

CAD Checker

User Guide

Version 2.0
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SYMETRI
ADDNODE GROUP

CAD Checker Software Licence Agreement

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Overview of Symetri CAD Checker software

To enable different companies to share CAD data it is imperative that all the data is produced to a set of agreed standards. Such standards are likely to include layer conventions, text and dimension styles and other basic data structuring.

CAD Checker is a software application designed to assist AutoCAD users in confirming that data within their drawings has been produced to such a standard and to generate an error report.

The definition of these standards is held within a xml standards file (with a file extension .cco). Users may use specified standards files provided by their CAD Manager or download them from a project website. Alternatively users may create their own standards file using CAD Checker.

The range of features within an AutoCAD drawing file that may be checked against a standard by **CAD Checker** include -

- All layers in the drawing conform to a specified layer naming standard (specified exclusions to the standard are allowed)
- The name of the title block matches one of a specified list of AutoCAD block names
- The title block attributes conform to a specified standard, this can include -
 - specified attributes must not be left blank (e.g. Drawing name, Scale)
 - the "filename" attribute reports correct drawing filename
 - viewports in the drawing match the scale(s) specified in the "scale" attribute
- All line-type names in the drawing conform to a specified list of allowed values
- Specified types of entities (e.g. TEXT, LINES, DIMENSIONS) must be on specified layers

- All text widths in the drawing conform to a specified list of allowed values
- All text heights in the drawing conform to a specified list of allowed values
- All text style names in the drawing conform to a specified list of allowed values
- All text fonts in the drawing conform to a specified list of allowed values
- All entities in the drawing optionally conform to "BYLAYER" colour
- All entities in the drawing optionally conform to "BYLAYER" linetype

CAD Checker is developed and distributed by Symetri Ltd

<https://www.symetri.co.uk/>

System Requirements

One of the following Autodesk products, installed and running on the appropriate hardware and operating system:

- AutoCAD 2017
- AutoCAD 2018
- AutoCAD 2019
- AutoCAD 2020
- AutoCAD 2021

Or one of the following Autodesk application products based on one of the base AutoCAD versions listed above:

- Architectural Desktop / AutoCAD Architecture
- Autodesk Building Systems / AutoCAD MEP
- AutoCAD Civil 3D
- Mechanical Desktop
- AutoCAD Map 3D

Supported operating systems:

- Windows 7 64 bit
- Windows 8 64 bit
- Windows 10 64 bit

Symetri CAD Checker requires 2MB free disk space.

Installation

The installation program for CAD Checker is supplied as an executable file.

This may be provided in downloadable format from a web site.

The filename for the installation program has the format –

CADCheckerxxx.msi

- where **xxx** denotes the version number.

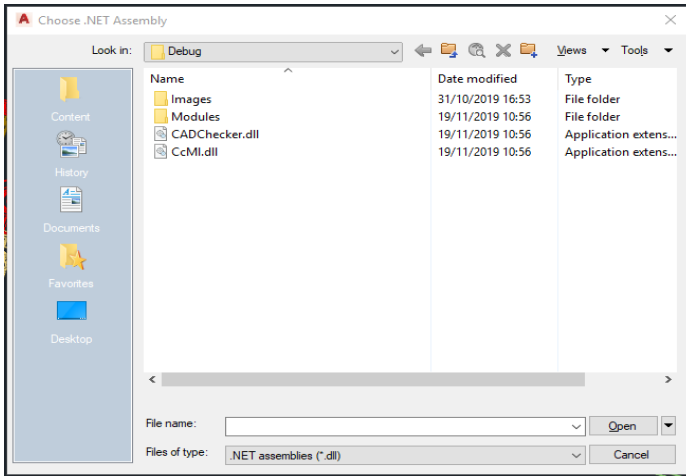
To run the installation routine –

- 1) Download the CadCheckerxxx.msi program to your hard drive
 - a) Double click on the program in Windows Explorer.
 - b) Select “Next” on the first screen.
 - c) Either confirm the default destination folder (C:\Program Files\Excitech\Cad Checker V2) or browse to specify an alternative destination folder.
 - d) Choose to install for the current user or for everyone.
 - e) Select the “Next” button to install the software.
 - f) Select the “Close” button to exit the installation procedure.

Running the Program

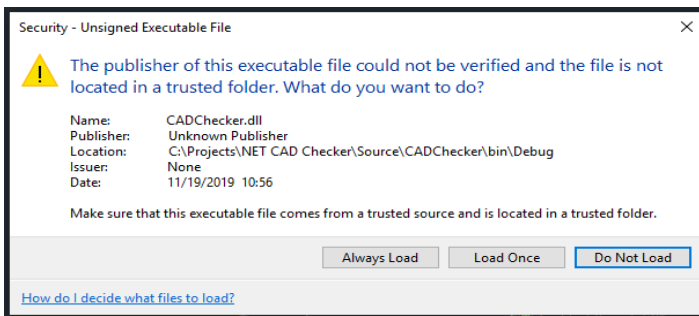
Cad Checker is installed as an AutoCAD Add-in, to initially load the application type NETLOAD in to the command line then in the pop up dialogue navigate to the install location. (C:\Program Files\Excitech\Cad Checker V2).

Choose CadChecker.dll



Click Open

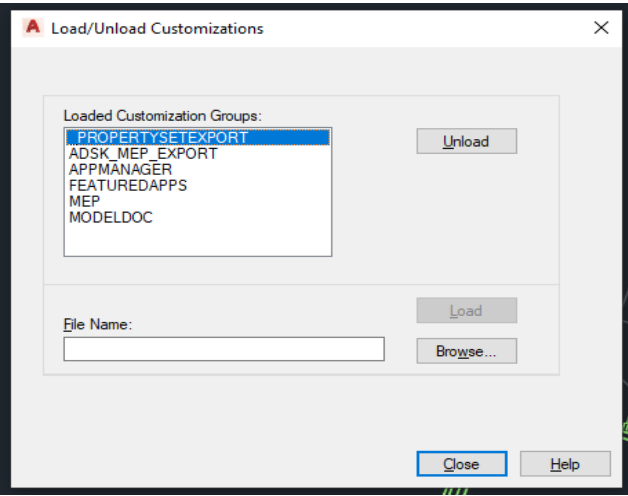
You may get the security message below:



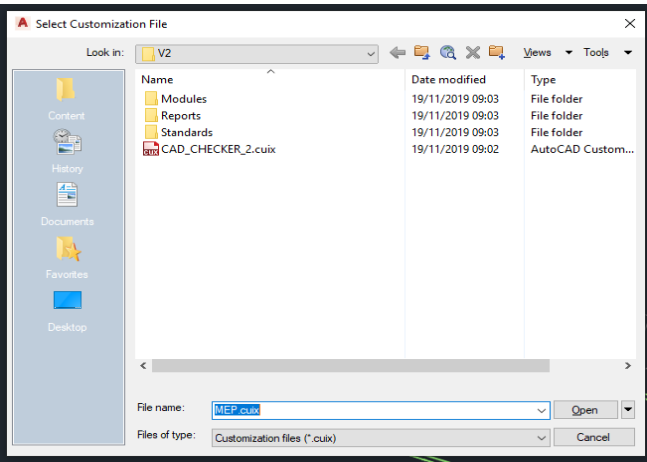
Click Always Load or Load Once.

