



FRAMECAD Structure Updates and How To's

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1 Version 11.1.7.0

1.1 UPDATE STICK MEMBERS (MU)

This command has taken over the old MS (Member Re-square command) and now includes the updating of truss chord members. It also re-populates missing member connection screws.

Commands:

Global name:	_MEMBER_UPDATE
Local name:	MEMBER_UPDATE
Default Shortcut:	MU (Member Update)
Space:	Detailing Space

Purpose:

Updates truss chords and webs, joist webs or wall lintel webs after editing.

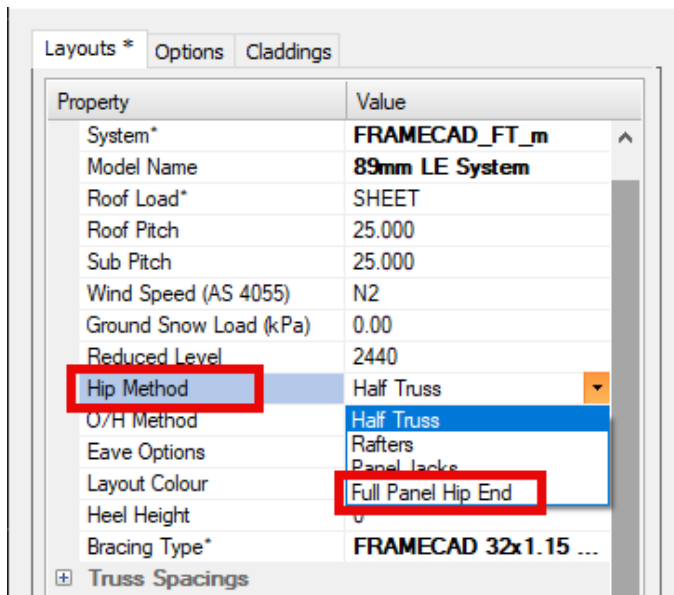
Re-populates missing member connection screws in trusses, webbed joists and walls.

Process:

- Type MU then press Enter.
- Select a member to update.
- Right click or press Enter to finish.
- All other webs in the frame (and chords in trusses) will also be updated and member connection screws re-populated.
- Note: The end of a web must be located within the edge of the member it is connected to before the MU command will work.

1.2 FULL PANEL HIP END OPTION

Option added to TSET - Layout Options - Hip Method which allows for use of a Full Panel Hip End. Full roof panels would normally take the place of rafters on the hip end.



Note that this does not detail the roof panel, it only removes any hip end trusses or rafters. Therefore, you will only get the truncated trusses. The horizontal top chords of those trusses are set down to suit a raftered hip end.

Also note that smart panels do not transfer any loads through to any supporting frames.

1.3 VIEW MAKE (VM) REPAIR OPTION

View Make (VM) now has a 'Repair' option added to it which will repair views that have been added, deleted or moved by the user and maybe causing issues.

- Deletes vacant views and updates any out of sequence remaining views.
- Resets tabs with Walls, Trusses or Joists to the correct type.

Command:

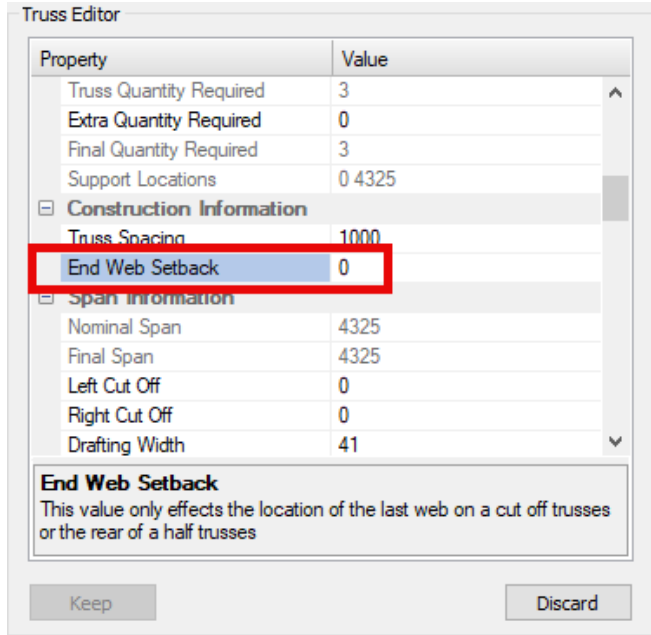
Command: VM

Repair or _Delete or enter new view name to make a view...

2 Version 11.1.6.0

2.1 TRUSS EDITOR – END WEB SETBACK

Option added to the **Truss Editor – Construction Information**, when listing a truss, which allows for the end vertical web at the high end of half trusses or the cut-off end of stop ended trusses to be edited to a set distance from the end of the truss.



The screenshot shows the 'Truss Editor' dialog box. It contains a table with 'Property' and 'Value' columns. The 'End Web Setback' property is highlighted with a red box and has a value of 0. Below the table is a text box explaining the property, and at the bottom are 'Keep' and 'Discard' buttons.

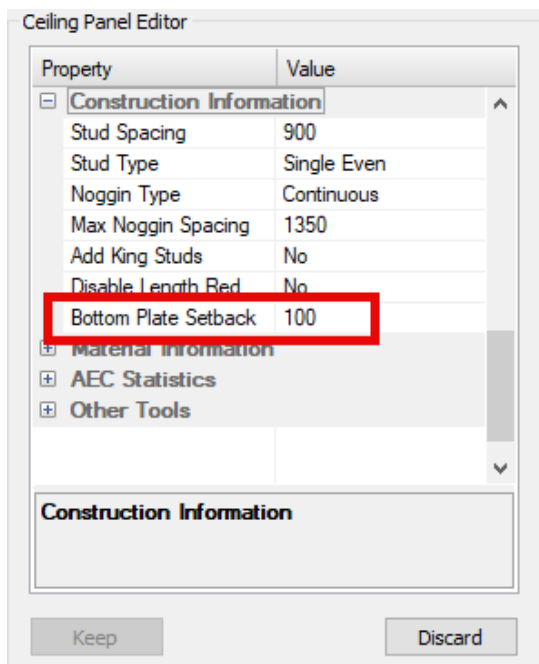
Property	Value
Truss Quantity Required	3
Extra Quantity Required	0
Final Quantity Required	3
Support Locations	0 4325
Construction Information	
Truss Spacing	1000
End Web Setback	0
Span Information	
Nominal Span	4325
Final Span	4325
Left Cut Off	0
Right Cut Off	0
Drafting Width	41

End Web Setback
This value only effects the location of the last web on a cut off trusses or the rear of a half trusses

Keep Discard

2.2 SMART PANEL BOTTOM PLATE SETBACK

Option added to the Smart Panel Editor – Construction Information which allows for the bottom plate to be offset into the panel by a set distance.



The screenshot shows the 'Ceiling Panel Editor' dialog box. It contains a table with 'Property' and 'Value' columns. The 'Bottom Plate Setback' property is highlighted with a red box and has a value of 100. Below the table is a text box explaining the property, and at the bottom are 'Keep' and 'Discard' buttons.

Property	Value
Construction Information	
Stud Spacing	900
Stud Type	Single Even
Noggin Type	Continuous
Max Noggin Spacing	1350
Add King Studs	No
Disable Length Bed	No
Bottom Plate Setback	100
Material Information	
AEC Statistics	
Other Tools	

Construction Information

Keep Discard

This is useful when the panel is used on the roof and forms the eave overhang. Setting the bottom plate back in allows for the fascia brackets to be easily attached to the protruding stud (rafter) members.

3 Version 11.1.1.0

Important Note: Because of the major changes with stick material now being represented as custom entities, Structure v11.1 is not data-compatible with Structure v9.2. Therefore, jobs that have been started in v9.2 must be completed in v9.2 and jobs started in v11.1 cannot be reverted back to v9.2 for editing.

If multiple people are working on the same job, then they must all be running the same version of the software.

When installing v11.1, you should not uninstall v9.2 right away. Both versions of the software can be run independently of each other so work can be continued on jobs that have already been started in v9.2.

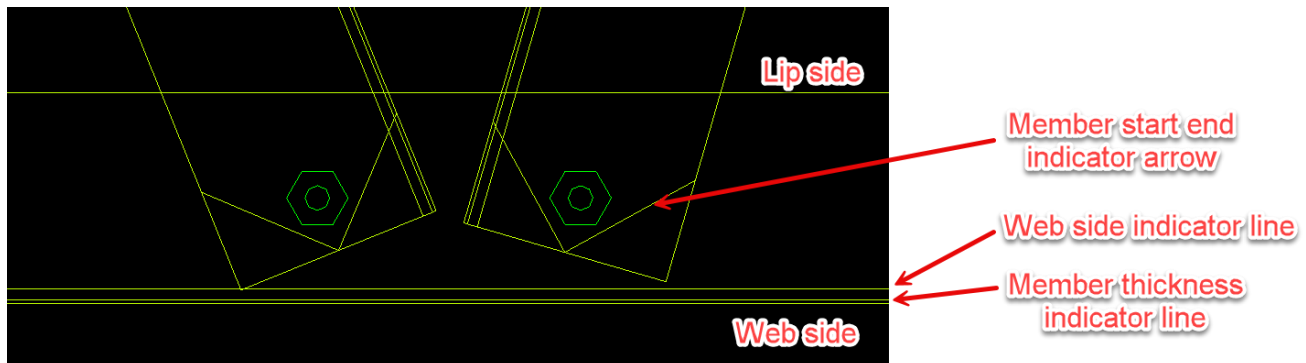
In Structure v11.1, it is recommended that you do not have both the centre snap and the perpendicular snap on at the same time.

3.1 CUSTOM ENTITY MEMBERS

Framing members are now custom entities. From a user perspective, framing members are now a solid entity rather than a polyline which allows you to visualise the orientation and direction of these members easily. They will also not distort out of shape when manually editing them. Other reasons for doing this is purely for software compatibility and future development purposes.

In the shallow axis (flange side) view, all framing members now show a double line along one edge to indicate the webbed side of the member, and a single line along the other edge which indicates the lipped side of the member. There is also an arrow indicator at one end which indicates the start end of the member (or the end that comes out of the machine first, i.e. the end that has the member information printed).

The webbed edge of the material also displays a third line indicating the actual material thickness.



3.2 ABSOLUTE TRUSS SPACING DIRECTION OPTIONS

TSET – Truss Spacing Types – Standard Spacing Type

Three options have been added for absolute truss spacings which allow for trusses to be absolutely spaced with the remaining gap at one of the following:

- remaining gap at the centre of the truss layout block
- remaining gap at the starting end of the truss layout block
- remaining gap at the finishing end of the truss layout block

3.3 BEAMS IN MODEL SPACE 3D

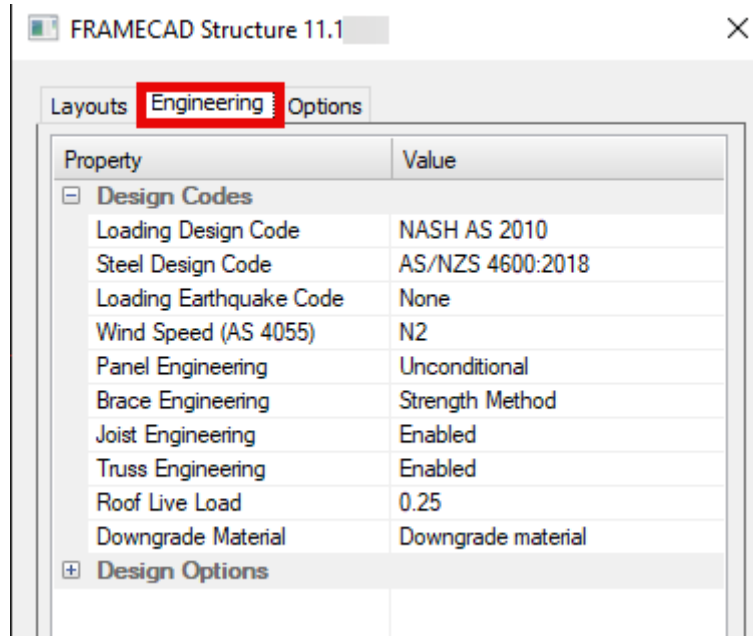
HRS beams input into the layout now show the actual shape when sending straight through to the Model Space 3D without needing to be detailed first.

3.4 BOTTOM CHORD RESTRAINT SPACING OPTION

There is now an option when listing a truss (Truss Editor – Effective Length Factors) to be able to change the bottom chord restraint spacing on individual trusses if required.

3.5 BORDER SETTING ENGINEERING TAB (BSET)

The Engineering information in BSET has now been moved to its own tab.



3.6 DEEP AXIS/BACK-TO-BACK TRUSS LAYOUT DIRECTIONS (TSET)

Allows the user to set the orientation of LC (Deep Axis/B2B) truss systems on a truss layout plan prior to input. The settings for this can be found in **TSET – Layouts – Truss Directions**.

The '**Truss Face Inwards**' options will have the webs of the trusses facing towards the centre of the roof block.

The '**Truss Face Outwards**' options will have the webs of the trusses facing towards the ends/corners of the roof block.

Note that these can be set as default settings if you have a custom data file. You will need to submit a support ticket through MyFramecad to request this.

3.7 DETAIL CHECK (DC)

This command does a layout check to see if there are any panels/trusses/joists in the layout that have not yet been built using PPD, JJD, TTD or SPD.

3.8 EXTEND MULTIPLE MEMBER ENTITIES (ME)

The Member Extend (**ME**) command now works for multiple entity selection.

To operate:

- Run the **ME** command
- Select the entity to extend or trim to
- Select '**P**' for point-to-point selection
- Select two points that cross all the members to extend/trim.

Note that the command will remain in the multiple point selection option until 'E' is entered to enable the single entity selection option.

3.9 HIP END CORNER GIRDER JACKS (TSET)

An option has been added to the **TSET – Truss Spacing Types** to set the hip end corner jack trusses as girders. This option would generally be used where the setback of the first truncated truss is greater than normal resulting in significant point loads at the hip corners, or where the user may specifically require a vertical web at the oncoming truss location.

Note that the first truncated truss will automatically be set as a girder to be able to pick up the oncoming point loads from the corner girder trusses.

3.10 HIP END CROWN TRUSS USAGE OPTION (TSET)

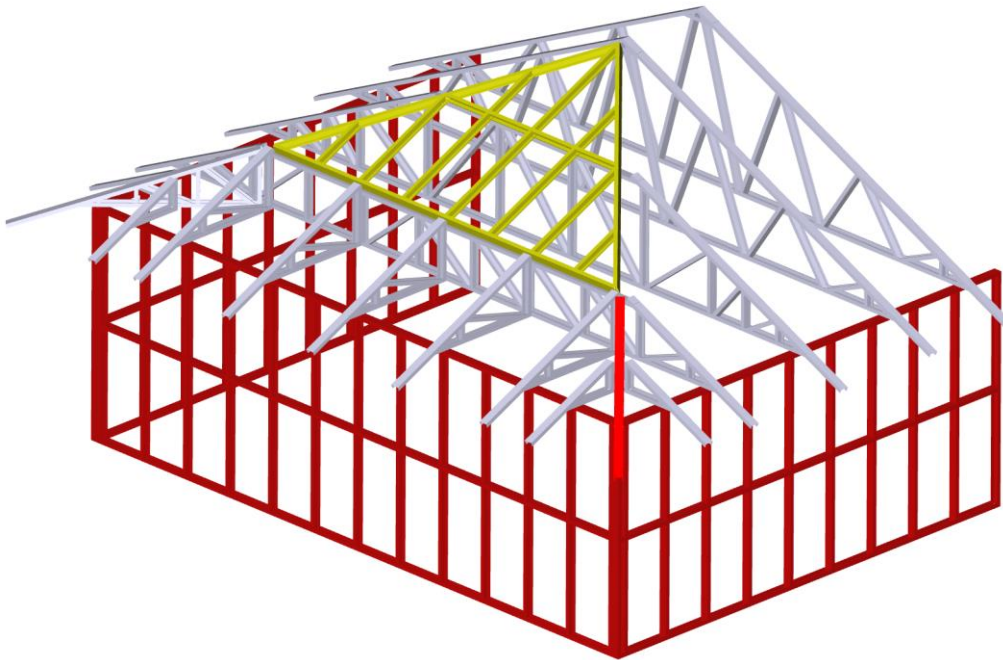
TSET – Truss Spacing Types – Crown Truss Option (hip apex truss)

Allows the user to choose between the following options for crown (hip apex) truss usage on hip end roofs:

- Do not add crown truss
- Add crown truss to outside of apex (crown truss will be 'Standard')
- Add crown truss to centre line of apex (crown truss will be 'Truncated')
- Add crown truss to inside of apex (crown truss will be 'Truncated')

3.11 HIP END PANEL JACKS (TSET – HIP METHOD)

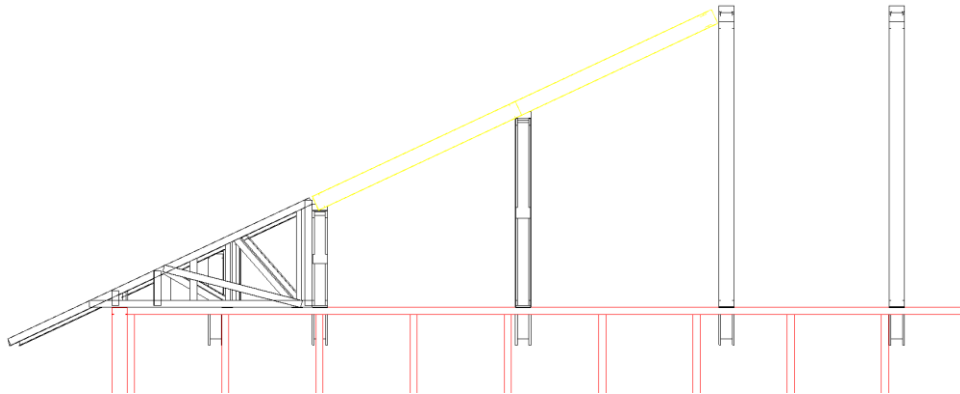
These are roof panels that sit on the horizontal top chords of the hip end truncated trusses. These will replace the hip end jack truss top chord extensions, and as a result, will also incorporate a member which runs along the hip line by default.



- The panel starts from the first truncated truss and finishes at the hip apex.

Note: The top front edge of the roof panel sits flush with the front face of the truncated truss.

- The first truncated truss is raised slightly to allow for the bottom edge of the roof panel to sit directly on it based on the roof pitch.



- The roof panel model and other options can be set in the 'Roof Panel Options' in TSET.

Note that panel jacks are 'Smart Panels', therefore they must be labelled, built and 3D generated using the associated smart panel commands, i.e. PLA, SPD and S3D respectively.

3.12 JOIST/BEAM MEMBER CATEGORY (ADD - JOIST)

When adding a joist or floor beam to the layout using the ADD command, there is now a 'Category' option which will filter through the member types.

3.13 JOIST PERCENTAGE DISPLAY OPTION (JSET)

The option to display the engineering percentage on the Detail sheet has been added to the **JSET** dialogue – Options tab – Detail Sheet Options section. This makes it consistent with the **TSET** display option settings.

3.14 LINES TO CNC OPTION (TCNC)

The TCNC (TEXT_CNC) command now allows lines to be set to be exported through to the XML file for import into Detailer.

3.15 MATERIAL DOWNGRADE (BSET)

A Material Downgrade options has been added to the 'Design Codes' section in **BSET** when the AS/NZS4600 or AISI S100 steel design codes are selected.

The available options are:

- **'Do not downgrade material'** – this will use the material grades as specified in the data file.
- **'Downgrade material'** – all material strengths will be calculated in accordance with:
 - AS/NZS4600:2018 Clause 1.5.1.1.
 - AISI S100-07 Clause A2.3.2
 - AISI S100-12 Clause A2.3.3
 - AISI S100-16 Clause A3.1.3
 - AISI S100-20 Clause A3.1.3
 - CSA S136-16 Clause A3.1.3

- SANS 10162-2 Clause 1.5.1.4.(b)

Please note that material downgrade may not be required if an adequate steel mill certificate or Product Documentation is available, which is to be assessed by an engineer.

Note: Once this is set, the user is no longer able to go back and change that setting within the current job.

3.16 NOTCH TO TOP OF WALL PANELS (PN)

The Panel Notch (**PN**) command can now be used to add notches to the top corners of wall panels.

When running the command, typing **S** and Enter will open the '**PSET – Options – Notch Settings**' dialogue where you can edit the notch parameters.

Note that if you require a top and bottom notch at the same end of a panel, then they both have to use the same width parameter.

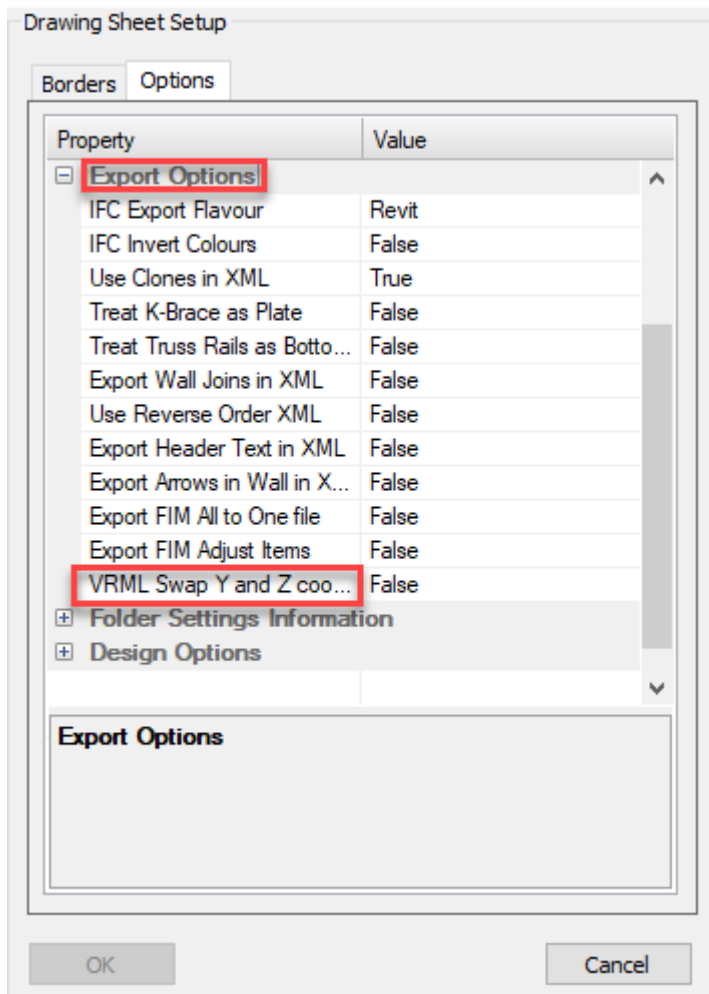
The values displayed in the command bar are **th** (top height) x **bh** (bottom height) x **w** (width).

3.17 STUD TO BOTTOM PLATE GAP

Functionality has been applied to the software which will automatically reduce the stud to bottom plate gap during the PUA/PPD process if it finds that the gap is greater than 3mm.

3.18 VRML CO-ORDINATE SWAP OPTION IN BSET

Allows the user to swap the Y and Z co-ordinates depending on which preferred VRML viewer is being used.



3.19 ZONES FOR DEEP CEE FLOOR LAYOUTS

The option to add zones into deep cee joists allows for the separation of individual floor setouts. This will aid the import process into Detailer, whereby the individually zoned floor setouts will be imported as separate frames instead of all being combined together as one.

In Structure, you will need to list all the members within each floor setout and apply a zone name in the '**Floor Member Editor**' dialogue box – **Zone Location**.

Be sure to observe the zone labelling requirements as specified in the information panel when clicking in the Zone Location line. **Zones cannot start with the characters 'X' or 'Z' and the first character cannot be a number. Zone text length must also be greater than 2 characters long and is limited to 6 characters. Spaces will be eliminated.**

4 Version 9.2.5.19

4.1 IFC BEAMS

Beams now go straight through to the IFC file from Model Space without having to detail them (PPD) first.

5 Version 9.2.5.18

5.1 PST – MORE PANEL STACK FIXES

More fixes have had to be made to the panels stacking to get the order correct.

- When moving panels from one stack to another, you must run the LA command and select the amended stacks individually to update them prior to running the CNC command in the panel tab.
- There is a limitation of six panels that can be moved between stacks.
- In previous versions of the software, when the BSET – Export Options – ‘Use Reverse Order XML’ was set to ‘False’, the panel order started from the top of the stack. This has now been corrected and now starts from the bottom of the stack. If your preference is for the stack order to come out of the machine from the top to bottom, then you will have to set the ‘Use Reverse Order XML’ to ‘True’.

5.2 WALL PANEL TOP AND BOTTOM PLATE END CLEARANCE

By default, wall top and bottom plates are always produced to the exact length of the wall frame.

A data file option has now been added which sets an end clearance distance for the top and bottom wall plates.

Note that this is a data file setting only.

6 Version 9.2.5.17

6.1 PST – PANEL STACK REFINEMENTS

Panel stacks have been changed to no longer be shown in blocks as this has created some limitations when it comes to editing them. The way they are now displayed allows for easier movement of panels between stacks.

After editing a stack, all the information should update automatically. If for some reason the information does not update properly, or you need to change the stack label, you can run the LA command and then drag a mouse selection over the individual stack (including the stack title information).

6.2 CNC – DEEP CEE BOXED JOISTS

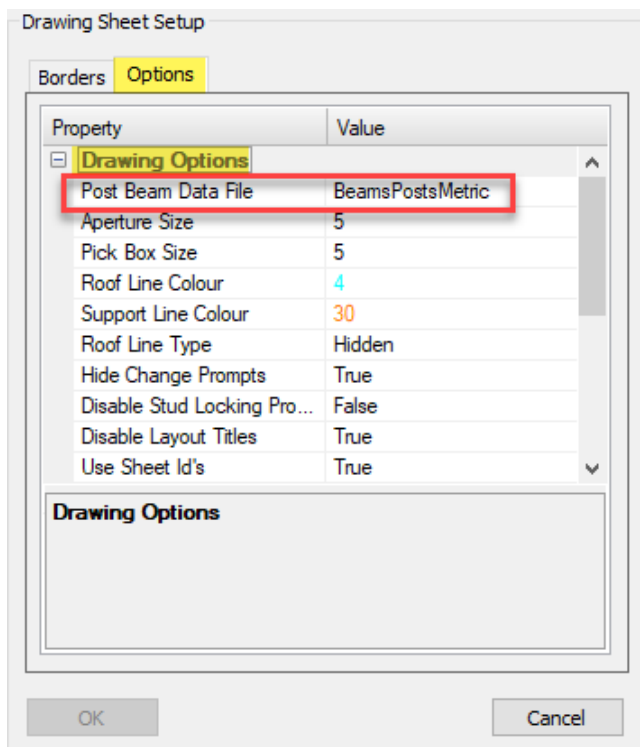
When running the CNC command from the floor layout plan for Deep Cee joists, the boxed joist members now export through to the XML file for import into Detailer.

