



AUTOCAD Land Desktop

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ABSTRACT:

In this 21st century in all field computerization has been took place .Our civil engineering field is also one of them. Various field in civil engineering such as Infrastructure design, surveying, construction management, estimation and costing etc. are heavily dependent on the computer programmers. In the introductory part of project some commonly used software has been discussed and the core of project is consisting of detailed discussion of one surveying tool that is AUTOCAD Land desktop.

Keywords: AUTOCAD Land desktop

I. INTRODUCTION

There are a variety of software programs which are available for the different specialized disciplines of civil engineering. Most civil engineers practice in specialized subsets of civil engineering, such as geotechnical engineering, structural engineering, transportation engineering, hydraulic engineering, environmental engineering, project and construction management and land surveying.

As a result of the expanding use and demand for these software programs, there was less of a necessity for occupations such as draftsman, because the engineer began to prepare and input the design parameters into the program, thus eliminating the need for manual drafting. Land surveying, a specialized subset of civil engineering, relies heavily on the computerization of the industry.

Another specific subset, infrastructure design, relies heavily on estimates of load, pressure, drainage and flow. Some software houses have attempted to provide design software catering for the variety of infrastructure design fields in an integrated manner. When planning the construction phase, various project management methods are used to estimate factors such as cost, schedule and resourcing. Different software packages rely on different formulas and theories as the basis for these calculations. Consulting engineers also take advantage of the insight software can provide as far as crossing services are concerned. A road design may have to accommodate the presence of underground pipes for example. Civil Designer is an example of a design package which forms an integrated data gathering, drawing, surface modelling and design system for civil engineering infrastructure.

Another aspect of software programs utilized by civil engineers is not only for the use of designing site infrastructure, but also to maintain it. As recent as 2011, there are programs available which allow the engineer to monitor bridges for cracks and settlements, as well as water distribution networks for failing subsurface pipes through the use of sensors installed. This has created the ability for the engineer to eliminate some of the costs and liabilities associated with human inspectors. AutoCAD Civil 2012 offers the ability to streamline applications as well as other Autodesk programs, making it easier and cheaper for the engineer to work with others. As a result, these programs have become much faster than the versions released five years ago, with the ability to incorporate much more information.

II. COMMONLY USED SOFTWARE IN CIVIL ENGINEERING

A. AUTO CAD 2D-3D:

Auto cad is software application for computer aided design (CAD) and drafting in 2D and 3D both. It is developed and sold by Autodesk inc. this is most commonly used software by engineers, architects and draftsman.

B. REVIT:

Revit building design software works the way engineer and designer thinks so you can develop higher quality, more accurate architectural design. Revit capture and analyse design concept in coordinated model from start to finish. In revit we can built elaborate assemblies as well as elementary building parts with extensive library.

C. PARK CAD:

Cad based software for generating conceptual parking lot design without tedious calculation. Park cad automatically run different combination of rows layout, rotation and position to create optimal parking space yield based on your parameter. You then simply review iteration and choose best one.

- D. STADD PRO. :
STADD Pro is one of the leading structural analysis and design software which supports 100 steel, concrete, and timber design codes. It has largest worldwide base.
- E. BEAM 2D:
A linear static structural analysis programme for plane frames.
- F. NONLIN:
A Microsoft window based application for dynamic analysis of single degree of freedom structural system.
- G. RISA 3D:
Structural engineering and design software for frames, truss, plate, shell analyses. It is developed by RISA technology
- H. TRUSS 2000:
Analyses of planar / spatial truss structure, elastic, instability testing of single whole structure, evaluating loss of bearing capacities
- I. ELPLA(ELASTIC PLATE) :
It is programme for analysing raft foundation of arbitrary shape with real subsoil model.
It analyse, design slab foundation to determine contact pressure, settlements, moments shear forces of slab foundation by method of finite element.
- J. ASPEN:
ASPEN is new soft geotechnical software aimed at the analysis of natural or artificial slope stability with most common limit equilibrium methods.
- K. HYDRONETS:
Analysis of hydraulic network with generic grid-autonomous definition of material, wearing extent of piping
- L. INLET MASTER ;
Inlet master is hydraulic programme that analyse and helps design performance of storm drain inlets. It allows the analysis of complete network of inlet.
- M. INOVYZE :
Software for water industry including data management, network modelling software to support planning operation in distribution sewerage provision, river management, coastal engineering.
- N. QUANTUM:
This is the route optimization technologies for rail and road engineering
- O. PENTAGONE BRIDGE:
Design software for all types' bridge design from simple grillage to complex cable stayed and complex bridges.
- P. BEES 3.0 :
The BEES (Building for environmental and economic sustainability) software measures the environmental performance of building products by using the life cycle assessments approach specified in ISO 1400 standard.
- Q. RING :
A rapid mechanism analysis tool for masonry arch bridges developed at university of Sheffield (UK).
- R. BARLIST
Reinforcing steel quantity estimating tool developed at Washington State DOT
- S. BRIDGE LCC:
User friendly life cycle costing software developed by National Institute of standards and technologies to help bridges engineers asses cost effectiveness of new alternative construction material.

