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## SLD AND LAYOUT PREPARATION FOR ON GRID SOLAR PV PLANT

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### ABSTRACT

The demand for electricity is peaking. At the same time conventional energy sources are depleting. To bridge the increasing demand and production same energy resources need to be exploited. Renewable energy resources seem to be the best solution. Solar energy has its importance in such a scenario because it is a clean, environmental-friendly, and infinity source of energy. The solar pv systems are often classified into off grid and on grid systems. Photovoltaic (PV) energy has a fast growing annual rate and is quickly becoming an important part of the energy balance in most regions and power systems. In this project a case study on the 84kw on grid solar photovoltaic system has been explained. Generally, when we construct a building, we need single line diagram and layout so in this project we will know about sld and layout. AutoCAD is a computer aided design and it allows to draw 2D and 3D designs more quickly and easily. based on specifications sld should be drawn. Google SketchUp is a 3D modelling computer program for a wide range of drawing applications.

**Keywords**—Solar modules, AutoCAD ,GoogleSketchup.

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### I. INTRODUCTION

The usage of solar Energy has been increased nowadays. Not only we save the electricity with the help of solar power plant but it also contributes towards the environment. Solar energy is simply the light and heat that come from the sun. Whenever the sunlight falls on the cell it produces electricity. Solar power plant is based on the conversion of sunlight into electricity by using of photovoltaics, indirectly by using concentrated solar power, or a combination. It is also called as concentrating solar power. This system generate solar power by using lenses or mirrors to concentrate a large area of sunlight into a receiver.

#### PHOTO VOLTAIC CELLS:

A photovoltaic cell is made of semiconductor materials that absorb the photons emitted by the sun and generate a flow of electrons photovoltaic cells are devices which converts light energy into electrical energy.It consists of two layers i.e. P-type layer and the N-type layer. The P-type layer consists of more holes and the N-type layer consists of more electrons. PN Junction is formed by joining the P-type and N-type layers.

### II. METHODOLOGY

#### **AUTOCAD software:**

AutoCAD is a computer-aided design software developed by the company Autodesk (hence the name AutoCAD). It allows you to draw and edit digital 2D and 3D designs more quickly and easily.The files can also be easily saved and stored in the cloud, so they be accessed at anywhere at anytime. AutoCAD is used for many applications like industry, by architects, project managers, engineers, graphic designers, city planners and other professionals.

#### **SYSTEM OVERVIEW:**

##### **System parameter**

##### **PV Module**

Plant Capacity : 84 Kwp

Module Capacity : 325 Wp

Total No. Of Modules : 34

No. Of Strings : 14

**Inverter:**

Inverter Capacity : 69 KW,20 KW

No. Of Inverter : 2

No. Of MPPT : 1

**SPECIFICATIONS**

Solar Modules	
Type of module	Poly Crystalline
Rated Power(Pmax), Wp	325Wp
Opt. Operating Voltage (Vmp)	37.41
Opt. Operating Current(Imp)	08.70
Open Circuit Voltage (Voc),V	46.21
Temperature Coefficient(%)	0.003
INVERTER	
Parameters	Specifications
Power Rating	69 KW
Manufacturer	Delta
No Of Inputs	18
MPPT Voltage Range	500-800
DC Input	95KWp

**GOOGLESKETCHUP software:**

SketchUp is a 3D modelling Computer-Aided Design(CAD) program used in various applications like interior design, architectural, industrial and product design, civil and mechanical engineering, films. The main advantage is shading analysis can be done. The tools used for designing a model are:

1. Large Tool Set.
2. Views Toolbar
3. Shadows Toolbar

**III. MODELING AND ANALYSIS**

**AUTOCAD Algorithm**

There are eight steps to obtaining SLD diagram

Step 1: Open Autocad app.

Step 2: Nibble the start screen on the bottom two tabs will appear learn and create.

- In left side of screen select the “start drawing” option to create a new project file.
- Click on sign option

Step 3: Next Click on start drawing.

- Click on file menu and then select new to create a new drawing.

Step 4: Introduce our-self with the workspace layout

Step 5: Click the home tab option which is at left corner of Autocad.

- If we draw anything by using tools, We will observe useful measurements near the cursor, Little length and angle

Step 6: Set our required measurements formats.

Step 7: by using some tools like line, rectangle, dotted lines sld should be drawn

Step 8: After completion of drawing next save the file.

**GOOGLE SKETCHUP Algorithm**

The following steps are included to obtain Layout.

Step 1: open Google sketchup app.

Step 2: click on get sketchup.

Step 3: click on personal project option and it is present on middle of form.

Step 4: click on Trimble ID and fill the details of our account information.

Step 5: After that, check the “Iam not a robot” option or enter the captcha text.

Step 6: click on create new account option.

Step 7: Activate our account and login to create our account.

Step 8: click on sketchup for modelling option.

Step 9: next complete the setup.

Step 10: Review some tools like line,move,arc,erase,for obtaining layout.

Step 11: scroll up or down to zoom in or out.

