



Advance Steel to Advance Design Tips and Tricks for a Good exchange.

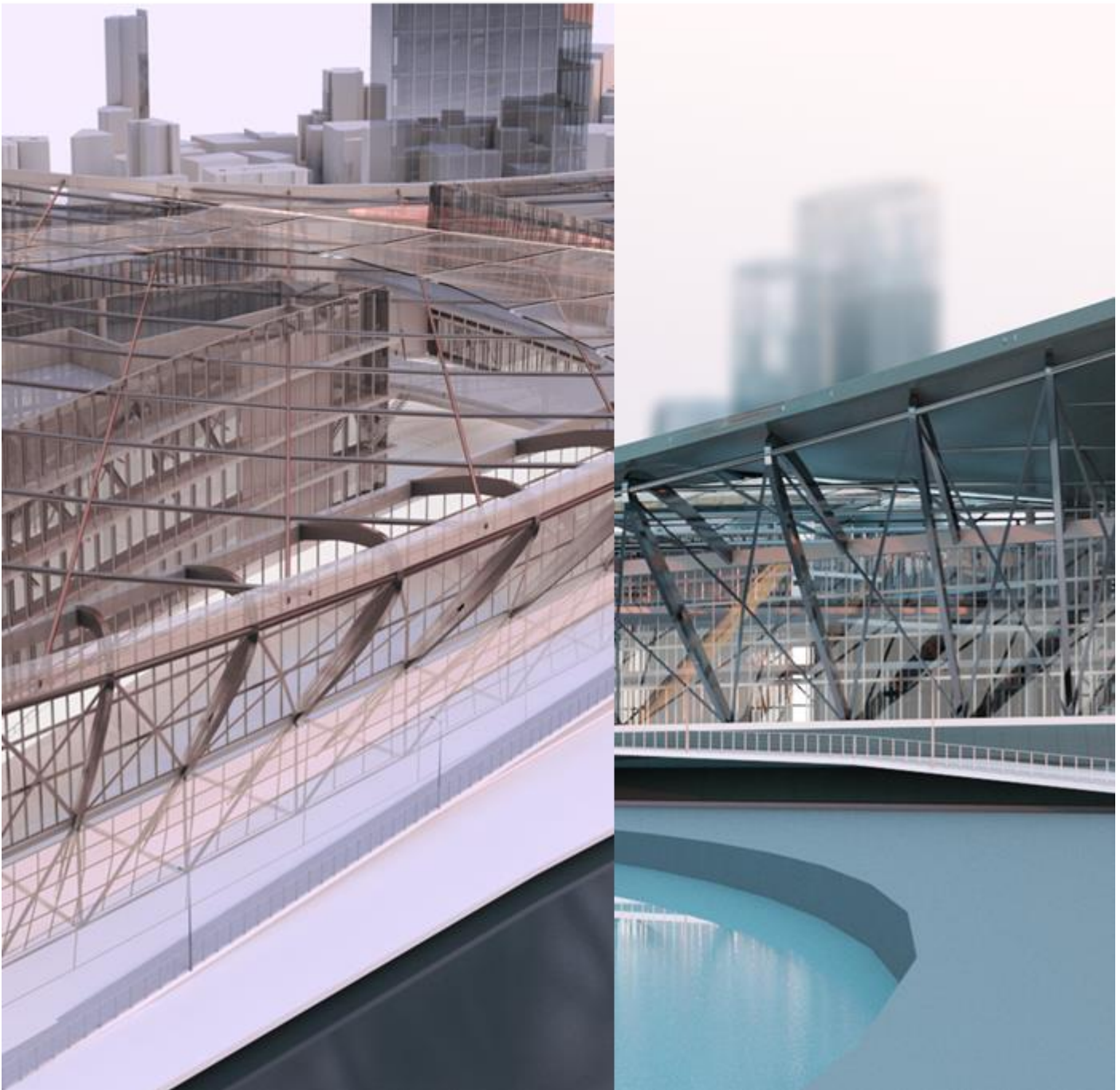


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Introduction

In this document we outline some key points to aid in the transfer from Advance Steel to Advance Design to aid the process of using the GTCX from Powerpack for Advance steel and Graitec BIM in Advance Design.

TOP TIP: WCS: model around the origin in Advance Steel, this way import is easier into Advance Design, as it then works about the same origin, work planes and predefined model views.

TOP TIP: Use Synchronisation, to co-ordinate the models between the platforms, rather than import to bring back only the needed changes to the AS source model. May sound basic to say this but **expect the user will try to import the whole model again.**

The premise of the exchange

Please remember the **premise is the model is starting as a schematic concept in Advance Steel** to be driven to Advance Design for Analysis. At this stage we are *not looking to be able to fully detail the model for the initial transfer into AD*, this will come later in the downstream detailing of the project.

AS Management tools.

If you need to change the default MT profile, then create a new one and set it to current.



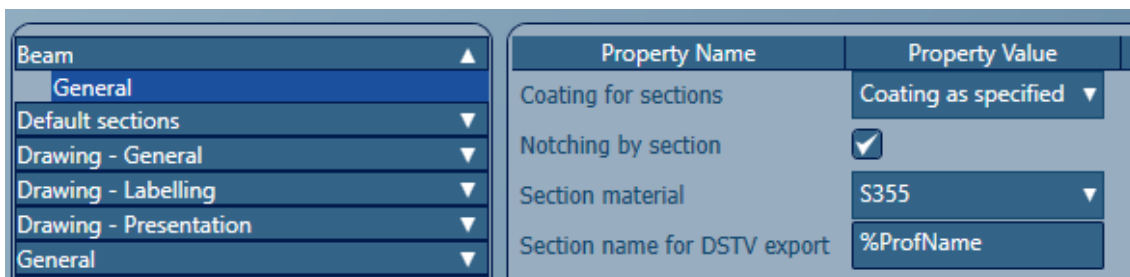
(Assume that AS Techs know how to do this)