Once the CADChecker.dll is loaded it will set various AutoCAD paths to enable the .dll to auto load in future.

To load the Cad Checker menu file type CUILOAD into the command line.

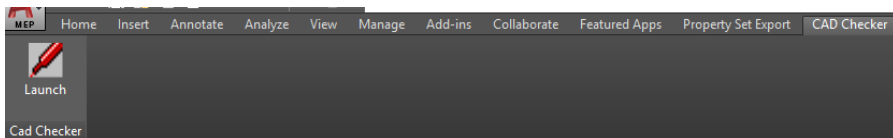


Click Browse
Navigate to the cui file CAD_CHECKER_2.cuix file in the install directory.



Click Open followed by Load in the cui dialogue.

This will install the CAD Checker ribbon button to launch Cad Checker:



Choosing a Standards File

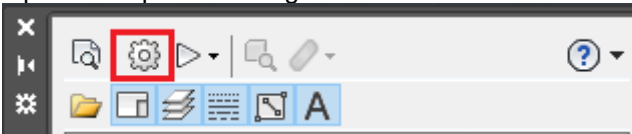
The type of the items in an AutoCAD drawing that CAD Checker is configured to check are held in a “Standards File” with the extension “.cco”.

A sample BS1192 (AUG) standards file is included in the “Standards” folder in the CAD Checker program directory. Additional standards files are available which already contain the criteria relating to specific CAD standards used on some large collaborative projects.

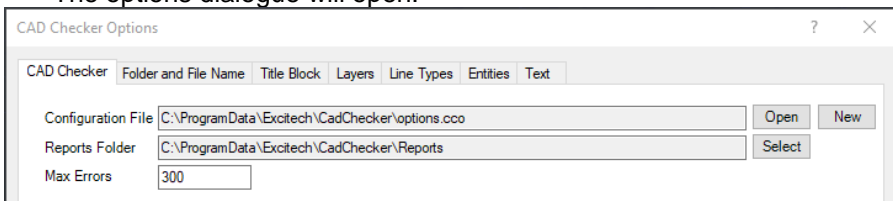
A typical example of a CAD Checker standards file is the one used by BAA for their CAD standards. The latest version is available for general use and can be downloaded from BAA’s website. Please contact Symetri Ltd for further details.

To load a standards file into CAD Checker –

- 1) Open the options dialogue via the toolbar button:



The options dialogue will open:



- 2) On the first tab Cad Checker click the Configuration Files Open button and navigate to the .cco file that contains the standards you would like to use.

Note that the standards file will be reloaded automatically when CAD Checker is next re-started.

Setting up Report Templates

CAD Checker is able to generate error reports as a result of checking an AutoCAD drawing this report can be previewed and printed.

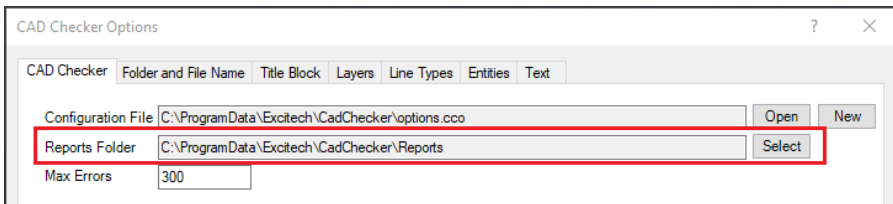
These reports are based on standard templates held in files with the extension “.xslt” and held in the following folder –

C:\Program Files\Excitech\Cad Checker V2\Reports

The default report templates have the Symetri logo.

An alternative logo can be used by replacing the Logo.png image in the Images sub folder.

To set CAD Checker to access a different folder for the report templates, Open the Options Dialogue via the main toolbar and in the Cad Checker Tab click Select next to the Reports Folder line :



Selecting what to Check

Different categories of checking may be enabled and disabled from the **Checker** pull-down menu or from the main toolbar.



Check Folder and Filename

Enables/disables checking of the folder path and filename

Check Title Block

Enables/disables checking of title blocks for the next drawing check.

Check Layers

Enables/disables checking of layer names for the next drawing check.

Check Line Types

Enables/disables checking of line type style names for the next drawing check.

Check Entities

Enables/disables checking of whether specific types of entity reside on specific layers for the next drawing check.

Check Text

Enables/disables checking of text sizes and styles for the next drawing check.

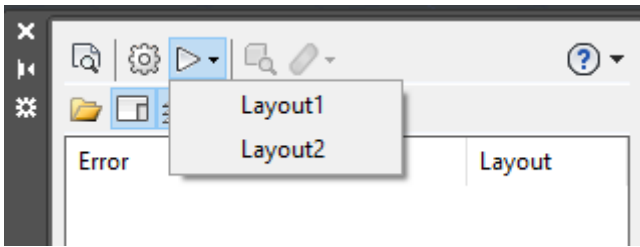
Running the Check

Before running a check on a drawing you should ensure that –

- The drawing is open in AutoCAD
- AutoCAD is waiting at the command prompt and no command is currently active
- The drawing has been recently saved

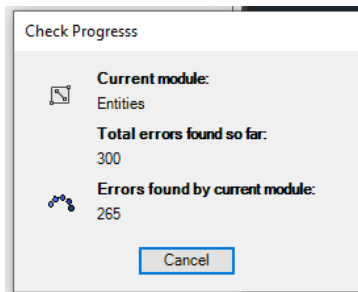
To run the check

Click the Check button in the toolbar :



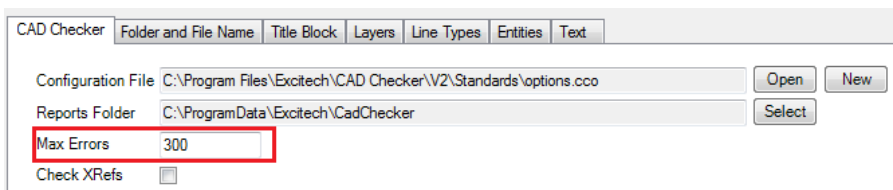
The user can choose the layout to check from the drop down.
Note only one layout can be checked at a time and not all functions are layout related. e.g. File and folder names.

