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AutoCAD
Autodesk

MANCHESTER | URBAN DESIGN | LAB

MUD-Lab Toolkit
AutoCAD Explained

This basic handbook aims to familiarize you with AutoCAD as professional tool widely used by architects and urban designers. At the end of the handbook you should be able to import your hand drawn layout, setting it into scale and use AutoCAD to draw your design precisely and prepare it for Photoshop.

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Series Editor: Dr Philip Black

Series Graphics/Software Editor: Dr Taki Eddin Sonbli

Regular Series Contributor: Mr Robert Phillips

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INTRODUCTION

AutoCAD is a very useful program for architects and urban designer as it works as a multi-functional drawing tool. It can be used to draw a very detailed accurate plan or a less-detailed large master plan. Its main features are accuracy and flexibility. You can bring your own hand drawn layout into CAD and then simply trace it to present the final accurate scheme, or you can draw in CAD from scratch. Everything you draw in CAD is easy to modify and rescale. In addition, AutoCAD has the ability to represent complex 3D perspectives based on the 2D layout and export/import drawing to other software. So simply think about AutoCAD as a space in which you can draw, colour, organize and present your work in flexible and accurate ways.

The common CAD files format is (.dwg). So when you open a (.dwg) file CAD will start, allowing you to continue your former work or start a new one. However, you can export your work easily to a ready to print JPEG (Raster) file or to a PDF (Vector) file so you can edit the drawing with Adobe Illustrator. Another CAD format is .dxf (Drawing Interchange Format, or Drawing Exchange Format). This format can be exported from other programs so we can use their files in CAD.

In the Technical Framework, AutoCAD is used to produce the skeleton of your accurate to scale masterplan. In other words, you will use it to create a simple wireframe master plan so you can take it to Photoshop and bring it to life. You do not have to add colours, trees, street furniture in CAD. The first thing we will do and show in this handbook is how to bring the Digimap map to CAD. Once this is imported, you then simply need to draw the streets, pavements, buildings, green and blue spaces boundaries that you designed in your site, and then exporting this as PDF ready for Photoshop.

EXPORTING A DIGIMAP MAP TO CAD: Two methods

The Digimap to CAD method

This feature is very useful in case you want to modify/improve an existing layout in a specific area. What you are going to do basically is exporting the map from Digimap to a .dwg format so it can be used in CAD. Then you will be able to manipulate the map according to your preferences without the need to redraw it. To do this you need to go to:

- **Digimap/ Ordnance Survey/ Data Download** (Download data for use in GIS/CAD). Refer to Digimap handbook for more details.

-Select the area of interest (simply inter the postcode using the search tool)

-From the **Select Data** list, go to **Vector Data** and tick **Victor Map Local**.

-Now download your data using the **Add to Basket** button. Select DWG as a format.

-You should receive an email with a link to your selected data. The downloaded data will include a .dwg file which can be opened with CAD. The file is ready to use in CAD.

The PDF - to Illustrator - to CAD method (Preferred)

This is our preferred and most useful method to start drawing the masterplan. The idea is to download the map from Digimap as PDF, and then edit and simplify it in Illustrator, transferring it into a skeleton map and then exporting it to CAD. We will show this in details in the practical session.

-Download the PDF vector map as usual from Digimap

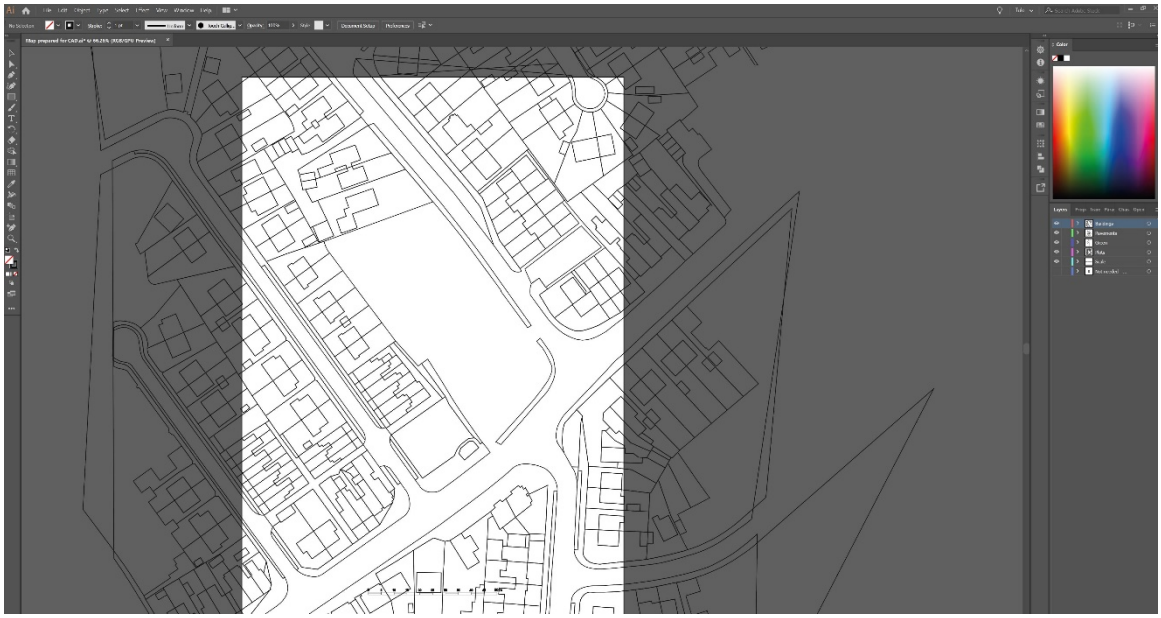
-Open the map in Adobe Illustrator

-Deconstruct the map into:

- Buildings layer
- Pavements layer (not streets)
- Green space layer
- Land lot layer
- Scale bar layer

-Remove the rest of the contents.

-Go into each layer and give its contents a no-fill and a black stroke. You should end up with this. Make sure you still have the scale bar.



-Export your file as DWG

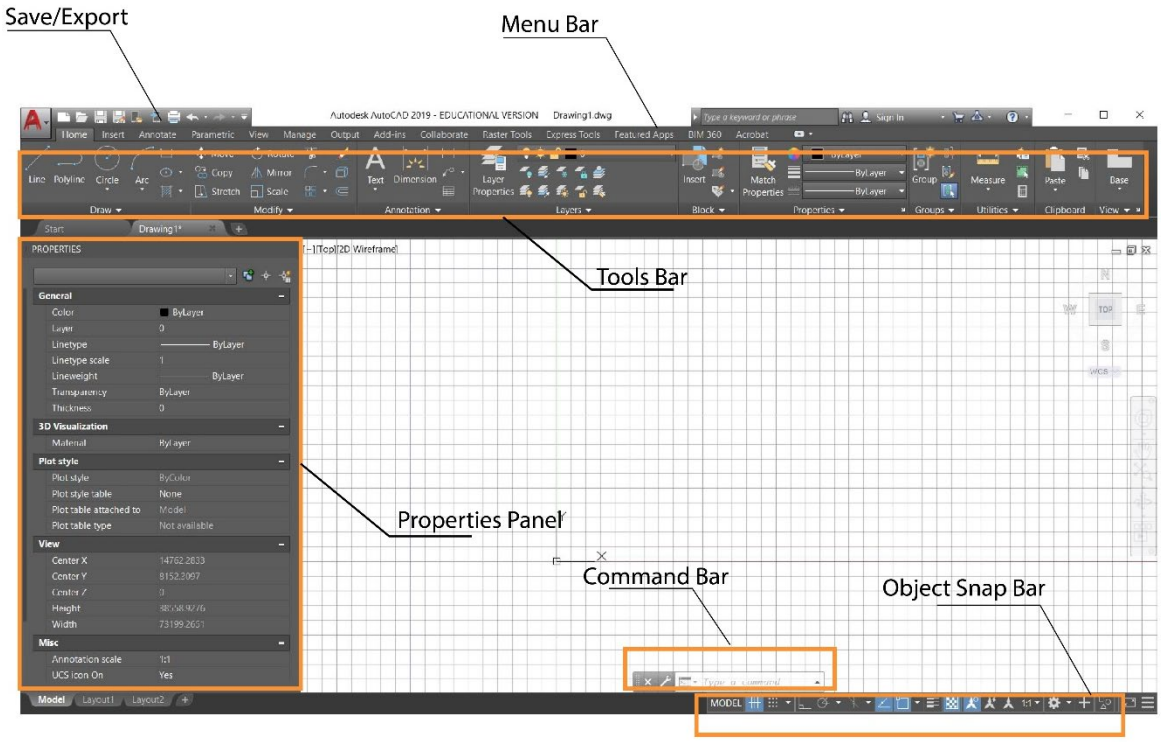
Your file is now ready to be used in CAD

OPENING AutoCAD

To open AutoCAD:

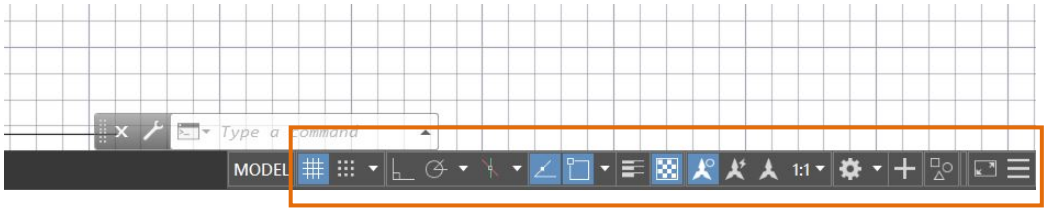
Go to: Start/ All programs/ Autodesk/ AutoCAD Architecture (English)/ AutoCAD.