III. SOFWARES USED IN SURVEYING

- A. AUTOCAD LAND DESKTOP
AutoCAD Land Desktop is based on AutoCAD and some components of AutoCAD Map 3D. Using AutoCAD Land Desktop, you can create, maintain, output, and analyse all the data in your land development projects.
- B. AUTOCAD CIVIL 3D
New and improved feature of auto cad civil 3D civil engineer Software enables civil engineers draftsmen and designers working on transportation development and water resource engineering project to work more efficiently. Auto cad civil 3d 2012 includes enhance alignment layout and tools that enable easier sharing of drafting and design standard. Auto cad civil 3d is solution for civil engineer design and documentation. Civil 3d designed for civil engineers, draftsmen, designer and technician working on transportation. Design land development and water project.
- C. AUTOCAD MAP3D
AutoCAD® Map 3D software is a model-based infrastructure planning and management application that provides broad access to CAD and GIS data, helping users make more informed design and management decisions. With help from intelligent industry data models and tools, infrastructure professionals can apply regional and discipline-specific standards to improve data quality, support productivity, and better manage infrastructure assets—all in a single, familiar AutoCAD-based environment. Auto cad map 3d Minimize time wasted on imprecise drawings and data. AutoCAD Map 3D helps makes it easier to integrate field-collected data.

D. 12D SOLUTION

12d Model is powerful surveying, terrain modelling & civil engineering software. It allows fast production in a wide variety of projects including mapping, site layouts, road, rail and highway design, residential & land developments, and environmental impact studies. It is the complete, SURVEY, MAPPING & DESIGN solution.

IV. AUTOCAD LAND DESKTOP

LDT is a very powerful design/drafting tool. It combines the elements of civil engineering, land surveying, GIS mapping and basic AutoCAD drafting functions into one program. To use these tools effectively, one should have a fundamental knowledge of the civil design process and procedures. It is also extremely important to have a firm understanding of the AutoCAD fundamentals. This program has features that allow it to communicate with data collectors, reduction of field data, and the drafting of line work from the field too! The tools in the program have four types of functions: Creating, Evaluating, Editing and Annotating. Whether you are working with points, lines or surfaces, the tools used on these objects fall into one of the four mentioned function. Land Desktop is designed for professionals in the land development industries, and includes the following products.

This is the AutoCAD for land development professionals.

- AutoCAD Land Desktop is designed for professionals in the land planning
- It provides a base level of functionality for land planners, surveyors,
- Civil engineers, drafters, and anyone who creates supporting documents.
- AutoCAD Land Desktop contains all the functionality of AutoCAD and some components of map 3D.

V. THE AUTOCAD LAND DESKTOP DRAWING ENVIRONMENT

The auto cad land Desktop drawing environment is The AutoCAD Land Desktop drawing shown in the following illustration

