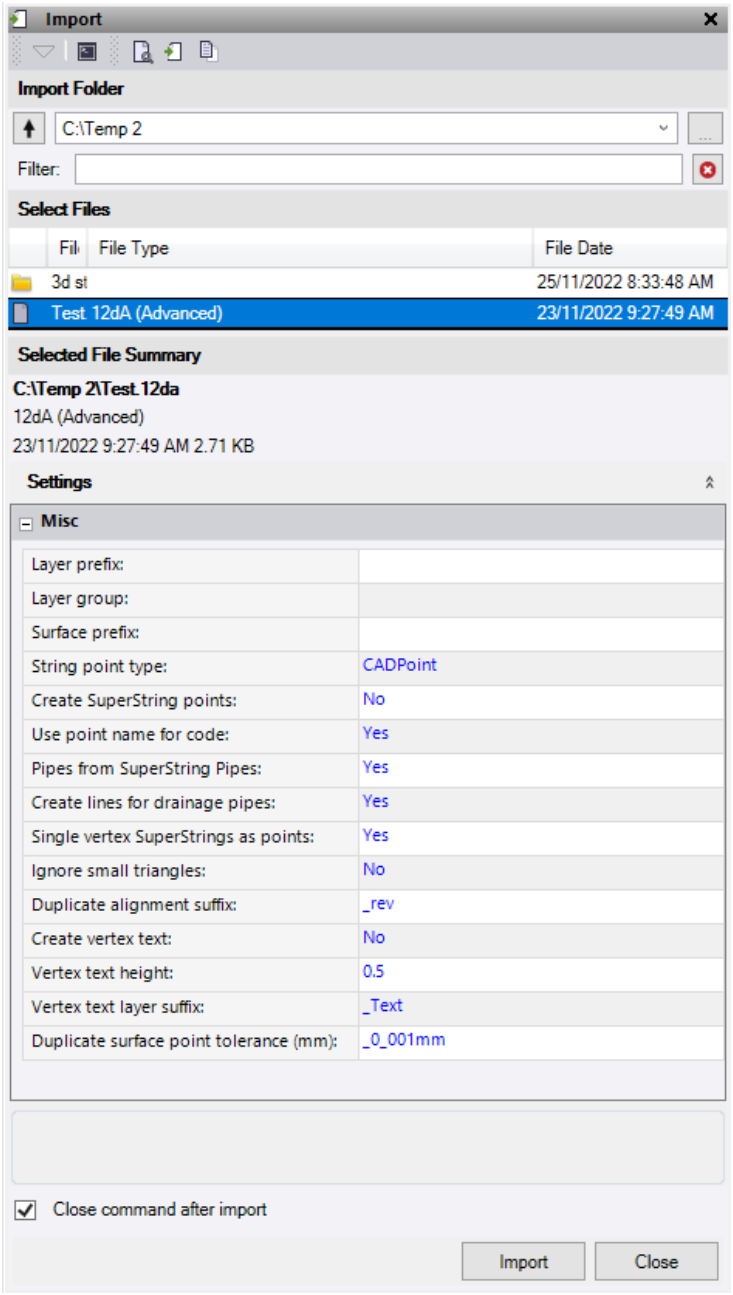
Description

12da is the native file format created by 12d Model software.

The ***12da Import/Export (Basic)*** can handle strings/points/surfaces and alignments for 12d.

The ***12da Import/Export (Advanced)*** can import advanced 12d data including, Pipe super strings, Drainage type strings, 12d Trimesh objects, hatch fills, attributes, Images, vertex text and super tins. It can now also import a colour.4d file from 12d and apply those colours to files subsequently imported to the TBC project.