AutoCAD will start after a few seconds. A black or white screen will appear. This is you work space in AutoCAD. Above you will see the Menu bar, the Tools Bar is under it. Below you will find the Commands Bar, and under it is the Snap bar. To make a black screen white: Right click/options/display/colours/ and change the colour at the right of the window. If the screen has the grid on, you can turn it off with F7.



Note the Object **Snap & Tracking** bar:

It includes settings that allow you to more specifically select your points, lines and polygons. At the bottom of the screen, under the command line, there are some icons that allow you to turn on/off these options listed below:



Snap and Osnap can be activated with F9 and F3 respectively. Turn them off for now.

HOW CAD WORKS

AutoCAD is a commands based program. You type a command (its shortcut, usually the first one or two letters) and hit ***Space*** in the command bar area and the program will prepare the tool for you to be used. Memorising CAD main commands is essential for sufficient and quick drawing.

You can select object simply with the mouse. It is important to distinguish the two ways of selection with the mouse. When you start selection from right to left, a green rectangle appears, but when you select from left to right a blue rectangle appears. In the first method (from right to left) CAD will select any object that is **partially or fully** included in the selection area. So if a part of rectangle is included, the whole rectangle will be selected. But with the second method you will be able to select **only** the objects that are **fully** included in the selection area. So if part of a rectangle is included in the selection area, it will not be selected.

The bar above the screen works as an interactive tools bar for each type of command you insert. So you will notice that this bar will change when you enter a command that its options are not included inside the current bar and will present the new command option. In addition, Options Bar allows you to find your working environment options quickly.

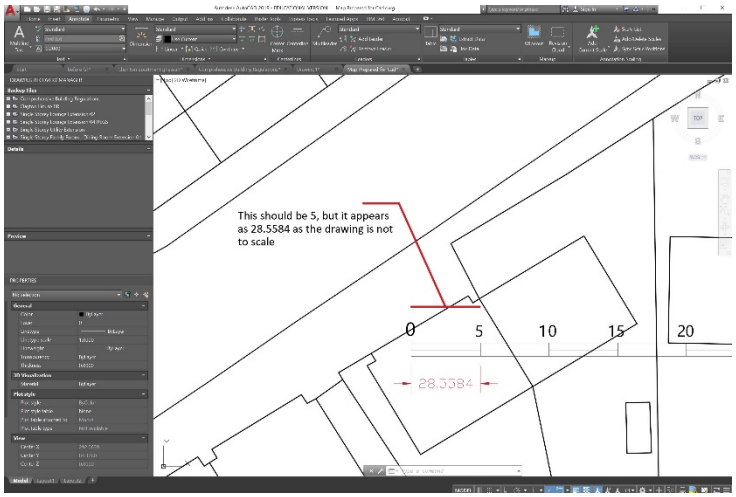
SETTING AN OBJECT TO SCALE

Every object you draw in CAD is measured in ***unites.*** So when you draw a line it will be measured in unites (e.g. 5 or 6 unites...rather than meters or inches). You can simply decide what this unit means whether it is a meter, an inch, a 10 meter...etc. So when you draw a street assuming that its width is 7 meters (7 units), you are using the metric units and this should be applied to all the rest of your drawing.

Open the DWG skeleton file you prepared in Illustrattor in AutoCAD. This map is not to scale. You will have to scale it in order to start drawing. You will do this only once.

In the command bar hit **DI** (for **Di**stance) and then Space.

Now measure the first module in the scale bar as below: left click at the starting point and another left click at the end point. You will see the ''distance'' down the screen. Make a note about the number you see (in this case it is 28.5584). It is clearly not the correct as this should be 5. You need to make this random distance equals 5 meters. We will use the command: **Sc**ale.



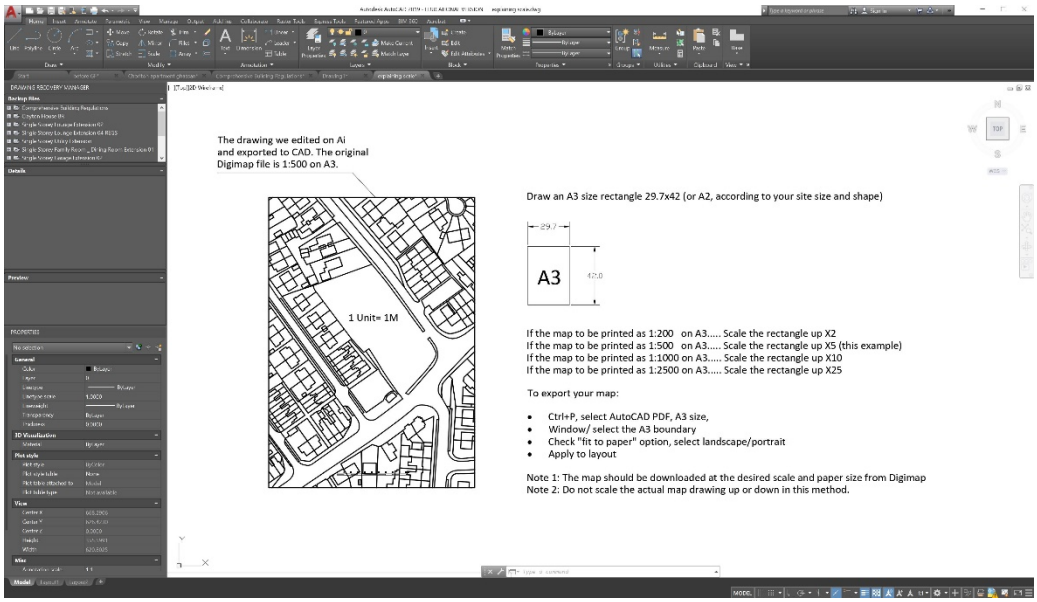
Type **SC** in the command bar and hit **Space**. Select the whole layout (the draft map) and hit **Space.** Select the base point (just left click anywhere, preferably at the middle of the map). Now in the command bar note that CAD is giving you two options: **C**opy or **R**eference. We need to select Reference. So type **R** and hit **Space**.

CAD will ask you about a reference length. This is the 28.5584 meters so type it and hit Space.

Now CAD will ask you about the new desired length. This is 5 meters. So type 5 and hit space.

You will note that the whole model is rescaled in which 28.5584 units are converted to 5 units. If you measure the scale bar module width now it will be 5 meters.

You will now (or when you finish drawing) draw an A3 or A2 rectangle manually (use the Polyline command P/space). This will act as you sheet boundary. Follow the instructions blow. These will be explained in details in the practical session.



THE MAIN COMMANDS IN CAD

When drawing in AutoCAD you have to type the command into the command bar at the bottom of the screen. You can also select the drawing tool you want from the tool bar. However, you should type commands to make drawing quicker. We will try here some commands. For example Line: you should type (**L**) and then hit ***Space*** or ***Entre*** so the command will be ready. Now try these:

Point (**PO/ Space**) – draws a point at anywhere you specify: po/space/ use the mouse left button to draw it.

Line (**L/ Space**) – draws a line from one point to another. Press (**F8**) while drawing a line to make the line direction free (Ortho off). Hit F8 again to restrict its direction to horizontal-vertical only (Ortho on). Type (L)/ space/ select the starting point by pressing the left mouse button/ type the length (10 for example)/ space/space.

Po**l**yline (**PL/ Space**) – draws a line/curve with multiple control points. It is a continuous line consists of multiple lines and curves, rather than a single line. Use **F8** for the same purpose of the previous command. Note that after each command name, you will see some options appear in the command bar. These options are useful to make the command more specific. For example in the Polyline (**PL**) command you see that you can make it and ***A****rch* by typing **A** and hitting Space before drawing, or you can modify the ***W****idth* of the Polyline by typing (**W**) and then specify the required width.

Note that:

- If you hit “Esc” while drawing a Polyline, the line is terminated from the last point you clicked or entered.
- If you type “cl” while drawing a Polyline, it draws a line segment from your last clicked point to the starting point (closing the shape that you were drawing).
- If you type “a” while drawing a Polyline, it allows you to draw an arc that are tangent to the last segment or arc. Notice that the arc only needs two points (starting and ending).
- If you type “s” while drawing an arc segment, you can draw continuous arcs
- You can change the colour of the polyline (and any other object) from the tool bar after selecting it.

Rectangle (**REC/Space**) : draws a rectangle with two corners specified.