While the error checking proceeds a progress dialogue will be displayed showing the total number of errors found so far:



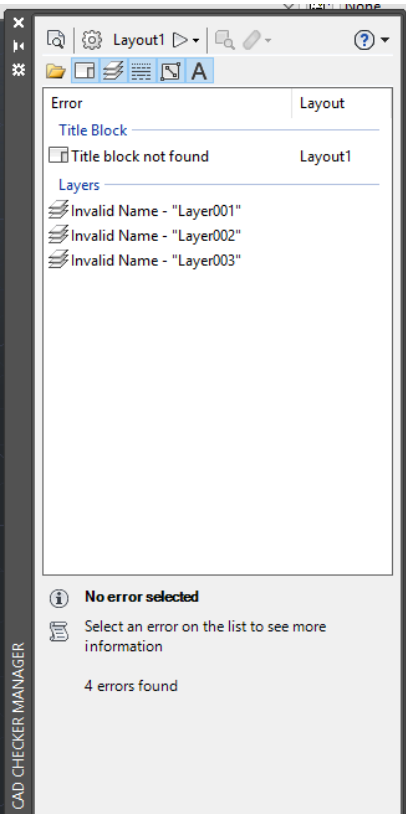
Pressing cancel at any time will abort the error checking procedure.

A maximum number of errors to be checked can be specified by setting the Max Errors in the Options dialogue :



Reviewing Errors

After a drawing check has been run a listing of any errors that have been found will be displayed in the main CAD Checker window.

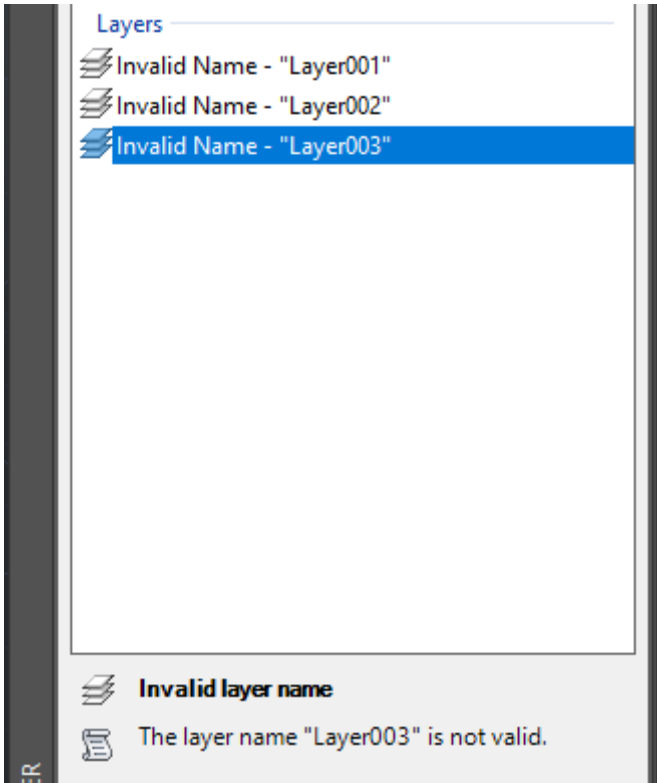


The following columns will be displayed –

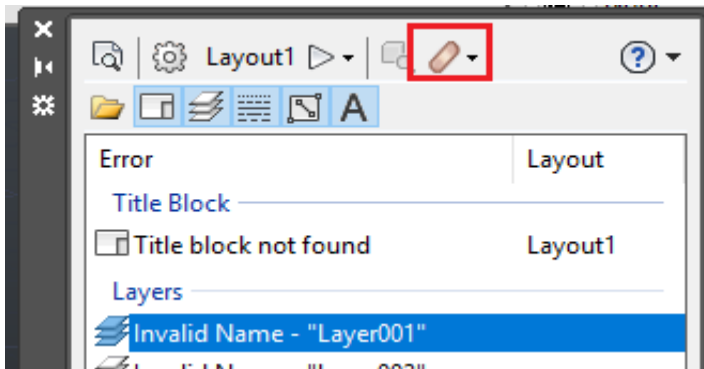
- Error** the type of error found
- Layout** indicates whether the error occurred in model space or paper space

The final section is the information section which will display detailed explanations about actions currently taken and selected errors.

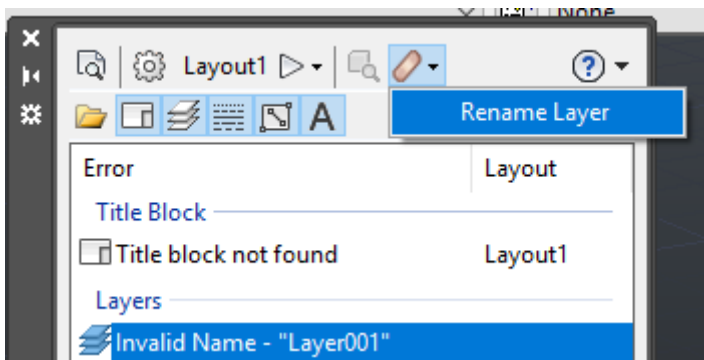
Selecting an error will result in the information section showing more details if available:



Selecting an error may also activate the solutions icon:



When active a solution is available for the selected error and can be applied by choosing the solution from the solutions drop down :

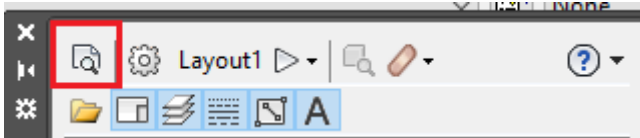


Choosing a solution will either apply the solution directly or display a dialogue with further action required to fix the error.
See individual configuration sections for available solutions.

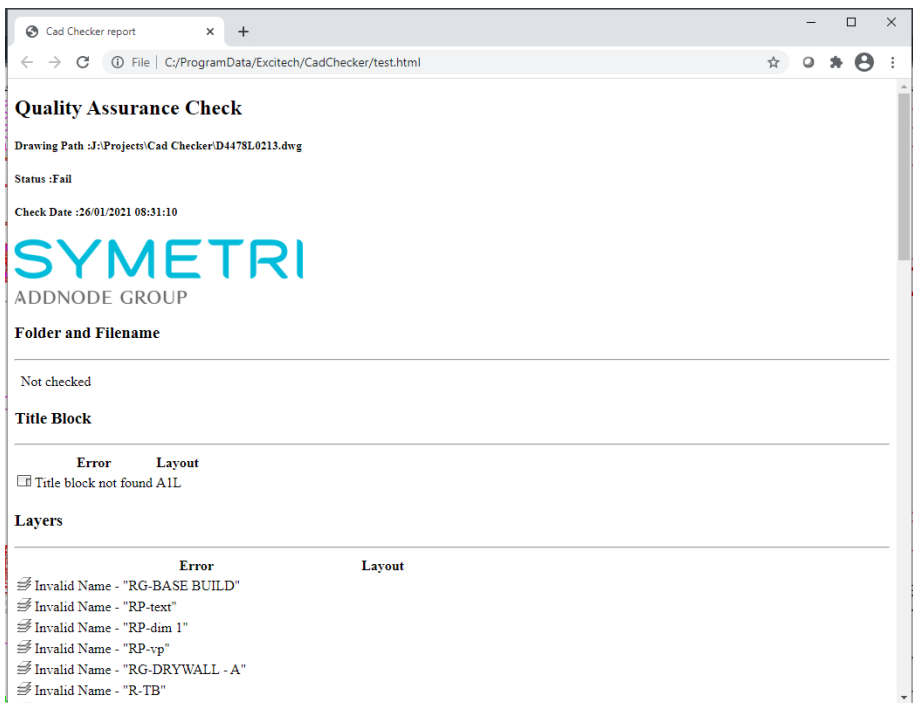
Generating Error Reports

CAD Checker can be used to create a printed report detailing the errors found with a particular drawing file.