6.3 SPD – SMART PANEL MODEL FILTERS

Filters for models have been added to the Panel Builder for Smart Panels when running the SPD command.

6.4 BSET – POST AND BEAM DATA FILE

An option has been added to BSET – Options – Drawing Options, which enables the user to set the default beam and post data file to be used.



Generally, metric users would select the BeamsPostsMetric data file, imperial users would select the BeamsPostsUS data file, and users in the EU countries would select the BeamsPostsEU data file.

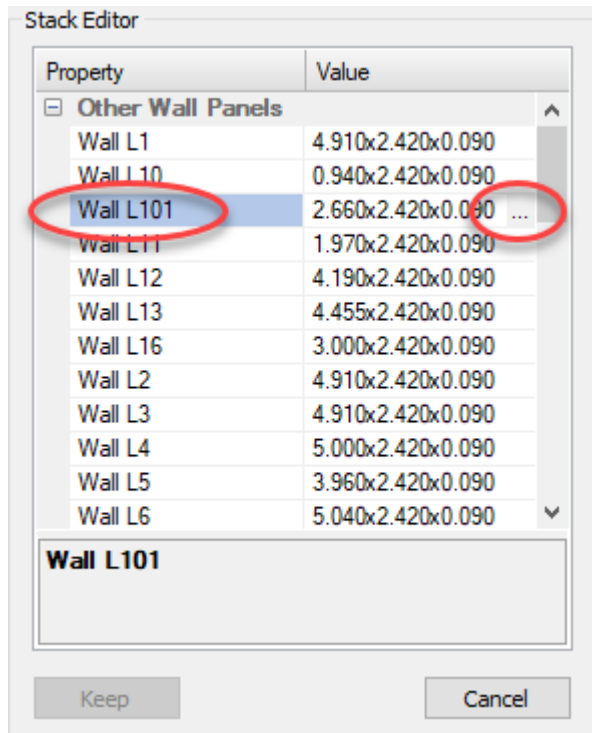
By default, beams and posts from the standard/user data file will be listed, then those from the BeamsPosts data file will be listed. I.e. if the same beam or post is present in both data files, then the one from the standard/user data file will take precedence.

7 Version 9.2.5.16

7.1 PST – PANEL STACK (MOVING PANELS BETWEEN STACKS)

Users can now move panels from one stack to another using the following procedure:

- Double click on the stack that you wish to remove the panel(s) from. This will open it in the block editor.
- Select and delete the panel(s) to remove.
- Exit out of the block editor and save changes.
- Double click on the stack that you wish to add the panel(s) to.
- Run the IW command to display the list of available panels to choose from.
- Select the panel that you want to add to the stack then click on the ellipsis button at the right end of the panel line.



- Once all required panels have been added, click on the 'Keep' button to update the stack.
- Exit from the block editor and save changes.

8 Version 9.2.5.15

8.1 PST – PANEL STACK

Panel stacks are now created as individual blocks.

They now have their own unique stack label that gets exported in the XML file.

Stack weights are included in the label.

Stack heights and widths are now dimensioned.

The Panel Stack Options can be found in PSET – Panels.

The PSR (Panel Restack) command is no longer required.

- Each panel stack is now created as a separate block. When changing the order of panels within a stack, you now have to double click on the stack to open it in the block editor, then make your changes, then close the block and save. This process will automatically update the stack order when creating the XML file.

9 Version 9.2.5.14

9.1 TIP OF THE DAY – UPDATE A WALL FROM LAYOUT AFTER PPD

If you have already built (PPD'd) all your walls and now you need to modify one wall in the layout, use the following steps to update the built wall in the detail sheet.

- make changes to the wall in the layout
- list the modified wall in the layout and select 'Go to detailed panel' go to the detail sheet elevation view for that wall
- PPD the wall from the detail sheet to go to the Panel Builder view
- double click on the panel name in the left-hand column of the Panel Builder to list it
- click on 'Amend' to amend it to the changes as made in the layout
- click on 'Update' to update the view in the detail sheet elevation.

10 Version 9.2.5.13

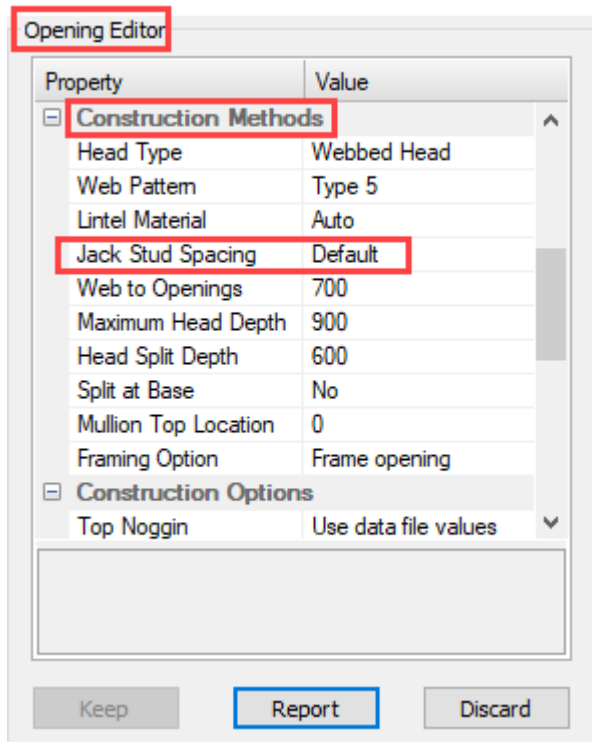
10.1 CNC – TRIM STUD EXPORT FOR ASSEMBLY PRIORITY

The trim stud either side of openings now gets exported to the XML file with 'TrimStud' set as the usage. This has been done to work properly in conjunction with the new RFY Export 'Assembly Priority' option in the **Detailer** software.

Note: This will only take affect prior to running the PPD command. If the panels have already been built using an earlier version of **Structure**, the 'Assembly Priority' option in **Detailer** will not work properly.

10.2 OPENING EDITOR JACK STUD SPACING OPTION

An option has been added to the Opening Editor which allows the header jack stud spacing to be changed.



The user just needs to overwrite the word 'Default' with a spacing value.

Note that this only applies to the header jacks and not the sill jacks. Also, it will only work for web patterns that have vertical members in them.

10.3 PSS - WALL STUD DESIGN SUMMARY REPORT

Command: _StudSummary

Alias: PSS

A wall stud design summary report has been added which displays and on-page list of the walls which provides the wall label, height, section, BMT, grade, stud spacing and noggin heights.

Stud Design Summary						
ID	Height	Section Type	BMT	Grade	Centres	Noggin
20-L1	2440	70S41-095-550	0.95	550	450(S)	1290
20-L2	2440	70S41-095-550	0.95	550	450(S)	1290
20-L3	2171	70S41-095-550	0.95	550	450(S)	1106
20-L4	2171	70S41-095-550	0.95	550	450(S)	1106

10.4 HEADER END JACK FASTENING HOLES

A data file option has been added to control the top and bottom locations and intermediate spacing for the header end jack fastening hole locations. Note that this is only a data file option that can be applied to custom data files.

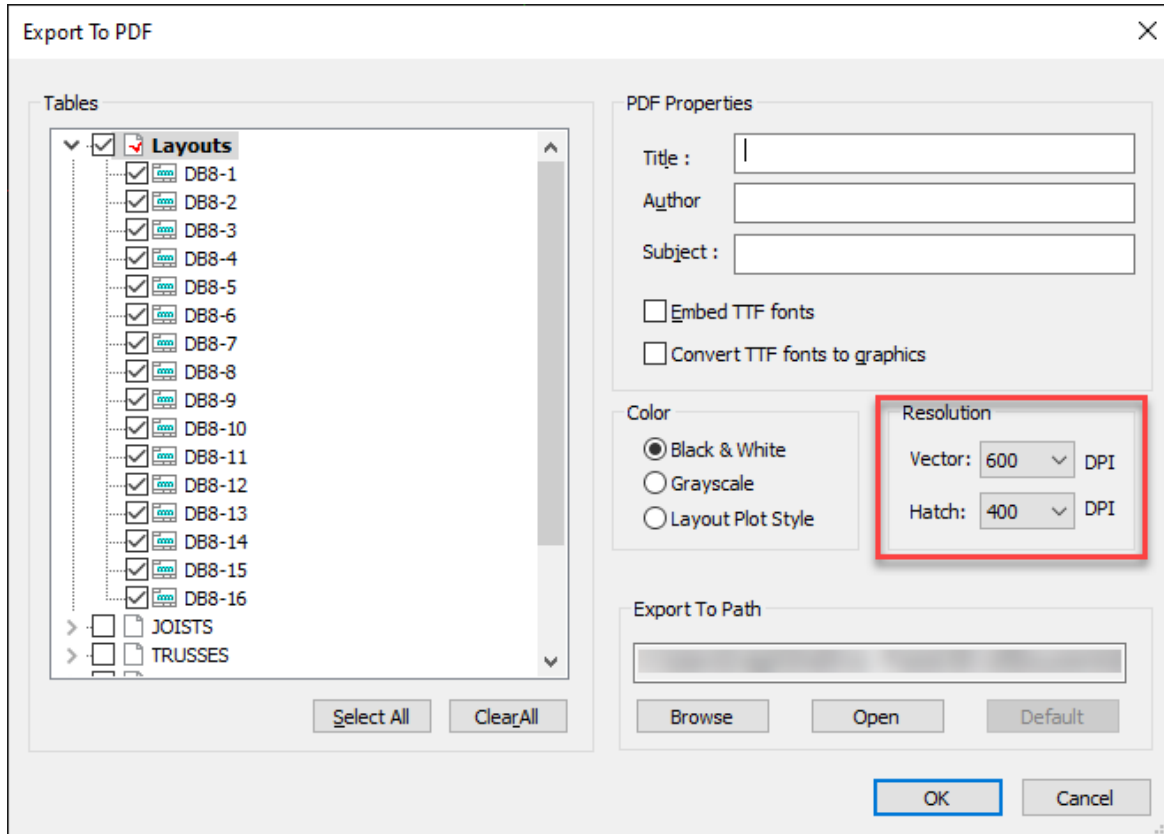
10.5 LISTING PANELS IN PANEL STACK

Panels in the panel stack can now be listed (LI). This can come in handy if the user wants to check the panels dimensions.

11 Version 9.2.5.10

11.1 PDF – DPI RESOLUTION SETTINGS

When running the PDF command, the user can change the DPI resolution settings for lines and hatching:



This will allow the user to set the PDF output to affect either the file size (Lower DPI) or print quality (higher DPI).

11.2 BRACING OVERLAYS

If one wall brace overlays another on the same panel, only the brace with the higher capacity will be considered.

12 Version 9.2.5.9

12.1 BSET – ADJOINING WALL TEXT

Option added to **BSET – Options – Export Options (Export Wall Joins in XML)** which exports the adjoining wall label to the XML file during the CNC process. These adjoining wall labels will be added to the end stud labels when viewed in the Detailer software.

12.2 BSET – TRUSS RAIL EXPORT

Option added to **BSET – Options – Export Options (Treat Truss Rails as Bottom Plate)**. This option is purely for tooling purposes, where it gives the rail member the same properties as the bottom chord member which means it will be tabbed over the outside of the top chord member instead of being inserted inside the top chord member.

12.3 JOS – JOIST ONPAGE SUMMARY

A new command called ONPAGE_JOIST (JOS) has been added which allows the user to manually select joists within a layout to be included in each onpage joist summary. This allows multiple summary lists to be created on larger jobs.

Note: the OR command will not update these lists.

12.4 LTA – TOGGLE ALL TEMP LAYERS

A new command called LAYER_TOGGLE (LTA) has been added which will toggle all the temp layers on or off at once.

12.5 TRUSS MODEL NAME IN DETAIL SPACE

The truss model name has been added into the detail sheet title box. This is to assist the user in more easily identifying whether a truss is using a LE (shallow axis) or LC (deep axis or B2B) model.

13 Version 9.2.5.7

13.1 TSET – UNIQUE TRUSS LABEL OPTION

An option to use a different label number for every truss has been included in TSET – Options – Label Options. Set the 'Use Individual Labels' option to 'True'.

14 Version 9.2.5.6

14.1 BM - ENGINEERING OF WEBBED JOIST REINFORCING MEMBERS

When adding a reinforcing member to webbed joist chords using the BM +alt option, you can now list and change that reinforcing member to any other gauge, or profile size available in your data file and the engineering will now be calculated correctly.

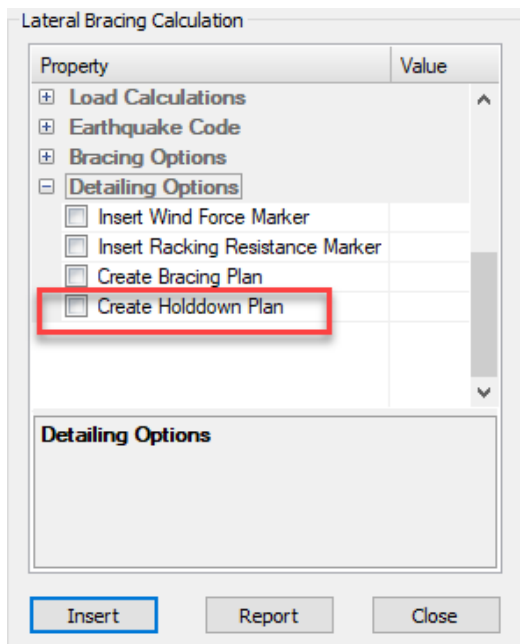
15 Version 9.2.5.5

15.1 BM - ENGINEERING OF TRUSS REINFORCING MEMBERS

When adding a reinforcing member to truss chords using the BM +alt option, you can now list and change that reinforcing member to any other gauge, or profile size available in your data file and the engineering will now be calculated correctly.

15.2 PCB – WALL HOLD DOWN PLAN

A new option has been added to the Bracing Calculator to create a Holddown Plan. This plan displays all the wall hold down components as per what is set in your data file.



16 Version 9.2.5.4

16.1 CB – CLEAR BORDER

A new command called ClearBorder has been added which allows the user to clear all the contents of a border in either the Layout tab or a Detail Sheet tab - the border itself will remain in place. In a detail space border, it will display “<- Left Blank ->” as red text across the border.

16.2 ET – COMPOSITE EXPLICIT TOOL ACTION

A new Composite Tool option has been added to the Explicit Tool Options which allows the user to add an increase in length to a framing member in the detail space elevations and apply any selected toolings to a set distance from the end of the member, including any length extension. As per any explicit tool, the extension and toolings are not seen in the elevation (only the marker is seen) but are applied during the CNC process and will only become apparent when imported into Detailer. That way the extension won't appear in the 3D in model space.

ET dialogue options:

Property	Value
Composite Options	
Material Increase	0
Tool Location	20
Drafting Colour	6
Detail Information	
Lip notch	No
Swage	No
Dimple hole	No
Std Service hole	Yes
Long Service	No
Bolt hole	No
Triple holes	No
Flange Hole	No
Chamfer cut	No
Left flange cut	No
Right flange cut	No
Web notch	No
Clear All	Press to clear all

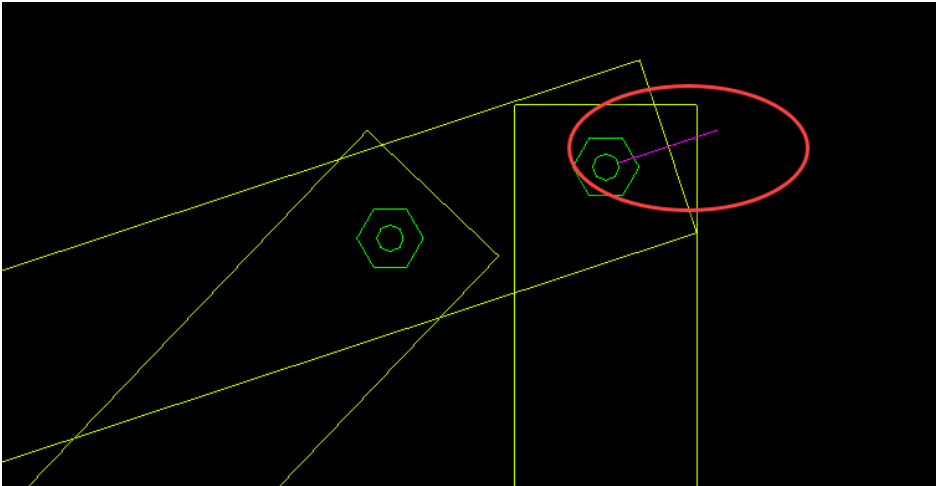
Buttons: Insert, Cancel

The Material Increase determines the length to extend the member by.

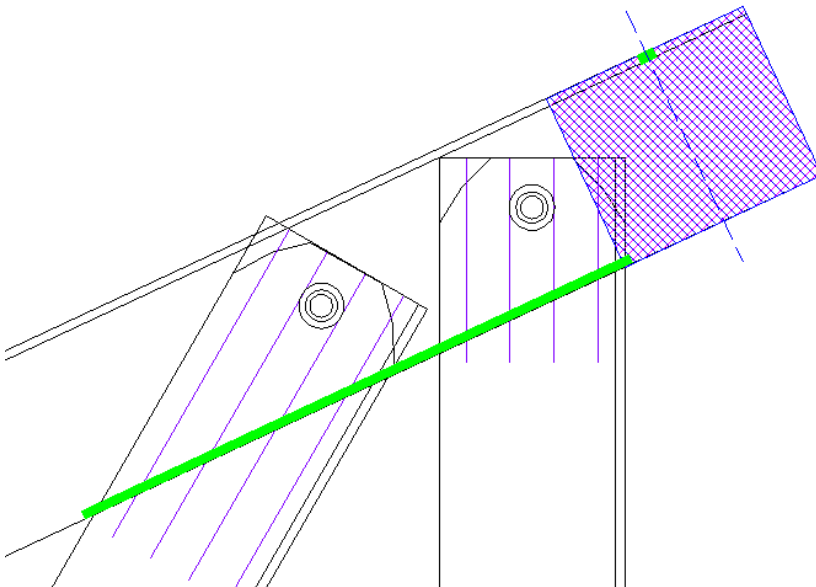
The Tool Location determines the distance back from the end of the member (including any length increase) to place any tooling (or combination of toolings) that are selected. If zero is entered as the Material Increase, then the toolings will be placed at the Tool Location distance from the end of the member as shown in the elevation.

To insert the composite tool, hold the ALT key down (as per the instructions in the Command Bar) and select close to the end of the member. The tool marker will be placed at the very end of the member.

Composite Tool as seen in Structure:



Composite Tool as seen when imported into Detailer:



17 Version 9.2.5.0

17.1 GIRDER TRUSSES

More work has been done to the girder truss point loading.

The user is now able to list a girder truss and set it as a double girder in the 'Construction Information' section. This will double the width of the truss on the layout and increase the single girder truss quantity to 2. It will also halve the load on each truss.

When changing to a double girder, the user will need to be aware that they will need to manually offset the truss in the layout to suit the exact location as this function will only increase the width along the centreline of the single truss.

These double component trusses must be fixed together in accordance with your local authority's requirements.

The option to add additional area loads to girder trusses has been reinstated in the 'Construction Information' section when listing a girder truss. Note that this only allows the user to add an additional square area of load to what is already applied as point loads from oncoming trusses.

Truss Relabelling

If you have already built your trusses from the layout and now need to relabel the trusses on the layout, you can update the labels in the detail sheet elevations by running the LA command.

17.2 VVD – 3D VIEWS

Process:

1. Create your 3D in Model Space using either the A3D, T3D, P3D, J3D or S3D commands.
2. Run the VVD (3D Views) command from anywhere within the job.
3. A new tab will be created called 3D Views. This will have four borders showing the four different aerial isometric views from the 3D that is generated in Model Space.

17.3 STAGGERED NOG SPREAD

An option has been added to the Panel Properties Editor to adjust the staggered nog spread distance when Noggin Type is set to Staggered. The distance is measured between the noggins.

18 Version 9.2.4.2

18.1 IW - INSERT WEB IMPLEMENTED FOR WEBBED JOISTS

Webs can now be manually modified and added using the IW (Insert Web) command.

There are two options available for web insertion as displayed in the command bar.

'P' for Points method – allows the user to select either two points to insert a single web or select a series of points alternating between the top and bottom chord where the webs will be evenly spaced between the first and last points selected. This functionality is identical to the truss web input.

'E' for Entity method – allows the user to select two vertical webs for the diagonal webs to be placed between.

18.2 BUG FIXES

Oncoming truss locator size issue fixed #20062

Truss height adjustment snaps fixed #19932

LI - Post negative RL bug fixed #20099

PSA Stud Setout by Entity fixed #20061

BSET/TSET dimension settings fixed and refined #20047

TTD Detail Design Drawing web data fixed #20090

Missing Beams in 3D fixed #20106

Truss engineering error bug fix #20035

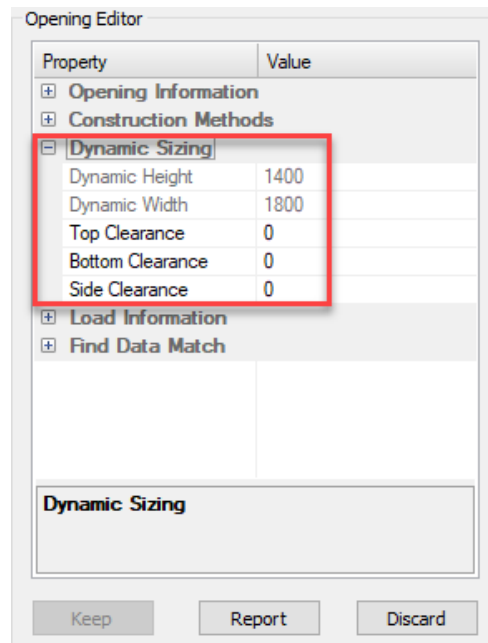
19 Version 9.2.4.0

19.1 DYNAMIC SIZING FOR OPENINGS

An option has been added to the Opening Editor which allows the user to add top, bottom and side clearances to existing openings. Multiple openings can be edited at once from the layout view.

To select multiple openings, run the LI (List) command and select one opening, then drag a selection fence over the entire layout then right click to confirm selection. If a window is selected first, then only windows will be listed and the Opening Editor will display as Window Mode. If a door is selected first, then only doors will be listed and the Opening Editor will display as Door Mode.

From the Opening Editor, scroll down to 'Dynamic Sizing' and make the changes as required and click on 'Keep'.



19.2 GIRDER TRUSS POINT LOADS

Structure now calculates the reactions from the individually supported trusses and applies those reactions as point loads directly to the girder truss bottom chord or top chord. This allows for differing point loads from the individual trusses to be applied along the girder truss.

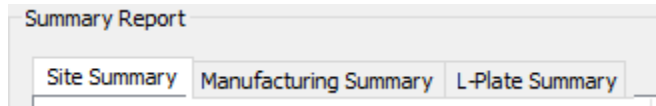
19.3 POSTS/COLUMNS

- IFC Export – 'Hot Rolled Steel' posts/columns now go through to the IFC file when running the IFC command from Model space.
- When posts/columns are added in the layout (Layouts), they are automatically populated in the Model space when the P3D or A3D commands are run. There is no need to PPD the posts/columns first.
- You can no longer add or amend posts/columns in the 'ADD – Posts' dialogue. It is recommended that you change the System Name to '**BeamsPostsMetric**' for metric material or '**BeamsPostsUS**' for imperial US (this also applies to users that have custom data files). **Note: Posts have now been removed from the standard default FRAMECAD_FT data files.**
- Option added in the Column Editor to turn on/off complex snap points.

- Please contact MyFramecad support if you require any other column material to be added.

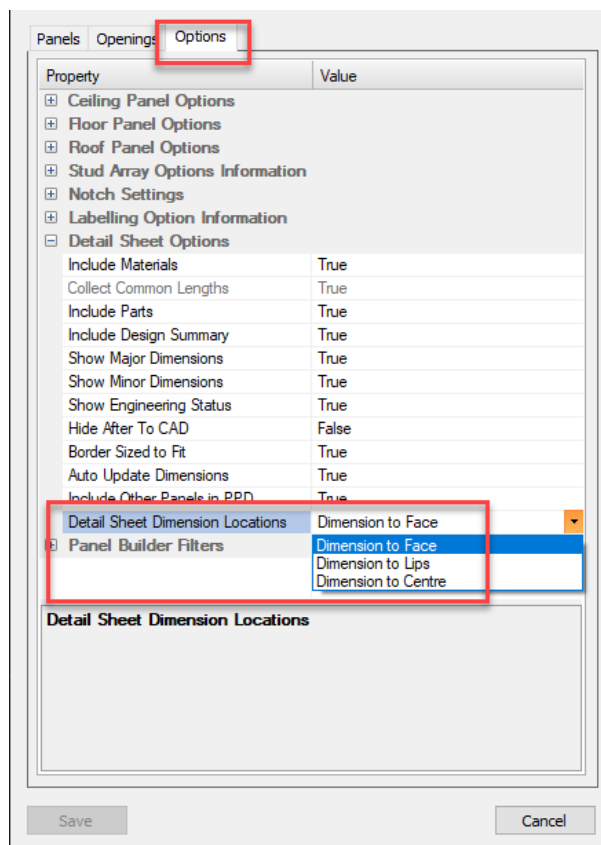
19.4 SUM – SUMMARY REPORT IMPROVEMENTS

A new 'Site Summary' tab has been added to the material Summary Report which includes ancillary material required for the site. Previously, these materials were only reported in On Page reports (TOA, POA and JOA).