- Click to designate first corner of the rectangle.
- Click again to designate the opposite corner of the rectangle

Polygon (**POL/Space**) – draws a polygon by the number of sides

- Enter in the number of sides
- Choose the center of the polygon using mouse
- If you choose “inscribed in circle”, it will draw the polygon inside a circle with your given radius.

- If you choose “circumscribed in circle”, it will draw the polygon with a circle inside of that polygon with your given radius.

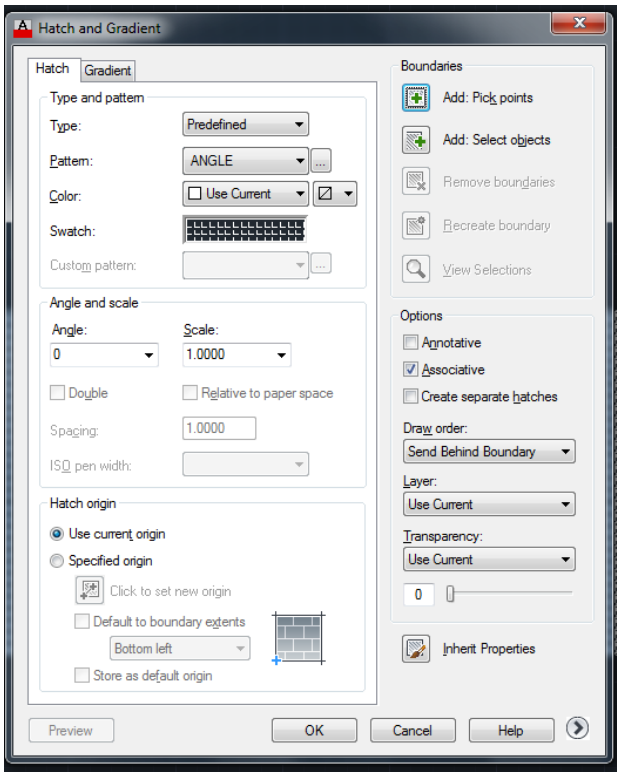
Circle (**C/Space**) – draws a circle centred at a point

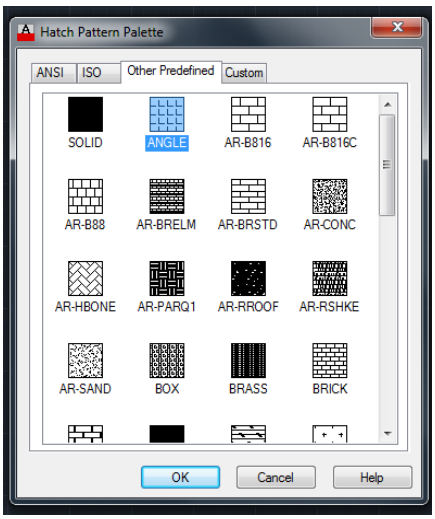
- Click to pick the center of the circle
- Pick the radius length by entering it in or clicking how large the circle should be.
- If you type “d” after picking the center, you can enter in the diameter rather than the radius

SPline (SPl)- draw a flexible line. Spl /space/draw points/ when you finish press space.

Hatch (**H/Space**) – adds hatch patterns or fills to a closed area or to selected objects.

- As you scroll over enclosed areas, AutoCAD will display a preview of the hatch within that enclosed area, given your settings.
- After clicking hatch, type “t” to get the settings, as shown to the right.
- Click the “…” for the Pattern option allows you to choose predefined hatches (shown below)
- You can adjust the angle and scale of the pattern.
- For the boundaries option:
    - When hatching a space defined by more than one object that causes overlapping zones, select “Add Pick points.”
    - When hatching a complete object, like a circle, rectangle, or polygon, select “Add select object.”
- Once the selections are set, you can click preview in the button on the left. Then Click Ok.





Note: As we are producing a simple masterplan skeleton, we do not have to use hatches.

Arc **(A/Space):** Draw an arch. CAD will give you two options: Either specifying the first and end points to draw it, or just the centre of the arc.

Divide (**DIV/Space**): divides a selected object into certain length or perimeter segment. You can draw from the node or you can place objects along the nodes (place trees 20 feet from each other on a sidewalk down a street).

- Select the object to divide (a line or an arc for example)
- Enter the number of segments

Distance (**DI/Space**): to measure distances between points

Undo (**U/Space**): to undo any command or move you did.

Note that when you want to select objects using the mouse: Pressing from right to left you will see a green selection area and it select everything inside the area even if a small part of the object appears inside the area, whereas pressing from left to right you will see blue area that will select *only* the objects that are fully included in the blue area so a half line will not be selected.

Erase (**E/Space**): erases the selected objects. You can get the same effect by selecting objects and hitting Delete.

Copy (co): copies the selected objects from one place to another

- Select the object(s)
- Click or enter in the coordinates for your base point.
- Choose the second point, which will be where you want the copied object to go, and finally left mouse click.
- NOTE: You can copy objects from an AutoCAD file to another, but you need to use the common method of copy-paste: Select objects you want to move from the first file, Ctrl+C to copy them, open the other file, and Ctrl+V to paste.

Move (m): moves your selected objects from one place to another

- Select the object(s)
- Choose your base point.
- Choose the point to move it to.

Mirror (mi): mirrors objects along the line that you define.

- Select your object(s). Hit enter when all of them are selected
- Pick your first point, and then pick the end point of the mirror line. (Notice the mirrored object shows up as a preview while you draw the line.
- It will prompt you to erase the original object. Type “y” for yes or “n” for no.

Offset (o): offsets objects to a distance of your choice

- It will prompt you for a distance to offset first. Enter in that number or click two points on the screen giving the distance that you want.
- Pick the object that you want to offset and then choose the side you want to offset it.
- If you're offsetting the object(s) multiple times at the same distance, you can click on the new object that was offset and click on the side you want to continue offsetting it to.

Scale (**SC/Space**): scales objects by a given ratio

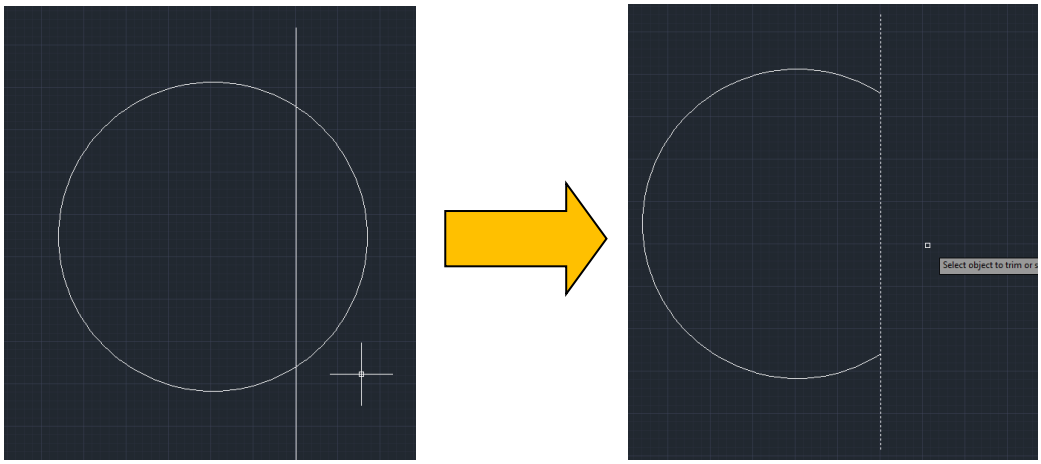
- Select the objects
- Click or enter in the base point
- Click or enter in the scale numerically (ex: 2 means double)

E**x**plode (**X/Space**): break selected complex objects such as blocks and polylines down to lines and arcs.

- Select the blocks or polylines you want to explode.
- Hit "esc" to finish. Select objects to ensure they were successfully broken down. You should multiple end points for lines and arcs if successful.

Trim (TR/Space/Space): trim objects using specified objects

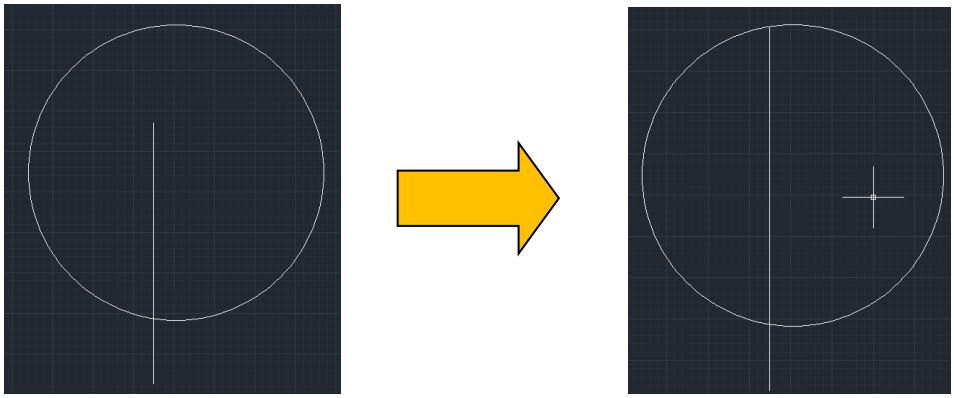
- Using the following image as an example, select the object you want to use as the "trimmer." For example, in this case, if you want to cut the circle and make it into an arc, you select the line first. And hit enter.
- Then choose the side you want to trim of the object you will be trimming. So for the example, if I want the arc to be the larger side of the circle, I would select the right side of the line, deleting the smaller side of the circle. Notice that it will trim the object immediately.



