



Instructions regarding Autocad drawings for use in IOS

1 Points of attention when drawing

The following instructions not only make drawings easier to handle for IOS, but they generally improve the maintainability of the plans.

- ✓ Make agreements in advance regarding zero points and drawing units (scale). This will prevent unnecessary complexity and avoid extra work when data from different drawings have to be combined (e.g. different floors of a building) or when drawings have to be replaced as a result of modifications.
- ✓ Use layers to group similar information. The information can be filtered later on to optimally visualize and easily retrieve specific information at a certain stage and/or in a given application (IOS).
- ✓ Where possible, use Autocad blocks to represent physical objects (e.g. existing appliances, warning signs...). Use these blocks in a consistent way.
- ✓ Add attributes to the blocks to save the information codes if this information is at hand. IOS can use these attributes to make a distinction between new, replaced and familiar objects while loading a new DXF file and after applying the modifications.
- ✓ Make sure that physical objects that are represented by lines and images consist of 1 line or image. Use for example polygons for a fire protection wall instead of 2 or more individual lines.
- ✓ Make sure that lines and images representing different physical objects can be easily recognised. The best way to do this is by using layers (e.g. a layer for interior walls, a layer for exterior walls, a layer for fire protection walls...). Consistent use of colours and line types may also prove to be very useful. Recognisability not only implies that it should be recognisable for people who look at the drawings but also for automated systems such as IOS. (e.g. using various shades of a colour may not be confusing for people looking at the drawing but it can be very confusing for an automated system because it will see different colours).
- ✓ Give layers and blocks a meaningful name and make sure the content is (and remains) consistent with the name. This may save both designers and IOS users a lot of searching.



2 Making a DXF file for use in IOS

If you want to import a drawing in IOS it must be saved in DXF format. This DXF file must comply with the following conditions:

- ✓ The DXF file may not contain external references (references to other drawings or blocks in other drawings). IOS will import the DXF file but ignore the external references. Use the “Xref Manager” in Autocad (“Xref Manager...” menu item in the “Insert” menu) to copy the information from the external files to this drawing (with the use of the “Bind” button).
- ✓ Make sure that there are no objects outside the view’s extent of the drawing. These objects will also be loaded in IOS and affect the Zoom All function.
- ✓ Watch out for light colours. By default, drawings in Autocad are made on a black background. Hence light colours will be more visible. IOS prefers to work on a white coloured background, just like regular paper. The objects can be less visible on this background. White coloured lines normally don’t pose a problem because they automatically appear in black in IOS, just like on Autocad print outs.
- ✓ Leave all present blocks untouched. Don’t explode them.
- ✓ All the information IOS needs must be retrieved from the model-space. Everything in the paper space (generally the page margins and title corner which are undesirable in IOS) is ignored by IOS.
- ✓ Information in layers that are marked as not “plotable” will not be visible. In most cases this information is unnecessary in IOS which means there is no problem.

Limitations of IOS:

- ✓ IOS has been tested with DXF files from Autocad 13 up to Autocad 2004. Because we didn’t evaluate older or newer versions we would like to be informed on problems that occur with those versions.
- ✓ IOS supports 3D transformations on 2D objects and blocks but not all 3D objects. (e.g. circles that are rotated around the X or Y axis and have an oval form when viewed from above will also appear as an ellipse in IOS. A 3D polyline will be ignored by IOS, while a 2D polyline that has been moved or rotated in 3D will be recognised as such.)
- ✓ IOS doesn’t support dimensions on drawings and shading. IOS will ignore them.
- ✓ Splines offer many possibilities in Autocad. IOS does support splines but it doesn’t support all its possibilities. In some cases IOS supplies an estimate of the spline coefficients.



3 Desired plans and information on plans for IOS Fire

In case of multi-storey buildings, there has to be a file for every floor. The zero point and the scale must preferably be the same.

In order to prepare the files for your company, we would like you to supply us with the following drawings:

- ✓ The complete site plan, featuring only the environment, the exterior walls of the buildings (no interior walls) and the names of the various sectors or buildings (in vector format) or the data shown or hidden by respectively enabling or disabling layers.
- ✓ The complete site plan on level 0 featuring both the exterior and interior walls of buildings or the data shown or hidden by respectively enabling or disabling layers. (Names of premises should be included).

In case of multi-storey buildings:

- ✓ The complete site plan at level 1, 2, etc displaying both the exterior and interior walls (at level 1, 2, etc) of the buildings (names of premises should be included). The location of the premises at level 1, 2, etc must correspond to their effective position in relation to the premises below.

4 Possible problems

Problem

The drawing seems to have been moved in relation to the floor below while adding a floor in IOS.