19.5 OTHER FEATURES

- Smart Panel length is automatically reduced to allow for the variation in depth when a 3D pitch is applied. The panel length is reduced by the panel depth multiplied by TAN of the pitch.
- IFC Export - More 'Hot Rolled Steel' beam shapes have been included in the range to go through to the IFC file.
- Zone labelling has been enabled for smart panels.
- Absolute spacing for saddle trusses at the end of a roof block has been implemented which allows for direct fixed roof sheathing to be continuous. This uses the standard truss spacing value. Saddles trusses are absolutely spaced from the last full truss when 'Standard Absolute Spacing' is set to 'True' in TSET.
- B2B truss bottom chord connection now recognises minimum fixing distance at heel ends and extends the bottom chord past the heel line where required.
- Wall detail sheet member dimension location options added to PSET – Options – Detail Sheet Dimension Locations. To update frames that have already been built, run the OR or LA command in the detail sheet after changing the option in PSET.



19.6 BUG FIXES:

Half hip roof input using the TD (Truss Draw) command fixed.

Staggered nog refinements at openings

Various Smart Panel fixes

SUM - Material quantity issue fixed when copying smart panels

Check for zero pitch truncated truss added

CNC/FIM export now works when blocks are present

FIM - Issue fixed where wall label contains spaces

BSET/TSET - Truss layout ordinate dimension options now recognised

K-Brace plan length issue fixed

PPD - Undo on cancel fixed

Split head member extension issue fixed #18538

RH Rafter support issue fixed #18886

BM - Can now box members in Smart Panels #19494

PDF from Model Space crash fixed #19413

Recessed floor joist vertical web member orientation corrected

Beam head engineering fixed #19738

Brace Density error message fixed #19737

A3D to make sure all lines are continuous #19838

Dropped eaves on B2B trusses fixed #15658

20 Version 9.2.3.19

20.1 WALL BRACE UPDATES

Wall brace custom entities, introduced in the previous release, now display with more clarity. K-Braces and Bridging Braces show an arrow at one end on the plan view. This indicates the start end of the brace member at the bottom plate of the wall. Strap braces and sheet braces show an arrow at both ends. You are now able to reverse the direction of K-Braces and Bridging Braces in both the plan layout view and the detail (elevation) view as per the instructions below:

- If you list (**LI**) a k-brace (or bridging brace) on the **layout plan**, there is now a 'Reverse Brace' option in the Brace Editor. The Reverse Frame/Reverse Member (**RF/MR**) command also works on the **layout plan**.
- If the elevation has already been built, you will need to run PUA for the brace direction to update in the **detail sheet**.
- If you list (**LI**) a k-brace (or bridging brace) on the **detail sheet**, there is now a 'Reverse Brace' option in the Panel Member Editor. The Reverse Frame/Reverse Member (**RF/MR**) command **does not** reverse the brace in the **detail sheet**. It will only flip the selected member orientation.
- Reversing the brace direction in the **detail sheet** will also reverse the brace in the **layout plan**.

20.2 PIB – INSERT BRACE IN DETAIL SHEET

K-Braces, Bridging Braces and Strap Braces can now be input directly onto a wall panel in the detail sheet using the Insert Brace (**PIB**) command.

When running the command, the user is asked to select the start and finish studs. You must have the End Snap turned on and selection must be one end of the stud.

Note: Inputting K-Braces in the detail sheet will not automatically reverse the direction of the right-hand stud.

20.3 OTHER UPDATES

TSET Loading values (except live load) reset to default after roof type change

TSET Loading values (except live load) reset to default after system name change

CNC message improved when no data file is found.

CNC - Jamb packers moved away from jamb stud in XML file.

Standard data file modifications

20.4 BUG FIXES

Smart Panel - Fastenings now display in detail sheet

Smart Panel - Missing fastenings fixed on sloped members

FIM Import fix

LI - Reversing LH Truss to RH Truss now shows correct orientation in Truss Editor (B2B Half Trusses only)

TPL on joist layout now goes through to detail sheet correctly

SUM - Lintel plates now printing correctly on multiple pages

TTD - Eurocode Cez change now reporting correctly

PBS - Build Studs not working when wall engineering is disabled in BSET and a wall model gets changed.

Smart Panel block member sort order fixed

Joist labelling speed improved

RS – Roof Shape code refined for v10.0

21 Version 9.2.3.18

21.1 ET – EXPLICIT TOOL

The option for a 'Long Service Hole' has been added for machines that have two service hole types available. There is no option automated tooling placement for this tool, it is only a manual tool placement operation.

21.2 OUTLINE COMMAND

A command called OUTLINE has been added which basically converts a polyline to a hidden linetype and places it on a layer called 'Outline'.

21.3 PUA - RE-ENGINEERING ALL TRUSSES/JOISTS/WALLS FROM DETAIL SHEET

You can now run the PUA command to re-engineer all the trusses, joists or walls in a detail sheet tab. This will maintain any detail sheet edits that have been made.

21.4 WALL BRACING CUSTOM ENTITIES

All wall bracing has now been converted to custom entities, which is basically the next step in future proofing the software. As a user, you will only see a change in the graphic representation but should not notice any change in the functionality.

21.5 ZONES

Zone grouping has now been included to be used with trusses. Refer Zone Grouping for Walls and Joists 40.1.37

22 Version 9.2.3.17

22.1 ENHANCEMENTS

22.1.1 C3D - CopyModel Command

A command called CopyModel (**C3D**) has been added which allows the user to easily copy selected entities/items from the Layout space into the exact same co-ordinate location in the Model space. The co-ordinate location in Model space will be determined by the presence of REF markers in the layouts.

Command added to Structure menu – Miscellaneous.

22.1.2 Grid Lines to IFC

Grid lines are now exported with the IFC.

22.1.3 Stud Marker Profiles

Stud marker profiles in detail space now automatically update whenever wall panels are edited.

22.1.4 LI - Smart Panels

Reset Labels option added to Smart Panels.

22.1.5 CNC - Missing Reference Markers

A warning has been added during the CNC process if the small reference marker circle, at the bottom left of wall panels, is missing.

22.2 FIM IMPORT OPTIONS

22.2.1 Not Frame Opening

A framing option has been added to the **Opening Editor - Construction Methods** which allows the user to “not frame an opening”. This is useful when importing an FIM file from Revit that has openings around every penetration that don't necessarily need to be framed around. Future versions may allow for other options to move members that interfere with the opening position.

22.2.2 Preserve Panel Label

Panel labels are preserved when importing an FIM file. The labels can be reset to the Structure default in the **General Information** in the **Panel Properties Editor**.

22.3 BUG FIXES

- Opening head and sill extension issue when the data file is set to extend these over multiple jamb studs.

23 Version 9.2.3.16

23.1 HOW TO ADD AN OPENING INTO A SMART PANEL

- Draw a rectangle of the required size and location within the smart panel.
- Type MJ (MEMBER_JOIN) and select the panel.
- Hold the ALT key down and select the opening polyline. All framing in the opening will be subtracted from the panel.

Note: This process can also be used to create notches in the corners and edges of panels.

24 Version 9.2.3.15

24.1 JOIST TEXT HEIGHT

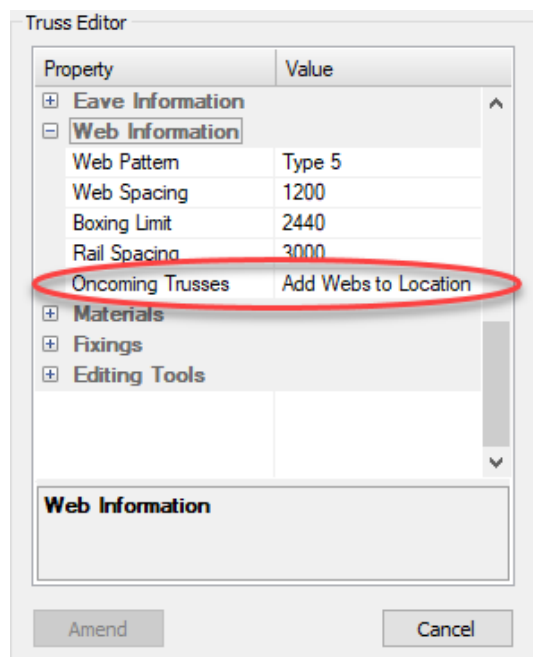
Option added to change text height of joists when listed.

24.2 SMART PANEL TEXT HEIGHT

Option added to change text height of smart panels when listed.

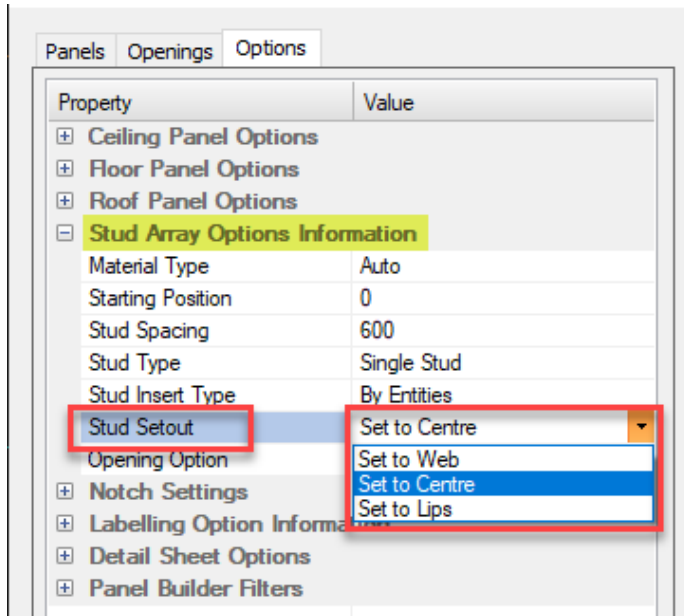
24.3 PARALLEL GIRDER TRUSS WEB ALIGNMENT OPTION ADDED

Option added to turn the alignment of vertical webs on or off for parallel chord trusses that are supporting other trusses in a girder loading situation. The web pattern must use vertical webs for this to work.



24.4 PSA - STUD ARRAY SETOUT OPTIONS

Option added to set out array studs to centre, web or lips of stud.



24.5 BUG FIXES:

PDF - Print to PDF issue fixed

ADD - Smart panel block editing fixed when using the ADD option

PSA - B2B studs going in as boxed studs fixed

REP - Floor Layout Report to CSV issue fixed

TTD - 'Filter On' displayed for Default model fixed

TOS - Imperial reporting issue fixed

TOD - Text box positioning fixed

FSD - Imperial reporting issue fixed

FIM Export - Illegal characters removed

XML Export - Illegal characters removed

TPL - Layout plan point load input for cut back trusses fixed

25 Version 9.2.3.14

25.1 PRP - PANEL REACTION PLAN

This is basically a gravity reaction plan which shows the average uniform load from supported trusses, joists and wall panels. It also shows any point load reactions for jamb studs, both within a wall and from walls above, and from girder trusses and floor joist beam bearers.

25.2 BRACING PLAN

The bracing plan has been modified to show the bracing holddown values, as set in the data file.

25.3 TEXT_CNC - TEXT TO CNC

Use this command to send additional text that is manually added to an elevation to the .xml file during the CNC operation. This will only work for standard text input, and will not work for multiline text.

To activate, run the command then select the required text. The command can also be found under 'Miscellaneous' in the Structure drop down menu.

25.4 BUG FIXES

PST - Panel Stack opening graphics fixed for imperial

Wall elevation member listing fix when changing material

PSA - Stud Array refined

26 Version 9.2.3.8 to 9.2.3.13

26.1 9.2.3.13

Bug Fixes:

Joist result printing from detail sheet fixed

SECT command print graphic issue fixed

PCB - Bracing plan information improvements

Missing opening header in raked walls fixed

Detail sheet border size for raking walls fixed

26.2 9.2.3.12

Hasp licence expiry warning added

SECT command now linked to data file

Bug Fixes:

Soldier webs improved for trusses with small cantilevers

SECT lips fixed

LI Panel materials updated

Parallel truss orientation issue fixed

Type 3 web spacing improved where web quantities are different each side at critical spans

BSET crash when ProgramData directory set to 'read only' fixed

PPD Wall cardinal directions fixed

FIM Export accuracy increased

FIM Export GUID fixed

RH Half truss ceiling pitch fixed

Section flange width fix for some imperial members

IW and ADD command fixed for panel material flange sizes

26.3 9.2.3.11

BSET - Show 'Not To Scale' option added

Different noggin options for different wall models allowed for as a data file setting

Wall panel start end marker expanded to allow either holddown tool or truss hole tool option

Bug Fixes:

LI - End clearance for joist blocking, end bearers and side bearers fixed

Holddown hole locations tidied up for k-braces

Wall Fixing data file setting fixed for different wall models

ADD - Added lintel plate now shows in 3D

ADD - Added lintel plate depth issue fixed

PPD from wall elevation no longer removes text unless LI changes are made

TD - Parallel truss roof input height fixed

PPD/SPD - Sort order improved

TTD - Supports moving in imperial fixed

Opening layer set to 'not visible' missed on uplift plan fixed

Strap brace width incorrect when listed and changed - fixed

LI - Strap brace calculations fixed when brace changed

Brace Editor material usage fixed

26.4 9.2.3.10

Bug Fixes:

RL's fixed for smart panels in imperial

Smart panel stud directions amended in XML and FIM files

PPD - Sort orders fixed

TD - Parallel truss height fixed on input

26.5 9.2.3.9

Bug Fixes:

Refined commands that use ALT key options

MC - Truss splice option fixed

Joist member end points fixed

Joist member snaps refined

Snaps fixed in floor entities

Snaps fixed in smart panels

Direction arrow fixed in smart panels

LI - Smart panels can now be listed in 3D

IFC - Smart panels export to IFC

26.6 9.2.3.8

Bug Fixes:

Section weight calculations improved

Joist member export report fixed

27 Version 9.2.3.7

27.1 S3D – SMART PANEL 3D

S3D (SMART_3D) added to create a 3D of smart panels as separate from wall panels.

Smart Panels have now been removed from P3D.

27.2 BUG FIXES

- Joist label text size for imperial fixed.
- EXPLODE for Smart Panels tidied up.
- LA for detail sheet elevation to 3D re-association fixed.
- RL's for Roof Panels fixed when listing and changing.

28 Version 9.2.3.6

28.1 INTELLICAD UPDATE

IntelliCAD Upgraded to 9.2.759. A full install of Structure is required.

28.2 SMART PANEL UPDATES

Smart panels have now been updated to be custom entities in this version of the software. This will allow us to enable more editing options as the next step in the smart panel development process.

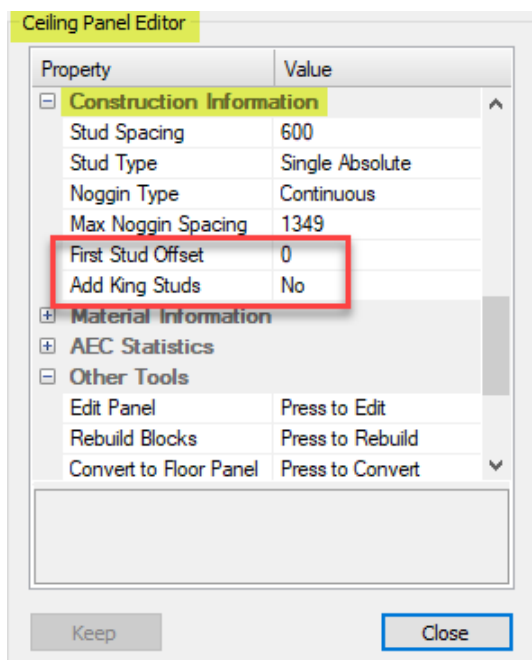
More detailed information for inputting and editing smart panels can be found in the Procedures Guide which can be accessed from the Help menu.

28.2.1 Convert Panel to Polyline

The option to convert a smart panel to a polyline has been removed as the EXPLODE command is now works on these panels.

28.2.2 Stud Setout Options

Additional stud setout options have been added for smart panels:



If the 'Stud Type' is set to use absolute spacing, then the 'First Stud Offset' can be applied. The offset distance is taken from the left-hand end of the panel to the centre of the first stud. If the 'Stud Type' is set to use even spacing, then the first stud offset will not be applied.

The 'Add King Studs' option places a stud at every change of plate angle in complex shape panels.

28.2.3 Layers

Smart panels are placed on 'Panel Ceiling', 'Panel Roof' and 'Panel Floor' layers.

Insitu blocks are placed on 'Block Insert' layer. This make it easier to erase or freeze blocks on the layout.

28.3 TEMP LAYER

Labelling no longer recognises anything on a Temp layer

PUA no longer recognises anything on a Temp layer

PCB no longer recognises anything on a Temp layer

PPD no longer recognises anything on a Temp layer

TTD no longer recognises anything on a Temp layer

JJD no longer recognises anything on a Temp layer

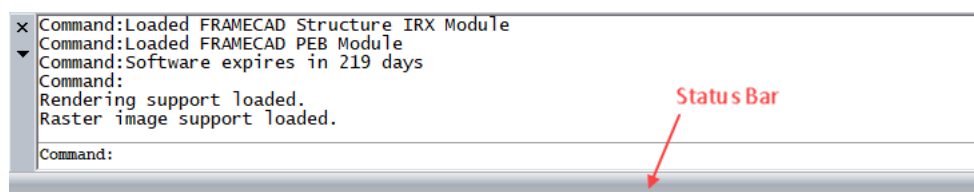
28.4 BUG FIXES

- Various smart panel bugs fixed.
- Bug fix where strap brace was displayed as a single line on the detail drawing in last release.
- SUM Report - Truss screw quantity discrepancy fixed.
- SUM Report - Plates added.
- Imperial bug fixed for header 'Max Web Spacing' when listing an opening.
- LP – Structural type walls included in the Load Path check.
- Point load added for deep 'c' members.
- Ampersand removed from XML and FIM exports when used in tab names.
- Bug fixed where 'Leaders' present in a job causes lockups when running some commands.
- Custom entity joist co-ordinates added to xml file output.
- Smart panel redline text removed on old jobs (again).
- Fixed issue where opening head member disappears in raking walls on small head height to top plate distances.
- REP - Panel Usage Report - Job Summary values missing - fixed
- CNC - Incorrect text positions fixed when imported into Detailer.
- TTD - Zero truss spacing now shows error instead of crashing or locking the program.

28.5 TIP OF THE DAY - HOW TO ACTIVATE THE COMMAND BAR

If, for some reason your Command Bar has disappeared, there are a number of options to turn it on again as outlined below:

1. Click anywhere in a blank area of the Status Bar at the bottom of the program. This option is possibly the most common reason the Command Bar may have disappeared in the first place as the user may have accidentally clicked here at some point.



2. Press Ctrl+9 to turn it on or off.

3. Right click anywhere on the Menu Bar and select it from the display options.
4. In the Menu Bar go to View – Display and select it from the display list.
5. In the Ribbon menu go to View – Display and click on Command Bar.

29 Version 9.2.3.4

29.1 BUG FIXES

- K-brace excluded from auto-dimensions in elevation
- Smart panel redline text removed on pre 9.2.3.3 jobs
- Issue where material in ceiling panels drawn prior to v9.2.3.3 is doubled up on CNC fixed
- LI – Issue when listing walls and changing material in wall panels fixed for horizontal members
- FF – Find Item command fixed for smart panels
- Zero spacing on girders no longer returns an error
- Support issues for trusses attaching to girders at skewed angles fixed
- LA – Roof panel labelling fixed where only roof panels exist
- Possible bug fix where program crashes on PPD of non-webbed beams
- Note: PSA stud avoidance options not working as yet

IFC Export does not yet work for smart panels.

30 Version 9.2.3.3

30.1 REVIT INTEGRATION

Ceiling panels are now included in the FIM Import option.

To import .fim files from Revit, use the **FC_IMPORT** command. This command can also be accessed from the **Structure – Imports** menu. You must be in the 'Model' tab to do this.

30.2 GENERAL DETAILING

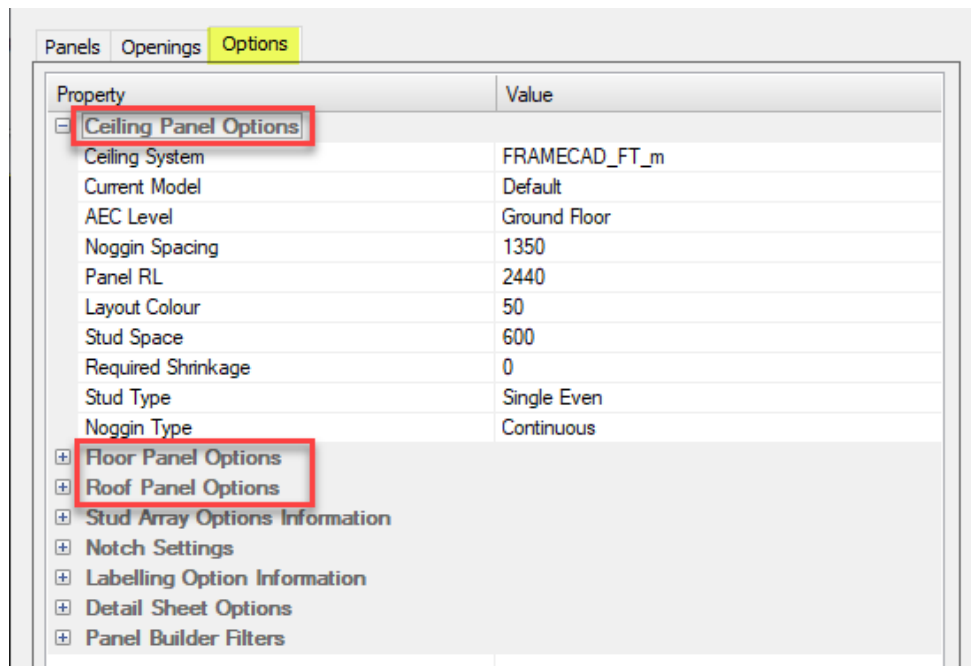
30.2.1 SC – Smart Ceiling Panels

The Ceiling Panels definition within Structure has been widened and now allows for non-rectangular panels and the ability to rake a panel in any direction. The input and editing method is explained in detail in **section 4.15 Ceiling, Roof and Floor Panel Detailing** in the **Procedures Overview** manual.

The **SC** (Smart Ceiling) alias will eventually replace the **CD** and **PDC** (Ceiling Draw) aliases.

SR (Smart Roof) and **SF** (Smart Floor) options have also been added. The RL is taken from the underside of Ceiling panels and from the top of Roof and Floor panels.

All setup options can be found in the **PSET – Options** dialogue box.



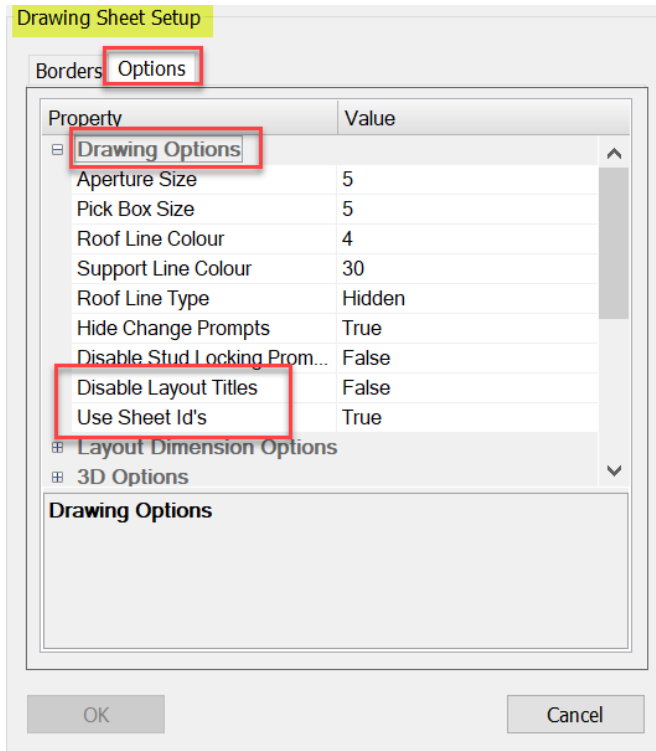
IFC Export does not yet work for smart panels.

30.2.2 SPD – Panel Builder

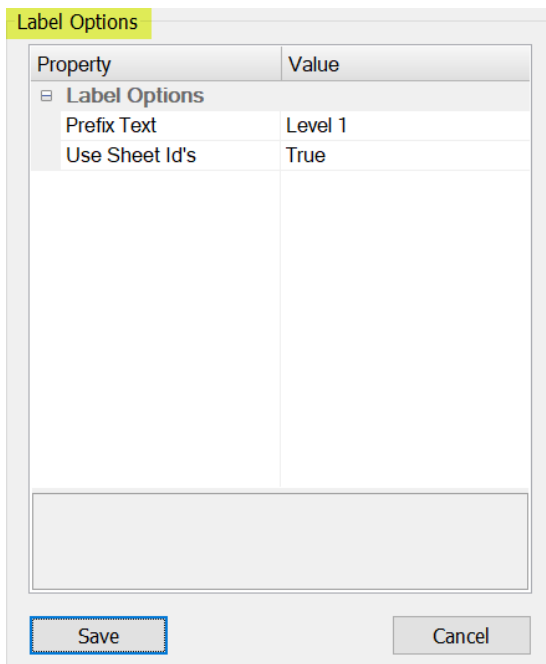
This allows the user to build smart panels only. PPD can also be used but filters are required to show smart panels only.

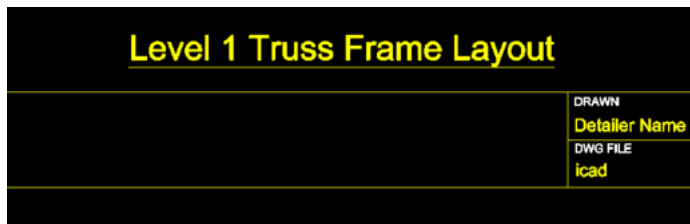
30.2.3 Layout Title ID's

Layout titles are automatically added to a layout when labelling members as long as 'Layout Titles' are enabled in the BSET settings. There is now an option to add a prefix to these titles when 'Use Sheet Id's' is enabled.



When labelling a layout, a Label Options dialogue box will be displayed which allows the user to add a prefix to the default layout name. The default layout name can be edited by listing the label.





A title can also be listed (LI) for more options in the Sheet Label Editor, including the option to change the default layout name.

Property	Value
Sheet Label Options	
Text Prefix	Level 1
Text Suffix	Truss Frame Layout
Use Sheet Id's	True
Layer Name	Text_350
Text Height	350
Text Colour	2

At the bottom of the dialog are 'Save' and 'Close' buttons.

30.2.4 Reference Guide

The 'Reference Guide' has been temporarily changed to a PDF format.