Extend (EX/Space/Space): extend objects to reach specified objects

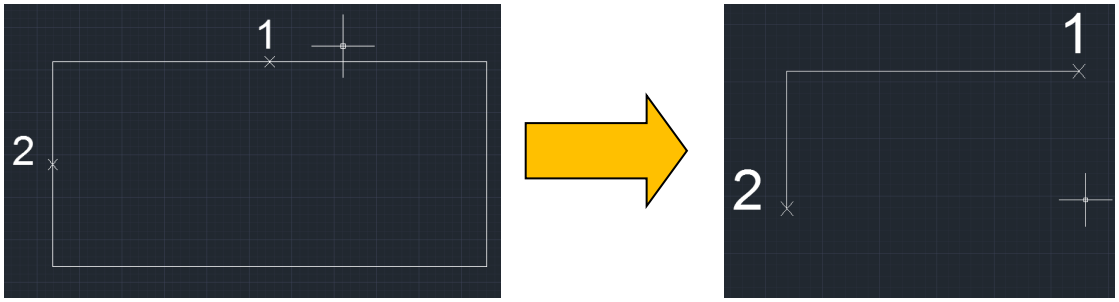
- Using the images below, select the object that you want to "extend to." In this case, if you wanted to extend the line to the north end of the circle, you would select the circle first. Then hit enter.

- Then choose the object you want to extend, which in this case would be the line itself. The line will extend immediately.



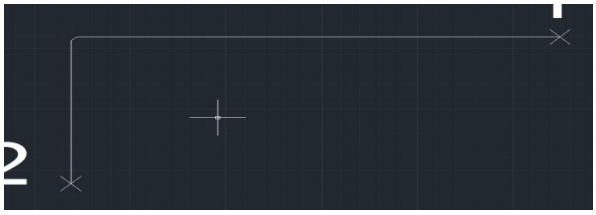
Break (BR/Space): makes cuts through continuous lines.

- Select the object by choosing where you want the break to start and then click where you want the break to end.
- Keep in mind that if you're breaking a non-close shape, the break occurs between the two points (i.e. a line). If it's a closed shape, the portion that will be kept is going to be the portion between the points moving counterclockwise as shown below.



Fillet (FIL/SPACE): connects two objects with an arc that is tangent to the objects and has a specified radius.

- Select or type in fillet
- Type "r" for radius and enter in your radius (i.e. 0.5)
- Select the first object and then select the second object



- You can fillet: rectangles, tangential lines, arcs, etc.

- If the radius is 0, or you didn't enter in a number for the radius prior, fillet will just connect the two lines together (extends the lines so they join together).

Rotate (RO/Space): To rotate an object. Remember using F8 to make the object rotating freely or strictly horizontal-vertical.

Mirror (MI/Space): create a mirror to your selected object (a very useful command)

Reselect the **p**revious objects (p/space): sometimes you select a lot of objects to move or rotate them for example. You want then for example to copy or mirror them, so you do not have to select them again. Insert your new command/space/ p /space/ and CAD will select them again. This order is very useful and will save you time and efforts.

Regenerate (RE): always use this command when you feel the CAD working space becomes small, the movement becomes slow or the curved lines do not appear smooth. It is a command to refresh CAD working space.

Save (Ctr+S): always remember to save you work by clicking Ctr+S. Make this routine command

Align (al): allow you to align objects according to selected objects, lines, pointes:

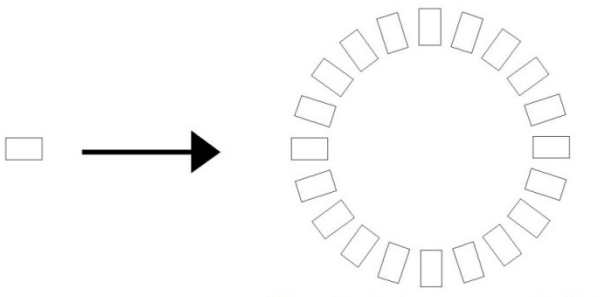
Al/space/select object/space/select the first point you want to align/select the new base point for the first point/ select the second point you want to align/ select the new base point for it/ space/space.

Regen (re) – regenerates the display, smoothing it out after zooming in or out and updates the screen, essentially a refresh button. This is a very useful command especially when CAD screen is stuck in a specific scale in which that you cannot zoom out. This command will solve this issue.

Match (MA/Space): Matching the colour/hatch of one object with other object. MA/Space/select the object with the colour or hatch you want/Space/ select the new object that you want its colour to be changed/space. The second object will have the colour of the first object.

Array (Ar/Space): creating an array of objects. It is a very useful command if you want to create a long row of trees for example, or if you want to distribute buildings on a regular grid:

Example: AR/Space - select object (a rectangle for example) - select the type of array you want (polar in this example) - select the total number of items (20) and the angle to fill (360) and the centre point of the circle. This is what you should get:



After using the Array command (polar)

Join: Join separate lines with a Polyline (convert a group of lines into a single Polyline for example). This is very useful to create closed areas which makes taking the drawing to SketchUp more effective.

Text (T/Space): Adding text to your work.

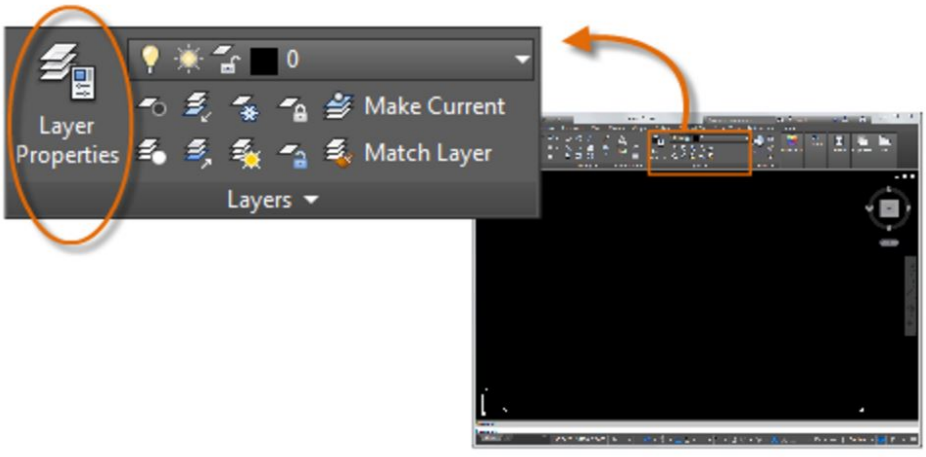
Important Notes:

- After finishing using a command, when you press *space* again (i.e. without typing any command), the program will re-bring the last command you used.

- Sometimes you spend a lot of time and effort in selecting several objects for a specific operation (e.g. you want to copy, rotate or mirror 20 selected buildings or trees). If you want to reselect them again for the next operation, you do not need to reselect them manually if you do the following:
  After giving AutoCAD the second command and hitting space, type: P/Space. The program will reselect the objects you selected for the previous operation.
  Example: M/Space/P/Space: CAD will reselect the objects used in the previous operation and will prepare them to Move command.
  This method is useful if you want to reselect the objects that you have just selected for another operation. However, you cannot use it if you select any other object by mistake for example. So if you expect that you will need to select certain objects again and again, put them in a separate layer as will be explained below.