Having run an error check and generated an error listing display an error report can be generated by clicking the report button on the app toolbar:



This will open the users default web browser which will then display the report as an html document:



The report can be printed via the print button on the report.

Creating a New Standards Database

Complex layer naming standards are currently in commercial use. Before creating a new standards database the proposed format for the various fields should be well planned and documented. The British Standard – BS1192:1998 – can be referred to for guidelines on how to structure a layer naming standard.

To create a new standards file from scratch backup your existing standards file.

In each of the option tabs set the required options.

On completion open the options dialogue and click the New button on the Configuration File line, this will display a save file dialogue where you can name the new standards file and choose its location.



To save the new file click OK on the main options dialogue:



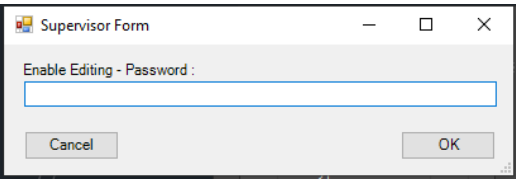
After saving the configuration file the file path in the options page will be updated and the new configuration file will be used from this point until changed again.

The various options pages are viewable only by default.

To start editing the option pages check the Edit Data checkbox

- ☐ Check XRefs
- ☒ Use Title block scale factor when checking text heights.
- ☒ Edit Data

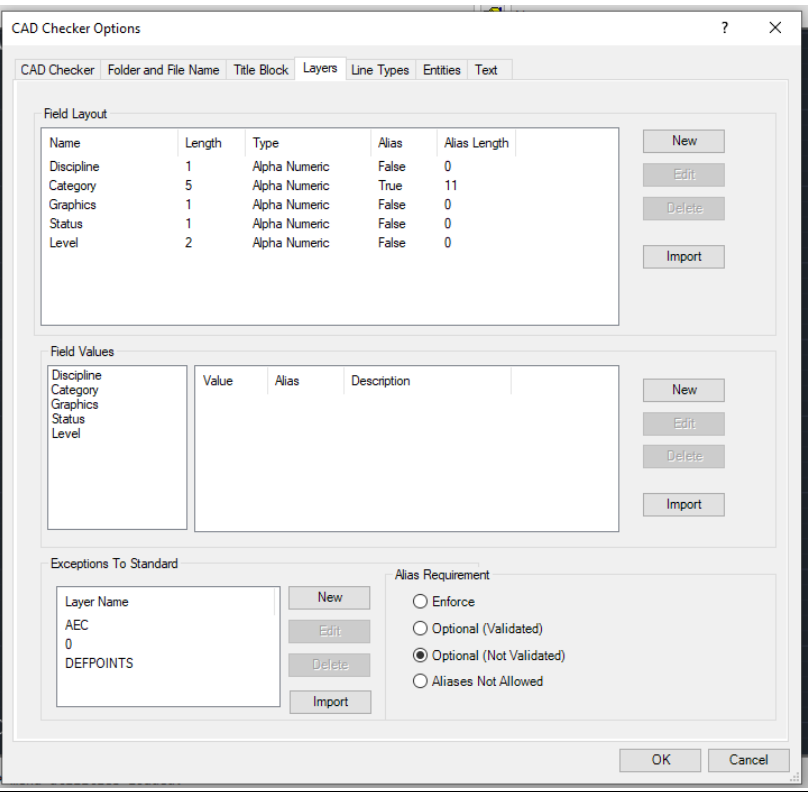
Enter the password:



A small dialog box titled "Supervisor Form" with a standard Windows window frame. It contains a label "Enable Editing - Password :" followed by a single-line text input field. At the bottom, there are two buttons: "Cancel" on the left and "OK" on the right.

Configuring Layer Naming Standards

The configuration for Layer Naming Standards (see [Appendix A](#)) can be accessed from the **Layer** tab of the Options dialogue.



The "CAD Checker Options" dialog box, with the "Layer" tab selected. The dialog is divided into several sections:

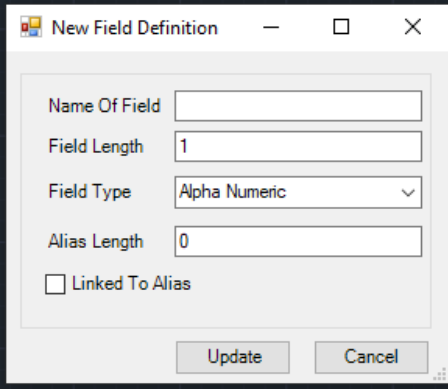
- Field Layout:** A table with 5 columns: Name, Length, Type, Alias, and Alias Length. It lists settings for Discipline, Category, Graphics, Status, and Level. To the right are buttons for New, Edit, Delete, and Import.
- Field Values:** A section with a list of field names on the left and a table with columns Value, Alias, and Description on the right. Buttons for New, Edit, Delete, and Import are on the right.
- Exceptions To Standard:** A list box on the left containing "Layer Name", "AEC", "0", and "DEFFPOINTS". To its right are buttons for New, Edit, Delete, and Import.
- Alias Requirement:** A group of radio buttons with the following options:
 - ☐ Enforce
 - ☐ Optional (Validated)
 - ☒ Optional (Not Validated)
 - ☐ Aliases Not Allowed

At the bottom right of the dialog are "OK" and "Cancel" buttons.

Field Layout

The field layout of the Layer Naming Standard (see [Appendix A](#)) as shown in the top area of this dialogue allows a user to define the basic naming rules for each layer type.

Pressing the New button allows the creation of a new layout segment:



Name Of Field : Is a definition of the layer name segment and usually describes its purpose.

Field Length: Defines the length of the segment

Field Type: This can be either numeric were the segment has to contain only numeric characters or alpha-numeric which allows for numeric and alphabetic characters.