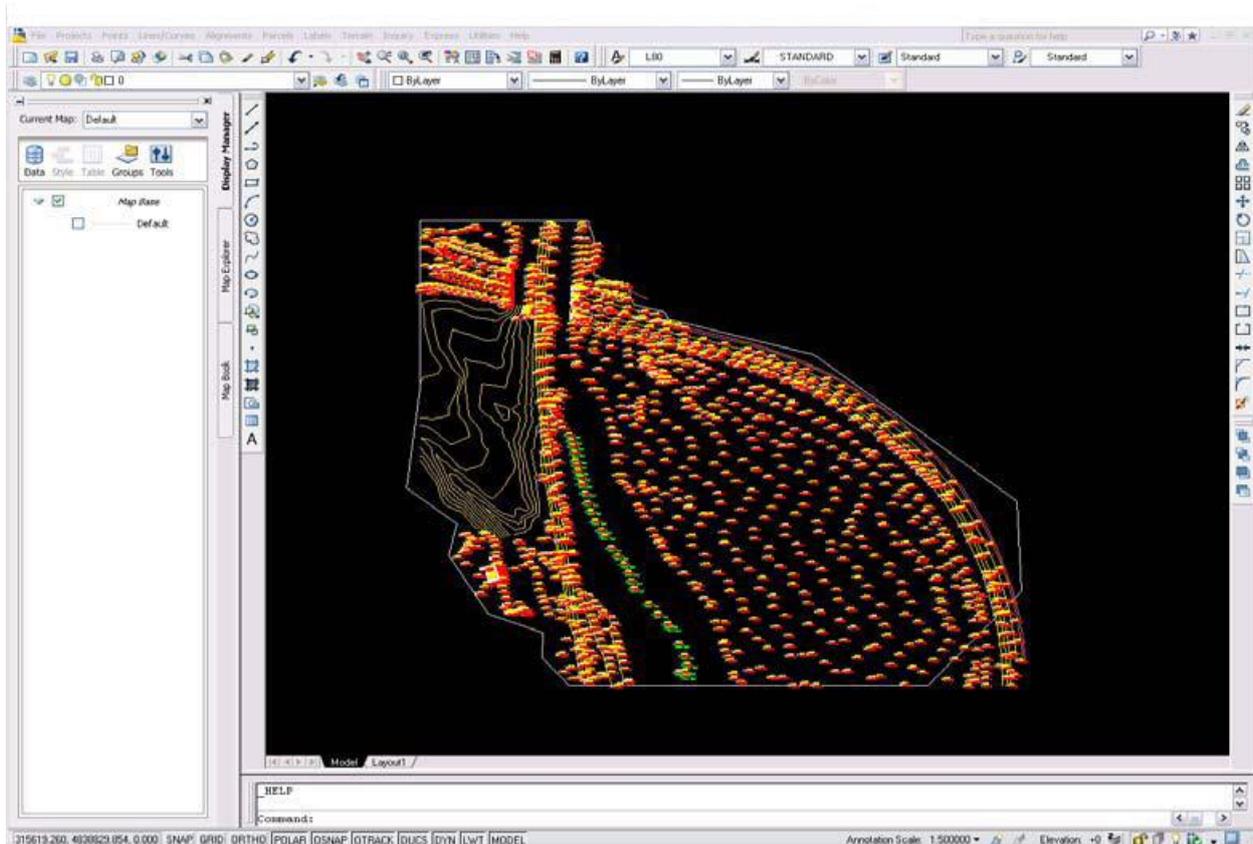


Figure 1. Drawing environment[1, page no 27]

To display the menus in the AutoCAD Land Desktop, select Land Desktop in the list. When you start AutoCAD Land Desktop, the AutoCAD Map 3D Workspace is displayed by default. You can use the Project Workspace to attach drawings to the current Map drawing, to define queries, and to attach databases. [1, page no 27]

VI. ACCESSING AUTO CAD LAND DESKTOP COMMANDS

You can access AutoCAD Land Desktop commands in a variety of ways. All commands are available from the pull-down menus, and you can select some commands from toolbars, shortcut menus, or by typing them on the command

line. Many AutoCAD Map 3D commands are available from shortcut menus in the Map Workspace, as well as from the Map pull-down menu.

You can control the pull-down menus and toolbars that are displayed using Workspaces. When you first start AutoCAD Land Desktop, select Land Desktop in the Workspace toolbar list to make the Land Desktop workspace current and to display the Land Desktop menus. There are also workspaces for the civil engineering tools (named Civil Design) and the surveying tools (named Survey). Select a product workspace from the Workspaces toolbar list to make that workspace current and to display menus for that set of features.