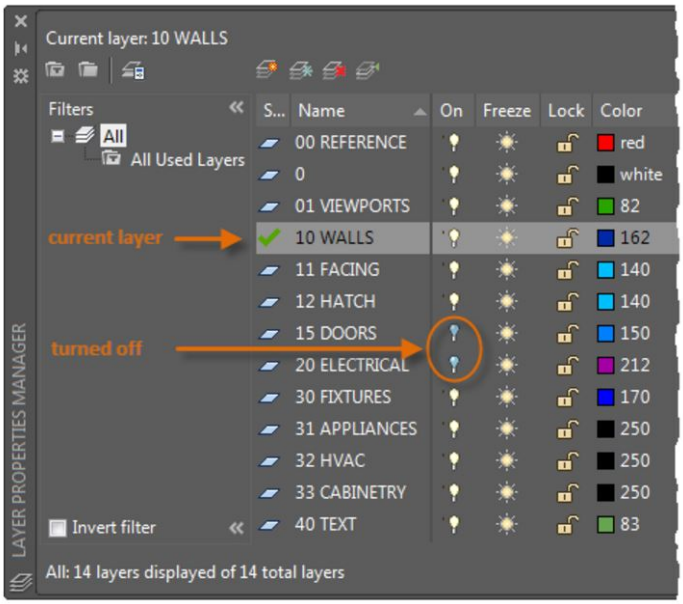
LAYERS

Assign objects into different layers to organize them. Layers allow you to organize your drawings in a clearer manner. Organizing buildings, streets, trees, greenery...etc into different layers will allow you to generate different types of maps easily (e.g. street maps only, green infrastructure map only...etc). From Layer properties, you can select a layer, turn off selected layers, lock selected layers or change the colour of selected layers. When you select a layer, all new objects are automatically



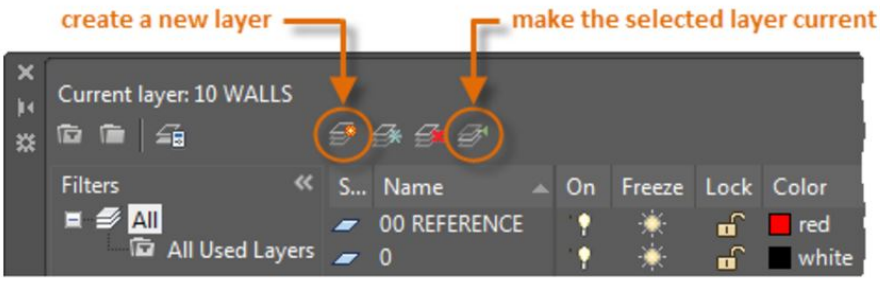
assigned to this layer. The default layer is “0” which cannot be deleted.

To allocate an object to a layer you just have to select the object and then select its desired layer from the layer bar. In the example below, the current layer is named 10 WALLS. Two layers are turned off namely 15 DOORS AND 20 ELECTRICAL.



Layer Properties include:

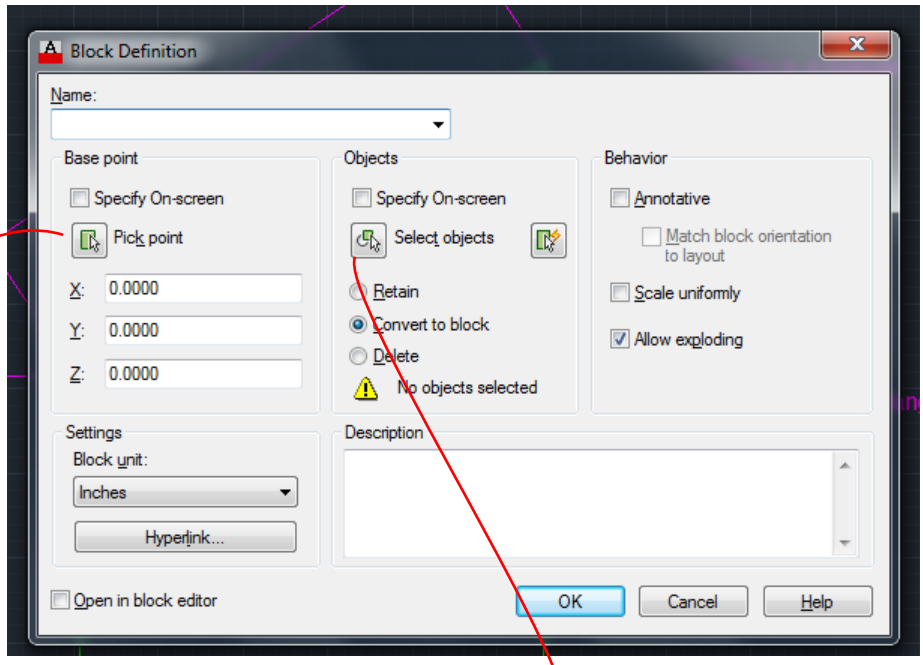
- Name – Unique name for each layer (Be Descriptive)
- Colour – Colour of the layer
- Linetype – Continuous line, dashed line, dotted line, etc.
- Lineweight – How thick or thin the line is
- On [Visibility] – Makes the layer visible or not visible (If light bulb is yellow, it’s on. If it’s dark, it’s off)
- Freeze – Freezes the layer, doesn’t allow you to see it
- Lock – locks the layer from being selected but it is still visible (although more transparent then other layers)
- Difference between Visibility vs. Freeze is that frozen layers aren’t included in regeneration, while layers with visibility off are.



BLOCKS

Block (B/Space): group of objects joined together as one entity.

- Type B/Space for block. A block definition window will pop up, as shown below.



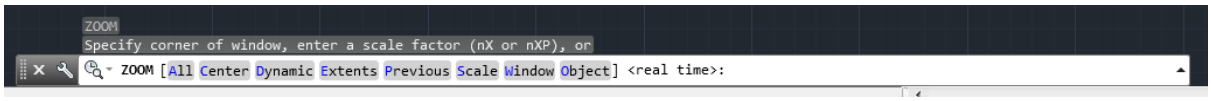
- Enter in a name (be descriptive)
- Click on “Select Objects”
- Make sure Convert to block is checked
- Select Pick point to choose a base point
- Click OK. You can now import the block as one entity.

So you can design a tree for example and make it as bloke to copy it easily and to use it in other files and projects. You can also import other blocks (figures, cars, junctions...etc) from external sources which are generously available online.

VIEWS

Zoom (Z/Space) – Three ways to zoom in and out:

- The middle wheel on the mouse allows you to zoom in and out (towards the computer monitor to zoom in, away to zoom out). Double click the wheel to zoom all the way out.
- Type Z/Space in the command line and choose from options.
    - All - use if you get lost: z/space/A/space
    - Extents – zooms to the point where you can see all the objects drawn
    - Window – allows you to select a window to zoom into that you specify
    - Previous – takes you to the last view you saw



Pan (P/Space) – allows you to slide the drawing screen without changing the size. You can also pan by clicking on the wheel of the mouse and holding it down while you slide the mouse.

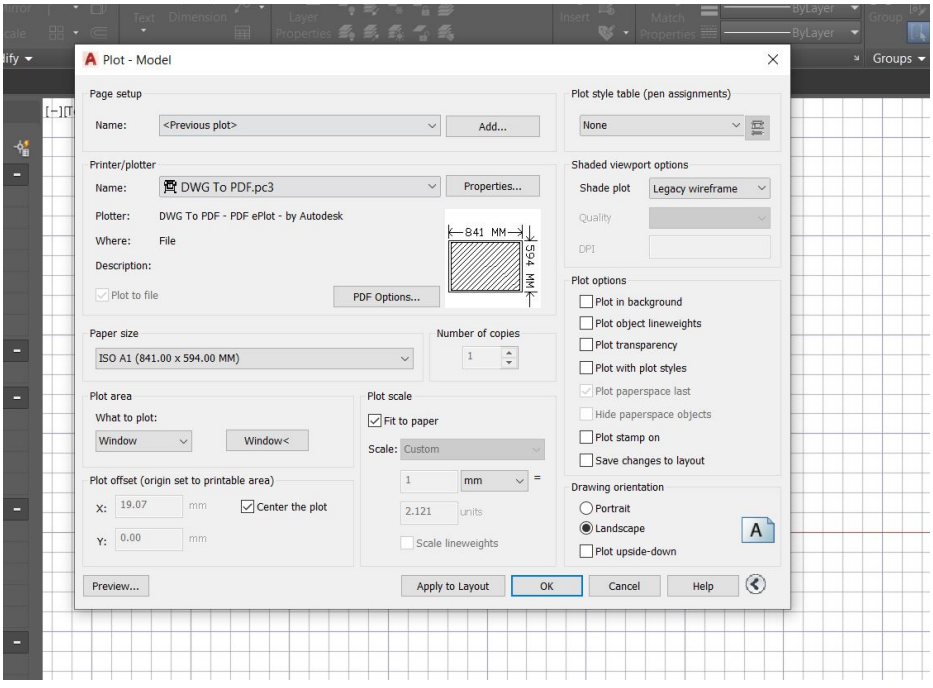
EXPORTING AND SAVING YOUR WORK

We ***export*** CAD files to use them in other softwares such as Photoshop or SketchUp Free (the basic SketchUp that does not read DWG files). We ***save*** the file to reuse it in CAD or to import it by SketchUp Pro (This software can read DWG) to create the 3D model.

To Save you rile: simply hit Ctrl+S and save it. I suggest saving your files as 2004 version. You will not be able to open a file that were done with a more recent version to yours unless the files are saved as older version such as 2004.

To Export: Plot (or Print) **Ctrl+P** is the command we use to export our files as PDFs or JPEGs. The PDF is the preferred export file as it is Vector and of higher quality. However in some cases we might need to export as JPEG to trace over the image in certain softwares.