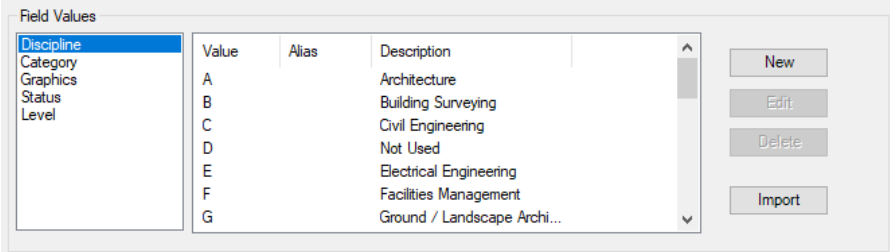
Linked to Alias: If Checked this segment is related to the alias appended to the end of the layer name. Only one segment can have an alias.

Alias Length: The maximum length for an alias.

Buttons on the right of the **Field Layout** allows the user to create a new definition, edit an existing definition and delete an existing definition.

There also exists an option to load the definitions from a comma separated file.

Field Values



The 'Field Values' dialog box is shown. It has a left-hand list with 'Discipline' selected. The main area is a table with columns 'Value', 'Alias', and 'Description'. The table contains the following data:

Value	Alias	Description
A		Architecture
B		Building Surveying
C		Civil Engineering
D		Not Used
E		Electrical Engineering
F		Facilities Management
G		Ground / Landscape Archi...

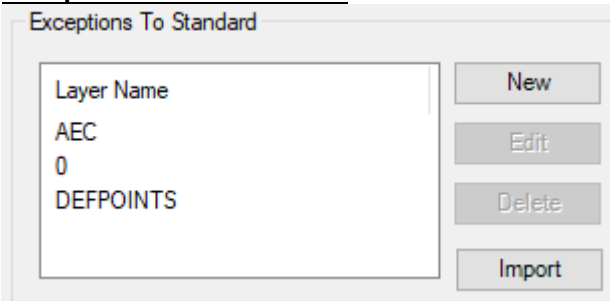
On the right side of the dialog, there are four buttons: 'New', 'Edit', 'Delete', and 'Import'.

The middle area of the dialogue allows values, aliases (if required) and descriptions to be assigned against the specified fields.

Click on the relevant field name in the left hand list to show the values assigned to that particular field. Buttons on the right allow for creation and update and deletion of values in this list.

Specifying optional fields: If a field value is filled with the “?” character this denotes that the field can be optional when checking layer names. For this to be achieved aliases must be disabled for all fields. A field can only be optional if it appears at the end of the layer name or is followed by other optional fields. For an example of this technique see the BS1192 AUG sample standards database (“BS1192AUGv2.CCO”).

Exceptions to the Standard



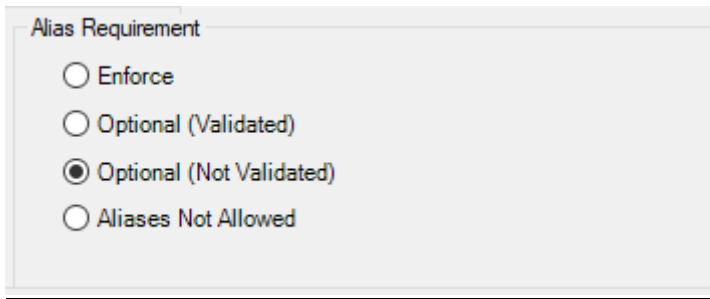
The 'Exceptions To Standard' dialog box is shown. It has a left-hand list with 'Layer Name' selected. The list contains the following text:

Layer Name
AEC
0
DEFPPOINTS

On the right side of the dialog, there are four buttons: 'New', 'Edit', 'Delete', and 'Import'.

The bottom left area of the dialogue allows for layer names that do not meet the standard to be specified as exceptions. These layers are then ignored when the drawing is checked.

Alias Requirement



Alias Requirement

- ☐ Enforce
- ☐ Optional (Validated)
- ☒ Optional (Not Validated)
- ☐ Aliases Not Allowed

The bottom right area of the dialogue allows for the management of layer aliases to be defined. (For a description of aliases see Layer Naming Standards in [Appendix A](#))

The following options are available –

Enforce

Aliases are mandatory

Optional (Validated)

Aliases are optional but if supplied they must be valid

Optional (not validated)

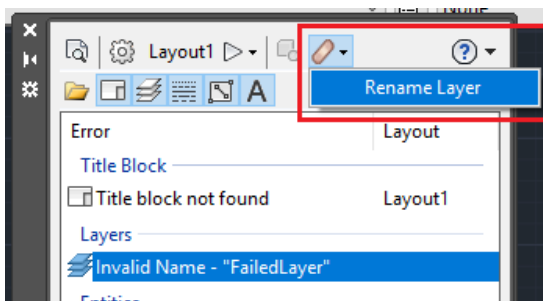
Aliases are optional and are not validated against the standards database

Aliases Not Allowed

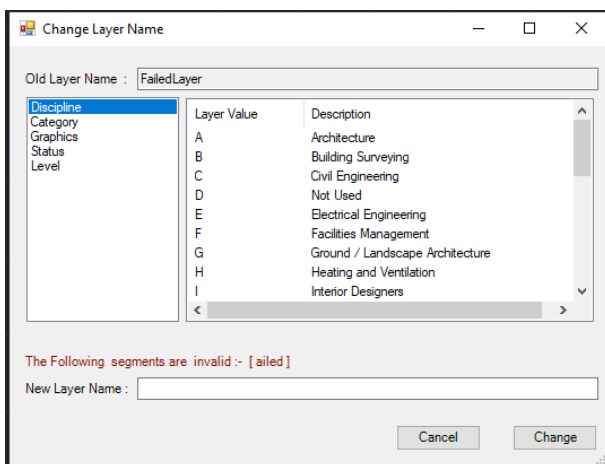
No Aliases are not allowed and will produce an error if present

Layer Name Fixes

When a layer naming error is found the solutions drop down should have a rename layers option:



Selecting the rename option will display the layer renaming dialogue:



This dialogue displays the old layer name and the various options for defining a valid layer name.

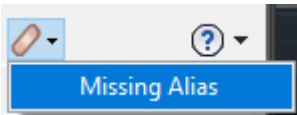
A new or existing layer name can be entered clicking change will rename the layer.

NOTE: The layer name is not checked for validity.

A missing alias error will occur when an expected alias is missing and alias usage is enforced.

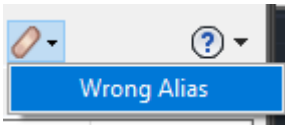
The solutions button will have a missing alias fix.

Click to append the correct alias to the layer name.



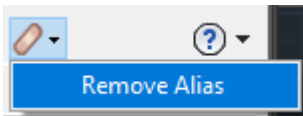
A wrong alias error will occur when an incorrect alias is found on a layer name.

The solutions button will have a wrong alias fix in the drop down.
Click the fix to replace with the correct alias.