Default Material Grade

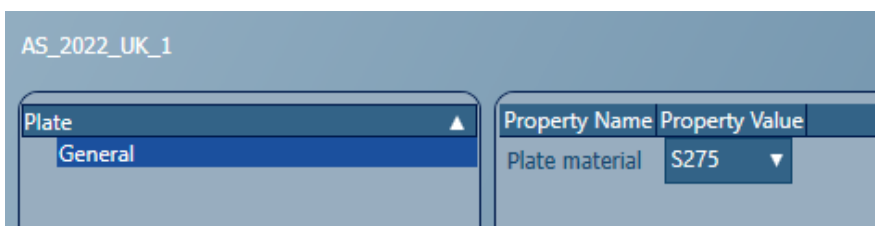
Set this to a **known Material in AD**, that is currently present in that system, this way you **avoid complicated mapping and sync issues. For the purposes of a demo**

For this example (from current UK AD config) other counties need to review separately:

- **Beams: S355**



- **Plates: S275**



Reason: for UK system in AD the Default Materials currently is S355 and S275

Modelling for Transfer to analysis. (AS to AD)

In this section we will offer advice on how to approach the modelling of a Structure within the AS workspace for transfer to the AD workspace.

Conceptual scheme.

When we position the interoperability between the platforms, it is important to present that the initial model in AS and how it is modelled may not reflect the final version used for detailing.

Why is this important, well detailing and analysis have different requirements to achieve their results and it is important to respect each of those and find a middle pathway between them.

For this example, we are starting in Advance Steel and there are some basics that can be applied to quickly achieve a Schematic model within AS.

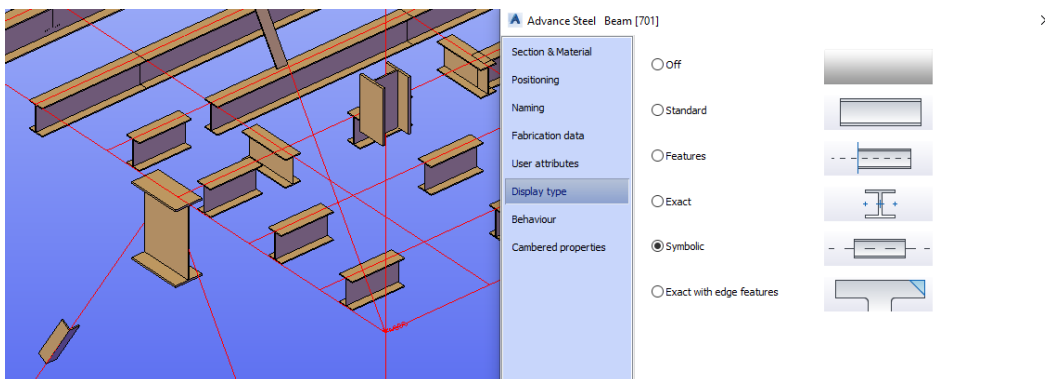
Manually modelling

Anyone familiar with AS will know that the system line placement is very important to how some of the macro tools interact with the beams, not going into detail but its placement can affect these, so even at this initial stage it is important to consider this as a basic.

System line.

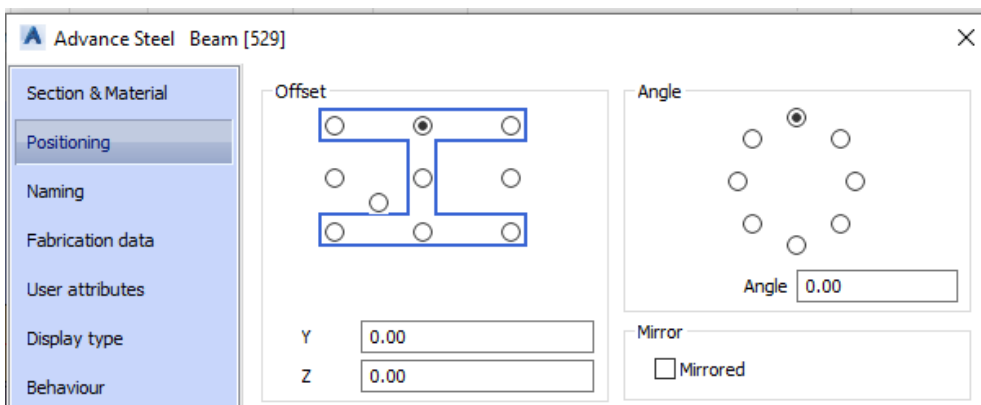
How a model is created at a basic form is important, for this best practice is to try and make sure that a model have system line to system line at nodal intersections.

Below is an **extract from an AS model**, where the practice of **placing the system line to the common intersecting nodal point**. (*Beam body turned off for clarity*)



Placement of the system line within the section body is also important to AS, but AD will use the centroid position for their processing, with AD there are options to incorporate the eccentric from the centroid location.

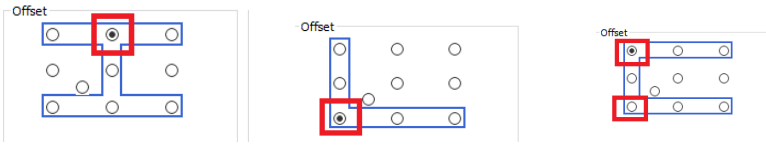
Typically, AS users are trained to place the system line in certain locations to allow for integration with the various macros and tools of AS, therefore Respect of these is needed for the transfer.



Examples of system line placement in AS.

For Planar beams placement relative to levels: SL:

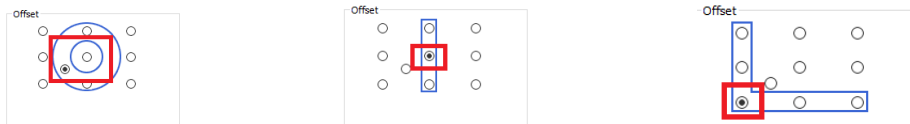
I Beams SL Top –Middle, **Angles** SL Heel of profile, **Channels** SL Top corner.