Import 12da Files



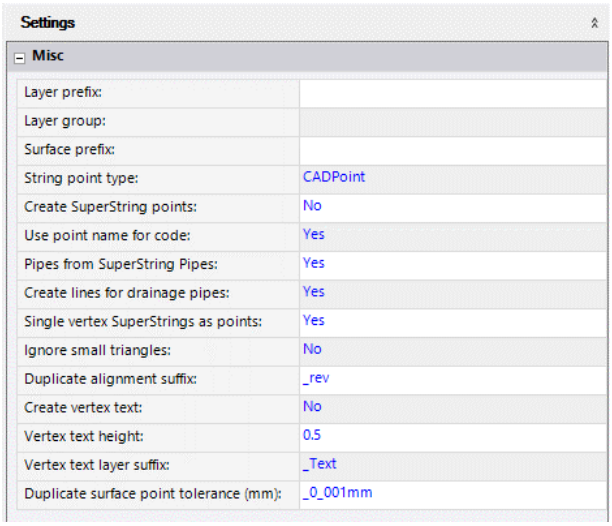
Importable Data		
Data common to each section	**How the data is handled when imported**	
String	This identifies the type of object that is defined in the section. See descriptions below of how each data for each type of string is handled when imported.	
Model	This imports as the object's Layer property. Data on an undefined model imports onto the **0** layer.	
Name	This is imported as the object's name property.	
Chainage	For alignment strings, this imports as the station value at the alignment's starting point (point of beginning).	
Breakline	This defines whether the string's data will be imported as one or more-point objects or as a linear object. See how the distinction affects the imported object in the section below.	
Colour	This original display colour is converted into the closest system colour when imported. User-defined colours are assigned the **By layer** colour and reported as warnings in the **Import Report**. Use of a "*colour.4d*" file prior to import will map the exact colours used in the 12d project. *(Advanced Import)*	
Attributes	Attribute data found in the "String" Attribute section and the "Vertex" Attribute section of a line or point is imported into a "12d Attributes" section on the line or point and shown in properties. ***Note:** "Segment Attributes" are not supported.*	
Vertex Text *(Advanced Import)*	Vertex and Segment text is imported into a "12d Text Data" section on the line or point and shown in properties. It can also be displayed as text using the "Create vertex text" setting on import. ***Note:** If "/" has been used in the text it will not be displayed.*	
String type	**Break line status**	**How the data is handled when imported**
2D *(Superseded by Super string)*	point	This data is imported as one or more CAD points with coordinates (X,Y values), but not elevations (Z values).
	line	This data is imported as a line string with coordinates, but not elevations. If this data contains only one point, it is imported as a 2D point (described above).
3D *(Superseded by Super string)*	point	This data is imported as one or more CAD points with coordinates and elevations.
	line	This data is imported as a line string with coordinates and elevations. If the line data contains only one point, it is imported as a 3D point (described above).
4D *(Superseded by Super string)*	point	This data is imported as one or more CAD points with coordinates and elevations. A text string naming each point is ignored.

	line	This data is imported as a line string with coordinates and elevations, and a text string for each named point on which the line string's segments are based. The text string name is used as the ID for its respective named point. The line string's segments are dependent on the location of the named points on which they are based: if a point is moved, the segments that use it changes accordingly.
Alignment *(Superseded by Super alignment)*	na	This data is imported as a PI-based (Point of Intersection-based) alignment with horizontal and vertical components.
Arc	na	This data is imported as a 2D or 3D line string (based on your data).
Circle	na	This data is imported as a 2D or 3D line string (based on your data).
Drainage *(Advanced Import)*	point	This data is imported as manholes which are created in the MSI manager based on the shape and size defined in the 12d file. Type Pit_v2 pits are imported at the first level of the pit but not the riser section.
	line	This data is brought in as Utility pipes. ***Note:*** *Pipes are set to "calculated" End type by default but can be edited in TBC after import.* The setting **Create lines for drainage pipes** is an option to create a 3d line string from centre to centre of the manholes applying the pipe invert level at the centre of manholes and placing them on a new layer of the same name with *_lines* as a suffix. ***Note:*** *Pipes that are designed as doubles using a single centreline are not supported and will import as a single.*
Interface	point	This data is ignored; no points are imported.
	line	This data is imported as a line string.
Pipe *(Superseded by Super string)*	point	This data is imported as a point
	line	This data is imported as a line string.
Pipeline *(Superseded by Super alignment)*	na	This data is imported as a PI-based (Point of Intersection-based) alignment with horizontal and vertical components.
Polyline *(Superseded by Super string)*	point	This data is ignored; no points are imported.
	line	This data is imported as a 2D or 3D line string (based on your data).
Text	na	This data is imported as 2D CAD Multiline text. The 'world size' value is used as the 'ground' text height. No paper text height is imported.
Super	point	This data is imported as a point if it has a "Vertex ID" and as CAD points for all other string point data. There is an option **String point type** in the settings that allows you to import string points as points instead if required.
	line	All Super strings are brought in as line strings. This is now the main format for all 2D,3D, 4D, Pipe and Polyline strings out of 12d.