In the Customize User Interface dialog box, you can create customized workspaces that contain the menus and toolbars you want to use. [1, page no 28]

A. KEY CONCEPTS

- To quit a command at any time, press ESC
- When you carry out a command, prompts and messages display on the command line. You can view a complete history of the prompts and messages of the current drawing session by pressing F2 to open the AutoCAD text window which records the commands.
- AutoCAD Land Desktop has additional context-sensitive menus that you can access by selecting an object and right-clicking.
- To change the menu display, change the current workspace.
- In the Workspace toolbar list, select another workspace from the list.
- To display the Workspaces toolbar, click Projects menu and choose workspaces.
- Enter WSCURRENT at command line, and then enter the workspace name.

B. TOOLBARS

When you start AutoCAD Land Desktop, the AutoCAD Standard and Object Properties toolbars are displayed at the top of the window, and the Modify and Draw toolbars are displayed on the left side of the graphics screen.

You can display other toolbars with various tool categories. Each toolbar contains a set of tools that represents specific commands in a category. Strata command by clicking a tool. To identify a tool, move the pointer slowly over the tool. A small label, or ToolTip, displays the tool name, as shown in the following illustration.[1, page no 29]



Figure 2. Labels [1, Page no 29]

C. OPERATION THAT CAN BE PERFORMED BY USING AUTO CAD LTD

1. Creating contour map
2. Creation road profile- Longitudinal profile
3. Road cross section
4. Proposed vertical alignment design
5. Calculation of volume
6. proposed grading- Mass grading +earth quantities
7. Subdivision layout plan
8. Septic design plan
9. Water shade design
10. Culvert, weir and riser design

VII. CREATION OF CONTOUR PLAN

You can use AutoCAD Land Desktop to create existing ground or finished ground contours. To create contours, you can

- Generate contours from the current surface model.
- Convert poly lines to contours.
- Victories contours on a raster image.
- Digitize a paper contour map.
- Copy contour

A. CREATING CONTOURS FROM A SURFACE

As you create contours from a surface, use a contour style that controls how the contour and contour labels display. For example, a contour style controls

- Smoothing
- Grip display (for editing contours and contour labels)
- Label text style
- Label position

When you create contours, you must choose a style. You can also specify elevation ranges, contour intervals, and whether to create the contours as AEC contour objects or poly lines. All contour definition, editing, and labelling commands work on both contour objects and poly line.

When you create contours from a surface, you base the contours on a contour style. Use the Contour Style Manager to define and modify contour style.