Columns /Vertical elements: SL: Middle for **I Beams/ Tubular elements** (Can be centroid depends upon shape)



Bracing: Tubular Sections: SL Middle, **Flat Section:** SL Middle, **Angle Section:** SL Heel of the angle.

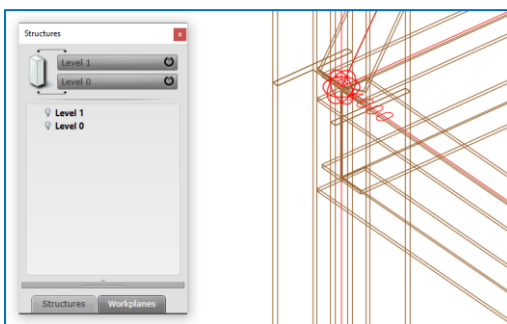


Note: this is not an exhaustive list and some allowances must be made for workng with special shaped profiles and their required alignment within the context that they are being used.

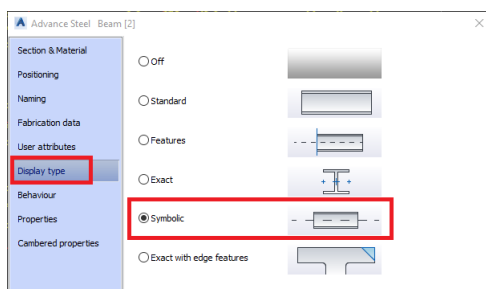
System line & Advance Steel Levels and element attachment to level.

Within AS the software provides options to create designated levels within a Structure of the model, these levels can be changed and controlled within the Project explorer of AS. These Levels allow for the attachment of the elements to them, for Beam type that attachment reference is the System line and Nodal points at start and end of the System reference line.

A level also has what is called a model view, this view is set to view directly at the level, so with the system line towards the top of the required section, whilst modelling the user sees the Top of Steel level and beam presentation.



Tip: To see the System line easily within a AS model change the beam presentation to ‘Symbolic’

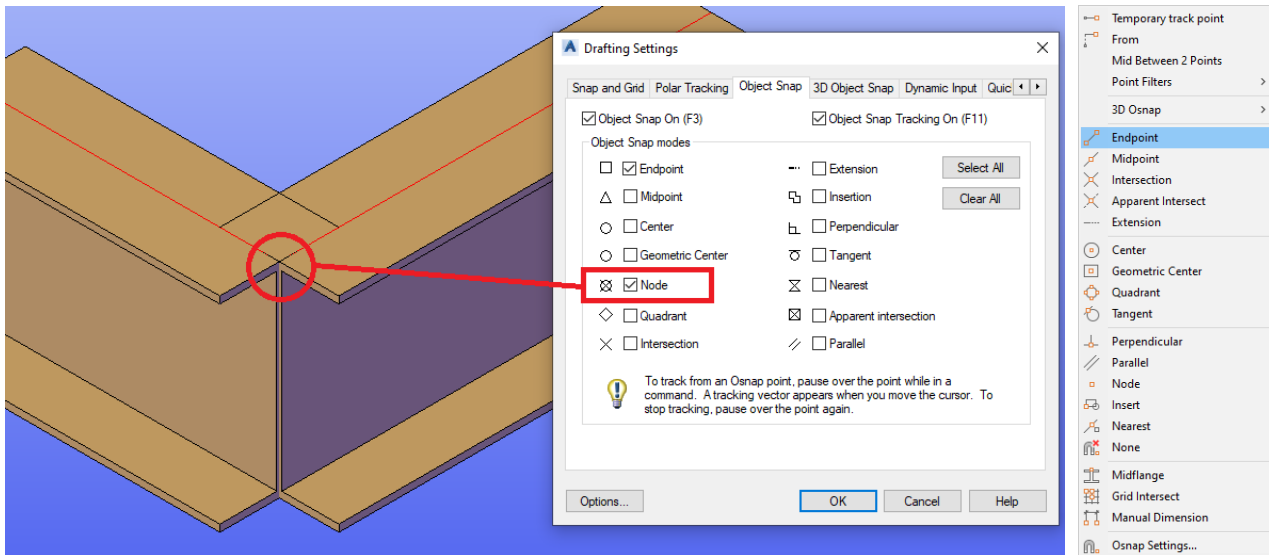


Modelling sectional elements.

Although we are in the detailing space of AS, if the user intends to go to the Analysis Space of AD, then the Steel technician should be considerate of this requirement at the Schematic Stage of the project.

Snap points type setting.

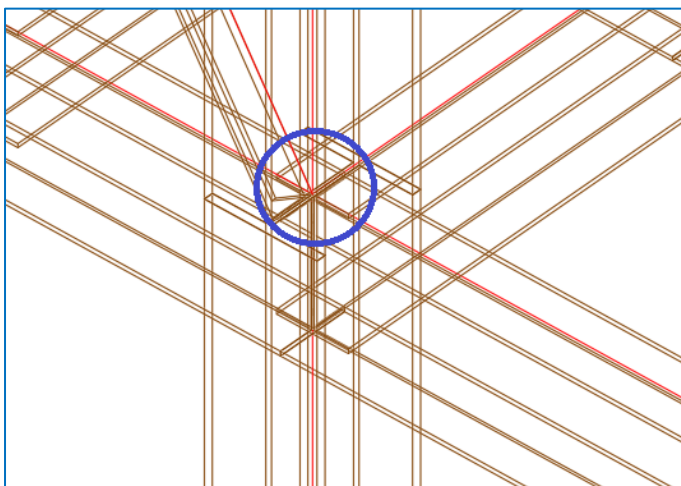
When working in AS, if doing just schematic modelling, the recommendation is to use the 'Node' snap option, this way it is easier to snap Node to node, other options are available via the contextual short cut menu. (*Shift + Right mouse click to access*)



Modelling 'Node to Node',

what does that mean, well when trying to create a manual structure aligned with the **internal object system line placement**, also we must consider the **system line node to system line node**, where every possible try to align these at these early stages of the project.

Why: to be considerate of the Analysis function required to for convergence of the nodes for the assignment of loadings at these intersections.