30.2.5 TEMPHIDE Command

A command called TEMPHIDE has been added to temporarily hide selected entities only.

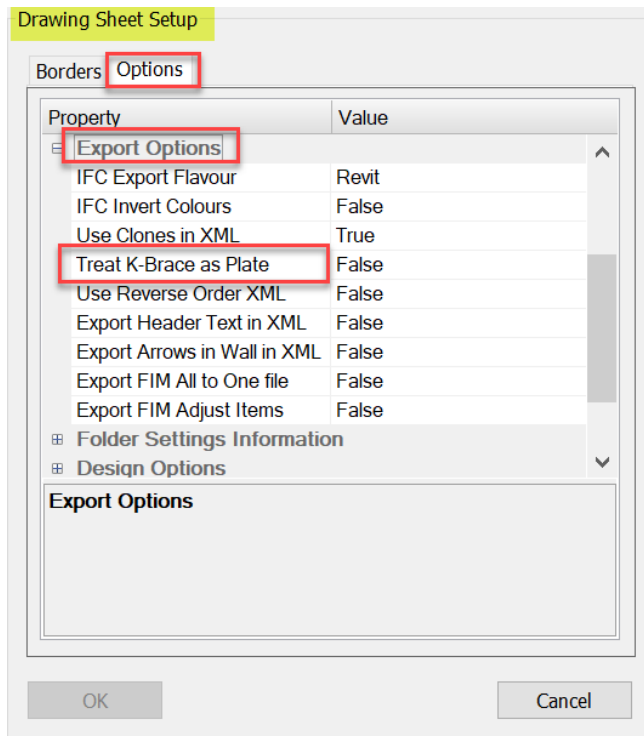
30.2.6 FIMEXPORTALL

Allows all tabs to be exported to FIM at once.

30.3 WALL DETAILING

30.3.1 K Brace Export as Plate Member

An option has been added to the Export Options in BSET which allows the K brace members to be exported as a 'Plate' member type instead of the default 'Stud' member type.

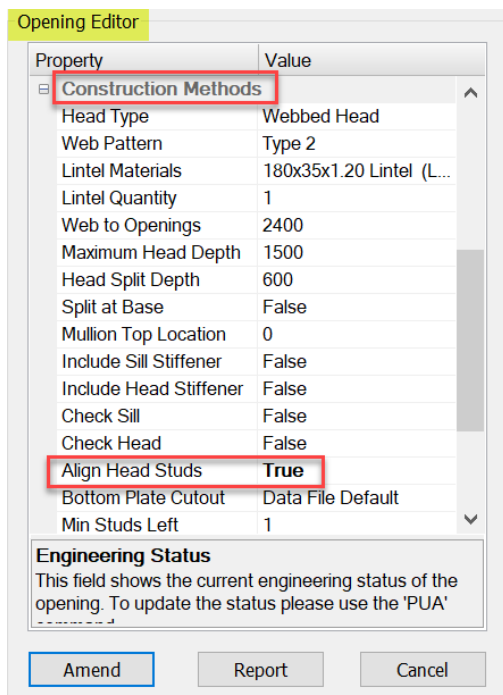


This allows the K brace to tab around the outside of stud members instead of being inserted inside the stud when frames are imported into the Detailer software.

Note: This method is not recommended if K braces are required to work in compression as well as tension as the web and lips will be notched out at the ends of the members.

30.3.2 Header Stud Alignment

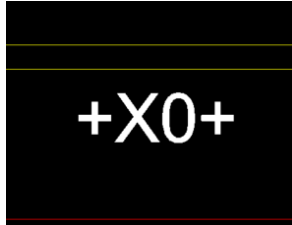
In addition to the Wall Engineering Enhancements, there is an option added to the Opening Editor (accessed when listing (LI) an opening) which allows the user to activate web alignment to trusses in opening headers. This only applies to web patterns with vertical members.



Note: Studs will only be placed where point loads are. Use the Stud Array (PSA) command if any other stud placement is required.

30.3.3 Beam Lap and Panel Notch Label Markers

If you lap a beam and it is not labelled, a temporary label will now be added to be able to display the 'lap' markers. A plus symbol on the right side of the label indicates a RH beam lap and a plus symbol on the left side of the label indicates a LH beam lap.



If you notch a panel and it is not labelled, a temporary label will now be added to be able to display the 'notch' markers.



An asterisk symbol on the right side of the label indicates a RH wall notch and an asterisk symbol on the left side of the label indicates a LH wall notch.

30.4 TRUSS DETAILING

30.4.1 TD Truss Input Options

New roof truss block end options have been added when using the TD (Truss Draw) command. These are 'Rafter Only' and 'Girder', and are accessible when selecting the 'More' option.

Print style ByColor
Print style table None
Print table attached to Model
Print table type Color-dependent print st...

View

Center X	14867.9
Center Y	10497.8
Center Z	0
Width	23745.2
Height	10889.6

Misc

Annotation scale	1:1
UCS icon On	Yes
UCS icon at origin	No
UCS per viewport	Yes
UCS Name	* WORLD *
Visual style	3D Hidden
Set PICKADD	Add
Set PICKAUTO	Yes
Set PICKBOX	8
Set PICKDRAG	No
Set PICKFIRST	Yes

FRAMECAD Structure 9.2.3

Roof End Type

- Gable
- Gable Frame
- Girder
- Half Boomerang
- Half Dutch
- Half Gable
- Half Hip
- Half Saddle Only
- Half Truss Only
- Half Valley
- Hip
- None
- Outriggers
- Parallel
- Radial
- Rafter Only
- Saddle Only
- Structural Gable
- Top Chord Brace

Command: TD

Right click for setup or select first point for truss block...
Select second point for truss block...
Select third point for truss block...
Select Roof Type...Dutch, Hip, Gable, Valley, Boomerang, Radial, Dormer, DRopped Valley, More...m

30.4.2 UT - User Truss Layout

User Truss (UT) roof block input command added. User Trusses basically change the top chord direction (from raking to horizontal) wherever they intersect roof lines. Note: Data file may be updated to enable this option.

Secondary Rafters are included as part of the User Truss roof block input options. This option places non-structural rafters over the top of the horizontal top chords of user trusses.

'User Girder' trusses have been added to the list of available truss types to compliment 'User' type trusses when listing a truss. Data file may need to be updated to access these truss types.

30.5 WALL ENGINEERING ENHANCEMENTS

30.5.1 Panel Reaction Plan (PRP)

Panel Reaction Layout Plan Command added (**PRP**) - similar to bracing plan and truss uplift plan commands.

Produces a wall layout drawing with maximum base reactions for uniform and concentrated loading from the wall design.

30.5.2 Design for Concentrated Loading

Stud Design and Detail Design Reports now include design information for Concentrated Loading from Truss and Joist Members.

Opening Concentrated Loading design extended to also include:

- Joist Beams which are supporting other joists
- Trusses and Joists with a tributary width (spacing) of 20% of the opening length (or greater)
- Truss and Joists bearing on or near Jambs
- Header top plate check for concentrated loads

Stud Concentrated Loading design extended to also include

- Joist Beams which are supporting other joists

30.6 TRUSS ENGINEERING ENHANCEMENTS

30.6.1 Back to Back Trusses

Analysis and Design extended to consider fabrication tooling for crossing members

- Flange cut modelled with moment and axial releases to the most horizontal member for web crossing web or chord crossing chord.

30.6.2 Inline Trusses

Analysis and Design extended to consider fabrication tooling for crossing members

- Web notch modelled with moment and axial releases to most horizontal member only for crossing members (rather than both members as done previously).
- Flange cut modelled with moment and axial releases to the most horizontal member for crossing reinforcing members: LCLE crossing LCLE (assumes both reinforcing members are on same side of truss)
- Chord & Web end to mid Web joint ('knee joints') - web bending strength and plating of joint now dependent on web orientation - reduce strength if lip cut, plate if not lip cut (previously both plating and strength reduction done regardless of member orientation)

31 Version 9.2.3

31.1 INTELLICAD 9.2

This version of the software has moved CAD platform from IntelliCAD 9.1 to 9.2.

The installer file creates a new directory and desktop shortcut for Structure V9.2, therefore both V9.1 & V9.2 may be used on the same computer. Versions earlier than 9.1 will be automatically deleted.

The following are some of the new features that come as part of IntelliCAD 9.2 (these are not specific to the functionality of Structure):

31.1.1 User Interface

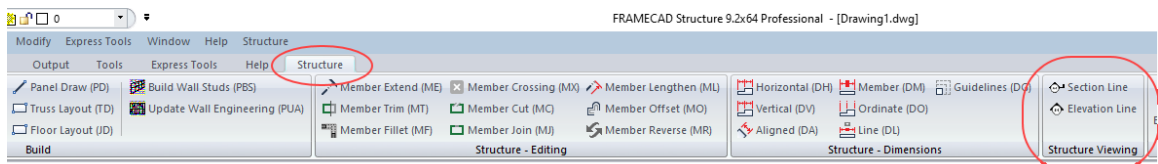
- When you start IntelliCAD, a Start Page displays automatically where you can quickly open files or choose from other common tasks. If the Start Page is not activated on start-up or you wish to reactivate it, type **GOTOSTART** or press **Ctrl+Home**. All Structure commands are not available and the command bar is not accessible until a new or existing job is activated.
- On the status bar you can now toggle Cursor Type (regular or gunsight) and XOR Cursor (cursor colour is inverted when overlapping an area of the same colour).



- Right-click a drawing tab to see options for the tab.

31.1.2 Working with Entity Views

- Create a section or elevation from a 3D drawing to determine a two-dimensional projection of the area you want to view using the **SECTIONLINE** and **ELEVATIONLINE** commands, or select from the '**Structure – Miscellaneous**' drop-down menu, or select from the '**Structure – Structure Viewing**' ribbon menu.



Note: If either command is not recognised, run the **AECOBJECTS** command and ensure it is set to '**ON**'. The program will need to be restarted for any changes to take effect.

The **Section** line is a polyline that can consist of continuous segments that define the area you want to view:

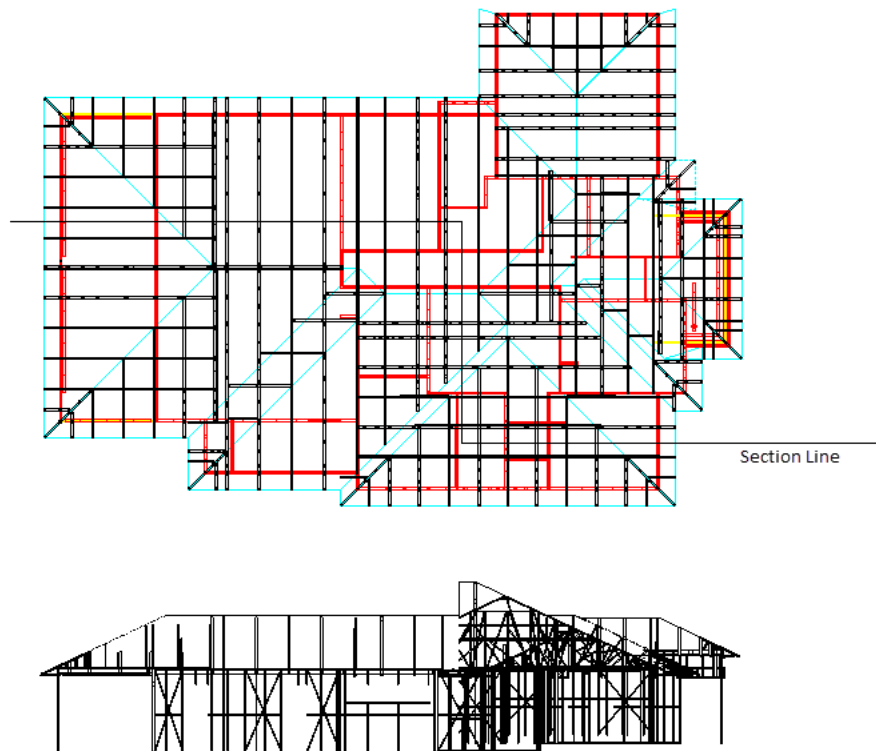
- Select **Section Line (SECTIONLINE)** and draw a polyline through the building that you want to view. The polyline can be stepped to include various continuous section segments of the building if required.
- Click on a location to place the 2D section view.
- Go into the **AECAUTOUPDATE** command and type in **1** (or '**on**') to set to **On**. If the section line is altered by length or location, the 2D view will then automatically update to suit.

Command:

AECAUTOUPDATE

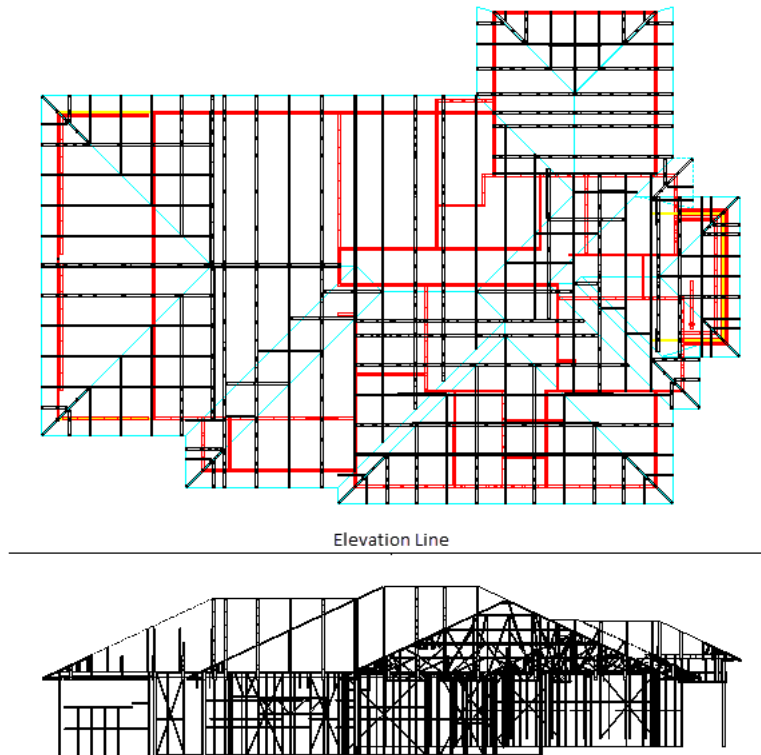
Enter new value for AECAUTOUPDATE <OFF>: 1

- To reverse the viewing direction, right click on the section line and select '**Reverse**' in the context menu.



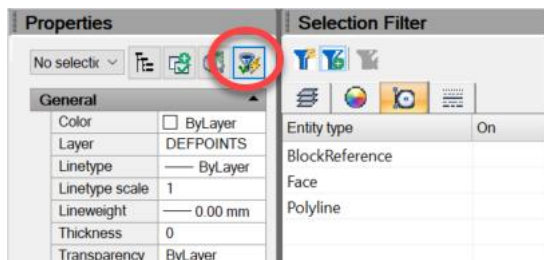
The **Elevation** line is used to create a 2D elevation:

- Select Elevation Line (**ELEVATIONLINE**) and draw a line parallel to the side of the building that you want to view.
- Click on a location to place the 2D elevation view.
- Go into the **AECAUTOUPDATE** command and type in **1** to set to **On**. If the elevation line is altered by length or location, the 2D view will then automatically update to suit.
- To reverse the viewing direction, right click on the elevation line and select '**Reverse**' in the context menu.

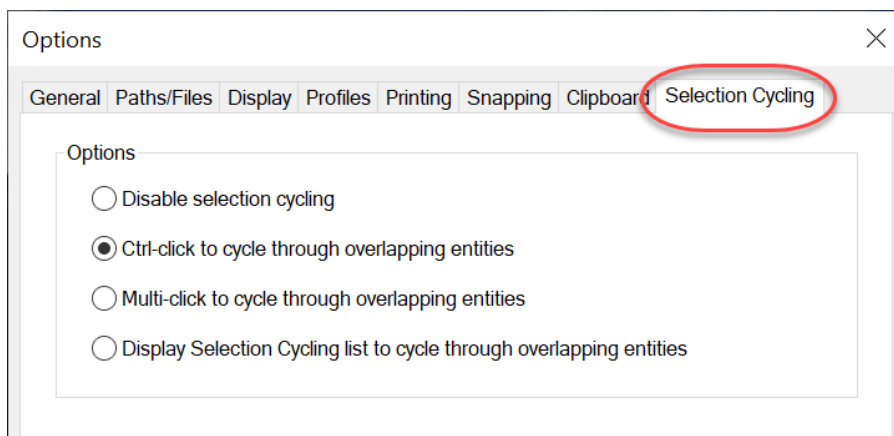


31.1.3 Selecting and Modifying Entities

- Use the Selection Filter button to display the Selection Filter pane, which displays all entities in the drawing and allows you to filter and select entities by layer, colour, entity type, and linetype.



- Click the Selection Cycling tab in the Options dialog box to specify which method you want to use when selecting entities that overlap.



- Use the Overkill command to delete or combine duplicate or overlapping entities in a drawing, reducing the drawing's file size and complexity.
- If you choose Undo or Redo from the ribbon toolbar, you can view and also select a range of actions.
- Polygons, rectangles, and break lines have additional grips and properties for smart editing.

31.1.4 Text

- Work with multiline text using right-to-left fonts.
- Create additional types of lists for multiline text.

31.1.5 New and Changed System Variables

- BLOCKEDITLOCK, CROSSHAIRMODE, OVERKILLMODE, OVERKILLTOLERANCE, OVERKILLTOLARCCORD, OVERKILLTOLARCENDPOINT, SELECTIONCYCLING.

31.1.6 Superseded IFC Commands

- BIMATTACH supersedes IFCATTACH
- BIMIMPORT supersedes IFCIMPORT
- BIMPANE supersedes IFCPANE

Refer to the IntelliCAD Help document for more detailed information (press F1 in the program to open).

More options and explanations can be found in the CAD Help (Help menu) or by pressing F1.

NOTE: If any menu commands appear to be missing, please run the DO_ONCE command to update.

31.2 REVIT INTEGRATION

Functionality has been added to allow the user to import Revit Walls into Structure, and then automatically create Structure Wall Panel Layouts from them. Additionally, any Built Frames can be exported to Revit so that framing members are superimposed onto the Revit model. This integration is done via the **FRAMECAD RevLink** Revit plugin using an "**FIM**" file.

This is an add-on feature to the software which is licenced separately. Your HASP will need to be updated to enable the Revit Integration functions.

Please refer to the **FRAMECAD RevLink User Manual** and the **RevLink_Structure Integration** manual for detailed information.

31.2.1 FIM Import

To import .fim files from Revit, use the **FC_IMPORT** command. This command can also be accessed from the **Structure – Imports** menu. You must be in the 'Model' tab to do this. Currently only wall objects will be imported.

Property	Value
Import Options	
Plan ID	0. Ground Floor FFL
Import This Plan	Yes
Existing Items	Import and Replace
System Name	FRAMECAD_FT_m
Model Name	M11 89S 0.75 G500
Import Width	89
System Width	90
Cleanup Intersections	Yes
Import Openings	Yes
Add Opening Clearan...	Yes
Opening Clearances	
Window Vertical	0
Window Horizontal	0
Door Vertical	0
Door Horizontal	0

Change Cancel

Select the required options and click on 'Change'. The wall objects can then be listed (LI) and coded.

31.2.2 Create Panel Layout from Imported 3D Objects

Once the 3D wall objects in the Model tab are coded as Structure wall entities, you then need to create the layout in the Layouts tab. This is done using the **CREATELAYOUT** command. This command can be found in the Structure drop down menu or on the **Structure – Build** ribbon menu.

Property	Value
Available Options	
Desired Level	Wall 0. Ground Floor FFL
Drawing Sheet Label	Wall Frame Layout
Label Drawing Sheet	True
Append Level to Label	True

OK Cancel

Adjust the options as required then click on 'OK'.

31.2.3 FIM Export

Once the frames are built, they can then be exported back to a .fim file. The command for this is **FIMEXPORT** which can also be accessed from the **Structure – Exports** menu.

31.3 GENERAL DETAILING

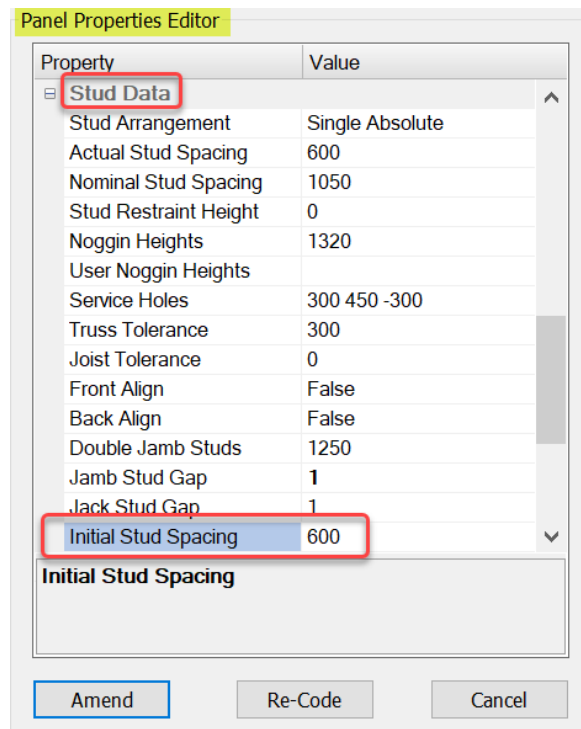
31.3.1 MT – Member Trim Command Removed

The **MT – Member Trim** (_MEMBER_TRIM) command has been removed as the **ME – Member Extend** command can be used for extending and trimming. In the instances where a member needs to be trimmed, just select the portion of the entity which you wish to keep. N.B. This command was initially removed in v9.1.2.8.

31.4 WALL DETAILING

31.4.1 Stud Spacing Options

An option has been added to the **Panel Properties Editor – Stud Data – Initial Stud Spacing** to change the initial stud spacings in a wall that has already been coded.



31.4.2 Jamb Stud Quantity Override

A new option has been added to the **Opening Editor – Construction Methods – Min Studs Left/Right** to allow the user to override the minimum number of jamb studs either side of an opening. This is to increase the number of jamb studs greater than what is calculated by the software or what is set in the data file. Enter '0' to reset to the default values.

Opening Editor

Property	Value
Construction Methods	
Head Type	Webbed Head
Web Pattern	Type 5
Lintel Materials	150x32x1.0 Lintel (LN)
Lintel Quantity	1
Web to Openings	1800
Maximum Head Depth	2000
Head Split Depth	600
Split at Base	False
Mullion Top Location	0
Include Sill Stiffener	False
Include Head Stiffener	False
Bottom Plate Cutout	Data File Default
Min Studs Left	0
Min Studs Right	0

Construction Methods

Amend Report Cancel

31.4.3 Double Jamb Studs to Minimum Opening Width

An option has been added to the **Panel Properties Editor – Stud Data – Double Jamb Studs** to set the minimum opening width before double jamb studs are added. This is a default data file setting but can be edited by listing (LI) walls.

Panel Properties Editor

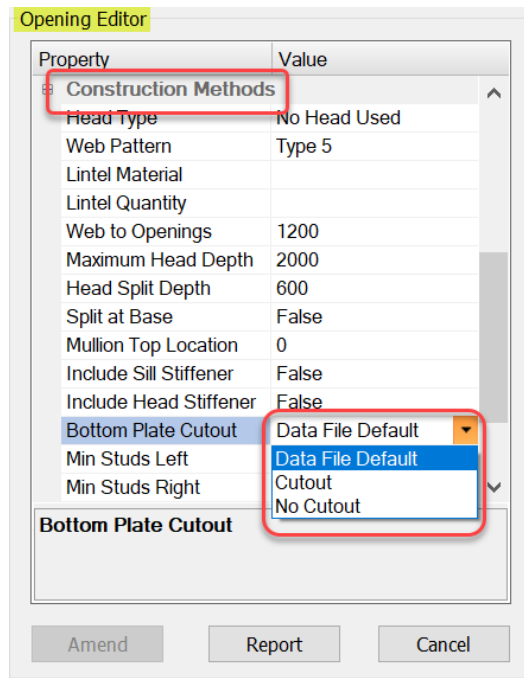
Property	Value
Stud Data	
Stud Arrangement	Single Absolute
Actual Stud Spacing	600
Nominal Stud Spacing	600
Stud Restraint Height	0
Noggin Heights	1220
User Noggin Heights	
Service Holes	300 450
Truss Tolerance	300
Joist Tolerance	300
Front Align	False
Back Align	False
Double Jamb Studs	1250
Jamb Stud Gap	1
Jack Stud Gap	1
Initial Stud Spacing	600

Stud Data

Amend Re-Code Cancel

31.4.4 Bottom Plate Cutout for Door Openings

Web notches either side of a door opening in the wall bottom plate are set on or off by default in the data file. The user now has the option to turn these on or off in the **Opening Editor - Construction Methods – Bottom Plate Cutout** and changing the option accordingly.

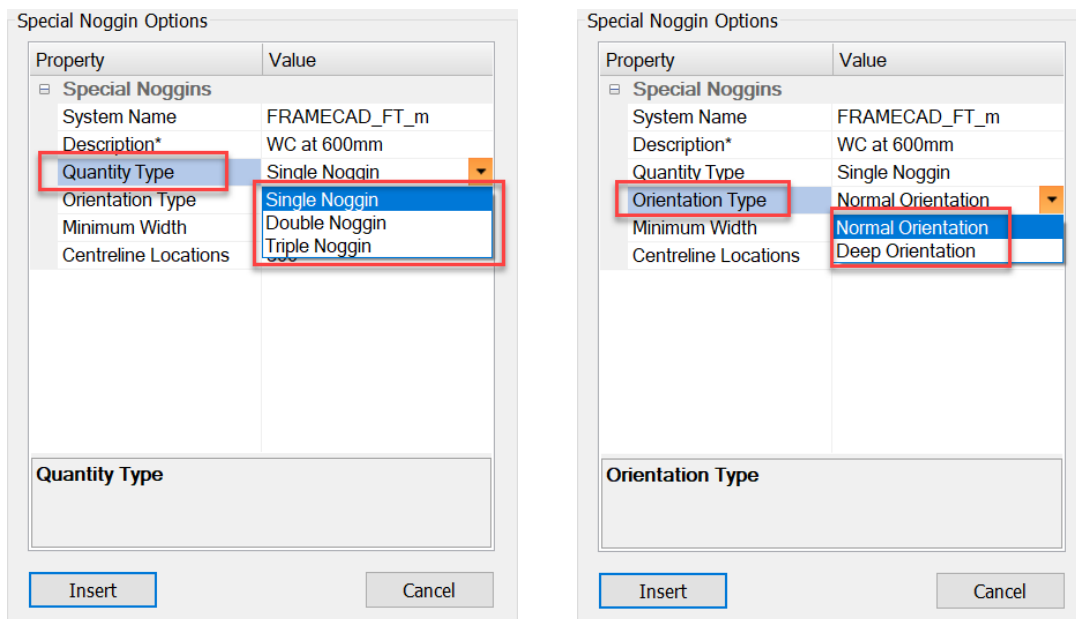


31.4.5 PPD – Panel Builder Filters

Filters in the Panel Builder now include External and Internal walls.