		▪ If the data does contain arcs, it is imported as a 2D or 3D line string (based on your data). If a point data block is defined, there is the option in the settings to create points on nodes. The line string's segments are associative with the location of the named points on which each segment is based. ▪ If the line data contains only one point, it is imported as a CAD point. All spiral segments on are imported as straights. Vertex and segment text are imported and can be displayed as text depending on your import setting. Attribute data is imported except "segment Attributes". String Attributes come in with the line string and Vertex Attributes come in on points if the **Create SuperString points** setting is on. The setting **Pipes from SuperString Pipes** is an option to create the 3d pipe object as well as the line string if the data exists and is placed on a new layer of the same name with *_pipes* as a suffix. During import a pipe deflection test is done on the data to isolate poor geometry strings and they are placed on their own layer named *_Check_Geometry* for review. Vertical pipes will be nudged by 1mm off vertical on imported so they can be displayed.
Super_alignment	This data is imported as a segment-based horizontal alignment and a PI based vertical alignment. The pipe diameter value is used if the setting, **Pipes from SuperString Pipes** is checked to create the 3d pipe object and is placed on a new layer of the same name with *_pipes* as a suffix. The alignment string attributes are imported if available. ***Note:*** *Nonstandard transitions are imported as straights and are shown in the warning message with details.*	
Tin	This data is imported as a 3D surface with 'internal data'. All triangle edges are imported as internal break lines. All vertices that are not used by surface triangles are ignored. ***It is recommended that when exporting a surface from 12d you do not use the "Output full tin" option. It is also recommended to set the "Duplicate point tolerance" in the Surface Project Settings to 0.001mm. This can now be done at the bottom of the 12d import pane.*** ***Note:*** *Internal data is data that is embedded in a surface on Import. It cannot be edited in this program. External data includes objects that have been added to a surface as members. They influence the surface's shape and can be edited or removed.*	
Super Tin *(Advanced Import)*	This data will be imported and turned into a "*Composite Surface*". If the Super tin contains tins using the "Remove" mode, they will be ignored and flagged at import. ***Note:*** *If the composite surface does not form properly try recreating the surfaces that are being used in the composite surface within TBC using the original surfaces as the members for each surface.*	
Trimesh *(Advanced Import)*	This data is imported as a 3d BIM object. It is also displayed in the "BIM Data" section of the project explorer.	
Image Files *(Advanced Import)*	Images attached to points and lines will be imported and shown in the "Media Files" folder in the project explorer. Images attached to lines in 12d will have points created for them to attach to in TBC. Plan Images shall be drawn in the plan view of TBC. ***Note:*** *Images need to be in the same folder as the 12da file using them.*	
Non-importable Data		
▪ Styles ▪ Faces		

❖ Extra Options for the **Advanced Import** are the ability to set import parameters as follows below.

Import setting – This is default layout, which is also what you get when using the drag and drop method unless you change a setting while importing through this pane and then any subsequent drag and drop import will use the last settings applied and the import pane will hold the last used settings as well until changed again.



Layer prefix: Ability to add a prefix to all the layers upon import.

Layer group: Ability to combine all new layers into a new group.

Surface prefix: Ability to add a prefix to all surfaces upon import.

String point type: Import 12d point type data as CAD Points or Points. If the point in 12d does not have a "Point ID" then it will come into TBC as a CAD point unless this is set to "Point".

Create SuperString points: Ability to turn off importing the point data block on every 12d super string node. Only needed if the super string has vertex attributes.

Use point name for code: Ability to use the 12d point name as the feature code name in TBC.

Pipes from SuperString Pipes: Ability to create a utility pipe string in TBC from a 12d super string with diameter and justification. Data placed on a new layer of the same name with *_pipes* as a suffix.

Create lines for drainage pipes: Ability to create a 3d line string when importing a 12d drainage string from centre to centre of the manholes applying the pipe invert level at the centre of manholes. Data placed on a new layer of the same name with *_lines* as a suffix.

Single vertex SuperStrings as points: Turns single vertex 12d string types into points.

Ignore small triangles: Stops the import of tiny triangles from 12d that are less then $1mm^2$ and can cause problems to the surface and not import properly.

Duplicate alignment suffix: When importing a file, it checks if the project currently has alignments with the same name and will add a suffix to the alignment name as set in the settings by the user.

Create vertex text: Ability to create text from 12d vertex and segment text data and display on screen.