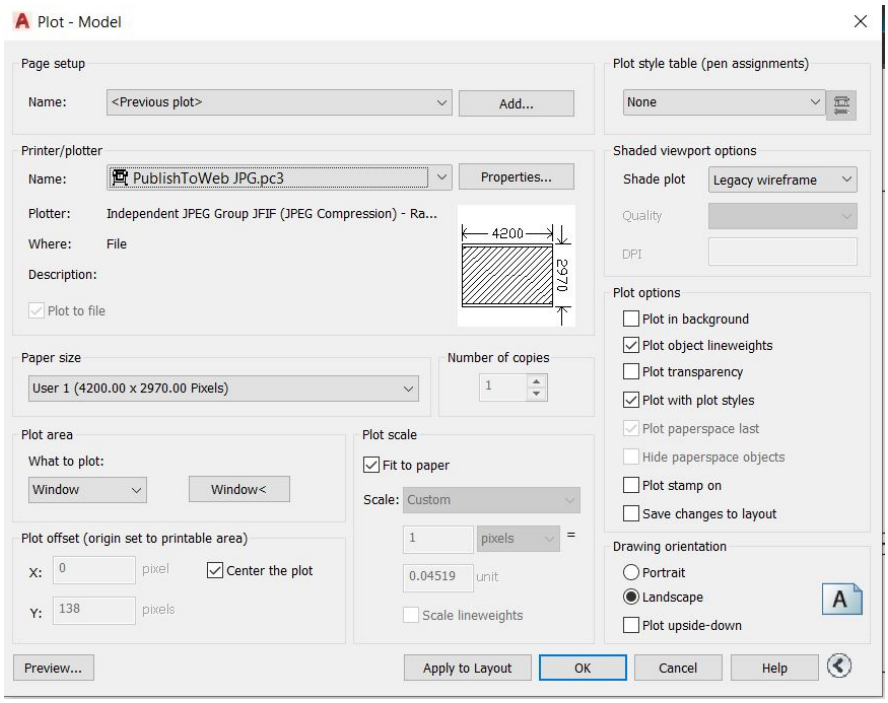
Hit Ctrl+P/ in the ‘name’ section select ‘DWG TO PDF/ select paper size (usually A3 or A1), change ''display'' to ''window''/ choose your area of printing (the A3 boundary you created)/ tick ''fit to paper'' and press preview. If you are satisfied press the mouse right button and press ''plot''.



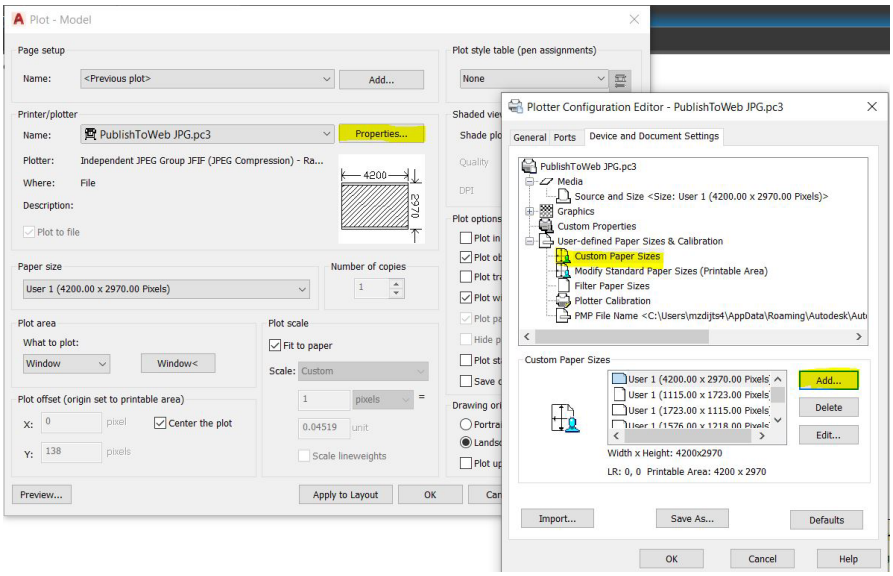
Exporting from AutoCAD to .JPG

To export your map as .JPG we are basically going to create a print sheet of a raster A3. You need to do the following:

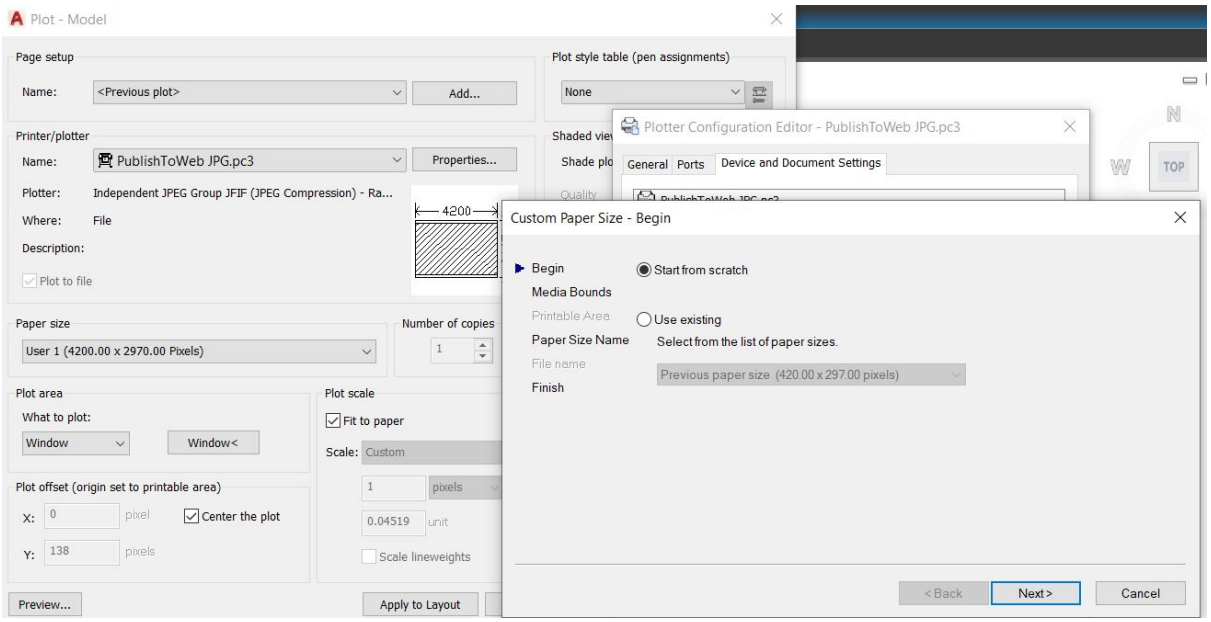
- Ctrl+P to open the print/Export window
- Click on Window and select the A3 boundary around your masterplan (just like what we learned before when we export to PDF)
- Select Publish To Web JPG printer



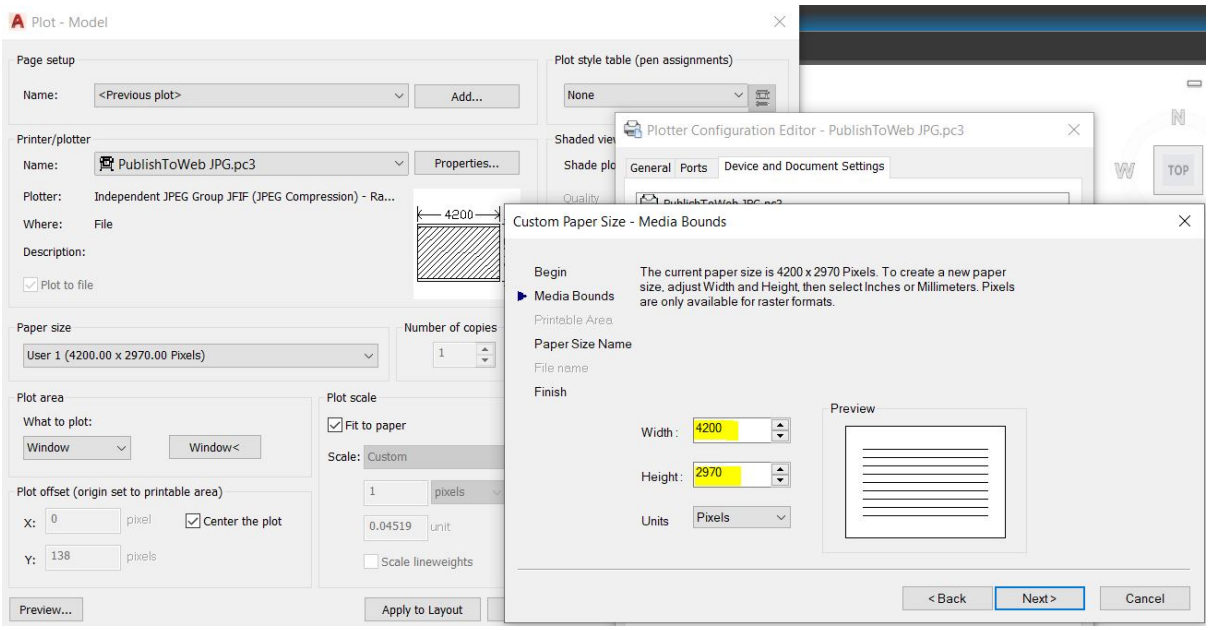
- Click on Properties/ custom paper size/ Add