31.4.6 PSN – Special Noggin Updates

The **PSN (Special Noggin)** command now allows for single, double or triple nogs.



There is also the option to change the orientation. Note that deep axis orientated members will go through to Detailer below the wall frame, but all the correct tooling will be included.

31.5 WALL ENGINEERING ENHANCEMENTS

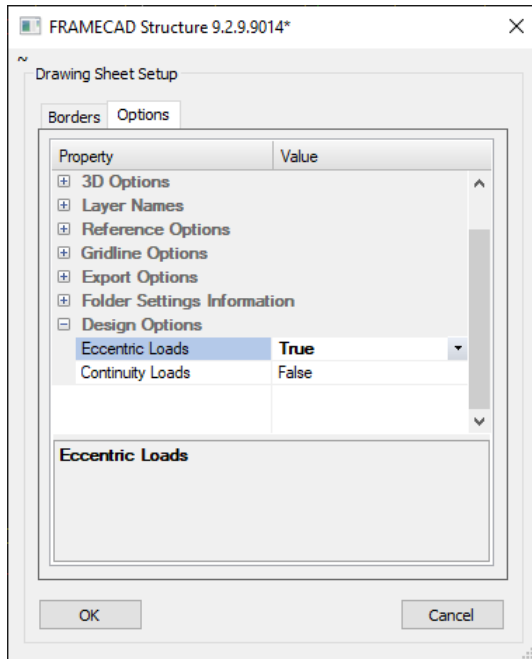
A number of Wall Engineering options have been added to allow for the more refined design of larger Buildings (buildings for which the simplified methods used for low rise residential buildings may not be not applicable). The added Engineering follows procedures and standards practices for North America (AISI).

31.5.1 Stud Design for Ledger (Balloon) Framing (AISI, CSA only)

When the 'Eccentric Loads' option is selected in the Design Options (BSET), axial loads from trusses and joists that are directly supported on the face of a wall panel (as opposed to bearing on the wall panel) are applied as eccentric loads.

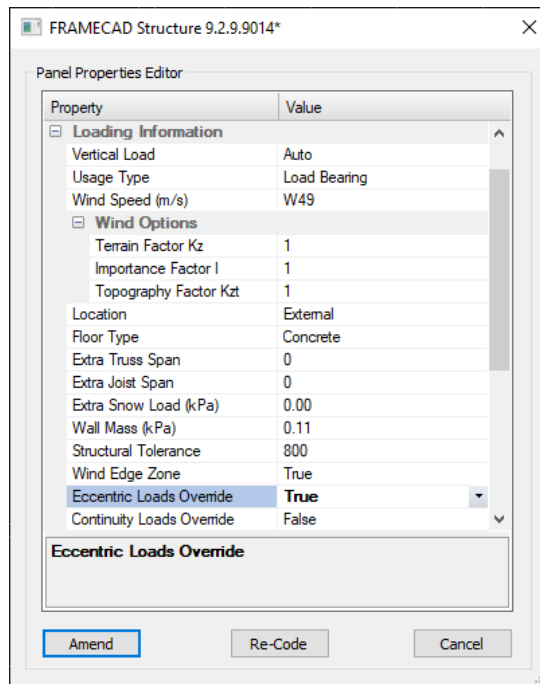
NOTE: Trusses and Joists are considered as face fixed where the end of the members lies within 20 mm (3/4") of the drawn panel face, or have a bearing on the wall of less than ¼ of the wall panel width.

For Design checks, end moments are applied to the top end of studs equal to the net eccentric loads times an eccentricity of ½ the panel width. Eccentricity moments are combined with Wind moments where applicable, following the procedures of the AISI Design Guide 2016.

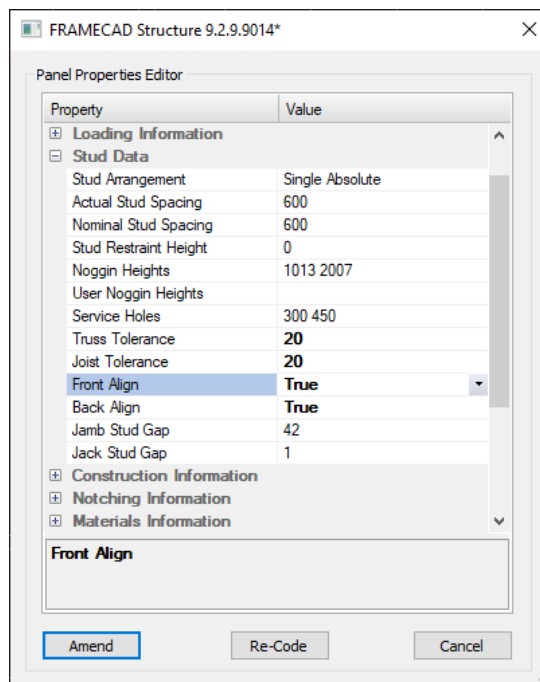


Wall Location	External	
Usage Type	Load Bearing	
Dead Load (G)	6.40	kN/m
Live Load (Q1 = max(Q2,Q3))	6.60	kN/m
Roof Live Load (Q2)	4.36	kN/m
Floor Live Load (Q3)	6.60	kN/m
Live Load (Q4 = Q2+Q3)	10.96	kN/m
Snow Load (S)	2.13	kN/m
Wind Up Load (Wu)	5.14	kN/m
Wind Down Load (Wd)	1.00	kN/m
Wind Horizontal Load (Wh)	1.06	kPa
Wind Horizontal C&C (WhCC)	1.75	kPa
Panel Self Weight	0.33	kN/m
Applied Point Load (P)	1.1	kN
Impact Load (P2)	0.7	kN
WIND EDGE ZONE	True	
ECCENTRIC AXIAL LOADS:	Auto	
Dead Load (G)	0.88	kN/m
Roof Live Load (Q2)	0.00	kN/m
Floor Live Load (Q3)	3.30	kN/m
Snow Load (S)	0.00	kN/m
Wind Up Load (Wu)	0.00	kN/m
Wind Down Load (Wd)	0.00	kN/m

A Loading Information option (LI) is also provided to force a design check for Eccentric loads from the end of trusses and joists regardless of whether they are fixed to the wall face, or bearing on the wall. Note that this option only takes effect on design when the BSET 'Eccentric Loads' design option is also set to "True".



Wall Studs by default are not aligned with trusses and joists fixed to the wall face, as typically a ledger beam is provided to spread the load evenly between the studs. A Stud Data option (LI) is now provided to align the studs with these trusses and joists should this be specified. Users may choose to align studs with members fixed on panel front, panel back, or both

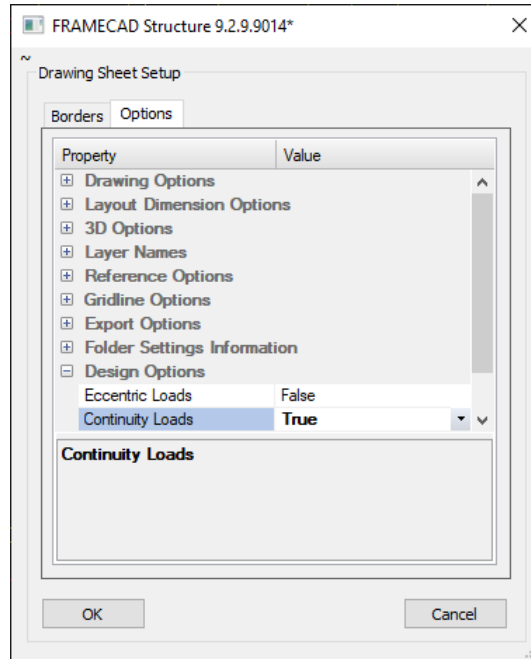


31.5.2 Stud Design for Joist and Truss Continuity Loads

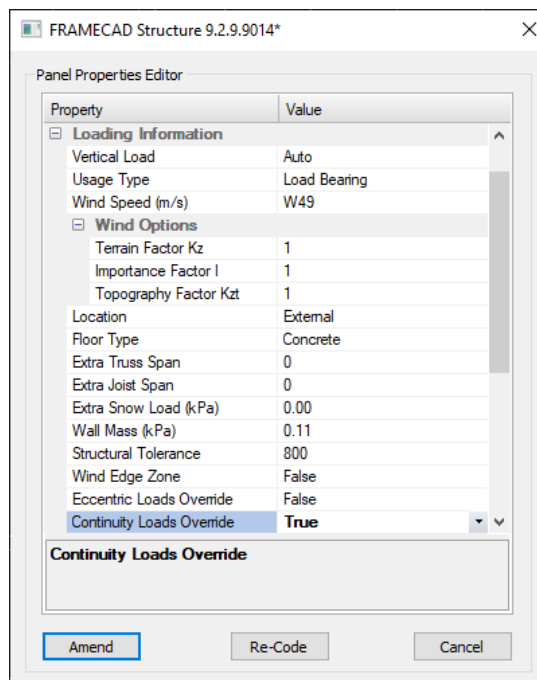
The Structure software finds the imposed loads from the roof truss and floor framing on referenced layouts, and converts these loads to uniformly distributed loads considering the load tributary width. Tributary width is the loading

width from the roof trusses and or floor between supports. Tributary width is typically taken as half the span distance to the adjacent support, or full span if the adjacent end is unsupported (cantilever).

When the 'Continuity Loads' option is selected in the Design Options (BSET), tributary width from internal spans is now increased by 25% (i.e. tributary width of 5/8 of span as applicable for a continuous beam). Tributary Width for end spans is not changed - while theoretically the reactions at the end supports of a continuous span are reduced, it is prudent not to consider this in design, so as to make provision for patch loading, non-elastic system stiffness, and the potential for changes in construction (e.g. multi-span joist being split into single span members).



A Loading Information option (LI) is also provided to force the Continuity Loads tributary width to be applied regardless of whether the loading span is internal. Note that this option only takes effect on design when the BSET 'Continuity Loads' design option is also set to "True".



31.5.3 Enhanced Design for Wind Face Loading (AISI, CSA only)

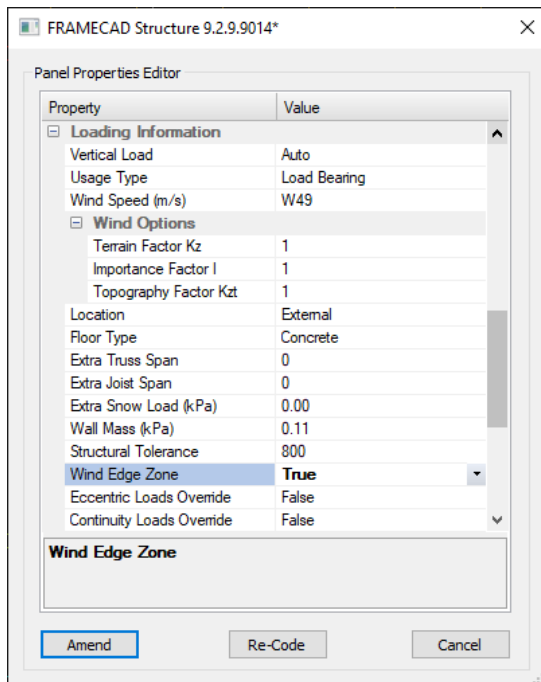
Wall Stud Design has been enhanced to consider Main Wind Force-Resisting System (MWFRS) and Cladding and Component (C&C) wind loads separately.

Previously studs were designed for a combination of Axial loads plus the bending effects of C&C face wind loads concurrently. However, the AISI Standard permits that wall studs may be designed for:

- combined bending and axial load effect based on MFWRS wind loads
- bending load effect based on C&C wind loads
- deflection limits based on 42% of C&C wind loads with no axial loads

These provisions are now implemented for all AISI and CSA designs. Design load combinations and wind pressure coefficients have been updated and refined to suit.

Additionally, a Loading Information option (LI) has been added to designate a wall panel as being located in a building Wind Edge Zone. The C&C wind design loads are increased accordingly (to ASCE Fig 30.4) for these panels – refer to Engineering manual for details.

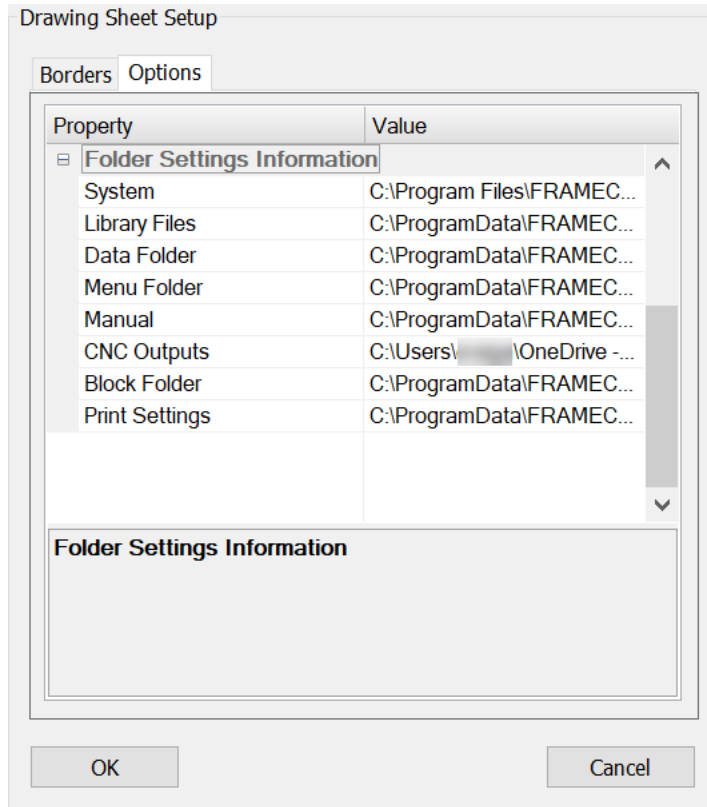


Wall Location	External	
Usage Type	Load Bearing	
Dead Load (G)	6.40	kN/m
Live Load (Q1 = max(Q2,Q3))	6.60	kN/m
Roof Live Load (Q2)	4.36	kN/m
Floor Live Load (Q3)	6.60	kN/m
Live Load (Q4 = Q2+Q3)	10.96	kN/m
Snow Load (S)	2.13	kN/m
Wind Up Load (Wu)	5.14	kN/m
Wind Down Load (Wd)	1.00	kN/m
Wind Horizontal Load (Wh)	1.06	kPa
Wind Horizontal C&C (WhCC)	1.75	kPa
Panel Self Weight	0.33	kN/m
Applied Point Load (P)	1.1	kN
Impact Load (P2)	0.7	kN
WIND EDGE ZONE	True	
LOAD CASE RESULTS:		
		Max Stud Spacing
(single stud):		
1.2G + 1.6Q2 + 0.5Q3	728.7	mm
1.2G + 0.5Q2(or S) + 1.6Q3	640.7	mm
1.2G + 0.5Q3 + 1.6S	909.4	mm
1.2G + 1.6P1	1474.5	mm
1.2G+0.5Q2(or S)+0.5Q3+1.0Wh	500.0	mm
1.2G + 1.6Q2(or S) + 0.5Wh	600.0	mm
1.0WhCC	639.7	mm
0.42WhCC	614.8	mm
P2	1743.4	mm

32 Version 9.1.2.6

32.1 FOLDER SETTINGS

The **Folder Setting Information** has been shifted from PSET to BSET.



32.2 DEEP C JOIST SERVICE HOLE ENGINEERING

Scenarios:

For existing data files and jobs where the 'Standard (service) hole included' option in the Floor Member Editor is set to 'False' – holes are not considered. The Detail Design Drawing in the Joist Builder (JJD) specifies hole end distances that puts holes outside web crippling zone.

Existing data file and jobs where "service hole included" option in joist LI has been set to true, or has been changed and service hole lines drawn: - holes considered anywhere, but with minimum edge distance of 10 inches (US Standard).

One-page report specifies 10" hole end distances.

New hole data file system:

Where "service hole included" option in joist LI has been set to true- holes considered anywhere, but with minimum edge distance of 10 inches (US Standard). One-page report specifies 10" hole end distances.

Where "service hole lines drawn - holes considered at drawn location. One-page report specifies hole locations.

33 Version 9.1.2.5

33.1 WALL FRAME STARTING END LOCATOR HOLE

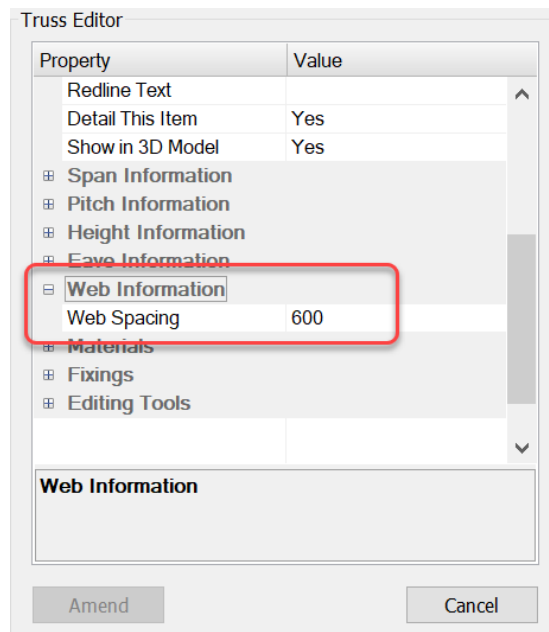
An option has been added to the software as a data file setting, which allows for a webhole/bolthole punch to be applied to the left-hand – start end – of a wall frame.

There are three semi-permanent options available:

1. The tooling to be applied to the bottom plate (12mm from the end of the frame).
2. The tooling to be applied to the first stud (20mm up from the bottom of the frame).
3. No tooling to be applied (default setting).

33.2 GABLE FRAME WEB SPACING

The web spacing on gable frames can be altered by listing (LI) the gable frame and editing the Web Spacing in the Web Information.



34 Version 9.1.2.4

34.1 JSET – JOIST BLOCKING

More joist blocking options have been added to JSET:

- Intermediate span blocking can now be added by adding and 'Int Bearer Type' and setting the blocking option in 'Internal Bearer Method'.
- Blockings can now be placed at every alternate joist space by selecting 'Alternate Blocking' in the 'Bearer Method' and 'Internal Bearer Method' dropdown options.

34.2 PLB – PANEL LAP BEAM

When a beam is lapped over a panel, the label will get a '+' symbol added to the beginning or end of the label according to the end that is lapped.

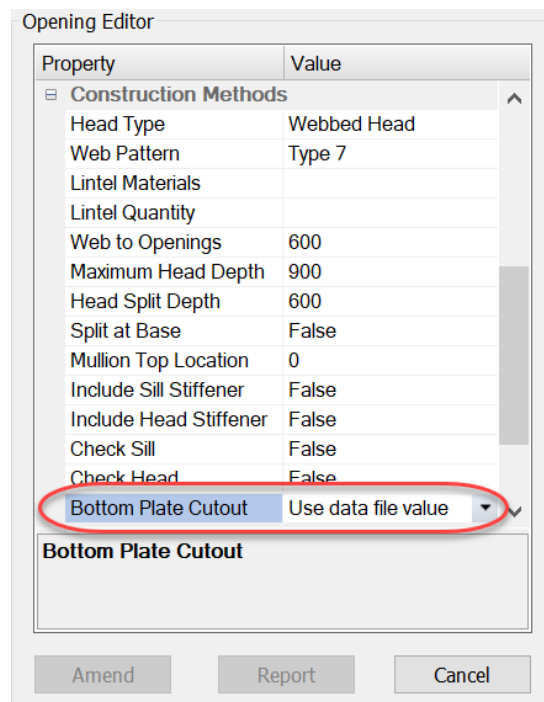
35 Version 9.1.2.3

35.1 TSET/PSET/JSET - BUILDER FILTERS

The frame building filters can now be pre-set prior to building frames. The filters that are normally selected in the Truss Builder, Panel Builder and Floor Builder views have been replicated in TSET, PSET and JSET under the Options tab.

35.2 BOTTOM PLATE WEB NOTCH TO OPENINGS

The bottom plate web notch to either side of a door opening is able to be changed when listing (LI) the opening. Previously it was only a data file setting.



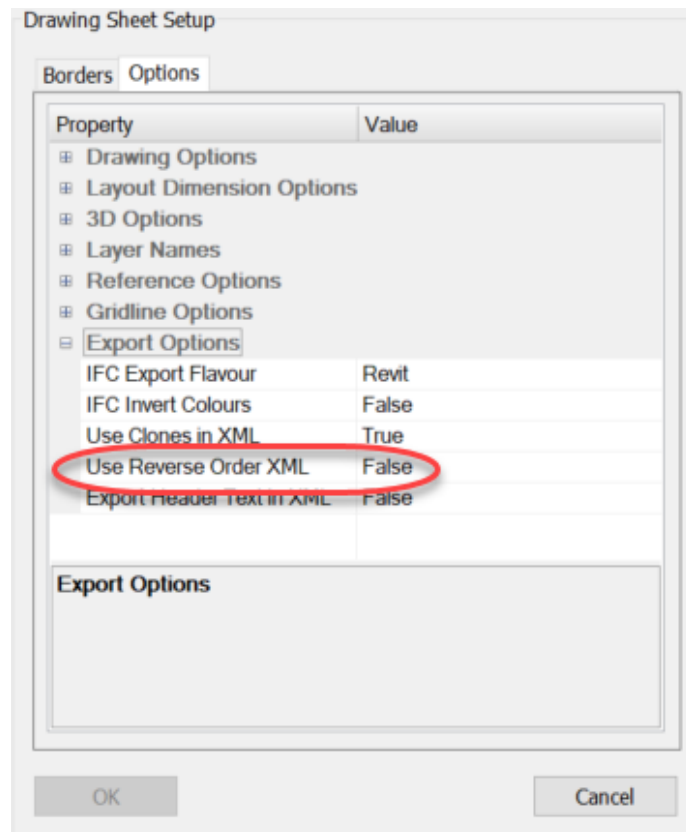
36 Version 9.1.2.1

36.1 GENERAL DETAILING FUNCTIONS

If you are upgrading from v9.0 to v9.1 you **must** download and run the Full Installer. This will create a new separate desktop shortcut called "FRAMECAD Structure 9.1". The Upgrade Installer will only work if you already have v9.1 installed.

36.1.1 BSET – Reverse Frame Order Export

An option has been added to BSET – Options – Export Options to allow wall panels in the XML file to be exported in the reverse order as shown in the panel stack, as generated by the Panel Stack (PST) command.



36.1.2 Layout Colours

Layout colours can now be set and altered in JSET for floors, prior to input, in the same way as they can be changed in TSET for trusses.

You can also change the colours for beams and posts in the ADD dialogue prior to input.

36.1.3 Sectional Properties and Capacities Report

A 'Sectional Properties and Capacities Report' can now be printed from the SECT dialogue box.

36.1.4 Zone Grouping Check

A command called CHECKZONE has been added which checks the layout to see if any walls or joists have been missed when applying the zone grouping option. Zone Grouping can be found in the How To section, item 40.1.37.

36.2 TRUSS DETAILING ENHANCEMENTS

36.2.1 ADD – Truss by Entity (All Half Truss Types)

When inputting a half truss type by entity, the heel end of the truss will start from the end of the line that the initial selection was closest to. The second selection determines which side of the line the truss sits.

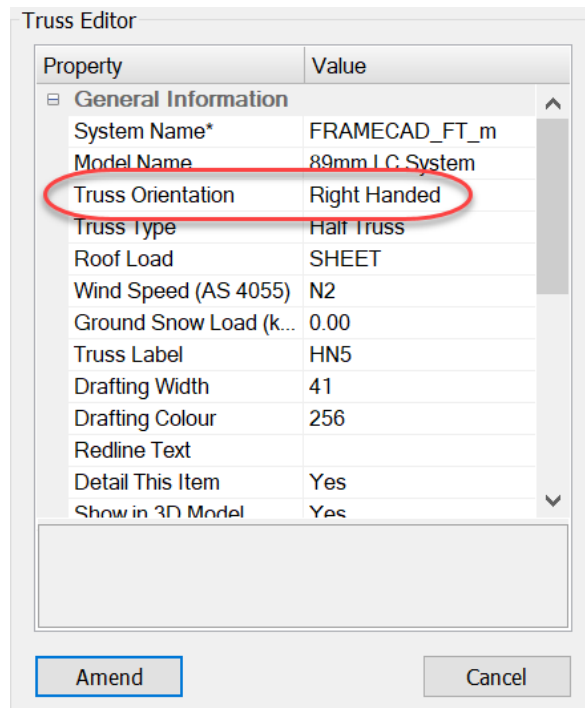
36.2.2 ADD - Right Hand Truss Input for Back-to-Back Half Truss Types

Right-hand back-to-back half truss types are now able to be input using the ADD – Truss option. This only applies to all half truss types, jack rafters and hip rafters.

When inputting a truss using the point to point option, the first point selects the heel end of the half truss, the second point selects the high end and the third selection point determines which side of the truss it is to be viewed from, i.e. which side the web members will be facing.

When inputting a truss type by entity, the heel end of the truss will start from the end of the line that the initial selection was closest to. The second selection determines which side of the line the truss sits and is to be viewed from, i.e. which side the web members will be facing.

