. Revit software based plan view of 3bhk flat

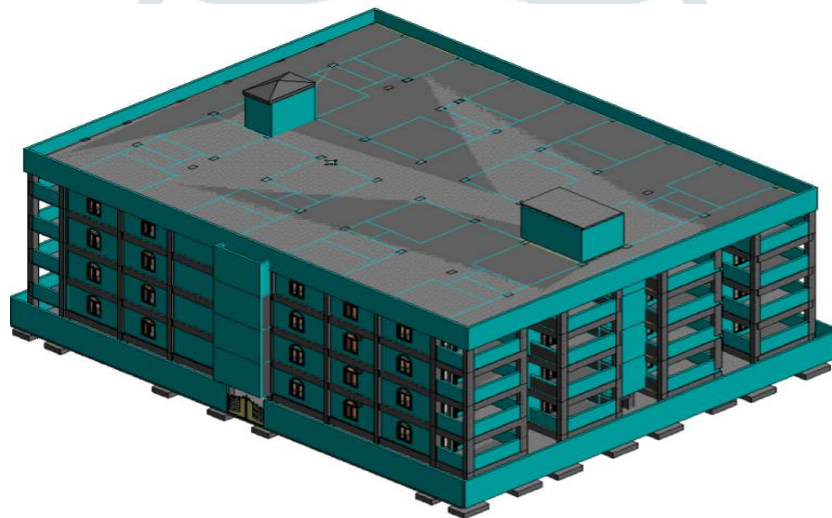


Figure 7. Revit software based 3D view of 3 bhk



Figure 8. Revit software based plan view of 2bhk flat

**D) Design and Drawing of Double bed room flats:** Figure.8 shows the ground floor plan of double bed room flats (2bhk). The approximate area is 698.75m<sup>2</sup>. It is a residential building type and it's a 3-floor's building including ground floor. Total number of 2bhk flats in the township is five. Figure 9 shows the 3D view of double bed room flats (2bhk).



Figure.9. 3D view of 2bkh flat

**E) Design and Drawing of Restaurant:** Figure. 10 shows the ground floor plan of restaurant. This is of approximate area 1137.5m<sup>2</sup>. It is a residential building type, it's a 2-floor's including ground floor building. The height of the each floor is 3.5m. The figure-26 shows the 3D view of restaurant. Total number of restaurants is in the township is one only.

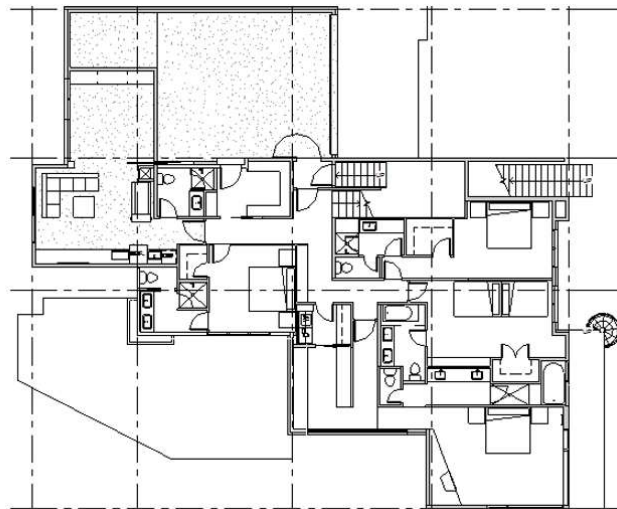


Figure 10. Plan view of restaurant



Figure.11. 3D view of restaurant

**F) Design and Drawing of ATM:** Figure 12 shows that the plan view of ATM. Figure 13 shows that the 3D View of ATM. The height of the ATM is 3m. Total number of ATMs in the township is two.