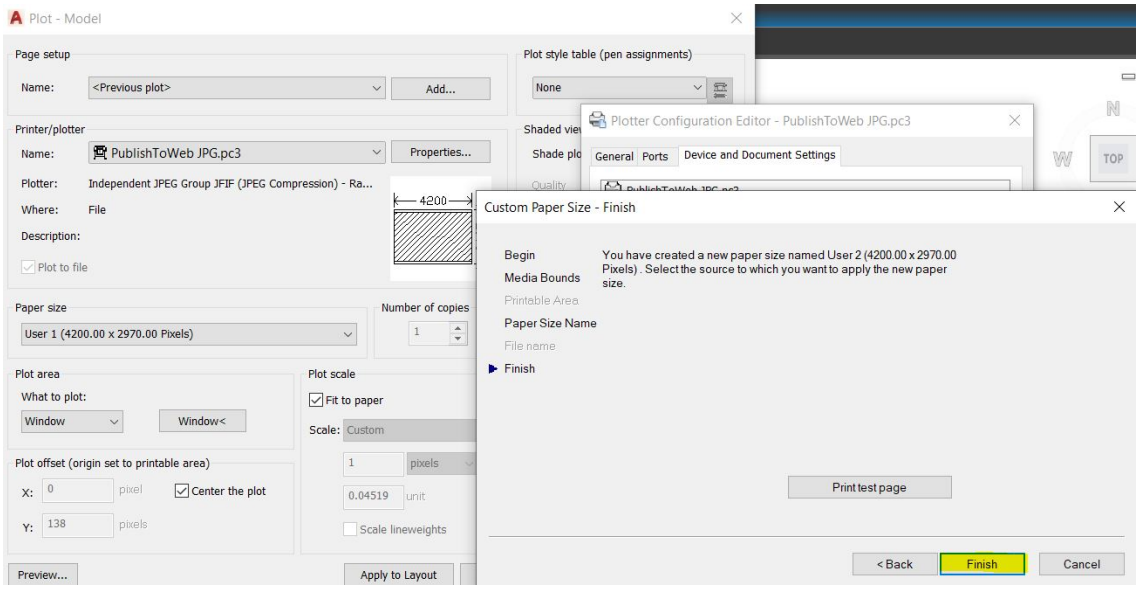
- Start from scratch /next



- Create an A3 raster print of 4200X2970 pixels (an A3 is 42cmX29.7cm). This is not the best quality graphic but it is enough to be used for SketchUp Free without having big file size internet issues. Hit Next.



- Name the print and hit Finish.



- You will find your new custom print under the paper size drop window. Remember that the window needs to be selected, fit to paper checked. Finally hit OK.

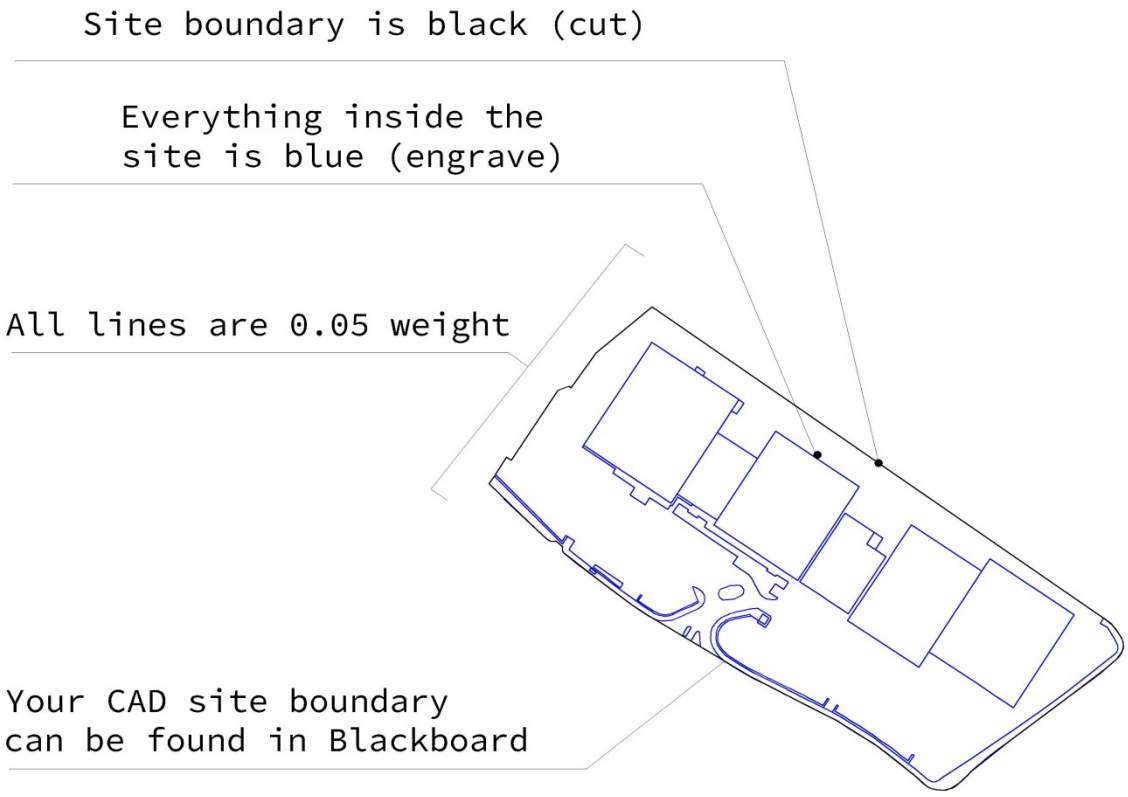
A BRIEF GUIDE TO 3D MODELLING WITH CAD

This short section is designed to guide you through the process of making 3D models using CAD based laser cutter. Your (.dxf) file (CAD file) needs to be well prepared in order for the laser cutter to read it and cut/engrave your drawing. Each laser cutter has specific sects and requirements. This guide is only compatible with the modelling workshop that the University of Manchester Urban Design Team is working with. Please follow this guide carefully and contact the Design Officer if you have any questions.

Important notes to keep in mind:

- You need only three layers in your CAD prepared file: Layer 0 (cannot be deleted), Layer **CUT** and layer **Engrave**. All elements need to be on layers CUT and Engrave. Any element on layer 0 **will not** be read by the laser cutter, and so will disappear.
- Line weight is 0.05 for all lines.
- Use the already done CAD site boundary in Blackboard, otherwise your masterplan will not fit perfectly within our big neighborhood scale 3D model.

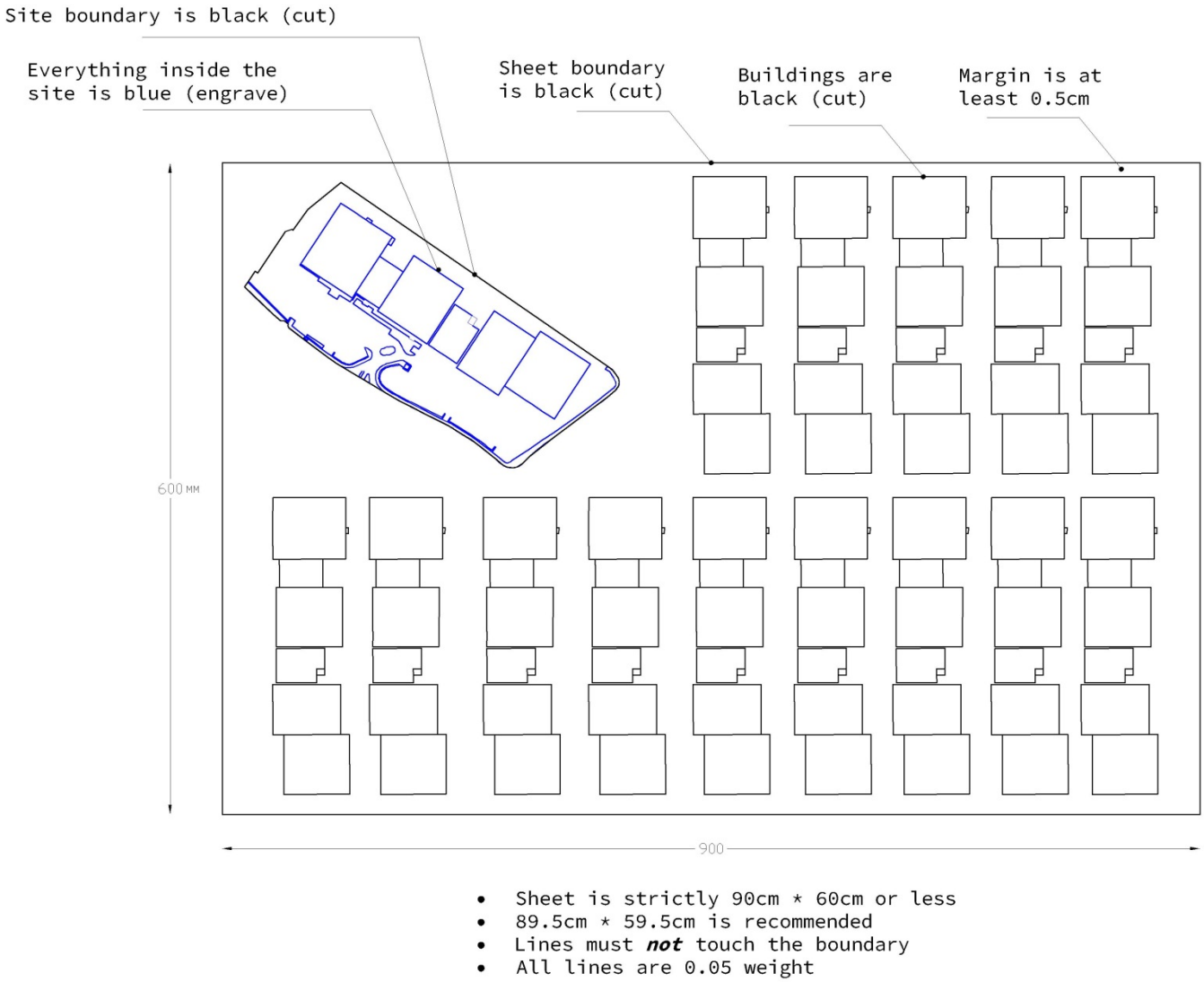
Step 1: Preparing your site for engraving (The model base)