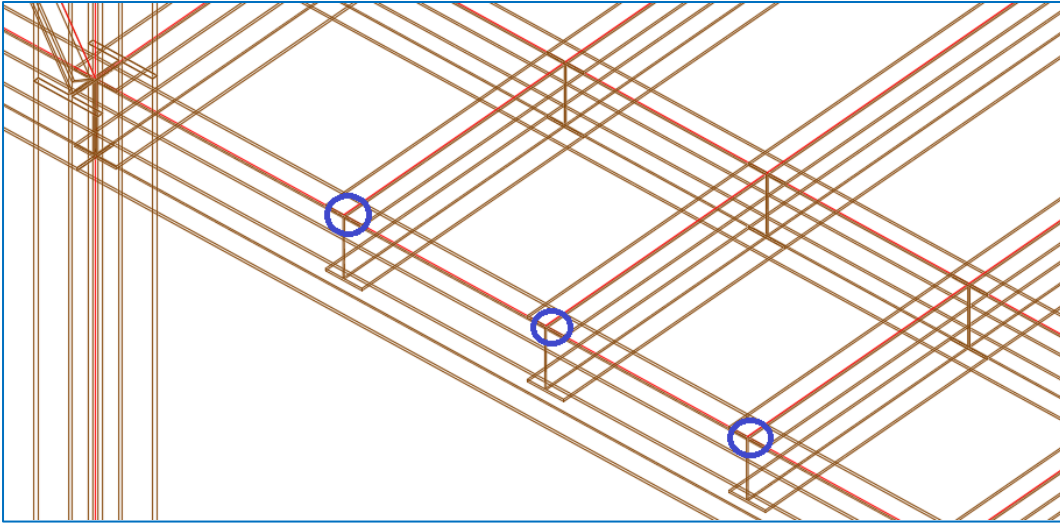


Modelling 'System line to System line'

What does this mean, in the manually modelling of the Structure, typically we would try to **make a system line go to a system line at a Beam-to-beam mid span** intersection.

Why: on the AS side this helps with the detailing of the drawings and dimensions, but also the joint functions trim back the beam element and place components like plates etc.

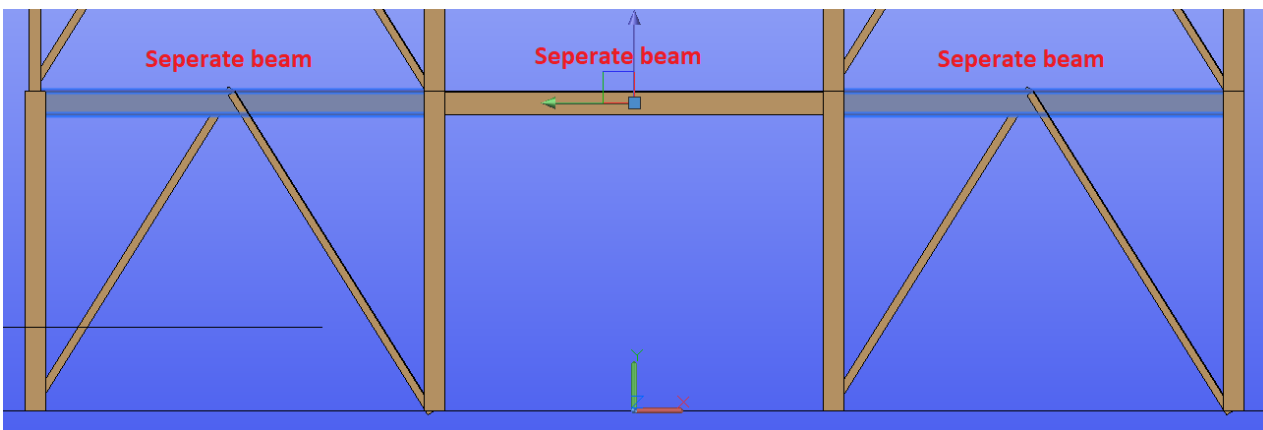
For analysis, this alignment aides in again the nodal loading between the finite elements.



Modelling Beam Spans

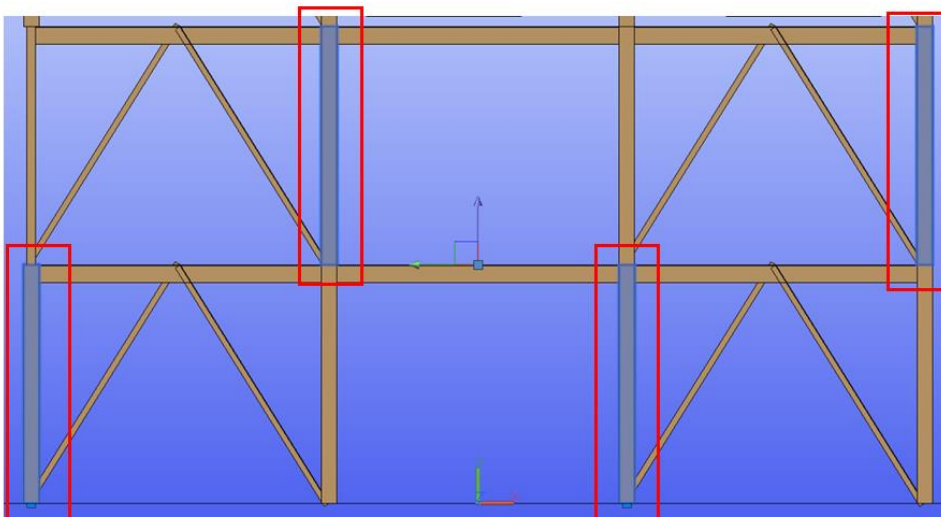
When modelling the manual placement of beams within AS, the typical idea is to just run beam continuously at the Schematic Stage, but for going to analysis a good practice is to split this at each intersecting column.

This is again for the creation of nodal flags within AD and loadings being applied during the design process.