Solution

Use the IOS zero point tool to indicate corresponding zero points.

Problem

After loading a drawing IOS appears to have made a wrong assumption concerning the dimensions of a drawing in Autocad and the indication of the scale in IOS is incorrect. You can recalibrate manually but it won't be very accurate.

Solution

Right-click on the drawing to display the context menu and choose the "Calibrate" menu item in the "Background" submenu. This menu-item allows you to indicate the dimension that was used for the drawing.

Problem

While loading a drawing in IOS some parts of the drawing appear to be missing.

Solution

Check whether the correct layers are enabled in IOS ("DXF Background/Show/Hide Layers" menu item in the context menu of the drawing).

IOS doesn't support every drawing element. It usually concerns information that is unnecessary for IOS (e.g. shades, indications of scale), so it isn't really much of a problem. See "Limitations of IOS" above.

Check whether the elements concerned are in a plottable layer and whether they're not inside the paper space in Autocad.

Check whether they have not been drawn in a light colour in Autocad.



Make sure it doesn't concern parts that come from an other drawing via an external reference. Use the "Xref Manager" in Autocad ("Xref Manager..." menu item in the "Insert" menu). You will be provided with a list of external references. Select them one after the other and click on the "Bind" button to copy the data from the external references to the actual drawing and make a new DXF file of the resulting combined drawing.



Instructions regarding Autocad drawings for use in IOS (optional)

Specific services: creating new IOS objects from DXF

DXF files can be used as a background drawings in IOS but IOS offers many more possibilities with DXF files. We can extract information from the content of the DXF file to automatically make a number of objects in IOS and even to enter information on these objects in our database. A specific XML file can be generated for this purpose.

The customer has to provide the following data:

- a representative plan
 - DXF format
 - Alle necessary blocks appear in the DXF file
- Library of blocks in Autocad
 - list (Word or Excel) of the names of the blocks that need to be converted to IOS
 - list (Word or Excel) of the descriptions e.g. identification code (attributes that need to be detected in Autocad)
- IOS is capable of detecting polygons Premises and fire protection walls (or other elements that one wants to convert to IOS elements – with the exception of elements that will be represented by icons) need to be drawn up from polylines or perfectly joined lines (shapes that are not perfectly closed cannot be detected). Here, it is also of great importance to classify every group of elements one wants to visualise in a separate layer.
For drawing up intervention or evacuation plans the following elements (as far as one wishes to convert them into IOS elements) must have been drawn as separate entities on CAD level:
 - Premises
 - Elevators
 - Stairs and/or staircases
 - Fire protection walls
 - Stairs and/or staircases
 - Evacuation routes and/or circulation areas
 - Blocking equipments
 - Blocking zones

Attention!

- The plan has to be representative. All plans that are eligible for this ISO function should be drawn up in a consistent way.
- The list of names and descriptions must be supported with a list of IOS icons. Only icons that correspond with the IOS icons can be converted.



Creating new IOS objects from DXF

This will be done by using an XML file defining which blocks in the DXF file correspond to which object types (and icons) in IOS.

- DXF blocks

For each block in the DXF file we can currently define in the XML file to which IOS object it has to be converted.

We can specify two IOS object types if a different object has to be chosen in IOS and if the block in the DXF file has been reflected (e.g. emergency exit to the right and emergency exit to the left).

We can specify whether the icon in IOS has to be rotated according to the direction in which the block in the DXF file drawing was turned.

- DXF attributes

If the blocks in the DXF file drawing are provided with attributes (such as an identification code) we can specify that they are used to fill in the properties of the IOS object.

It has also been provided that if there is an attribute that indicates the parent location (premise, floor...) the object in IOS will be automatically linked to that location. We can also specify whether the parent location concerned must be created if it cannot be found in IOS.

Adding and/or updating IOS objects from DXF

Some parameters have already been provided in the configuration file to allow updating of IOS by retrieving information from an updated DXF file. Some objects may be added but even an object that has already been made in IOS can be updated.

- Search criteria for existing objects in IOS

For each object type an attribute (and a corresponding property in IOS) can be specified to be used as a unique key for recognizing objects.

For each object type a distance can be specified within which an existing object can be considered analogous.

- Parameters to indicate what can be updated.

For each object type in the configuration file it can be specified whether new objects may be made. If this is not allowed, only existing objects will be updated.

For each object type it has to be specified whether the object has to be moved. A minimal and a maximal difference can be set for the positions that were found. The position of an object on the drawing will only be updated when the difference falls within the marked range.

- Same object on several drawings

If an object appears on several drawings (e.g. multiple buildings on one site) and an attribute is available that can be used as a unique key, a master representation of the object will be created on the first drawing and a shortcut to the same object on the second drawing.