The orientation is indicated when listed:

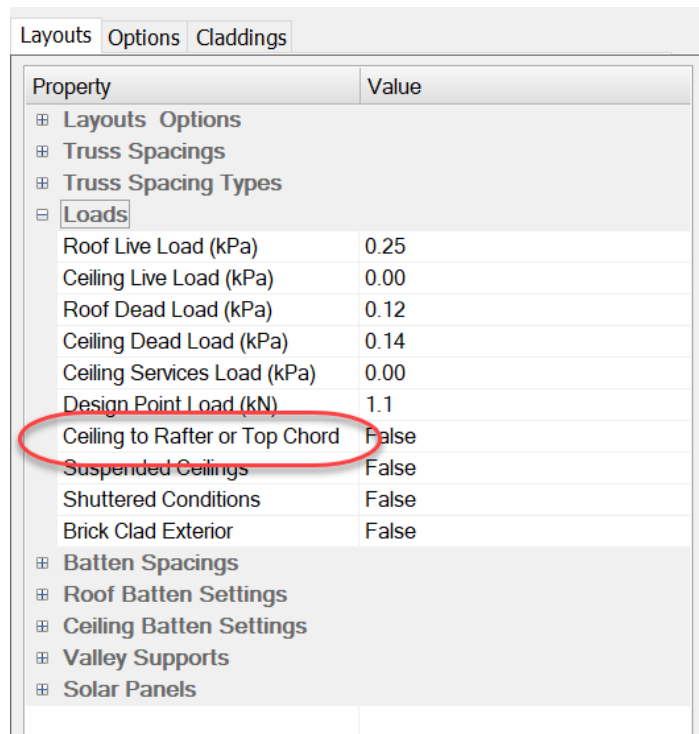


Property	Value
General Information	
System Name*	FRAMECAD_FT_m
Model Name	89mm L.C. System
Truss Orientation	Right Handed
Truss Type	Half Truss
Roof Load	SHEET
Wind Speed (AS 4055)	N2
Ground Snow Load (k...)	0.00
Truss Label	HN5
Drafting Width	41
Drafting Colour	256
Redline Text	
Detail This Item	Yes
Show in 3D Model	Yes

Amend Cancel

36.2.3 Ceiling Load to Top Chord

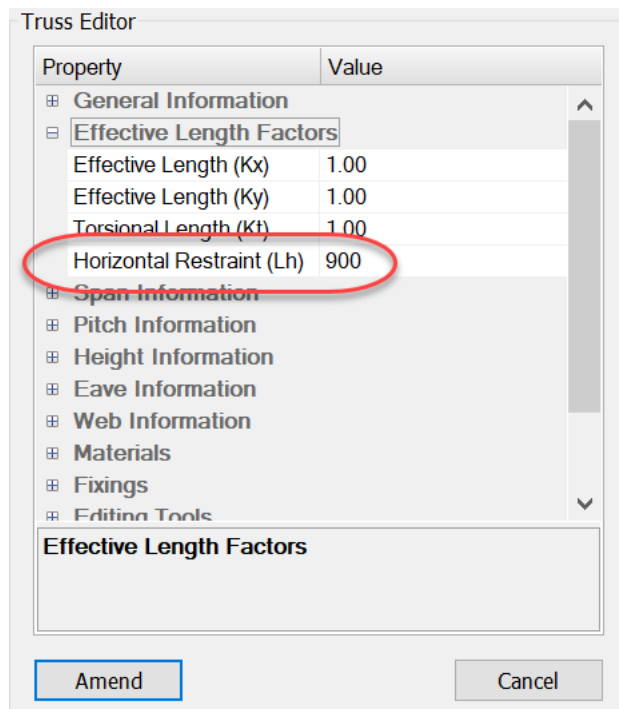
An option has been added to TSET – Layouts – Loads, which allows the ceiling load to be applied to a rafter or to the top chord of a truss.



Property	Value
Layouts Options	
Truss Spacings	
Truss Spacing Types	
Loads	
Roof Live Load (kPa)	0.25
Ceiling Live Load (kPa)	0.00
Roof Dead Load (kPa)	0.12
Ceiling Dead Load (kPa)	0.14
Ceiling Services Load (kPa)	0.00
Design Point Load (kN)	1.1
Ceiling to Rafter or Top Chord	False
Suspended Ceilings	False
Shuttered Conditions	False
Brick Clad Exterior	False
Batten Spacings	
Roof Batten Settings	
Ceiling Batten Settings	
Valley Supports	
Solar Panels	

36.2.4 Horizontal Chord Restraints to Truncated Trusses

An option has been added to the listing properties of truncated trusses (Truss Editor – Effective Length Factors – Horizontal Restraints) that allows horizontal top chord restraint spacings to be modified in situations where the hip end rafters or half truss top chords don't run over the horizontal top chord of the truncated truss, e.g. where the horizontal top chord is flush with the roof plane.

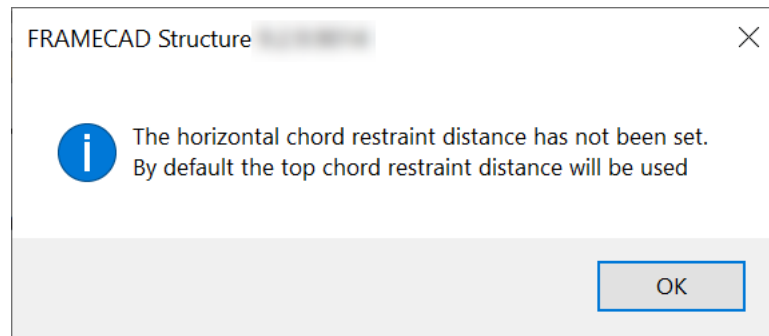


Property	Value
General Information	
Effective Length Factors	
Effective Length (Kx)	1.00
Effective Length (Ky)	1.00
Torsional Length (Kt)	1.00
Horizontal Restraint (Lh)	900
Span Information	
Pitch Information	
Height Information	
Eave Information	
Web Information	
Materials	
Fixings	
Editing Tools	

Effective Length Factors

Amend Cancel

By default, a calculated value is applied to truncated trusses that have been input automatically using the JD command. If a truncated truss of any type is manually input using the ADD command or if a truss is listed and changed to any truncated type truss, then this value will be reset to zero which is the default setting that uses the roof batten spacing and the following warning message will be displayed:



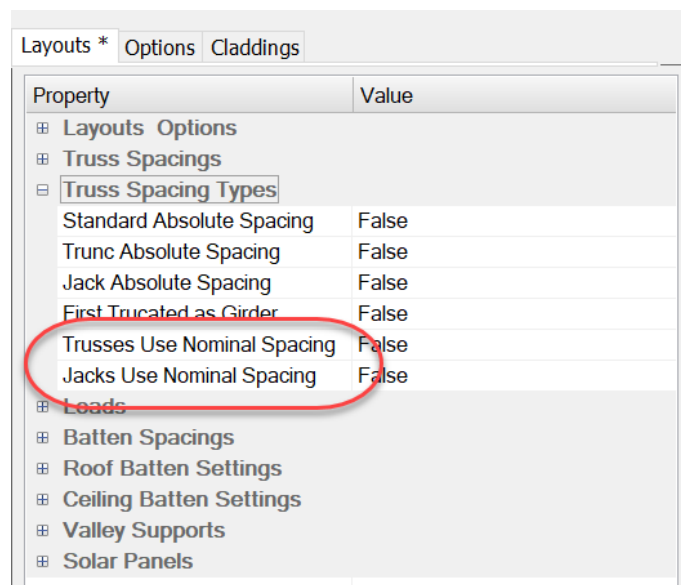
You can then change the restraint value if required, as described above.

36.2.5 TSET – Truss Design Centres

An option has been added to TSET – Layouts – Truss Spacing Types which enables the truss engineering to use the design centres, as specified in the Truss Spacings section. Set 'Trusses Use Nominal Spacing' and/or 'Jacks Use Nominal Spacing' to 'True'.

By default, these are set to 'False', which will use the actual spacing of the trusses when input using the TD truss input method.

NOTE: Truss spacings do not automatically adjust if trusses are moved or added in layout. The user must list trusses to alter the spacings if required.



36.3 JOIST DETAILING ENHANCEMENTS

36.3.1 Multiple Sized Service Holes for Deep C Joists

Machines that produce different size service holes can be added in the joist layout. To do this, activate the **JSH** (Joist Service Hoe) command, draw a line across the joist layout to indicate the service hole location, then list and change the line to suit the required service hole size. When the xml file is created from the layout using the CNC command, this information will be transferred through to Detailer to apply the correct tooling.

This functionality requires data file updates.

36.3.2 Joist to Wall Loading Tolerance

When a joist sits on top of a wall, the loading tolerance distance to the centre of the wall is increased from 0 to 10mm to ensure that all loads are correctly being reported where joists are split along the centreline of the wall.

When joists are fixed to the side of a wall, the loading tolerance distance is set to 10mm to allow for support member or support bracket clearances.

37 Version 9.1.1

37.1 INTELLICAD 9.1

This version of the software has moved CAD platform from IntelliCAD 9.0 to 9.1.

The installer file creates a new directory and desktop shortcut for Structure V9.1, therefore both V9.0 & v9.1 may be used on the same computer.

V9.1 will run V9.0 jobs, however, due to the major changes in V9.1, it is recommended that existing jobs near completion continue using V9.0.

37.2 DESIGN CODES AND STANDARDS

New Versions added for North American and Australasian Standards:

- IBC 2018 (USA Building Code)
- NBCC 2015 (Canada Building Code)
- AISI S100-16 / CSA S136-16 (North American CFS Specification)
- AS/NZS 4600:2018 (Australasian CFS Standard)

37.3 GENERAL DETAILING FUNCTION

37.3.1 Imperial Units Precision Standardised

Input and output reporting updated to provide consistent precision. Typically, dimensions reported to 1/16".

37.3.2 FFIND – FRAMECAD Find

The **FIND** command, which is intended to find Structure frame entities, has now been changed to **FFIND** so it does not overwrite the standard IntelliCAD FIND command, which is used to find and replace text.

37.3.3 Show in 3D Model

All frame types have an option to not be displayed in the 3D model. List (LI) a wall, truss, joist, beam or post and go to 'Show in 3D Model' in the General section and set to 'No'.

37.3.4 LA – Truss Labels

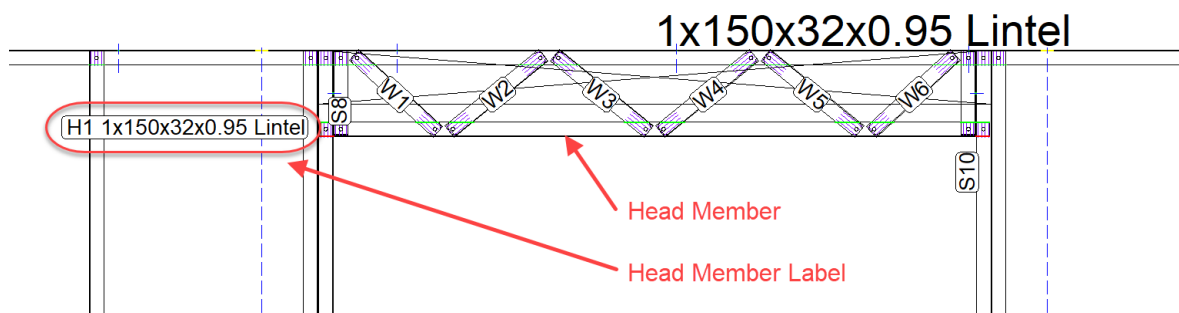
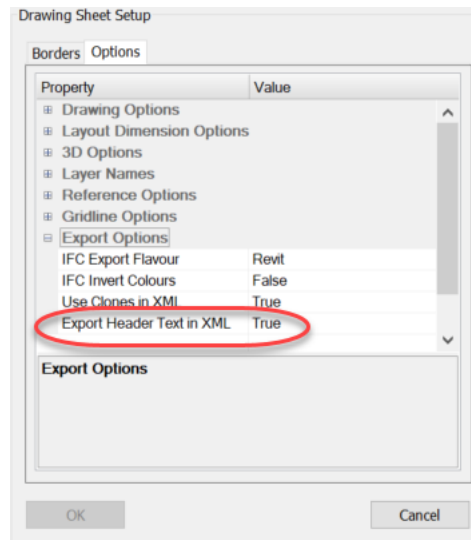
Truss labels are now placed outside the trusses if an overhang is present.

37.3.5 Truss Orientation

When inputting LE trusses, the trusses are now orientated the same way around from one end of a roof block to the other with the exception of half trusses. Orientation is dependent on whether they are input in a clockwise or anti-clockwise direction when using the TD truss input command. Half trusses are always orientated with the heel of the truss at the left-hand end.

37.3.6 Export Lintel Plate Header Text in XML

An option has been added to the '**BSET Export Options**' to enable the lintel plate text to be exported in the XML file and printed on the head member. This option makes it easier for the assemblers in the factory to see where lintel plates are required.



37.3.7 VER – Structure Version

'Current IRX Version' - Current version of the Structure software loaded.

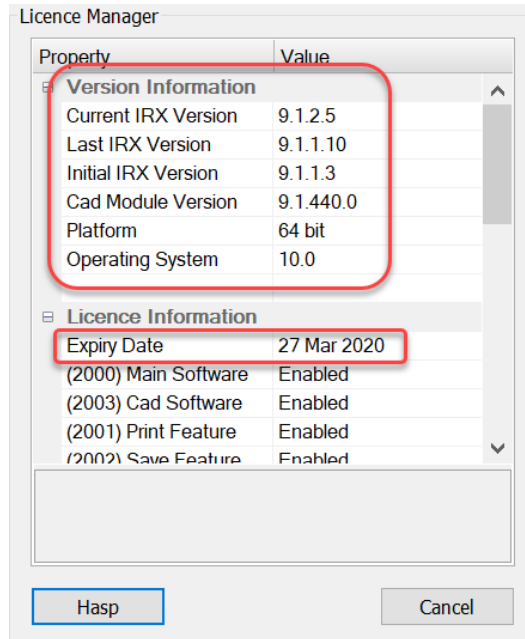
'Last IRX Version' - When a drawing is last saved, the current software version loaded is saved with it.

'Initial IRX Version' - When a drawing is started, on the initial save the current software version loaded is saved with it.

'CAD Module Version' - Current version of IntelliCAD that the Structure software is built on.

Operating System platform information - x64 bit or x32 bit. Currently only 64 bit is supported.

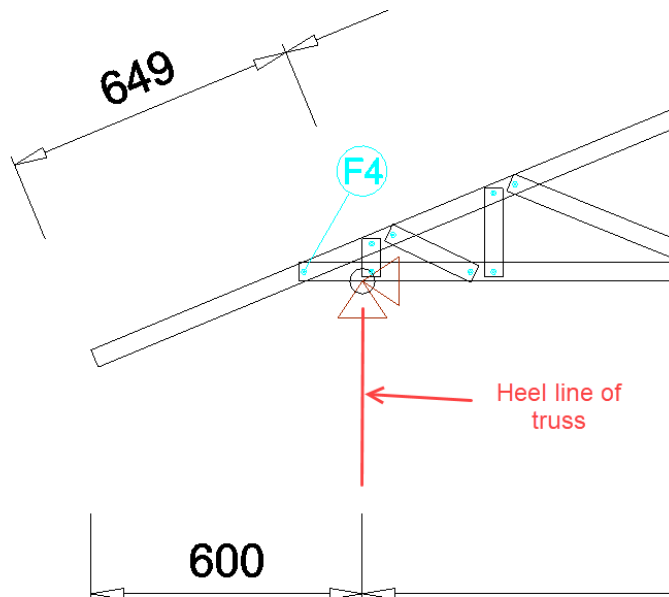
Licence Expiry Date. Days remaining on licence also appears in the Command Bar when the program is first opened.



37.4 TRUSS DETAILING ENHANCEMENTS

37.4.1 Extended Eave

A new eave option called '**Extended Eave**' has been added to the software which extends the bottom chord out past the heel of the truss to directly intersect with the top chord.

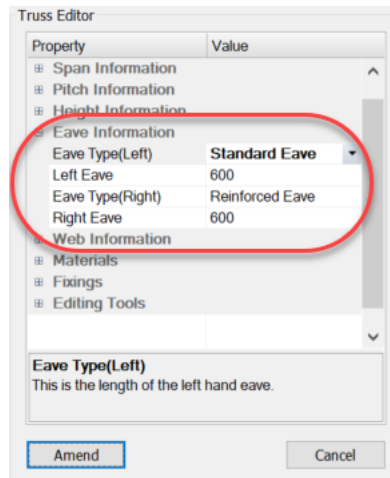


This creates extra support for the top chord overhang, therefore limiting the need to use the reinforced eave option in some situations, and only if lip notches are **not** created in the top chord at this location. When used in conjunction with Detailer v5.0.1.9, the bottom chord will tab around the outside of the top chord, thus eliminating any further lip notching in the top chord. The outside edge of the first vertical web is at the nominal heel location of the truss.

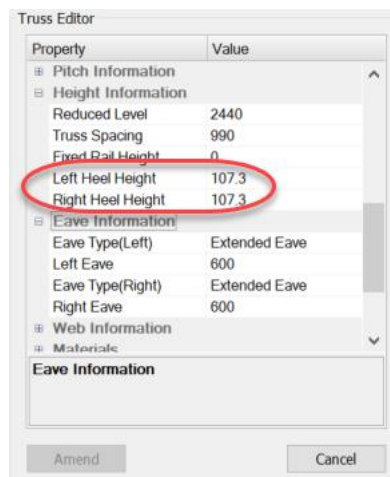
This option is available in TSET – Eave Options. Existing users will either need to change to another data file and then change back again, or activate the RESTALL command to return to the factory default settings.

37.4.2 LI – Eave Options

Left and right eave options can now be altered independently of each other when listing a truss from layout.



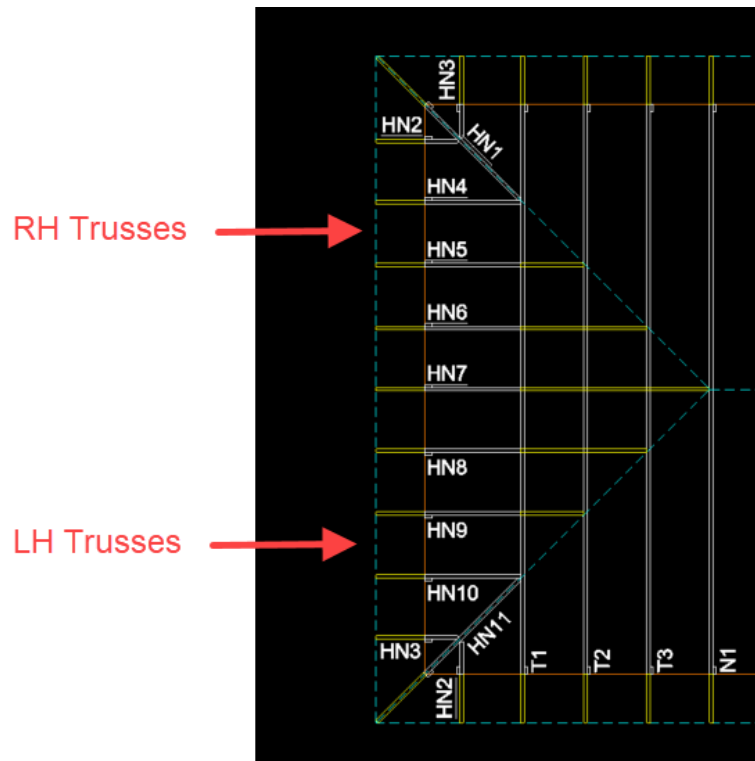
Care needs to be taken if changing between eave options as different calculations are required to achieve the correct heel height for them to work properly. If you want the heel to automatically recalculate, you will need to change the Heel Heights to '0' **before** changing the Eave Type.



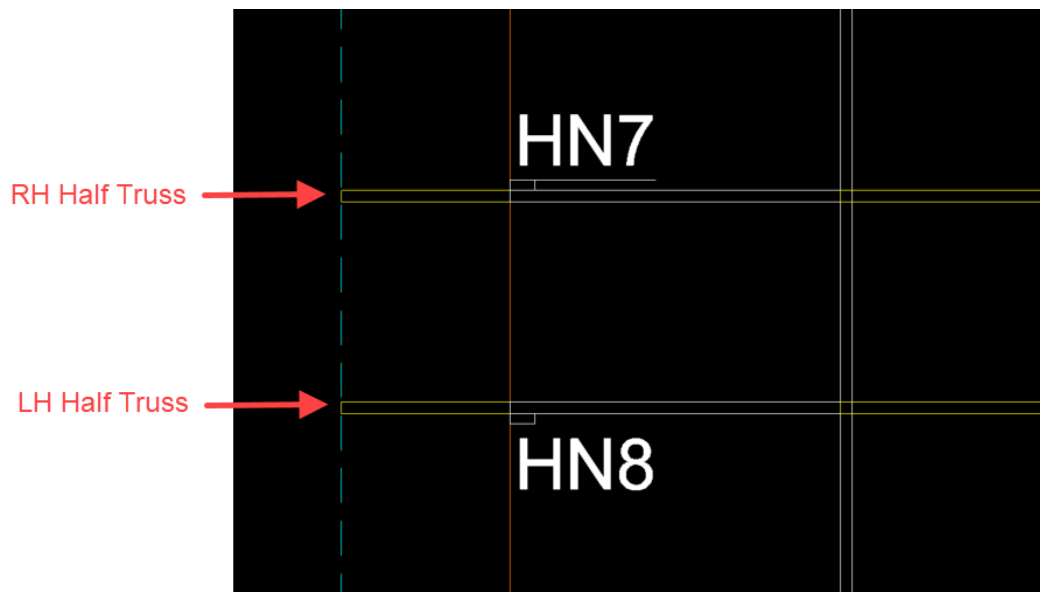
Important Note: Any change in heel height after trusses have been input will not automatically correct the heights of truncated trusses or stop-end heights (when they occur at the opposite end of the truss) to suit.

37.4.3 Right-Hand Trusses for LC Truss System

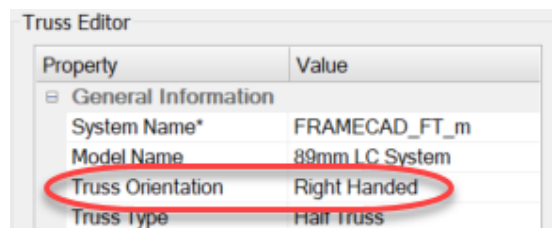
When inputting LC (back- to-back) trusses, the software now inserts right-hand trusses into the hip ends. Right-hand trusses are defined as a **HALF** standard/ girder/ saddle/ truncated truss with the heel at the right-hand end when viewed in elevation.



Right-hand trusses are indicated on the plan with an underlined label. The truss marker is also placed on the opposite side of the right-hand half truss to that shown on a left-hand half truss.



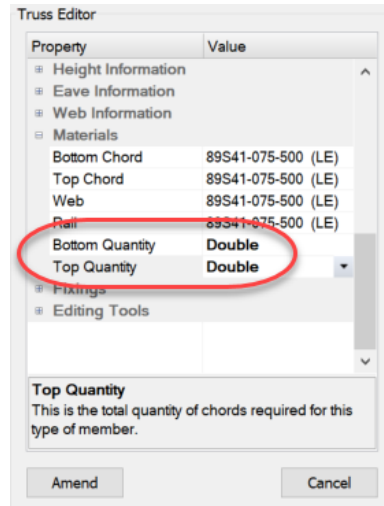
When listing a truss, the Truss Editor also shows the orientation information.



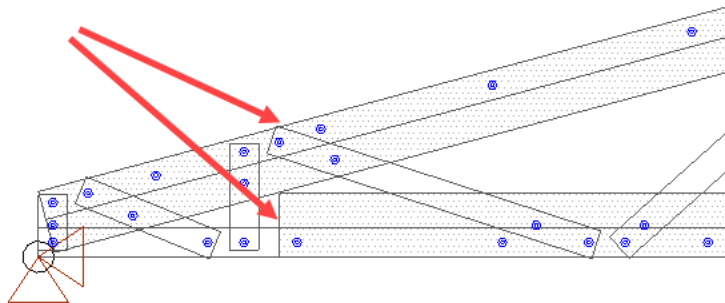
If the user needs to change from one orientation to another, use the MR (Member Reverse) or RF (Reverse Frame) command in the truss layout. Orientation cannot be changed when listing a truss or after a truss has been built.

37.4.4 Reinforced Truss Chords

Chord Member Reinforcing may now be applied to Trusses in the Layout plan by listing a truss and changing the Top or Bottom Chord quantity to 'Double' (LI). Using this method, the Chord reinforcing members are trimmed so as not to overlap adjacent chord Reinforcing.

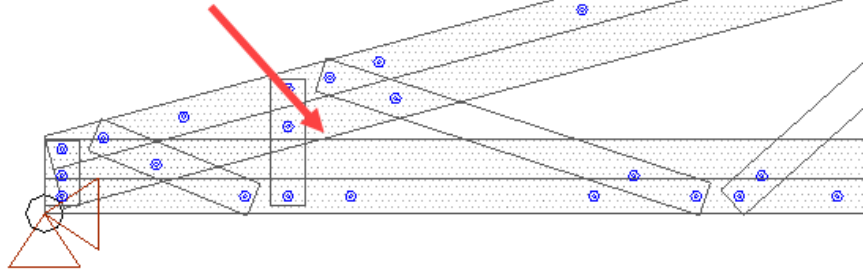


top and bottom chord reinforcing members do not intersect

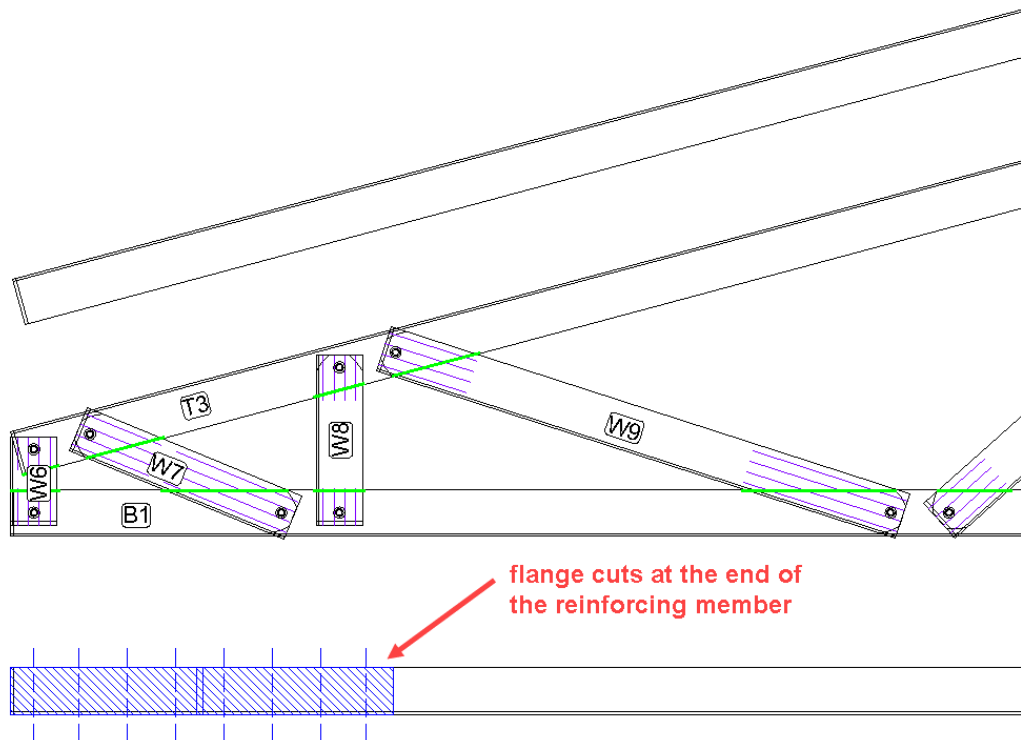


When truss chords are fully reinforced, using either the **BM (+Alt)** command on the Detail Sheet or by extending reinforcing that was applied in the Layout sheet, the exported reinforcing member will automatically be flange cut at the intersections to enable them to fit together.