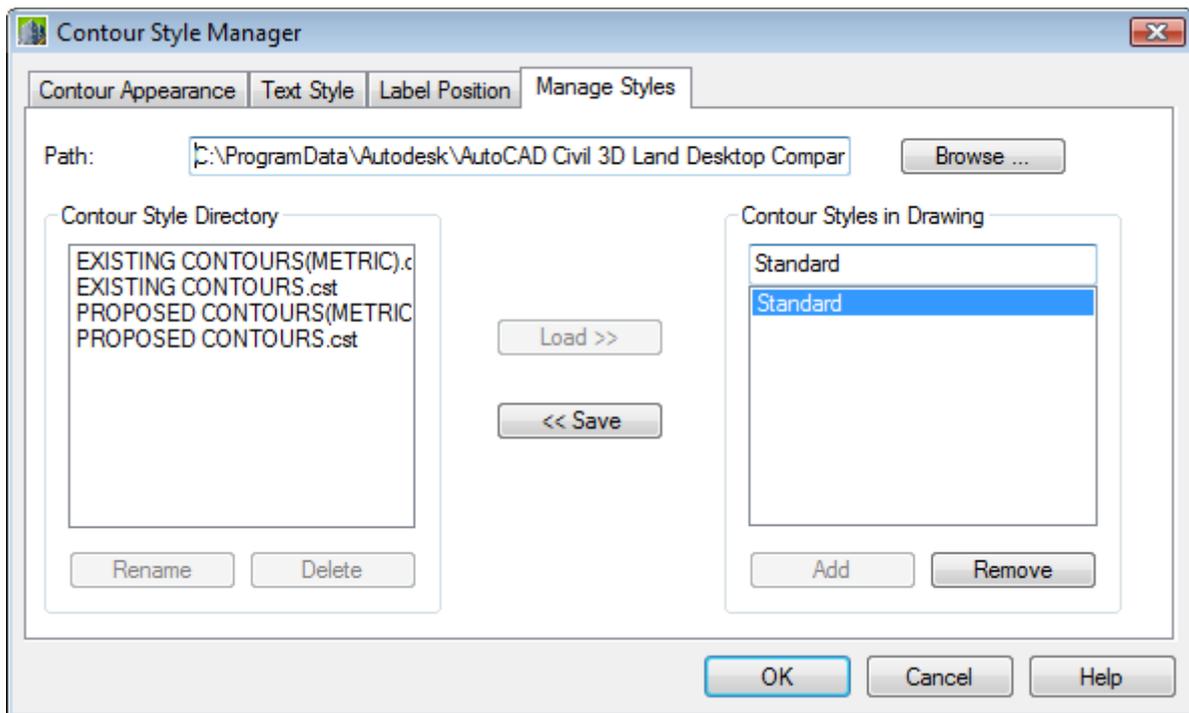


Figure 3. Contour style manager

B. KEY CONCEPTS

- Contour styles store groups of settings in the drawing so you can use them again without having to redefine the settings you want to use.
- Choose a contour style when you run the Create Contours command from the Terrain menu.
- You can use the Manage Styles tab to save contour styles to an external file and also to add contour styles from an external file. This is helpful when you use the same contour styles in more than one drawing or in different projects.
- You can click inside the Preview window on the Contour Style Manager and adjust the view angle of the previewed contours by moving the pointing device

C. PROCEDURE

1. From the Terrain menu, choose Create Contours to display the Create Contours dialog box.
2. Select the surface from which you can create contours. By default, the current surface is displayed in the Surface box.
3. Specify the elevation range.
4. Specify the vertical scale.
5. Specify the minor and major contour intervals.
6. Under Properties, choose either contour objects or poly lines
7. To create contour objects, under Properties, click Style Manager to display the Contour Style Manager dialog box.
8. Use the Contour Style Manager Dialog box to smooth contours, and to specify the contour appearance, the text style for contour labels, and the label position.
9. Click OK to return to the Contour Style Manager Dialog box, and then click OK to generate the contours.
10. You can label the contours using the commands in the Terrain Contour Labels menu