Modelling Columns – Split at main levels

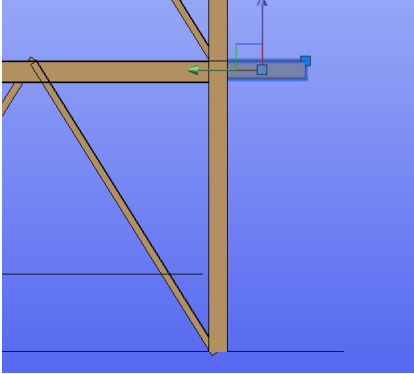
When working in multi-level structures, split the columns at the main levels, again this is need for analysis.



General note: although at the schematic stage, the model may not reflect what is required for detailing, this can be addressed later within the detailing process, using standard tools within AS to replace elements and merge or align and match properties.

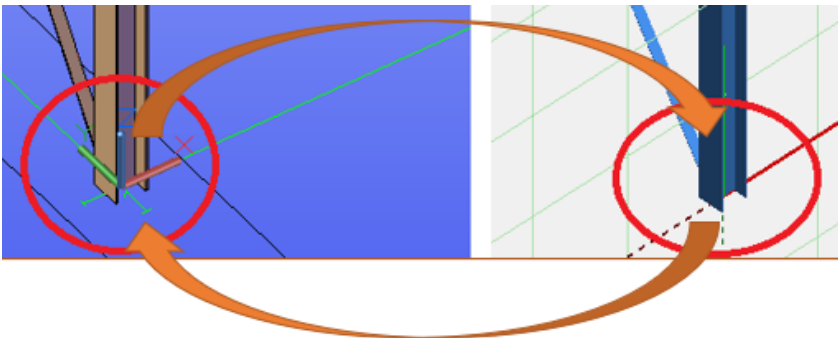
Modelling: Cantilevers

Model as separate elements, to extend from the column/main beam node point



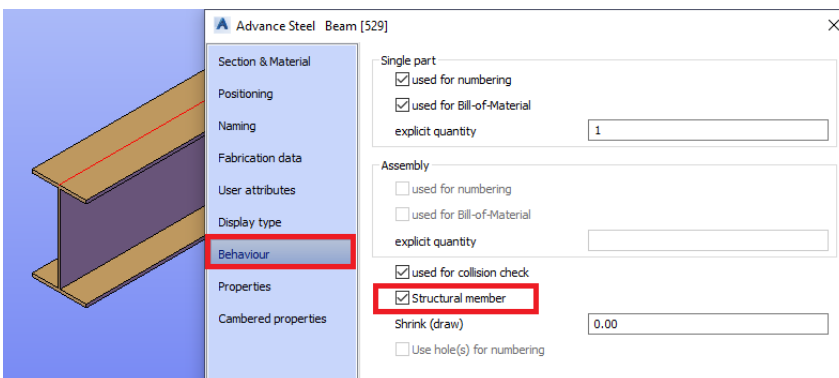
Modelling: Transfer origins

If at the schematic stage, model about the **WCS origin in AS (0,0,0)**, then when transferring it will come into **AD at the same co-ordinate reference**, making it easier to work with the predefine work planes and view of AD.



Modelling Structural Elements

When **transferring an Element from AS to AD**, it **must be designated as a Structural element**. When elements are defined by the "Structural member" property. The importation of the Advance Steel model in to Advance Design, all the **elements with a disabled "Structural member" property will be ignored**.



If an Advance Steel element is defined as a "Structural member", then this element will be imported in the Advance Design model through the BIM transfer.

Advantages Help: [Advance Design to Advance Steel Structural member](#)

Modelling: Use of the Model role

When using Advance Steel, the model role is very important, so best practice is to add this role into the object properties, if the user is manually modelling an element. If the user is using a Structural element macro, like the portal, bracing, purlins etc. and the Graitec Structural designer, then these are set by default.

[Why is it important to use model roles in Advance Steel? · Graitec Advantage](#)

In Advance Steel, the "model role" defines how members are used and influences many different settings. One example is that the part mark prefixes are assigned according to model roles.

The **most important effect of the "model role"** is the **drawing presentation. Based on the "model role", Advance Steel objects are presented, labelled, and dimensioned in different ways.** The association between "model roles" and their drawing presentation is critical to the correct drawing output.

Modelling with Levels & Beam attachment.

As previously stated, the user can attach beams to levels created within the Project Explorer, even is using the Structure designer to start a scheme, these levels (effectively Work planes)

Although elements within Structural element macros cannot be attached to levels or work planes, when the macro is removed it is possible to make that association.

Consideration even at his early Stage should be given to the Creation of a series of levels and a basic Grid, these help in the downstream processing of the model.

Autodesk Help pages

[About Levels | Advance Steel 2022 | Autodesk Knowledge Network](#)

[About Workplanes | Advance Steel 2022 | Autodesk Knowledge Network](#)

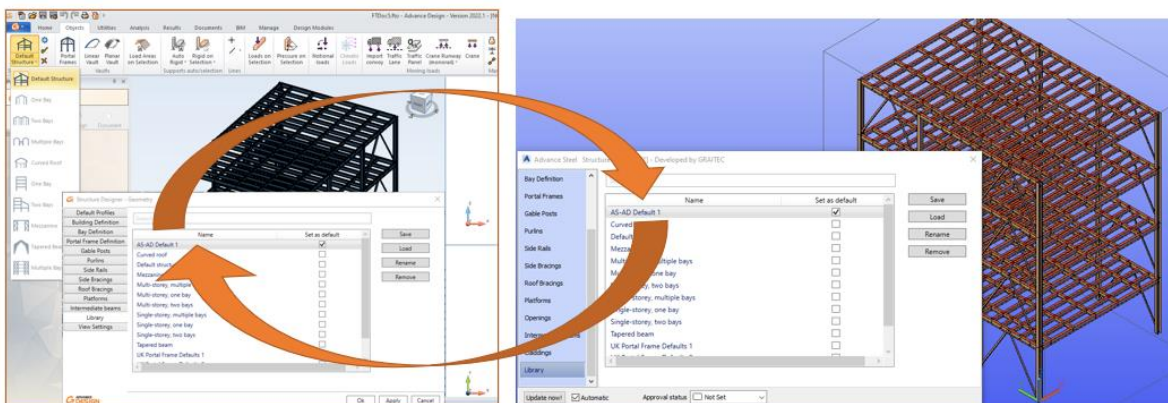
TOP TIP: Use Synchronisation, rather than import to bring back only the needed changes to the AS source model. May sound basic but expect user try to import the whole model again.