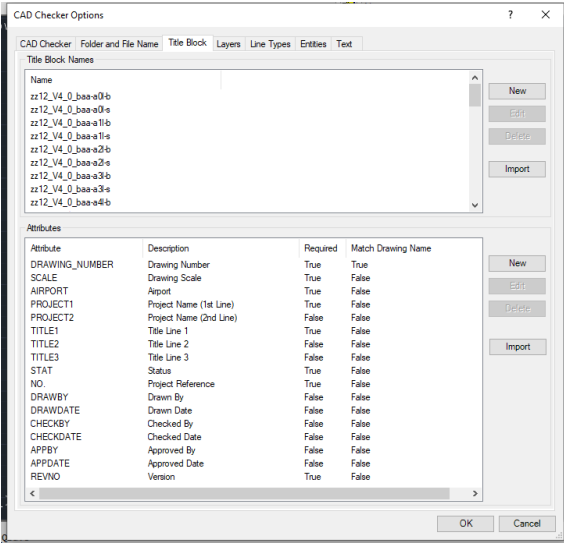
A remove alias error will occur when an alias is found on a layer name and Aliases not allowed is checked.

The solutions button will have a remove alias fix in the drop down.
Click the fix to remove the alias.



Configuring Title block Standards

The configuration for Title block Standards can be accessed from the **Title Block** tab of the Options dialogue.



Recognised Title blocks

The top area of the dialogue displays a list of the AutoCAD block names that relate to valid title blocks. Buttons on the right allow the user to edit and delete existing entries.

There is also an option to import a list of title block names from a comma delimited file.

Attributes of Title blocks

The bottom area of the dialogue relates to the attributes of the AutoCAD block used as the title block.

The following columns are included –

Attribute

This is the name of the attribute.

There is a special attribute named **SCALE**

This relates to an AutoCAD attribute on the title block that is used to hold the scale(s) in one or more viewports.

A single scale should be entered in the format -

1:50

Multiple scales should be entered in the format –

1:50, 1:100 or **1:50 1:100**

An error will be reported if a viewport scale does not match one of the scale values entered in the title block.

By setting the scale value to “AS SHOWN” the scale values in viewports will be ignored and no scale errors will be generated.

Description

The description is used to identify the attribute on the error listing and on the error report. It is recommended that the same text is used as that used for the attribute “prompt” in the AutoCAD block.

Required

Indicates whether the specified attribute in the drawing title-block is required to be filled in. An error will be generated if the attribute is marked as required but is left blank in the drawing.

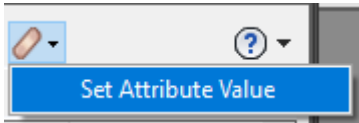
Match Drawing Name

When this is checked the attribute value must match the drawing name.

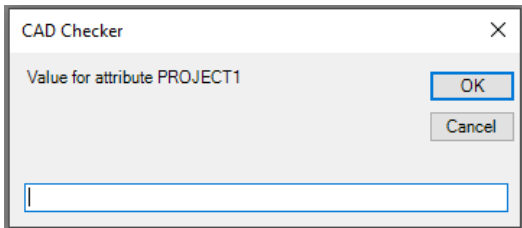
Title Block Errors

If an attribute is set as required but the field value is empty an attribute error will occur.

The solutions button will have a Set Attribute Value fix.



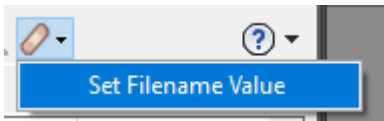
Selecting this fix will display a dialogue where a new value can be entered:



If an attribute is marked as a match drawing name field but the field value does not match the drawing name then a File name error will occur.

The solutions button will have a Set Filename Value fix.

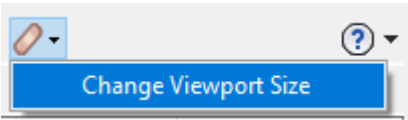
Selecting this option will update the attribute with the correct filename.



If the scale attribute is used and a viewport does not have the correct size then a Viewport size error will occur.

The solutions button will have a Change Viewport Size fix.

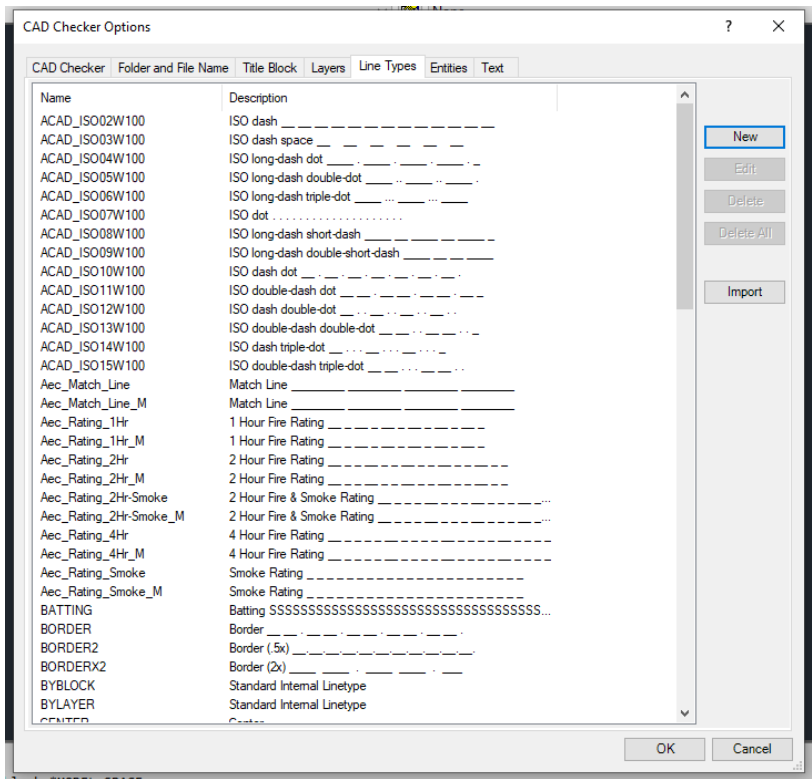
Selecting this will attempt to re-scale the viewport.



NOTE: This may not always work as expected and viewports may need re-sizing manually.

Configuring Linetype Standards

The configuration for Linetype Standards can be accessed from the **Line Types** tab of the Options dialogue.

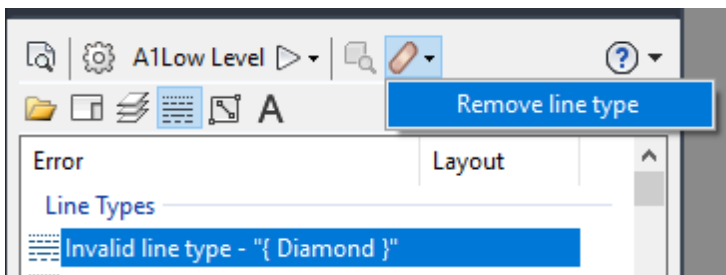


This dialogue displays a list of valid AutoCAD linetype style names and their descriptions. Buttons on the right allow for creation and update and deletion of entries in this list.