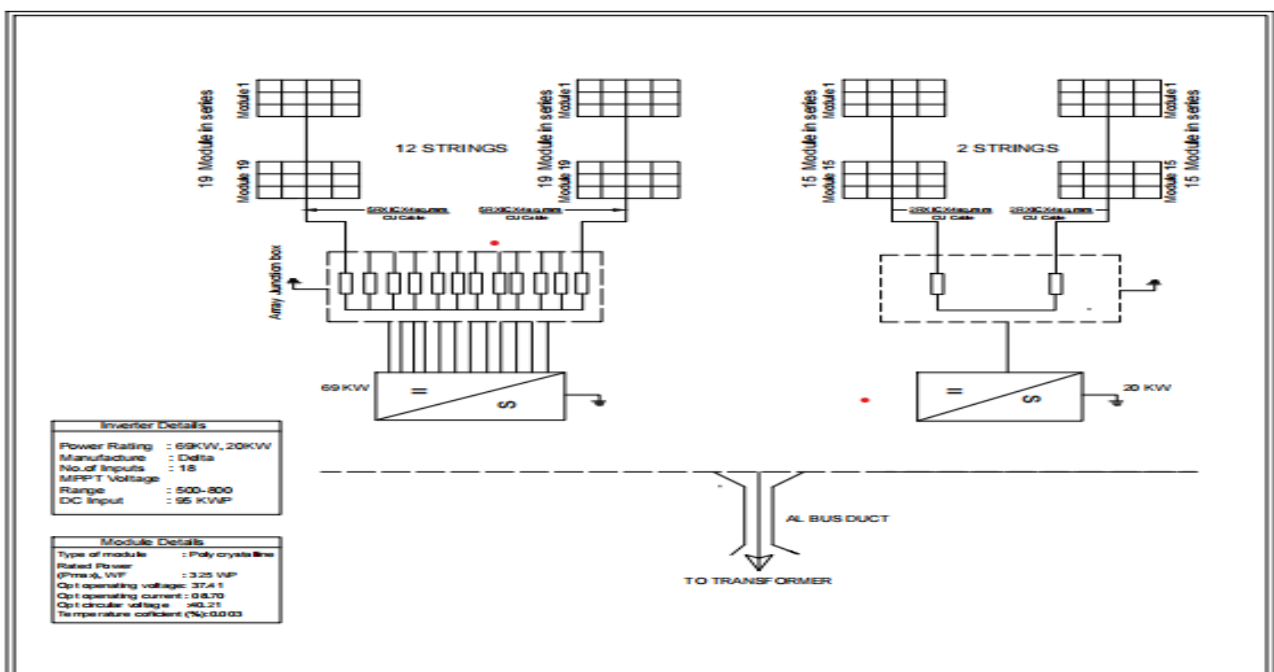
Step 12: After completion of layout save our project.

For creating a structure following points should included:

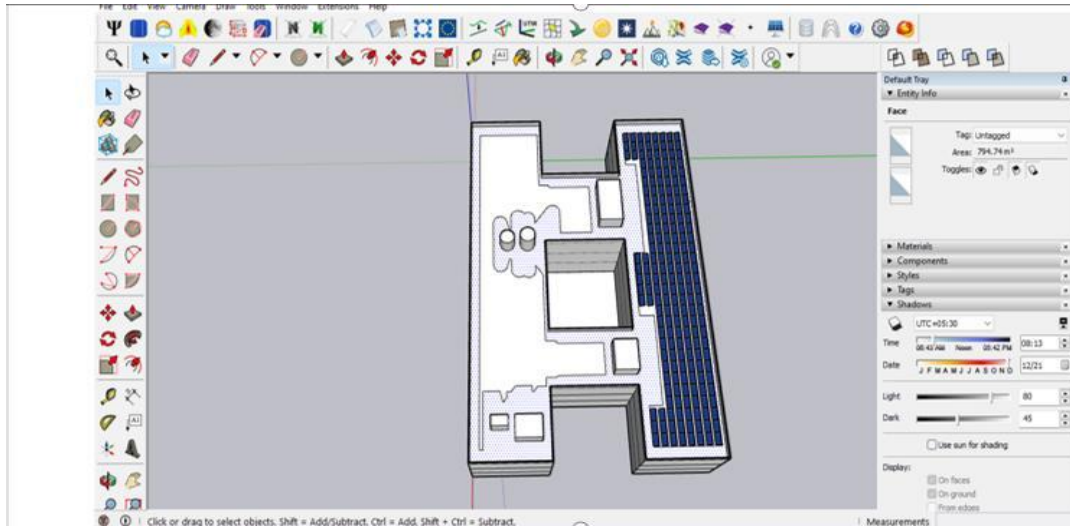
- ◆ Draw the base for our structure.
- ◆ Next, select the “Modify tool” option.
- ◆ Click the “push/pull” option.
- ◆ Click and drag the surface for extending it.
- ◆ Add details for our structure.
- ◆ Paint it and save our project.

**IV. RESULTS AND DISCUSSION**

**SLD OF 84KW ON GRID PV PLANT**



**LAYOUT OF 84KW**



Layout diagram

**V. CONCLUSION**

Finally in this project we discussed the case study on 84kw on grid pv plant.. The details regarding the components, design consideration to be adopted were clearly explained Based on specifications and calculations sld should be drawn . Apart from this, a case study has been illustrated to show the performance study of on-grid PV system. Autocad and google Sketchup software results are almost in sync with the practical data. The presented work in this paper will be help full the society, industry-academia etc. in positive way.

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