Modelling with the Structure Designer (AS/AD)

We look in section at how to work in conjunction with the Structure designer to create basic concepts schemes quickly.

Using the Structure designer can be a way to create schematic models in both platforms, allowing users to set up standards and use these as a Starting point for their concept modelling. Als this means that the either Engineer or detailer can do this to aide each other, within the design process.

The using the GTCX transfer process, changes to these basic schemes can be transferred between disciplines using the Synchronisation process within both systems.



Structure Designer Config: Set up in dialog the system line positions and section sizes relative to country.

Structure Designer Config: Set up building types.

Top Tip: Use the Structure Designer to create your basic concept models.

Tip: Need to **remove macro dialog to sync the model when returned to AS**, if the AD model is ungrouped. If grouped, then the sync will respect the SD Macro in AS.

Tip: AD – complete the macro, but to access elements you need to un-group the structure via the Model browser. E.g., to edit materials.

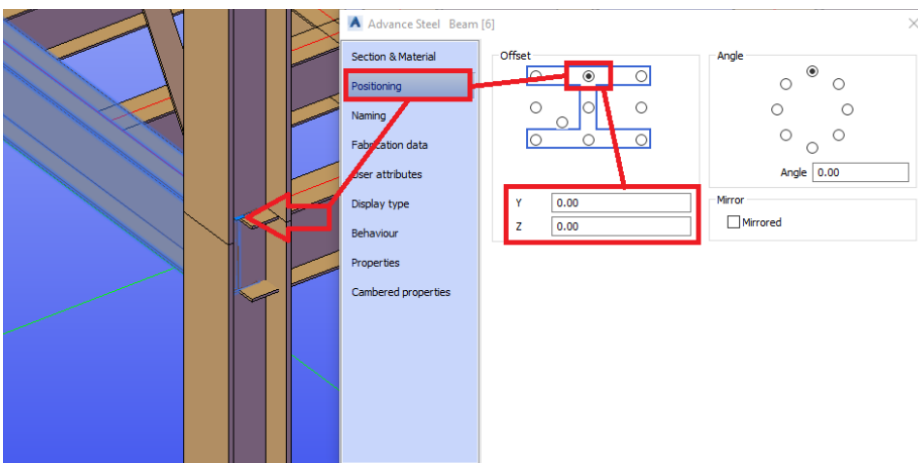
Quick and easy way to set up those basic company standards for concept modelling in both AD And AS.

Returning Model elements to AS from AD

When returning model elements from AD, there are some points to note in this process that the user may not notice, but can be simply corrected using tools within AS.

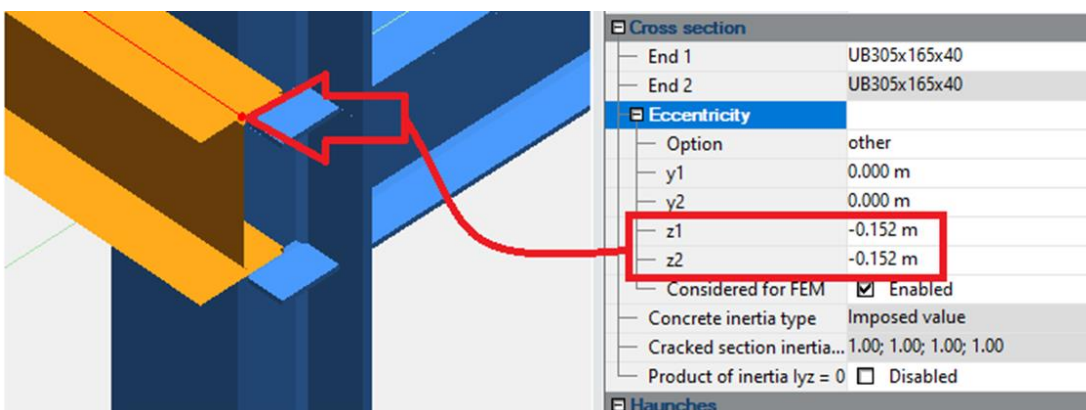
If the model was **originating within the AS platform**, and the user is **receiving changes** from the **Engineer via AD platform**, then the **best option is to use the Synchronisation approach**, to integrate and accept those changes back into AS.

One of the key changes that can be seen if the System line setting and its internal positional offsets.