Intersection point of top and bottom reinforcing members. Bottom reinforcing member will have flange cuts, starting from this point.



The correct flange cut tooling (LH or RH) applies to the reinforcing members being fixed to the front face of the truss (as seen in the detail sheet view in FRAMECAD Detailer).



37.4.5 Inline Truss Screw Quantities

Screw quantities for inline trusses are now counted as even numbers.

37.5 TRUSS ENGINEERING ENHANCEMENTS

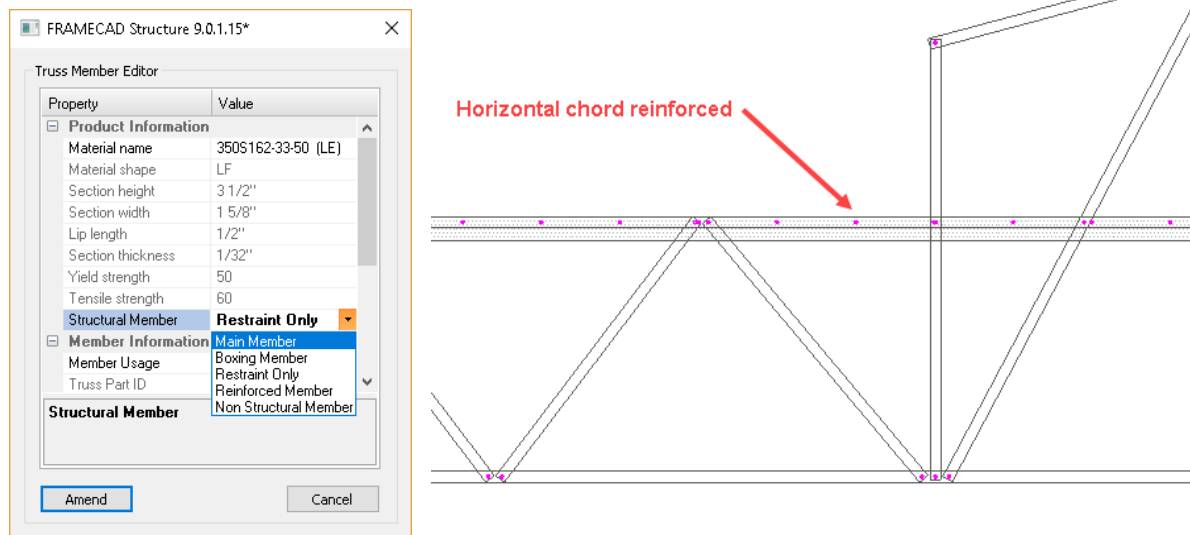
Modifications have been made to Inline (LE) Roof and Floor Truss Engineering to take further consideration of web and lip cuts. These changes mean that the analysis will now provide an automatic assessment of web and lip cut effects on most truss configurations produced through manual editing in Detail Drawings (in addition to truss configurations generated by the Truss Builder), eliminating the need for Engineers to specify additional reinforcing or plating in most cases.

NOTE: In some cases, for automatically generated trusses, the modified analysis method may show a higher capacity ratio than previously. This is due to a reduction in the level of moment redistribution considered at lip cut locations.

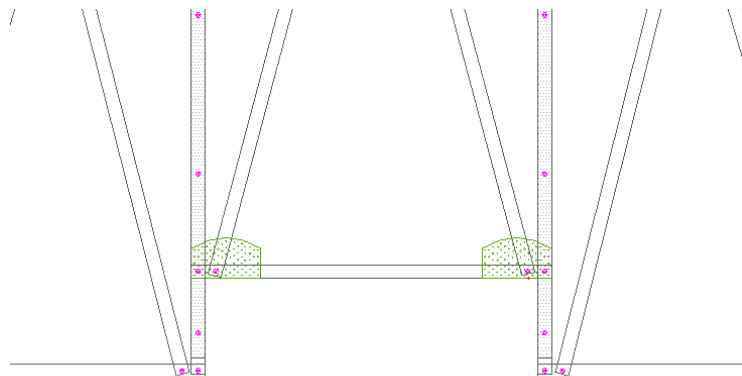
While this may be conservative for strength design, it does limit the amount of local deformation that can occur at truss joists, and so provides a higher quality system.

- Manually generated Internal Rails and Chords are now effectively modelled as restraint only, due to web and lip cuts required when crossing Webs – Note: Rails in Truss Builder generated trusses are considered as non-structural.

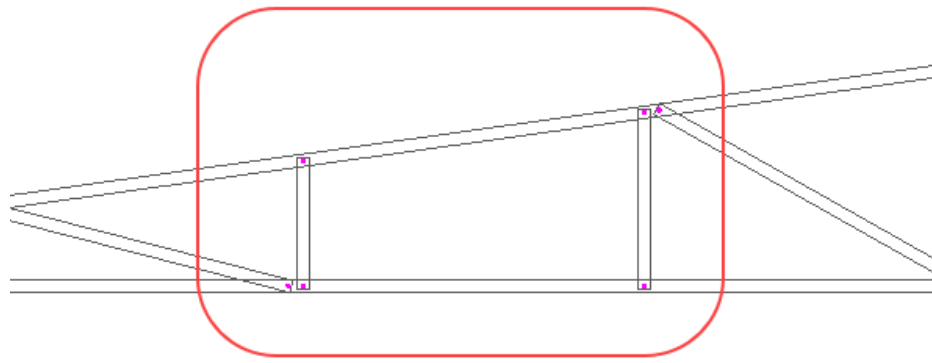
Should a Designer wish internal chords or rails to act as structural members, this can be achieved by reinforcing these members using the **BM (+Alt)** command. After reinforcing, **list (LI)** the rail and change the Structural Member status to **"Main Member"**:



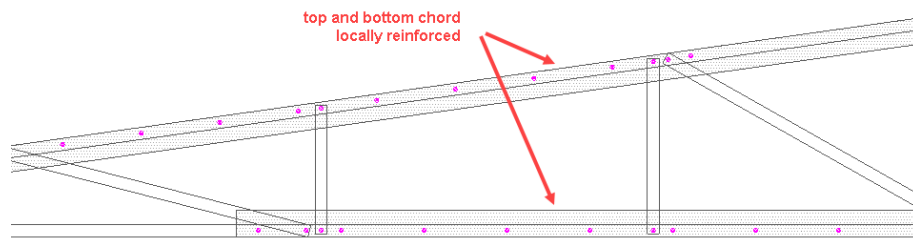
- Reinforcing Plates are now automatically added to External Chord end connections where web notching may be required. NOTE: For production using the FRAMECAD Factory machine control software, ensure that the 'Extend off stick end, with scrap piece' option is selected for 'Stick start/end processing' settings in 'Setup - Web Notch' (Tools Screen).



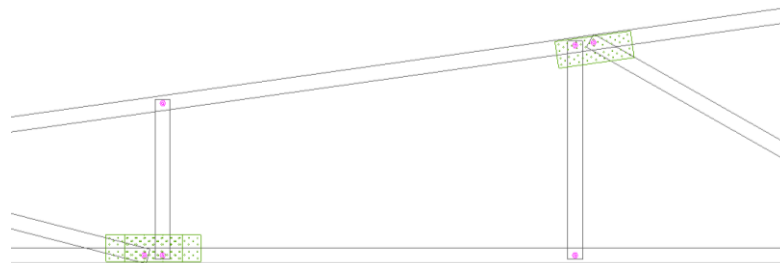
- Chord and Web bending stiffness and strength is modified at lip cut location to cover configurations where there is a break in the web pattern, i.e. for 'non-triangulated' web layouts drawn by users where the structure is effectively acting as a flexural member (beam) rather than as a truss.



In these instances, it is recommended to locally reinforce the chords:



- Reinforcing Plates are now automatically added to external chords at Web locations where local bending moments exceed the design strength, and reinforcing members are missing.



- Trusses Manually Edited in Detail Drawing will be Specified as **'Edited'**. This will highlight to the Engineer which trusses will require closer inspection in the Engineering review and highlight to the detailer trusses which will need to be modified should the layout be altered.

NOTE:

- An Engineering review is still required for all trusses, with particular attention required for 'Edited' trusses.
- As previously mentioned, the analysis typically does not take into consideration Web cuts (notches) in Webs, or External Chord Members notched over Webs. Any web notches in these members must be reinforced or plated in accordance with Engineers instructions.
- The Design does not check whether the quantity of screws specified fit within a member joint. Connector Plates should be provided in accordance with Engineers instructions where required.

37.6 JOIST DETAILING ENHANCEMENTS

37.6.1 Webbed Joist Screw Quantities

Screw quantities for webbed joists are now counted as even number quantities.

The screw requirement on all member joints for webbed joists has been set to '4' in the standard data files. This creates a more robust joist and is in general agreement with customer feedback. Most pre-existing custom data files may be set to '2'. In this case, extra screw fastenings will be nominated only where required. Custom data files can be altered on request.

The user can create a machine setup in Detailer for webbed joists with the Extra Fastening in the 'General' tab set appropriately (see section 4.2.3 in the Detailer User Manual) if they wish to make assembly easier in the factory. This will place an extra flange hole fastening at every joint for the secondary screw fastening.

37.6.2 Support Lines

In the previous release of FRAMECAD Structure Support line width and detailing options were added for floor framing. Instruction for these features were provided in the Procedures Overview manual under 'Detailed Procedures – Floor Joist Input'. Additional Information is provided here to assist adoption of these methods.

Additionally, a new support alignment type has been added: 'End Fixed' (LI support line). This applies a support to the top chord of the joist for when joists are end fixed into the side of another member, beam or wall.

Support Line Data (Support Line Editor - listing a support line)

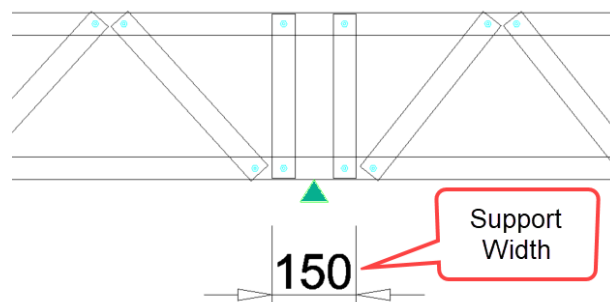
Property	Value
General	
Layer Name	truss_support
Linetype	Continuous
Drafting Colour	30
Support Line Data	
Alignment Type	Centre Aligned
Support Width	89
Treat Non Structural	False

Amend Cancel

- **Alignment Type:**
 - Edge Aligned – applies a width from the outside edge of a support line that sits at the end of the floor joists.
 - Centre Aligned – applies a width from the centre of the support line that is located anywhere along the length of the floor joists.
 - End Fixed – applies a support to the top chord of the joist for when joists are end fixed into the side of another member, beam or wall.

- Auto – determines whether the support line should be edge or centre aligned based on its location within a joist layout.
- **Support Width** – Total width of the supporting member under a joist. Double vertical members can be placed at either edge of a support by selecting '**Double Webs to Supports**' in 'JSET – Layouts Information' prior to inputting joists or by listing existing joist(s) and changing this option under 'General Information'. This will place two vertical members inside each edge of a support line of a pre-defined width. In basic terms, the support marker will still appear as a single point but will act as two supports at the given distance apart.

In the example below, the support width has been set to 150mm and is applied to a 'Centre Aligned' support line.



'End Fixed' alignment type would be set to '0' width.

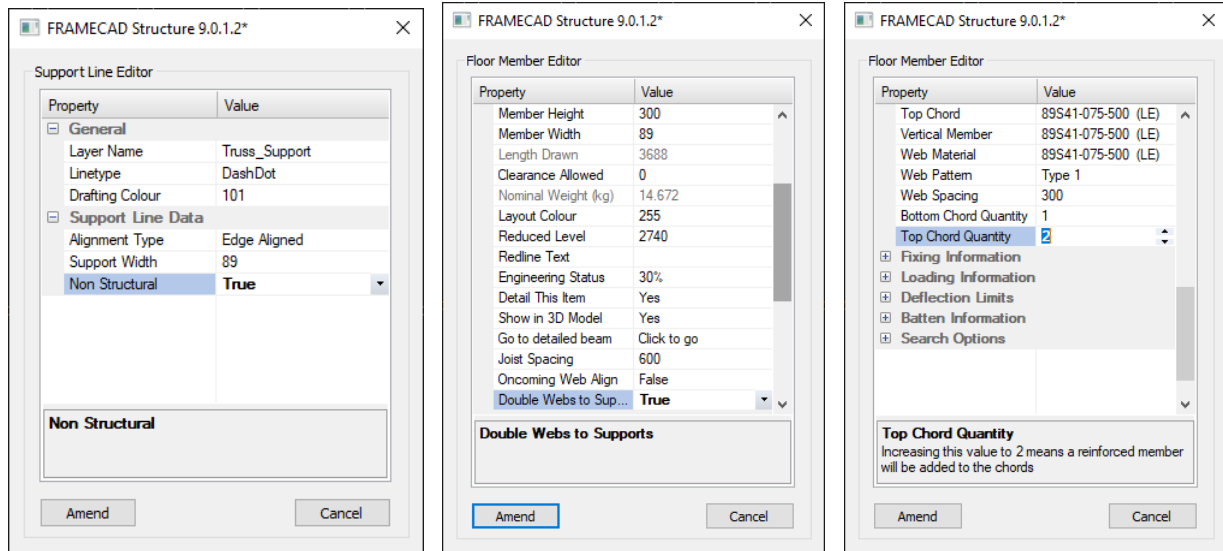
- **Treat Non-Structural** – 'False' will place a support point on the joist and also place a vertical web in the same location. 'True' will place a vertical web but no support point.

37.7 JOIST ENGINEERING ENHANCEMENTS

Modifications have been made to Floor Joist Detailing and Engineering to minimise Editing of Engineered Joist in Detail Drawings. This means the layout model will match the detail drawing, there will be less rework when modifications are made to the layout, and Engineering review work will be simplified.

- Truss Point Loads (**TPL**) and Chord Member Reinforcing (**LI**) may now be applied to Joist Members in the Layout plan.
- When 'duplicate' support lines (support lines with spacing less than Joist depth or 600 mm) are drawn in the layout, only a single Engineering support is generated in Engineering and Detail model – modelling a double support at close spacing would mean a moment fixity which is seldom realistic.

NOTE: If the intent of the user in drawing multiple support lines is to locate vertical webs, then the additional support lines should be set as non-structural in the line listing (**LI**), or alternatively at supports, double vertical members can be specified in the Joist Listing (**LI**). If an Engineering decision has been made to model closely spaced supports, then these can be added in the Detail Drawing for Engineering review (see following).



- **Engineering Modelling and Design of webbed joists has been extended to take further consideration of flange and web cuts (refer to section on Truss Engineering Enhancements).**
- Joists that are manually Edited in the Detail Drawing will be Specified as '**Edited**'. This will highlight to the Engineer which joists will require closer inspection in the Engineering review and highlight to the Detailer which joists will need to be modified should the layout be altered.

J1 Quantity Required = 1 (Edited)

- Floor Truss Engineering Model Export to SAP2000 has been activated.

38 Version 9.0.1

This version of the software has moved CAD platform from IntelliCAD 8.4 to 9.0. RESETALL activation is required after installing v9.0.

The installer creates a new directory for Structure v9.0, therefore both v8.4 & v9.0 may be used on the same computer.

v9.0 will run v8.4 jobs, however, due to the major changes in v9.0, it is recommended that existing jobs near completion continue using v8.4.

When swapping between versions, open the required version, then run the DO_ONCE command to load the correct menus and aliases for that version.

The user may notice extra studs appearing in lower level 'Load Bearing' walls called 'Multiple Stud'. These are placed below jamb studs or brace collector studs from walls in levels directly above (see section 38.4.1 for more detailed information). If these studs are not required, the user may change the wall type to 'Structural' as noted in section 38.4.2.

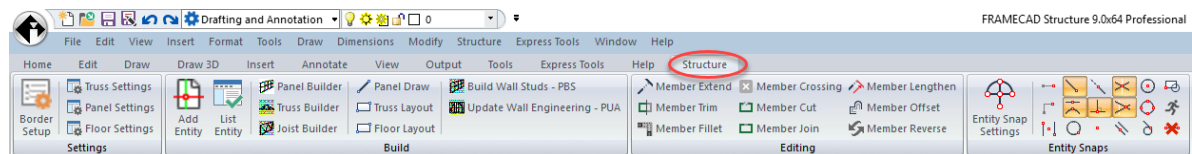
38.1 GENERAL

38.1.1 File Integration

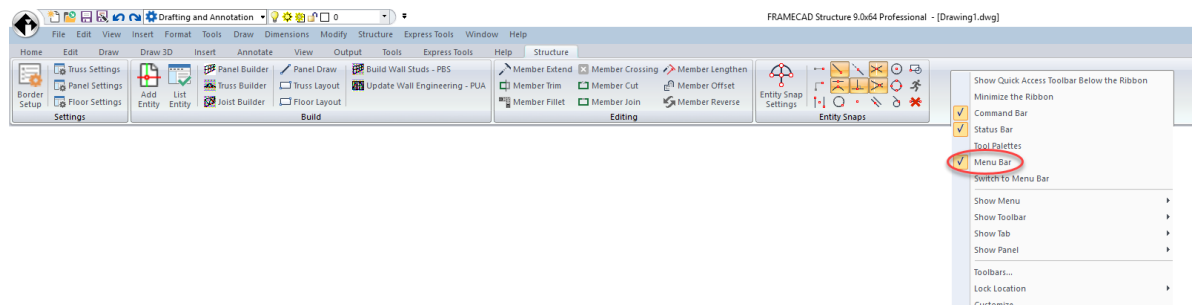
- **Attach Revit .rvt/.rfa files as underlays - BIMATTACH.** Once the file is attached, snap to it to trace, and use the BIMPANE command to open a Categories pane to control visibility.
- Open, save, and work with 2018 version AutoCAD .dwg files.

38.1.2 Enhanced Menu Ribbon

The Structure menu ribbon has added commands.



Tip: If the top drop down menu bar doesn't appear, you can turn it on by right clicking anywhere in the ribbon menu and selecting 'Menu Bar'.



38.2 LAYOUT MODELLING

38.2.1 Entity Input

Now draws the full wall, beam, joist, or truss entity as you input it. Placing the wall on one side of the selected points works as normal, however, if you need the wall to be centralised on the points, you have to drag the location marker out past one end of the wall.

38.2.2 Drawing/Editing

CV - Copy View:

Copies selected entities from one view (border) to another. The border to copy entities from must be centralised on the screen for this command to work.

MV - Move View:

Moves selected entities from one view (border) to another. The border to move entities from must be centralised on the screen for this command to work.

CC - Copy Post (Column):

Copies posts from one view (border) to another. The border to copy posts from must be centralised on the screen for this command to work.

MD - Member Divide:

Divides a member into a given number of equal segments or minimum lengths.

DG - Dimension Guides:

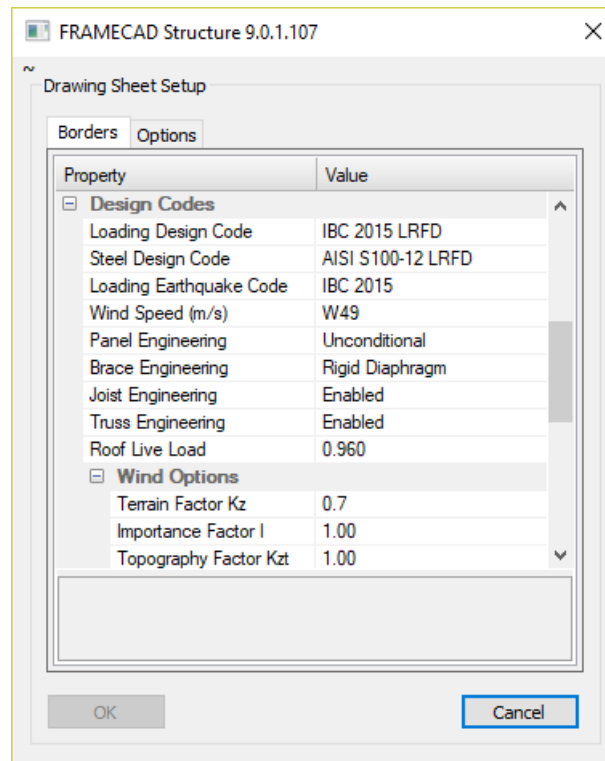
Provides guide lines for inputting building dimensions. Dimension guides do not get printed or exported to pdf, similar to Reference Markers.

CSL - Copy Support:

Copies selected walls to another border as support lines. These support lines are based on the centreline of the wall. The border to copy supports from must be centralised on the screen for this command to work.

38.3 ENGINEERING / MODELLING CONTROL

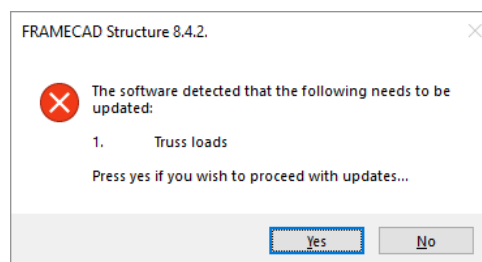
BSET – Border Settings



38.3.1 Options to control Engineering and Modelling functions

Under the 'Design Codes' section in BSET there are new options for Panel, Brace, Joist and Truss Engineering. These options are provided to allow users to work more efficiently when building or editing a model, particularly for larger buildings.

- **Panel Engineering:**
 - Unconditional – Full engineering is performed unconditionally on PPD from layout.
 - Automatic – Full engineering is performed initially on PPD, then only if changes are detected.
 - Semi-Automatic – An 'option to update' dialogue is presented on PPD if changes are detected.



- Manual – Engineering is only performed when the user selects "Update Wall Engineering" (PUA) in the layout or selects the 'Engineer All' option in the Panel Builder (PPD).
- Disabled – Engineering fully disabled. Build Wall Studs (PBS) is required to build studs.

Note: In most cases Engineering is only updated when using the PPD command from layout. Exception is when panel Stud Arrangement is changed to "Auto" for any panel.

PPD from wall elevations does not update engineering.

- **Brace Engineering:**

- Strength Method – Standard Structure wall bracing method with software limitations as outlined in section 2.2 of the Engineering Guide. Calculates the strength of the braces modelled and checks their combined strength against the total building Wind and Earthquake loads.
- Rigid Diaphragm – Considers floors and ceilings as rigid diaphragms in the bracing calculations, therefore Lateral loads are distributed according to brace stiffness and distribution. This option is only available for selected building design codes.
- Disabled – Engineering for bracing fully disabled.
- **Joist Engineering:**
 - Enabled/Disabled
- **Truss Engineering:**
 - Enabled/Disabled

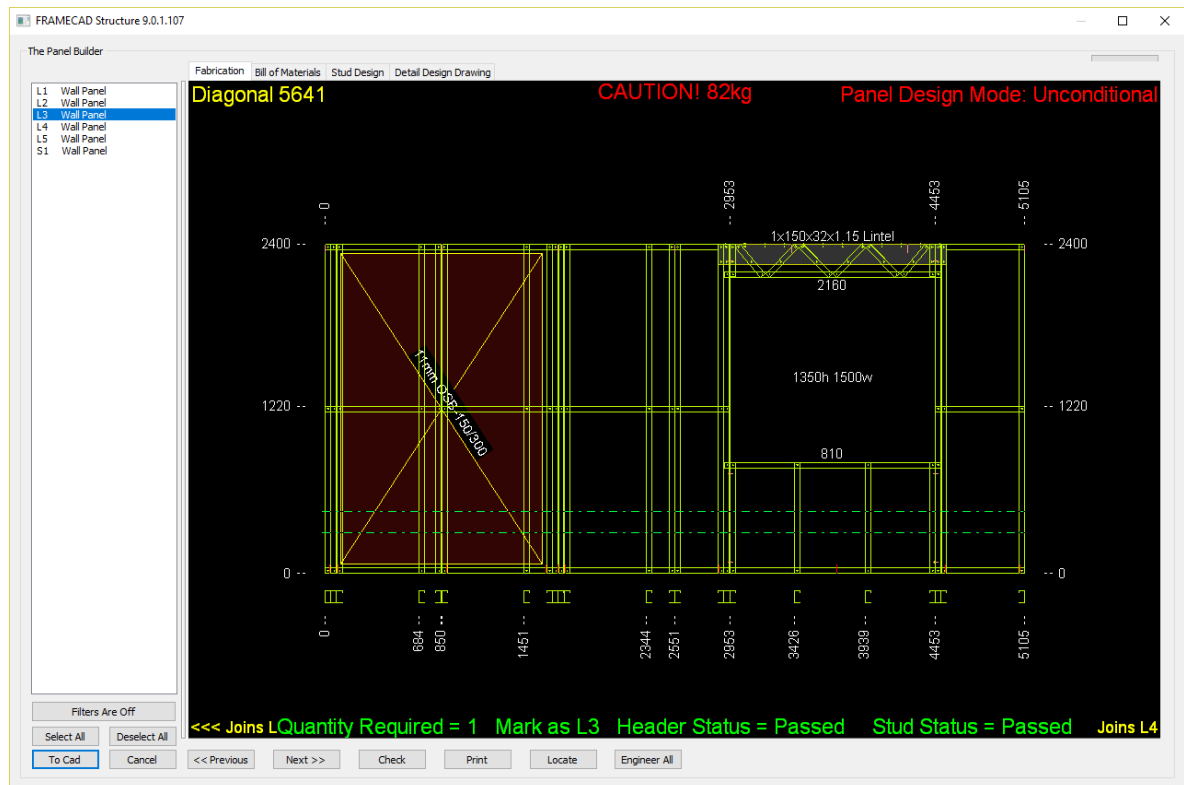
38.3.2 Additional Global Load settings (BSET form)

- Roof Live load: Default Roof live load set – changes with selection of Loading Design Code or user input
- Wind Options: Default Wind factors set (moved from TSET) – changes with selection of Loading Design Code or user input. Values may be modified on individual Panels or Trusses (LI).