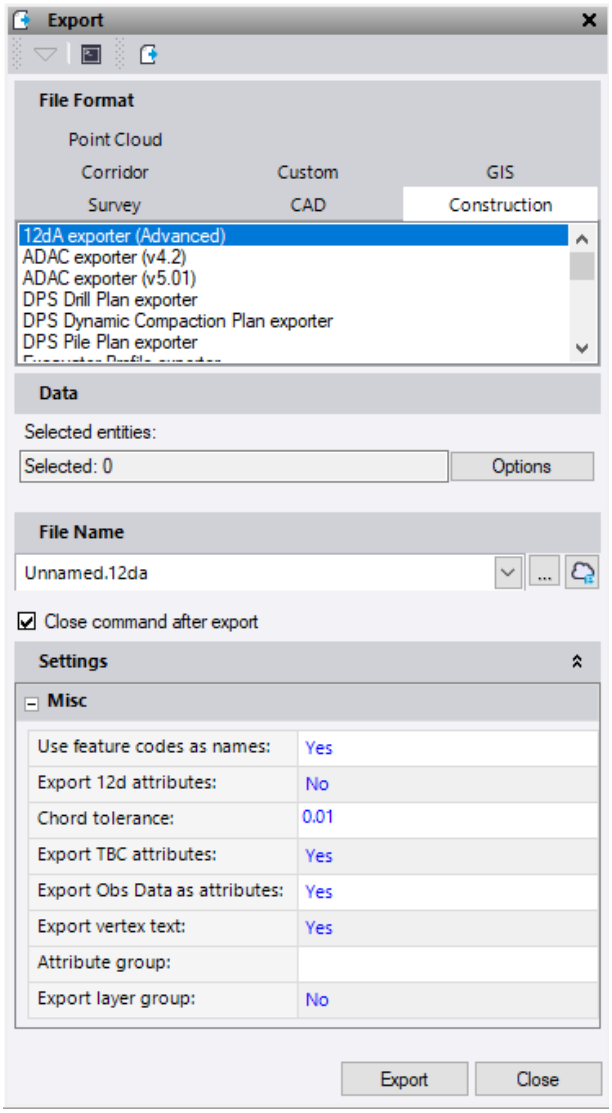
Vertex text height: Select the height value for the text created for the Vertex and Segment text. This can be changed in the properties after import.

Vertex text layer suffix: If the option to create vertex text is used the text will be placed on a layer with the same name as the data it came from but with a suffix of the user's choice.

Duplicate surface point tolerance (mm): This is the same setting as is found under the Project Settings>Computations>Surface. Its value will be applied to the 12da file imported regardless of what the project is set to.

Note: *At the completion of an import if there are any errors or warnings to report a box will pop up on screen. Please review these to determine if they affect the data that was imported.*

Export 12da Files



Process:

1. Select **Export** in **Home > Data Exchange.**
2. Click the **Construction** tab.
3. Select **12D Exporter** in the **File Format** list.
4. Click in the **Selected objects** box and pick the objects that you want to include in the export from a graphic view, or click **Options** and choose a selection option in the list.
5. Type a path and file name for the exported file in the **File Name** box or click the **Browse** button to browse for a location and specify a file name. *Note: By default, the exported file is given the name of your project.*
6. If you want to export another file after this one, uncheck the **Close command after export** box.

Click **Export**. The selected data is exported to the file you specified.

***Note**: If you do not have a licence for the ANZ Toolbox you will only have a **"Basic"** exporter and no extra settings.*

- Extra Options for the **Advanced Export** only are the ability to set export parameters as follows below.
  - **Use feature codes as names** allows points in 12d to have the name of the feature code instead of the Point ID.
  - **Export 12d attributes** allows any attributes that may have been imported from 12da files previously to be exported out again. This is defaulted to No unless you specifically need the function.
  - **Chord tolerance** applies a chord to arc tolerance to any linestring exported with “Vertical Tab” geometry to linearise it to allow import into 12d. Also is used for any horizontal geometry that is linearised. Default setting is 10mm.
  - **Export TBC attributes** controls whether attributes that are built in TBC are exported in the 12da file.
  - **Export Obs data as attributes** option allows the export of certain quality and instrument data from the GPS and TPS observations for points to be sent out as attributes in a “Field Data” attribute group.
  - **Export vertex text** controls whether the vertex text attached to the data is exported in the 12da file.
  - **Attribute group** allows the exported attributes to be grouped when using them in 12d. Enter a name of the group required to group them or leave blank for no group.
  - **Export layer group** will add the layer group that the layer is stored under in TBC to model information so that the same layer group will be set in 12d V15+.
  - Other Advanced exports that do not require an option to be checked.
    - Blocks will now be exported as strings for import to 12d. ***Note:*** *If there are many blocks in the data this will slow the export process due to the conversion required. Also, the name of the block will be lost in the exported data.*
    - Utility lines created in TBC will export the pipes as pipe super strings to 12d and the manholes and junction boxes will be exported as a Trimesh.
    - IFC Objects will be exported as a 12d Trimesh.
    - Images associated with points will have their connections exported in the 12da file and all the used images exported to the same location as the 12da file.