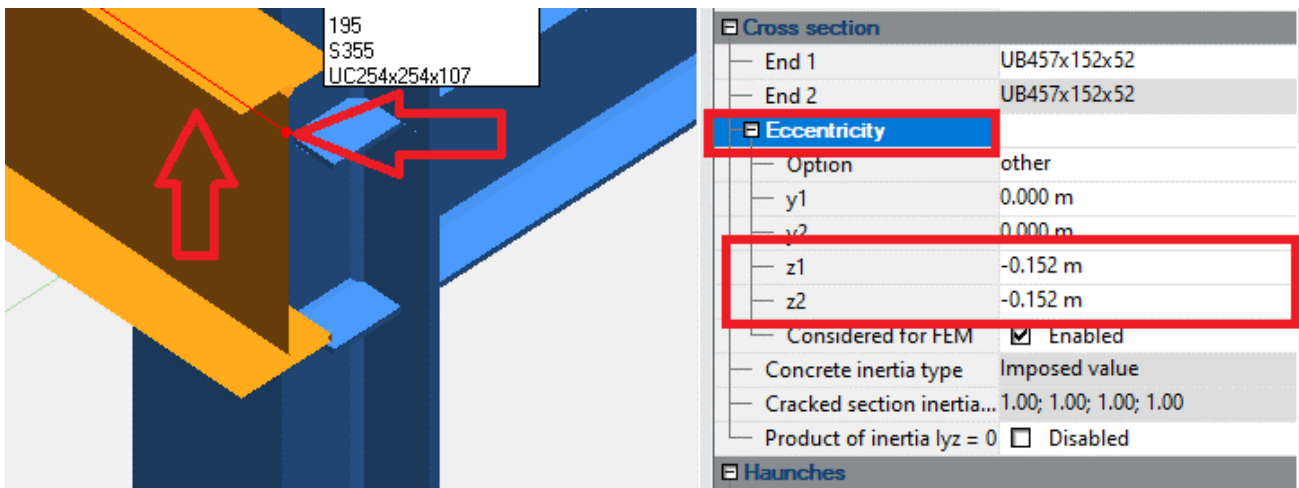


This is occurring within the import of the data into AD from AS, the system line becomes the Default reference for the analytical position. This means that the physical body relationship to the system position is now shown as a series of eccentricities, when in AD.

The eccentricities are shown relative to the centroid location of the beam shape, and thus give the appearance of the beam being in the same relative physical location.



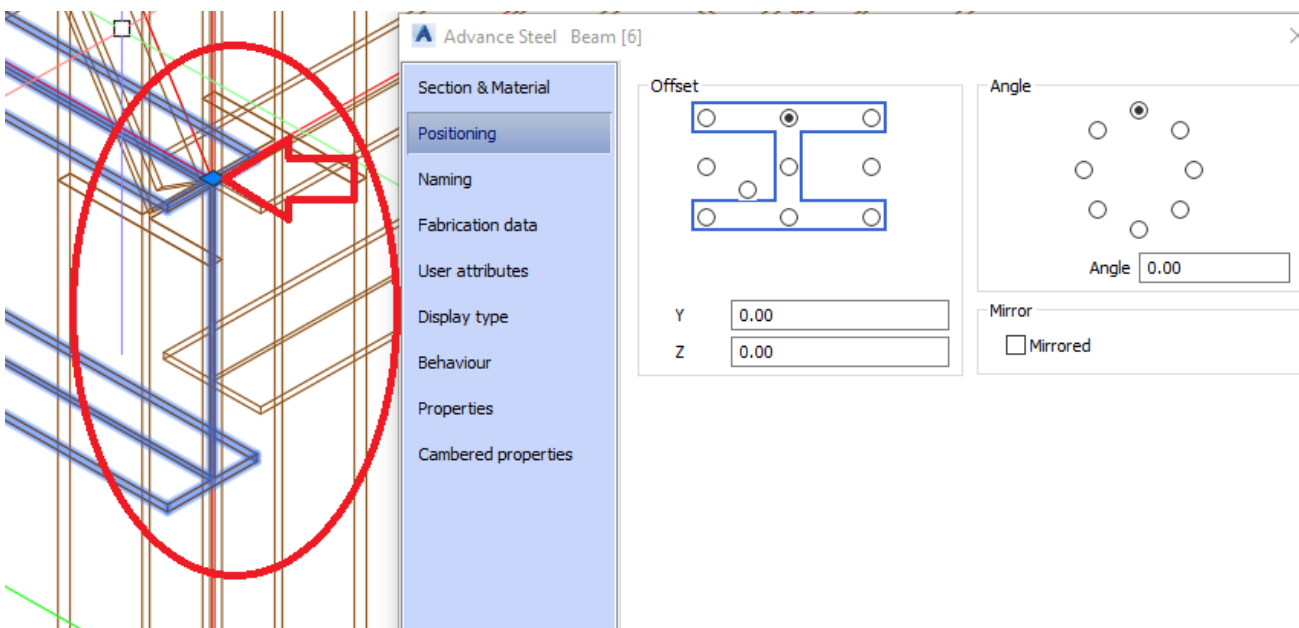
Only when a section profile is changed in the AD model, does the body of the beam move to be above this original offset position visually, the Eccentricity is still shown as the original value.



However, when the model is then returned to AS via the GTCX process and using the Synchronisation option, the element body is shown as the originating System line position.

	Decision	GTC ID	Object Type	Status	Level	Changed Attributes
[Search]	[Search]	[Search]	BEAM	MODIFIED	[Search]	[Search]
Horizontal_Beam	Keep	1168	Beam	Modified	- -	Type
Parameters	Keep	-	-	Modified	- -	Type
Name	Decision	Host Application Value		GTC File Value		
Type	Keep	UB305x165x40		UB457x152x52		

After sync option.



The **Beam System position** is maintained as it was **originally input** by the AS user, when using the **Sync process**.

Multiple line selection to set decision Value for selection Set.

When you are using the Sync option, rather than select each line and change the decision value for each, Try using this method:

Select the very first cell in the line with the Shift key + Left mouse button and then add the multiple lines

	Decision	GTC ID	Object Type	Status	Level	Changed Attributes
[Search]	[Search]	[Search]	[Multiple Selection]	[Multiple Selection]	[Search]	[Search]
+ Rafter	Keep ▾	96	Beam	Modified	- -	Type
+ Horizontal_Beam	Keep ▾	144	Beam	Modified	- -	Type

Select multiple lines via this line cell to edit all

Then select the drop down in the decision column just one line with activate

	Decision	GTC ID	Object Type	Status	Level	Changed Attributes
[Search]	[Search]	[Search]	[Multiple Selection]	[Multiple Selection]	[Search]	[Search]
+ Rafter	Keep ▾	96	Beam	Modified	- -	Type
+ Horizontal_Beam	Keep ▾	144	Beam	Modified	- -	Type

Keep
Accept
Ignore

Change to required decision value and all highlighted lines with alter to this value.

	Decision	GTC ID	Object Type	Status	Level	Changed Attributes
[Search]	[Search]	[Search]	[Multiple Selection]	[Multiple Selection]	[Search]	[Search]
+ Rafter	Accept ▾	96	Beam	Modified	- -	Type
+ Horizontal_Beam	Accept ▾	144	Beam	Modified	- -	Type

Then apply changes and confirm for these to be transferred into the model required.