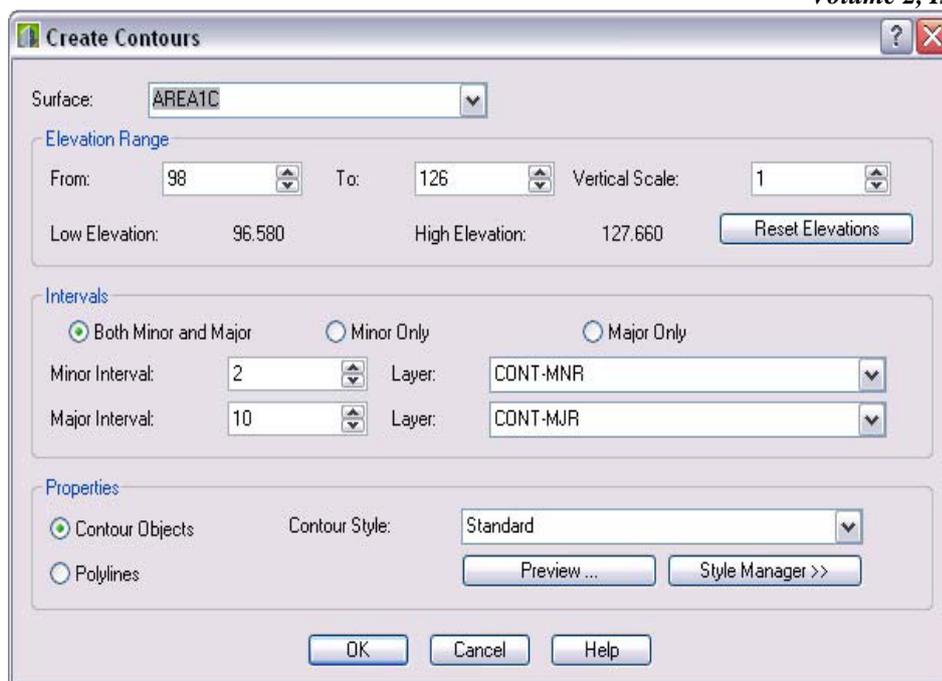


Figure 4. Contour Create

Contour map of site near Shivaji University

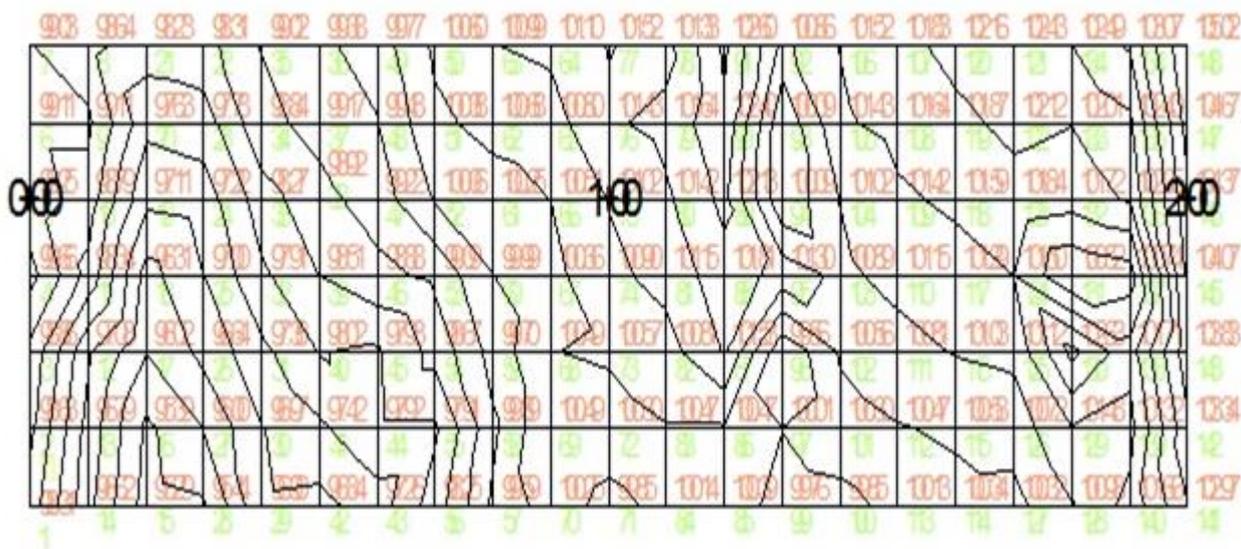


Figure 5. Contour map

VIII. ROAD PROFILES

A. WORK PROCEDURE:

1. Create existing surface considering the existing contours. (Terrain→Terrain model explorer→Create New Surface Contours→Add contour data)
2. Create centreline of the roads.
3. Create alignments. (Alignments →Define from polyline)
4. Create station labels. (Alignments→Create station labels)
5. Create profile of existing conditions. (Profiles→Profile settings→Sampling→Surfaces→Set current surfaces→Existing ground→Sample from surface→Create profile→Full profile)
6. Start creating proposed vertical profile based on requirement of cut and fill (Ideally cut and fill should be balanced). Also check for the requirements of client if any.(Profiles→Edit vertical alignments→Finished ground)

IX. GENERAL CHARACTERISTICS

1. **ACCURACY:** It is an important part of any type of work. we can achieve accuracy in work by using some software programmes. Computer applications gives great accuracy in the work in comparison with manual work
2. **SPEED:** In every field time is one of the important issue. To complete the project within the time it is necessary to speed up the work. Computer gives desired speed to work
3. **RELIABILITY:**The work done by using some computer is always more reliable.
4. **DILIGENCE:** Diligence is very useful characteristics of computer applications. We can perform operations continuously for long time.
5. **VERSATILITY:** We can perform number of operations within same software.
6. **HUGE STORAGE CAPACITY:**Due huge storage capacity we can stores huge volumes of data with aid of many inputs or output devices data of different forms can fed into or taken out.

X. CONCLUSION

Due to the various advantageous features use computer applications become essential part civil engineering. They help civil engineers not only to design but also to maintain civil engineer structure. Now a day's software programmes are treated as tools for completing project within the time efficiently. The software we have discussed in detail "auto land desktop is most useful design and drafting tool. This software can be used by professionals working in land development industries, surveyors and civil engineers. Definitely it has some limitation, but benefits do outweigh the shortcomings.

REFERANCES

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- [2] Standard information Boucher of Auto cad land desktop 2009