There is also an **"Import"** button which allows for a set of linetype style names to be imported from an AutoCAD **".lin"** linetype definition file.

Line-type Fixes

When a line type error is found the solutions drop down should have a remove line-type option:

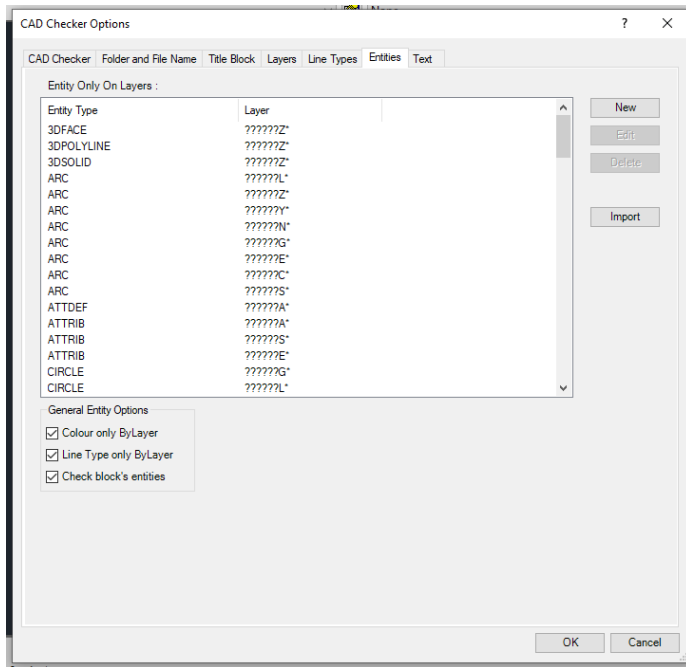


Selecting the Remove line type option will remove the line type if possible.

Any entity using the line type will need to be manually updated to a new line type.

Configuring Entity Standards

The configuration for Entity Standards can be accessed from the **Entities** tab of the **Options** dialogue.



Entity only on Layers

The main part of the dialogue displays a list of specific AutoCAD entity types and relates them to a layer wildcard. Buttons on the right allow for creation and update and deletion of entries in this list.

This list allows errors to be reported if a particular type of AutoCAD entity (e.g. "**TEXT**") is found on a layer that is not specified to hold that type of entity according to the layer naming standard (e.g. a layer not matching a wildcard "**??????T***").

A wildcard is a method of specifying a range of names that have a common part. The wildcard is composed of the actual characters for the common part and wildcard characters for the remainder.

Wildcard characters include -

* (asterisk)

Matches any string and can be used anywhere in the search string, for example *ABC matches ABC, AABC, 123ABC, etc

? (Question mark)

Matches any single character, for example, “?BC” matches ABC, 3BC, etc

General Entity Options

Two check box options allow the following checks to be made –

Entity Colour only ByLayer

If enabled will generate an error for any entity found in the AutoCAD drawing whose colour is specified explicitly rather than by the conventional “BYLAYER” property.

Using “BYLAYER” for entity colours ensures that colour assignment is controlled by layer management and therefore ensures a better control over data structure.

Entity Line Type only ByLayer

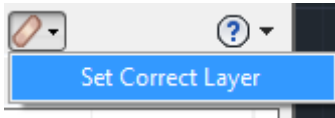
If enabled will generate an error for any entity found in the AutoCAD drawing whose linetype is specified explicitly rather than by the conventional “BYLAYER” property.

Check Block Entities

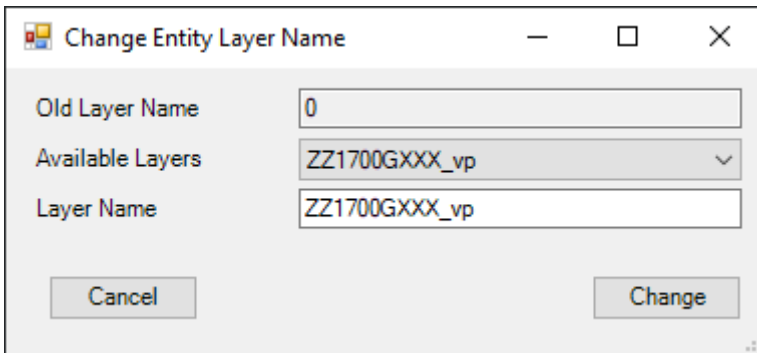
If enabled will check the entities within blocks.

Title Block Errors

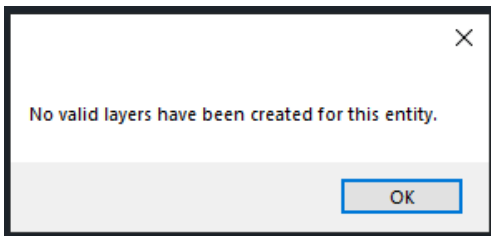
If an entity is not on the correct layer then a wrong layer error will occur. The solutions button will have a Set Correct Layer Fix.



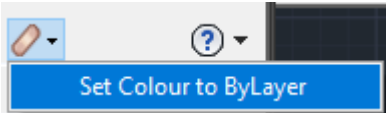
Selecting this option will bring up the Change Entity Layer Dialogue. The correct layer can be chosen from the Available layers list.



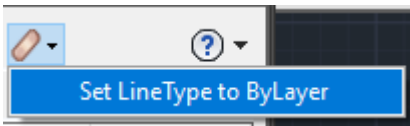
If a valid layer cannot be found the user will be warned and will need to create a valid layer before continuing.



If an entity should have its colour set by layer but the colour is set by another means, then a Colour not by layer error will occur. The solutions button will have a Set Colour to ByLayer Fix. Selecting this option will set the entities colour to ByLayer.

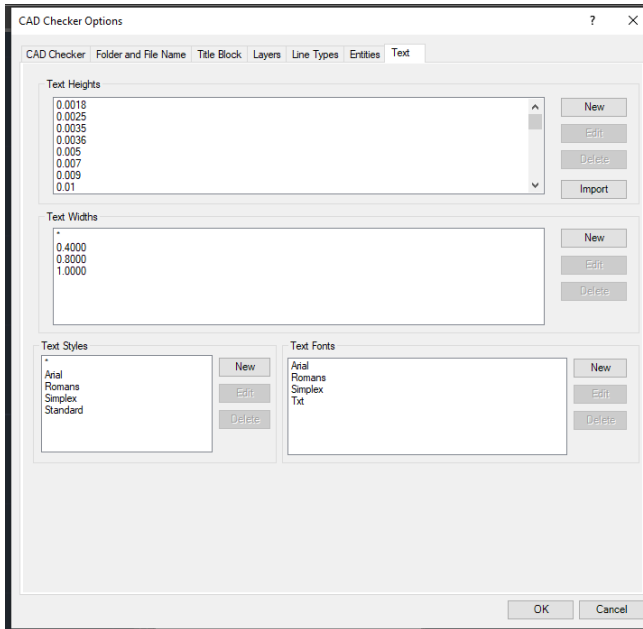


If an entity should have its line-type set by layer but the line-type is set by another means then a Line-type not by layer error will occur. The solutions button will have a Set Line-type to ByLayer Fix. Selecting this option will set the entities Line-type to ByLayer.