- All lines need to be **BLACK** or **BLUE**.
- **Black** for CUT
- **Blue** for ENGRAVE
- Line weight must be 0.05 for ALL lines
- Use the already done CAD site boundary in Blackboard
- Create two layers. One is CUT and one is ENGRAVR
- Make sure that the site boundary is black (cut), put in on the CUT layer
- Make all the lines within the boundary blue (you want them all engraved including buildings/streets…etc.). Put them on the ENGRAVE layer
- Everything on layer 0 (the default layer) is **NOT** readable by the cutter

Step 2: Preparing the building

- Draw a **BLACK** rectangle (90cm * 60cm or preferably 89.5cm * 59.5cm). To do this, (as you rescaled your drawing to 1:1) the rectangle needs to be 900x600 units.
- Put the rectangle on the CUT layer. The rectangle is the large wooden sheet that the laser cutter will use. Each student can use one sheet only. A second sheet is allowed is special circumstances (issues caused by the shape of the site for example)
- Put your site inside the rectangle as below
- Make sure that **no single line** is touching the sheet boundary. Keep a safe distance of 0.5 cm as a margin.



- Sheet is strictly 90cm * 60cm or less
- 89.5cm * 59.5cm is recommended
- Lines must ***not*** touch the boundary
- All lines are 0.05 weight

- Copy the buildings only from your site to outside the site as above. Make sure they are now **BLACK** as we want them to be cut.

- The number of copies depends on the number of floors in your proposed design. If the highest building is 12 floors, then make 12 copies. If you have a single very high building, then create multiple copies for that specific building.

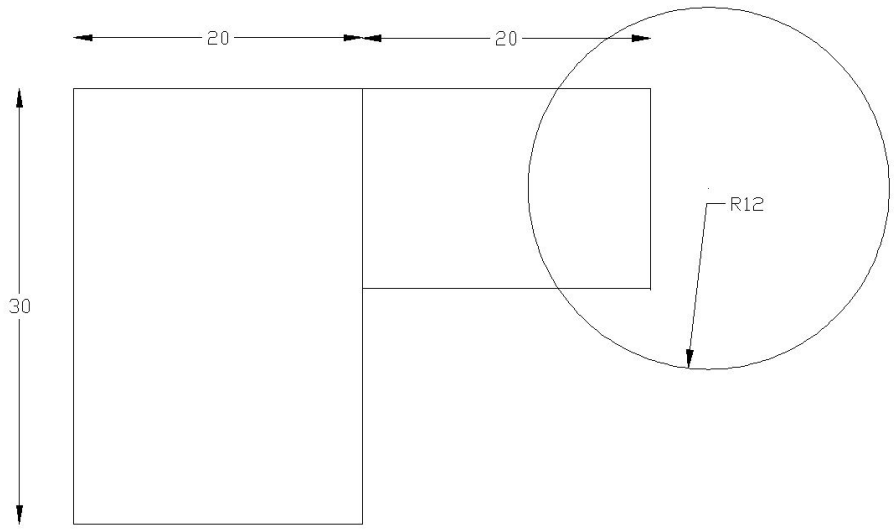
Step 3: Sending the files to the workshop/technician:

- You need to send the ready file as a **.DXF** or **PDF** format. Save your file as .dxf (file/save as/ .dxf 2004) or export as PDF (Ctrl+p/ DWG to)PDF.
- Do not send .dwg. Most workshop do not have CAD and so they will not be able to read your .dwg file.

A SHORTA PRACTICAL EXAMPLE

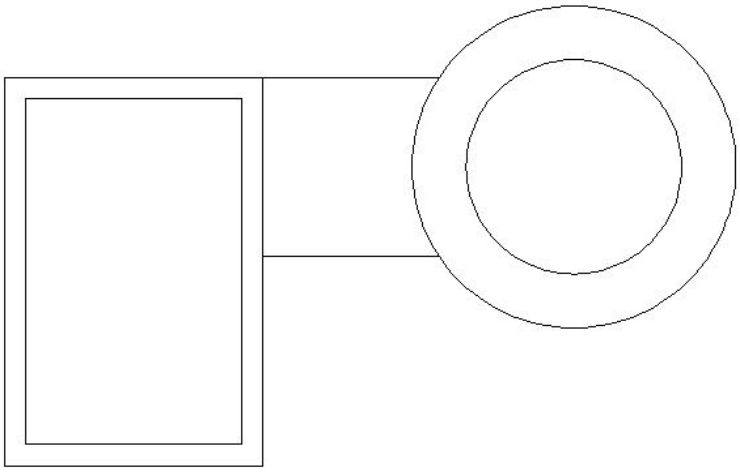
DRAWING A SMALL URBAN LAYPUT

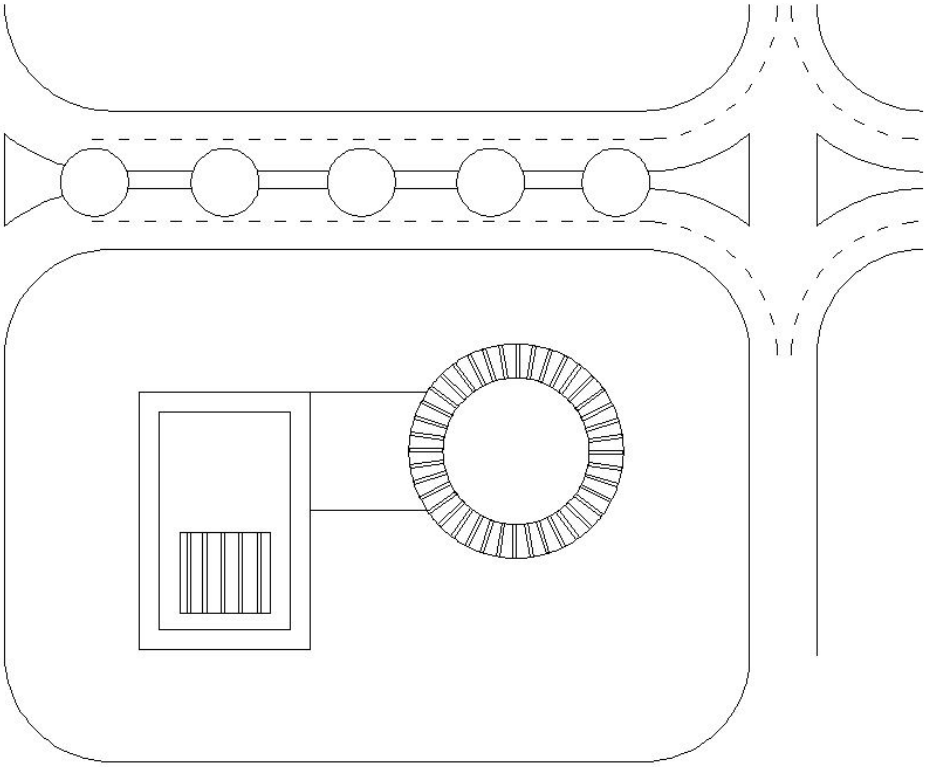
Using the Rectangle and the Circle commands draw the below shape, which represents abuilding layout, with the dimensions below. Remember using F8 to draw vertical and horizontal lines. Turn the snap toon (F9) on and off according to your preferences.



Now use the Trim tool (TR/Space/Space) to clean the circle, and use the offset cmmand (O/space) to draw an inner cyrcle and an inner rectangle as showed below.

Draw the next image using the following commands: Rectangle - Fillet- Array - Line - Offset - Mirror - Trim. You need to load the dashed line from the tool bar. Go to the drop in list of lines/others/load/ and choose the pattern you want. Make sure it is selected before drawing. You can change its from the line option menu: Select the line/Right click/Options/ and change the scale.





Use the Polyline command to add more details. Use the offset command to create paths. The Masterplan skeleton should look like this: simple and accurate wireframe. You do not have to add trees or street furniture. These will be added in Ps in 2D and in Twinmotion in 3D.