Model Documentation and Reporting during the Transfer Process.

When working in multiple platforms, it is important to remember that before the user imports your model, they have no idea what it contains and well sometimes it is not always easy to have a nice transfer, as materials are missing, section/profile type are not present. When this happens it causes the user to map the incoming profile to something that is not correct, to get the model into the receiving platform or even worse they skip the mapping and well the element is not present in the transfer.

When **transferring a model**, it is **good practice to consider the transfer file as part of the overall package of data** that is sent, it is the core data file, but also the users **can also send basic schedule data of profiles, sections, and material types**.

These **schedules/ BOM lists can be reviewed prior to the import** and the **receiving user can assess** if the need to **add in a profile family or material grades** and sub grades, so that when the go to map into software, they can make a **good mapping the first time around**.

If coming from **Advance Steel using the BOM palette** and a **basic materials list**, a list can be generated and saved to a PDF form in a few moments.

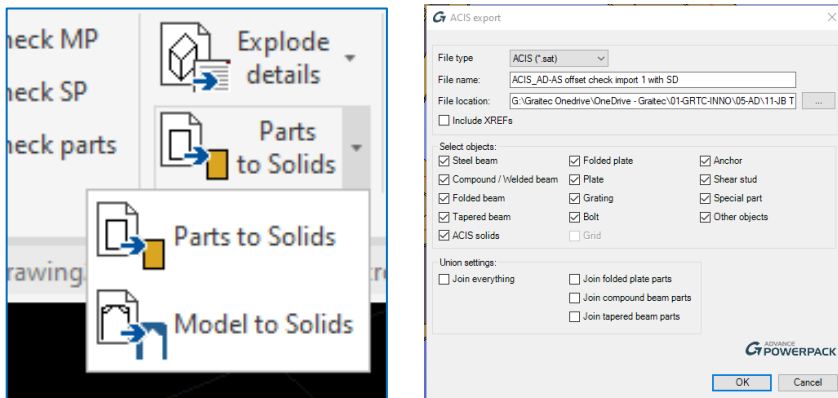
If coming from **Advance Design, reports can be generated** to accompany the transfer file.

Model export to accompany the transfer file.

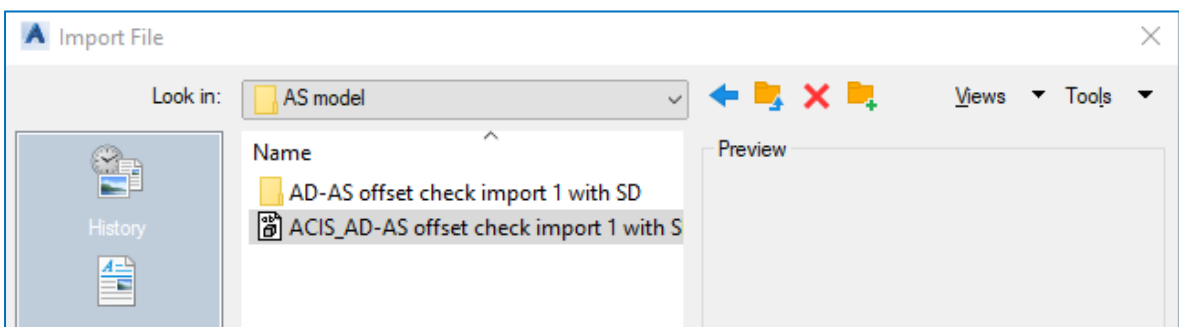
A good practice that we have found working with other platforms when we transfer the model, is to create a copy of the model in a basic format that can be seen in a basic viewer program. (Autodesk have several online viewer solutions) or in a basic CAD package. This can be in DXF, ACIS Solids or SAT format.

Advance Steel via Powerpack Model to Solids

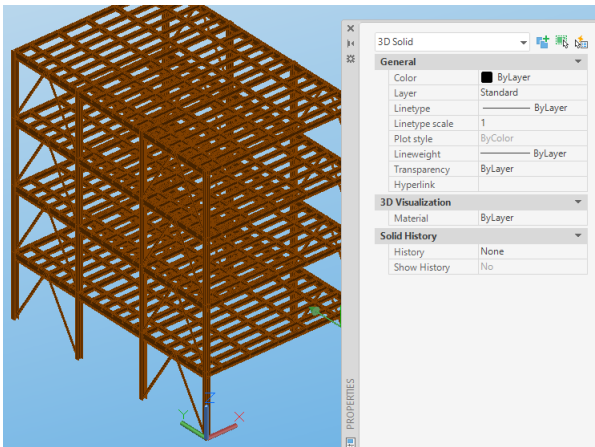
To do this we have tools in the powerpack for Advance Steel, The Explode commands, with the ‘Model to Solids’ command.



The resultant file is a *.sat file, this can then be imported into a DWG file, via the Standard AutoCAD command for ACIS-SAT import.

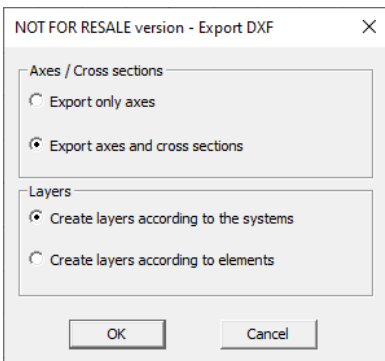


The resultant file can then be saved and used and sent along with the SAT file, for a user to open in plain Autocad to again visualise the model.



Advance design DXF export options.

Similar within the Advance Design Bim ribbon there are tools to export and one of those is the DXF option. With the Settings of Export Axes and Cross Sections, the physical image of the model and its context can be shared with Detailers and users of CAD systems.



The DXF file can be opened in for example AutoCAD (or advance steel) and seen visually how the model is intended to look, this can give a **good visual Presentation of the model prior to the import** and can be used if needed to act as an **underlay reference**, if there are issues in the transfer.

The DXF can be save as a DWG file as well for later reused and co-ordination.