Configuring Text Standards

The configuration for Text Standards can be accessed from the **Text** tab of the **Options** dialogue.

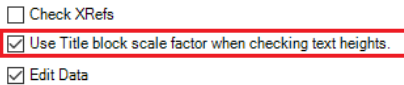


Allowable Text Heights

The top area of the dialogue displays valid AutoCAD text heights. Buttons on the right allow for creation and update and deletion of entries in this list.

CAD Checker will also allow text heights in a drawing that are a multiple of a text height from the list and a scale factor from the “Scale” title block attribute (see [Configuring Titleblock Standards](#) for a discussion of title block attributes).

Checking of text heights against scale factors in the title block can be disabled from the Cad Checker tab of the options dialogue:



☐ Check XRefs
☒ Use Title block scale factor when checking text heights.
☒ Edit Data

A wildcard option (denoted by a single asterisk) is allowed for Text Heights. When this option is added to the list any text heights are allowed.

Allowable Text Widths

The middle area of the dialogue displays valid AutoCAD text widths. Buttons on the right allow for creation and update and deletion of entries in this list.

A wildcard option (denoted by a single asterisk) is allowed for Text Widths. When this option is added to the list any text widths are allowed.

Allowable Text Styles and Text Fonts

The bottom left area of the dialogue displays valid AutoCAD text style names and the bottom right area displays valid text font names. Buttons on the right allow for creation and update and deletion of entries in this list.

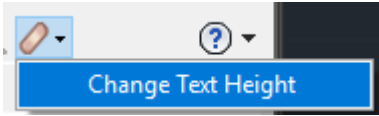
A wildcard option (denoted by a single asterisk) is allowed for Text Styles (not for Text Fonts). When this option is added to the list any text Styles are allowed.

Recommendation

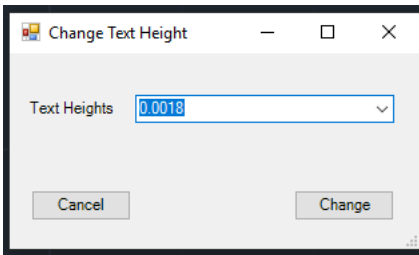
If it is not a requirement to check Text Height, Text Width or Text Style, add the wildcard to the relevant section, whilst retaining any existing 'preferred' values. Future checking then can easily be resurrected by simply removing the wildcard option.

Text Errors

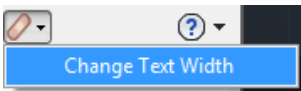
Text items with invalid Heights will generate an Invalid Text Height error. The solutions button will have a Change Text Height fix:



Selecting this error will display a dialogue with a valid list of heights, the user can select a height and apply it to the text item via the change button.

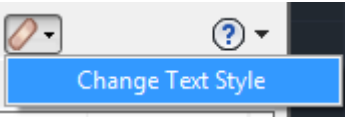


Text items with invalid widths will generate an Invalid Text Width error. The solutions button will have a Change Text Width fix:



As with the text height fix selecting this option will display a dialogue with a list of valid text widths.

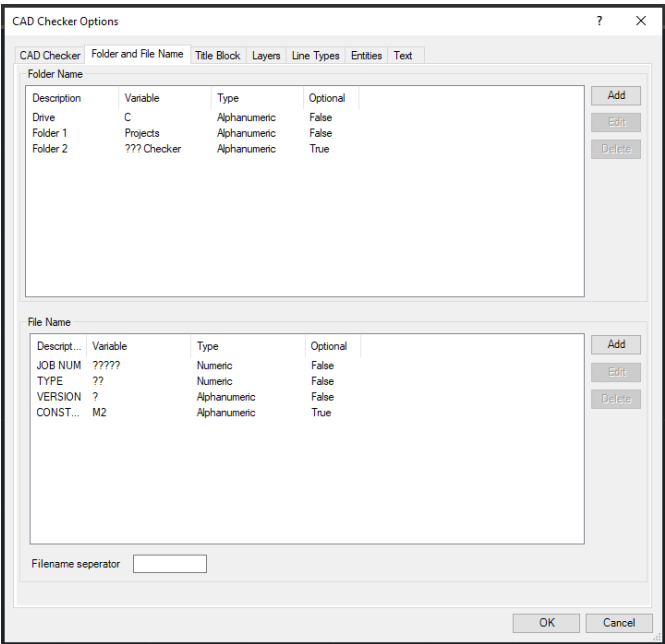
Text items with an invalid text style will generate an Invalid Text Style error. The solutions button will have a Change Text Style fix:



As with the text width fix selecting this option will display a dialogue with a list of valid text styles.

Configuring Folder and Filename Standards

The configuration for Folder and Filename Standards can be accessed from the Folder and Filename tab of the **Options** dialogue.



The top section allows the definition of the folder path.

Description: user definition for this segment of the path

Value: The value that this segment should contain, wildcards can be used here .

Wildcard characters include -

* (asterisk)

Matches any string and can be used anywhere in the search string, for example *ABC matches ABC, AABC, 123ABC, etc

? (Question mark)

Matches any single character, for example, “?BC” matches ABC, 3BC, etc

Type: Can be numeric or alpha-numeric. If set to numeric then this segments must only contain numeric characters.

Optional: only the last segment can be optional. Although it possible to define segments beyond an optional segment it is important to remember once an optional segment has been set every segment after is considered optional.

The second section allows for the definition of the file name structure.

Description: user definition for this segment of the file name

Variable: The value that this segment should contain, wildcards can be used here .(see above for usage)

Type: Can be numeric or alpha-numeric. If set to numeric then this segments must only contain numeric characters.

Optional: only the last segment can be optional. Although it possible to define segments beyond an optional segment it is important to remember once an optional segment has been set every segment after is considered optional.

Filename Separator: If a separator character is used in the file name this should be defined here.

Appendix A - Layer Naming Standards

Layer naming standards are based on fixed fields that are appended to each other to make up a layer name.

CAD Checker allows a name to be given to each field and allows the user to specify the length of the field, the type (alphanumeric or numeric) and whether an alias is associated with the field.

A layer alias is a text field that is appended to the standard layer name – normally to provide a more obvious description of the purpose of the layer. An alias can be specified for one (and only one) field.

An example of a valid layer name for a typical layer standard might be as follows –

A210G00_ExternalWalls

Where the following fields have been defined –

	Field Name	Length	Type
A	Discipline	1	alphanumeric
210	Element	3	numeric
G	Graphics	1	alphanumeric
00	Level	2	numeric
_ExternalWalls	The alias which relates to the Element code “210”.		