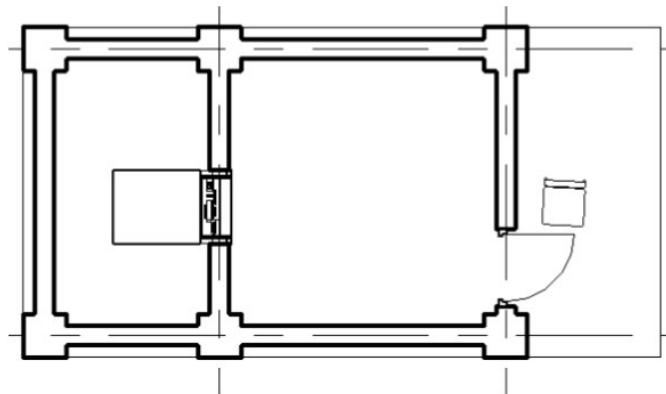


Figure.12 Plan view of ATM

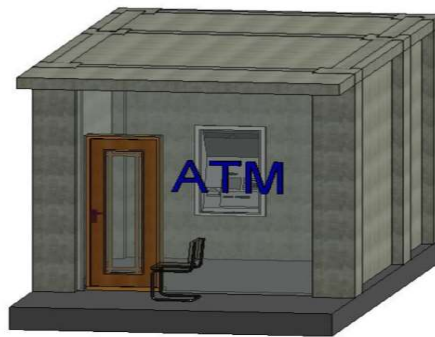


Figure.13. 3D view of ATM

G) *Modeling of Township:* The top view of township is given by Figure. 14 and alignment of 15 Acre land is given by Table.1

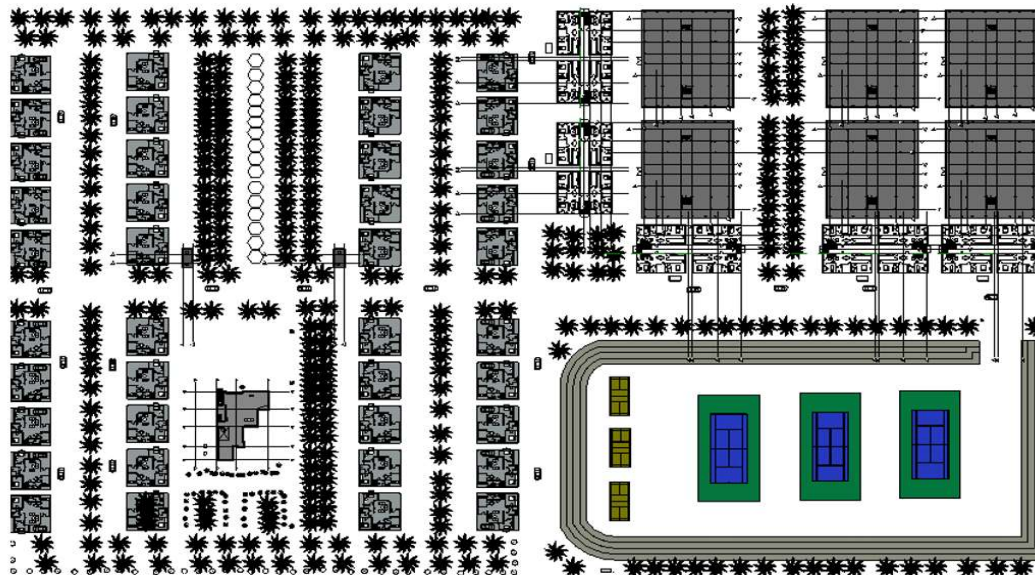


Figure.14. Top view of 15 Acre Township

Table.1 Land alignment of 15 Acre township

Sl.No	Name of Component	Length	Width	Total Area
1	Villa-1	14.00 m	15.00m	210.00m <sup>2</sup>
2	Villa-2	14.00 m	15.00m	210.00m <sup>2</sup>
3	2bhk flat	32.50 m	21.50m	698.75m <sup>2</sup>
4	2bhk flat	35.00 m	32.50m	1137.50m <sup>2</sup>
5	Play ground	150.75m	96.00m	61152.00m <sup>2</sup>
6	Park	134.40m	70.60m	9488.60m <sup>2</sup>

#### IV. CONCLUSION

In this paper, the planning, modeling and drawing of 15Acre Township in Auto cad/Revit 2016 Software is given. Each and every components of 15Acre Township is drawn in 2D and 3D view. The alignment of 15 Acre land is also given in the paper.

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