38.4 WALLS

38.4.1 Enhanced Wall Engineering

Wall Engineering function has been enhanced to consider a wider range of structure configurations and loading:



Wall Load Takedown: Load takedown method has been changed so that it is no longer dependant on how the flooring system has been modelled. Load takedown also now covers balloon framing and inline (of joists) beams.

Wall Design for Concentrated Loads: Wall stud design added for concentrated loads for specific applications:

- Wall panel directly supporting girder trusses, trusses with spacing > 610mm & joist/bearer beams (NOTE: for lower walls load is considered as distributed as per NASH guidelines) – 'Load bearing' panels type only
- Opening Jamb loads (checked on all wall panels below jamb) – 'Load bearing' panels type only
- Bracing Collector Stud loads (checked on all wall panels below collector studs) – Rigid Diaphragm Bracing design only

Header Design Loads: Design Loading has been refined to consider non-uniform distribution in panels:

- Design action analysis models point loads from Jamb studs in panels above, and directly supported girder trusses, trusses with spacing > 610mm & joist/bearer beams – 'Load bearing' panels type only
- Uniform loads adjusted for openings above (will decrease header loads accordingly rather than consider full panel load)

38.4.2 Panel Usage

Load Bearing – this wall type designs for uniform loading plus specific cases of concentrated loading (as per those stated in section 38.4.1) plus face wind loading. Concentrated loads will be carried through to the next level of walls below and studs will be placed accordingly. Therefore, for simple two-level buildings, Load Bearing walls would be used in the upper level and Structural walls would generally be used in the lower level.

Structural – this wall type designs only for uniformly distributed loads from above plus face wind loading. Studs are not placed under concentrated point loads, therefore, if studs are required directly under trusses or floor joists, then the Location Tolerance values should be altered to zero in either PSET for all walls prior to input, or the specific walls listed (LI) and altered for walls that already exist. This wall type should generally be used on the lower of two levels on a standard residential dwelling.

Non-Load Bearing – this wall type designs for face wind loading only.

For further clarification, see section 2.6.1 (Walls) in the Procedures Overview manual.

38.4.3 Output / Documents

- Wall Detail Design Drawings added to visually report designs – Loading and Engineering specifications (PPD)
- Sheet Bracing displayed on Detail Drawings
- Stud and Header design reports enhanced to report concentrated loads

38.5 LATERAL (BRACING) DESIGN

38.5.1 New Rigid Diaphragm Analysis (IBC and GB Design Codes)

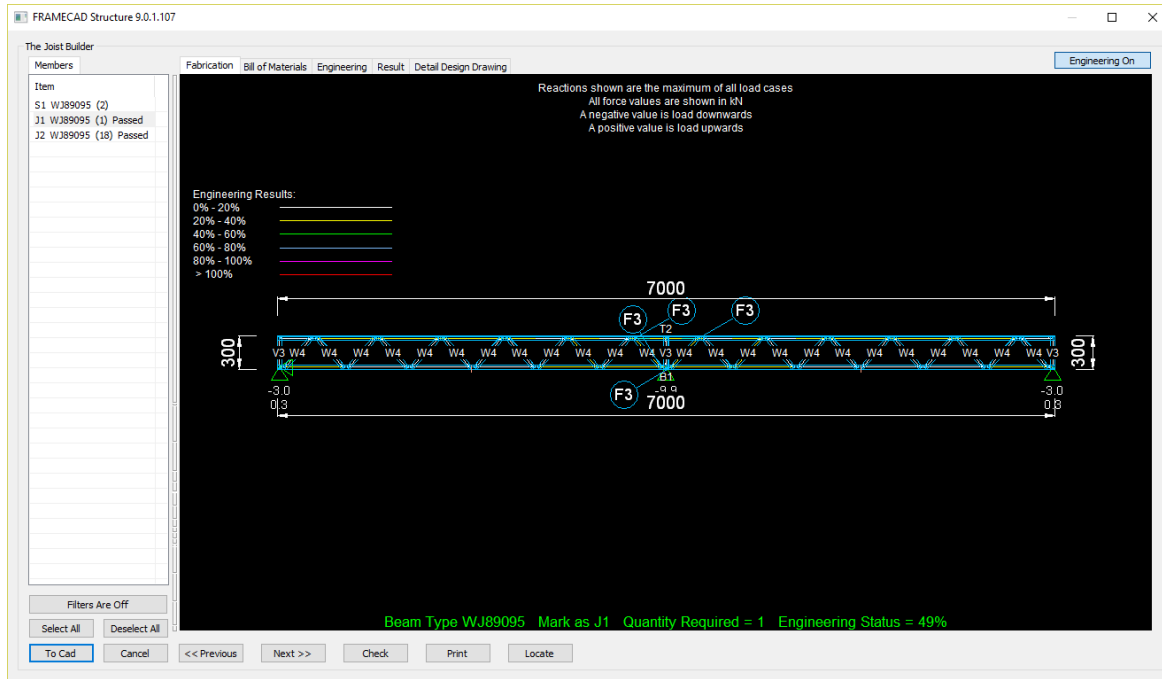
- Brace design actions calculated according to brace stiffness and distribution in level considered (Strap brace and Panel brace only)
- Bracing member checks
- Storey drift calculations and check
- Collector design action calculations

38.6 FLOORS

Floor Joist Engineering function has been added for both Webbed joists and Deep C joists.

This is similar to the Truss design function, but has been specifically tailored to floor systems and has added modelling features.

Please read sections 4.8 to 4.11 in the Procedures Overview manual for a description on how to detail jobs using the new joist system.



38.6.1 New Floor Joist Engineering

- Floor Joist Engineering Module added to Joist Builder (JJD)
- Concentrated loads from oncoming members modelled explicitly (Floor Beams)
- Custom point loads
- Drag Loads
- Point load type options
- User controlled deflection limits and point load distribution factors
- Supported width excluded from capacity checks
- Service hole strength calculations

38.6.2 Floor Detailing

- Webbed joist member editing in Detail Sheet
- Webbed joist chord reinforcing
- Support line type and bearing width input
- Double webs at support option

38.6.3 Output / Documents

- Joist Detail Design Drawings added to visually report designs – Loading and Engineering specifications (JJD)
- Joists Engineering graphical and tabular output forms (JJD)

38.7 TRUSSES

38.7.1 Enhanced Truss Engineering

Engineering Enhancements

- User specified Chord effective lengths
- Unbalanced Wind Load Combinations for IBC & GB codes
- Web eccentricity design in accordance with AISI
- Boxed inline section capacity modified to allow for web and lip notches

B1	89S41-075-500	26	248mm	B7	89S41-075-500	13	700mm	T3	89S41-075-500	26	4421mm	R4	89S41-075-500	23	460mm	W10	89S41-075-500	52	84mm																																																																																																																																																		
W6	89S41-075-500	26	167mm	W7	89S41-075-500	26	210mm	W13	89S41-075-500	26	193mm	W14	89S41-075-500	26	537mm			26	786mm																																																																																																																																																		
W11	89S41-075-500	26	659mm	W12	89S41-075-500	26	1315mm																																																																																																																																																														
Assembled Weight		35.1kg	FRAMECAD 10g-16mm Flathead		455	FRAMECAD 10g-19mm XDrive		1274																																																																																																																																																													
Quantity Required = 13 Mark as N1 Engineering Status = Failed Minimum number of fasteners required is 2 per joint																																																																																																																																																																					
<table border="1"> <thead> <tr> <th colspan="2">SPECIAL LOADING</th><th colspan="2">DESIGN LOADING</th><th colspan="4">LOADS & DESIGN FACTORS</th><th colspan="4">BRACING</th><th colspan="12">MAXIMUM MEMBER AXIAL FORCES AND CRITICAL STRUCTURAL DESIGN INDEX</th></tr> <tr> <td colspan="2" rowspan="2">No Point Load Applied</td><td rowspan="2">Load Cases: G D P S W Wd</td><td rowspan="6">Type Gravity(Dead) Roof Live Concentrated Live Snow Wind Up Wind Down</td><td colspan="2">WIND FACTORS</td><td colspan="2">Wind Pressure Factors</td><td colspan="4">Provide Chord Restraints at specified spacing Roof System Bracing to be specified by Engineer Member Effective Lengths for Design</td><td colspan="12">(All member values are factored as per specified load combination) S9-02: 0.00 0.07 148% (25)</td></tr> <tr> <td colspan="2">Terrain Factor Kz 1.00</td><td colspan="2">Wap 1.00</td><td colspan="4">Type Kx Lx Ky Ly Rest. R1 L1 L2 Min(Lx, Ly)</td><td colspan="4">Member Ten. CSI LC</td><td colspan="4">Member Ten. CSI LC</td><td colspan="4">Web Ten. CSI LC</td></tr> <tr> <td colspan="2"></td><td colspan="2"></td><td colspan="2">Importance Factor K1 1.00</td><td colspan="2">Bottom Chord 0.2</td><td colspan="4">4-6 -0.00 0.78 244% (24)</td><td colspan="4">Member Com. Ten. CSI LC</td><td colspan="4">4-6 -0.01 0.05 0% (8)</td><td colspan="4">5-6 -0.01 0.05 0% (8)</td></tr> <tr> <td colspan="2"></td><td colspan="2"></td><td colspan="2">Topography Factor Kst 1.00</td><td colspan="2">Top Chord 0.9</td><td colspan="4">6-8 -0.01 0.81 264% (24)</td><td colspan="4">8-9 -1.10 1.06 43% (4)</td><td colspan="4">8-9 -2.03 1472 29% (4)</td><td colspan="4">9-10 -0.88 3.87 9% (24)</td></tr> <tr> <td colspan="2"></td><td colspan="2"></td><td colspan="2">Snow Factors</td><td colspan="2">Windward</td><td colspan="4">9-12 -13.83 2.20 20% (24)</td><td colspan="4">10-11 -1.82 13.22 62% (8)</td><td colspan="4">10-11 -2.04 0.86 12% (24)</td><td colspan="4">11-12 -2.04 0.86 12% (24)</td></tr> <tr> <td colspan="2"></td><td colspan="2"></td><td colspan="2">No Snow Load Apply</td><td colspan="2">Bottom Chord 0.3</td><td colspan="4">12-19 -10.23 2.96 151% (4)</td><td colspan="4">13-15 -1.58 2.47 97% (4)</td><td colspan="4">13-15 -1.58 2.47 97% (4)</td><td colspan="4">13-15 -1.58 2.47 97% (4)</td></tr> <tr> <td></td></tr></thead></table>	SPECIAL LOADING		DESIGN LOADING		LOADS & DESIGN FACTORS				BRACING				MAXIMUM MEMBER AXIAL FORCES AND CRITICAL STRUCTURAL DESIGN INDEX												No Point Load Applied		Load Cases: G D P S W Wd	Type Gravity(Dead) Roof Live Concentrated Live Snow Wind Up Wind Down	WIND FACTORS		Wind Pressure Factors		Provide Chord Restraints at specified spacing Roof System Bracing to be specified by Engineer Member Effective Lengths for Design				(All member values are factored as per specified load combination) S9-02: 0.00 0.07 148% (25)												Terrain Factor Kz 1.00		Wap 1.00		Type Kx Lx Ky Ly Rest. R1 L1 L2 Min(Lx, Ly)				Member Ten. CSI LC				Member Ten. CSI LC				Web Ten. CSI LC								Importance Factor K1 1.00		Bottom Chord 0.2		4-6 -0.00 0.78 244% (24)				Member Com. Ten. CSI LC				4-6 -0.01 0.05 0% (8)				5-6 -0.01 0.05 0% (8)								Topography Factor Kst 1.00		Top Chord 0.9		6-8 -0.01 0.81 264% (24)				8-9 -1.10 1.06 43% (4)				8-9 -2.03 1472 29% (4)				9-10 -0.88 3.87 9% (24)								Snow Factors		Windward		9-12 -13.83 2.20 20% (24)				10-11 -1.82 13.22 62% (8)				10-11 -2.04 0.86 12% (24)				11-12 -2.04 0.86 12% (24)								No Snow Load Apply		Bottom Chord 0.3		12-19 -10.23 2.96 151% (4)				13-15 -1.58 2.47 97% (4)				13-15 -1.58 2.47 97% (4)				13-15 -1.58 2.47 97% (4)				
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Official Certified Design to Chinese building Codes GB50009 / GB50011/ GB50018 / JGJ227

- Member design to GB50018 added
- Building design to JGJ 227 added
- Building Loading to GB50009/GB50011 updated

- Full Chinese Language GUI

- Detail Drawings to Chinese Code Committee specifications to visually report designs (Chinese Language)
- Engineering Summary Report of Building Design (Chinese Language)



国家土建结构预制装配化工程技术研究中心

National Engineering Technology Research Center for Prefabrication Construction in Civil Engineering

FRAMECAD轻钢龙骨体系建筑结构设计及详图软件技术成熟，验算上符合JGJ227、GB50018等相关中国技术规范的规定，通过了行业标准编制组组织的技术审查，可有效、快速的实现结构设计和施工图纸输出，达到国际先进水平，能够满足在中国使用的需要。

FRAMECAD Structure Engineering Design and Detailing Software is recognized to comply with the provisions of Chinese national codes JGJ227 and GB50018.

After the technical assessment organized by the working group of JGJ227 for Low-rise Cold-formed Thin-walled Steel Buildings, the FRAMECAD software suite is recognized as a successful and efficient software for structural design and construction drawings to meet the requirements in China market.

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Convenor: Yuanqi Li, National Engineering Technology Research Center for Prefabrication Construction in Civil Engineering, Tongji University

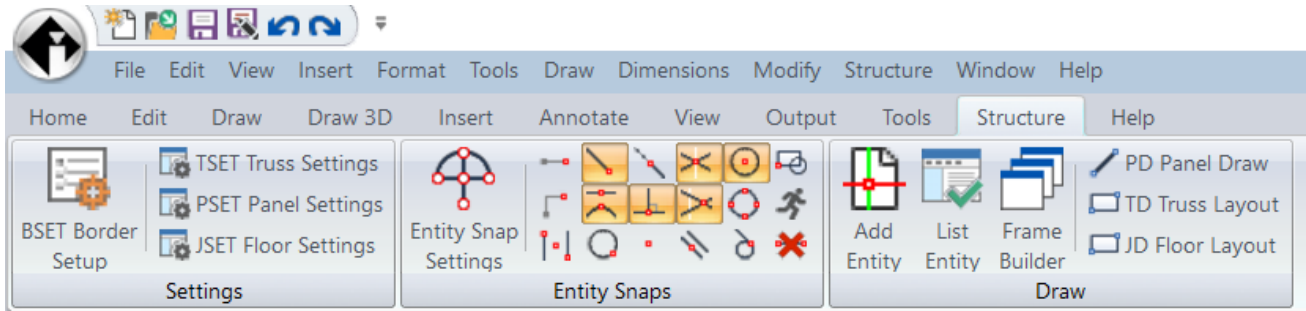


同济大学国家土建结构预制装配化工程技术研究中心

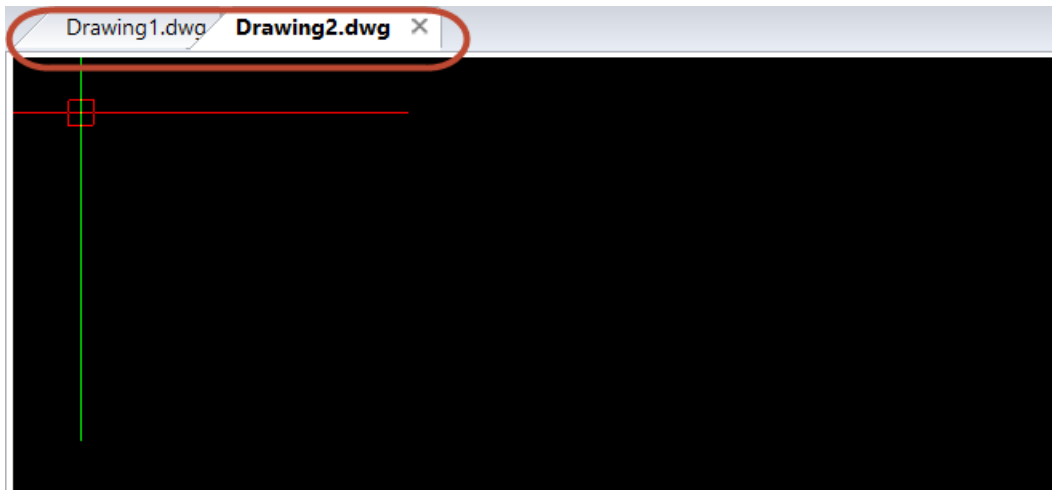
2018年4月16日

39 Version 8.4.1.1

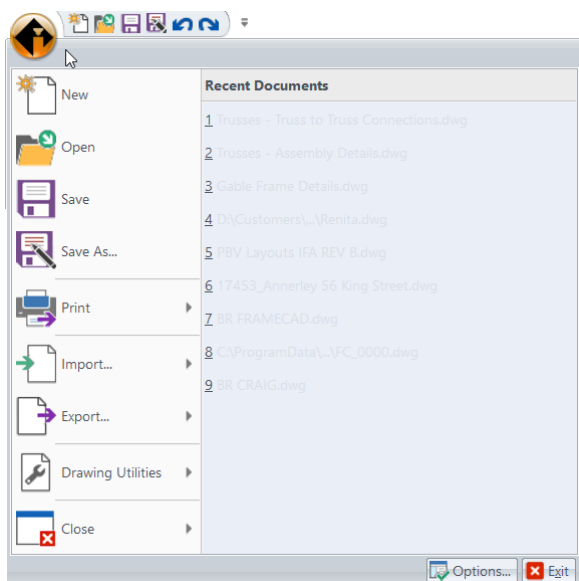
This version of the software has moved from IntelliCAD 8.1 to 8.4. The menu and screen layout in this version has changed. You will now see a ribbon bar below the menu bar which replaces the toolbar. Only a few selected items from the Structure menu have been included in the ribbon along with the Entity Snap options.



Another obvious feature are the drawing tabs displayed along the top of the drawing window. This allows the user to easily move between open drawings. Drawings can also be closed from here by clicking on the 'x' within the tab.



Additional information has also been added to the IntelliCAD icon at the top left of the screen.



39.1 BORDER UPDATE

The border logo has been updated. This may cause issues with the PDFEXPORT command and even inserting borders using the BSET command for some users with custom borders. In these cases, you will need to send the file through to FRAMECAD to be edited.

39.2 BSET – BORDER SCALE

Users can now enter a two-part scale separated with a colon (:). This is more useful for imperial drawing scales, e.g. 1/8" : 1'.

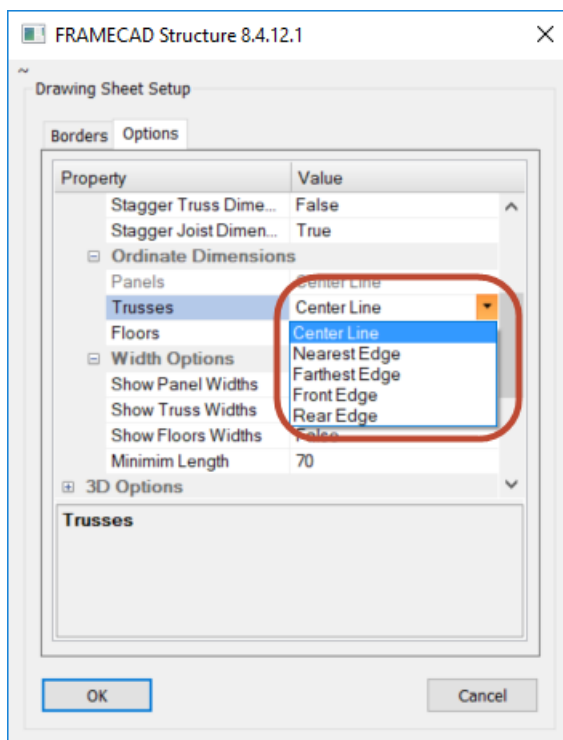
39.3 CTR – CENTERED

A command called CENTERED (**CTR**) has been added. This allows the user to select an entity or number of entities and move them to the centre of a border.

To use this command, type **CTR** then select the items you wish to move. Right mouse click or Enter to finish.

39.4 DO – ORDINATE DIMENSIONING

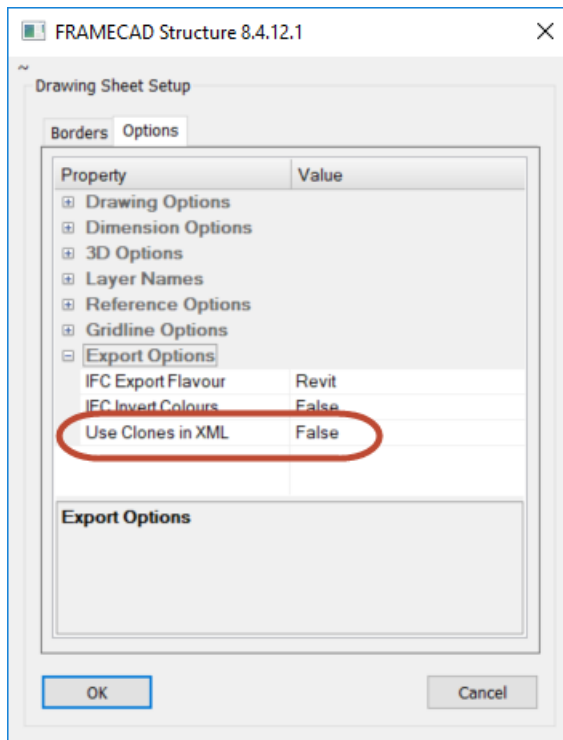
More options have been added to BSET – Options – Ordinate Dimensions which allow greater flexibility. These include dimensioning to Centre Line, Nearest Edge, Farthest Edge, Front Edge or Rear Edge. Nearest and Farthest Edge refer to the side of the truss relative to the origin point. Front and Rear Edge refers to the side of the truss relative to which way around the truss has been placed from left to right (i.e. the face of the truss as viewed in the elevations).



39.5 FRAME CLONING

Identical Joists and Trusses that have the same label can now be cloned when creating the XML file for export to Detailer. The option to allow for this can be found in BSET – Options – Export Options – Use Clones in XML.

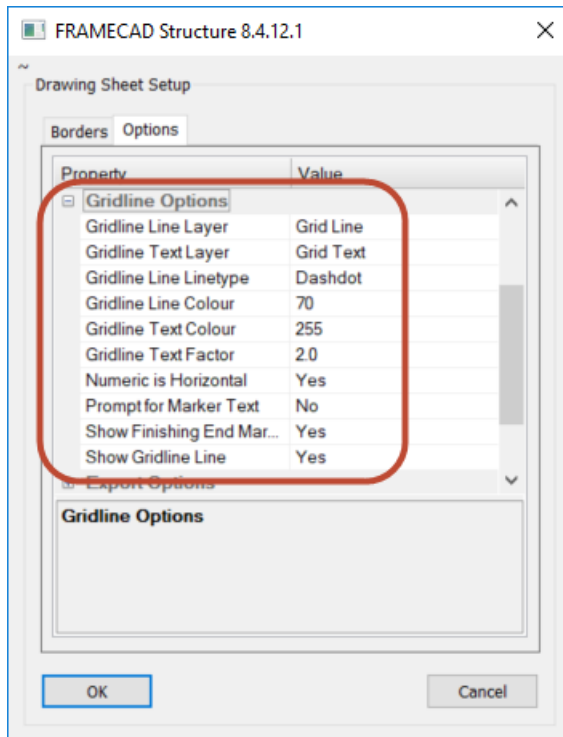
What this does is to utilise Detailers cloning functionality and group all joists or trusses that have the same label. This means that any editing required in Detailer only needs to be applied to the initial joist or truss and that edit will be applied to all its clones.



39.6 GL – GRIDLINE

A gridline input command has been added - GRIDLINE (**GL**). This allows the user to input a series of gridlines on their layout. The Gridline settings can be found in BSET – Options – Gridline Options. In the options you have the choice set either the horizontal or vertical gridlines to use numeric values.

To use this command, type **GL**, select the start point for the gridline, select the end point for the gridline, then you can select the location of each subsequent gridline. Right mouse click or Enter to finish.



39.7 IFCIMPORT (-IFCATTACH) – SUPERSEDED IN V9.2

Attaches an .ifc file as an underlay to the current drawing. This includes a layer visibility pane (IFCPANE). Refer to the IntelliCAD Help document for more detailed information (press F1 in the program to open).

39.7.1 IFCPANE – Superseded in v9.2

Allows the user to control layer visibility by enabling/disabling floors or categories using the IFC Categories Pane. Refer to the IntelliCAD Help document for more detailed information (press F1 in the program to open).

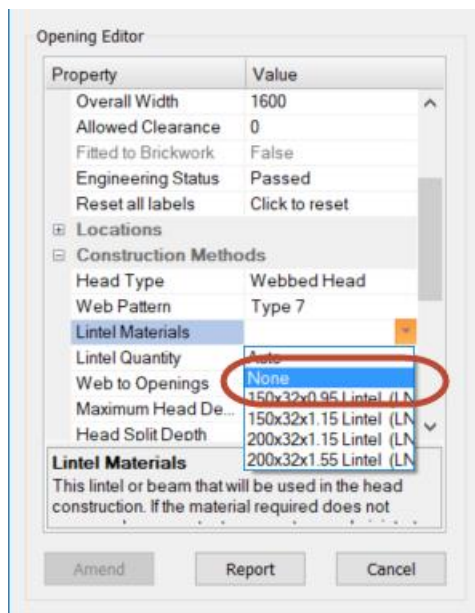
39.7.2 IFCOSNAP

Determines whether entity snapping is turned on for IFC underlays. Refer to the IntelliCAD Help document for more detailed information (press F1 in the program to open).

Note: These commands have now been superseded by BIM commands in IntelliCAD V9.2

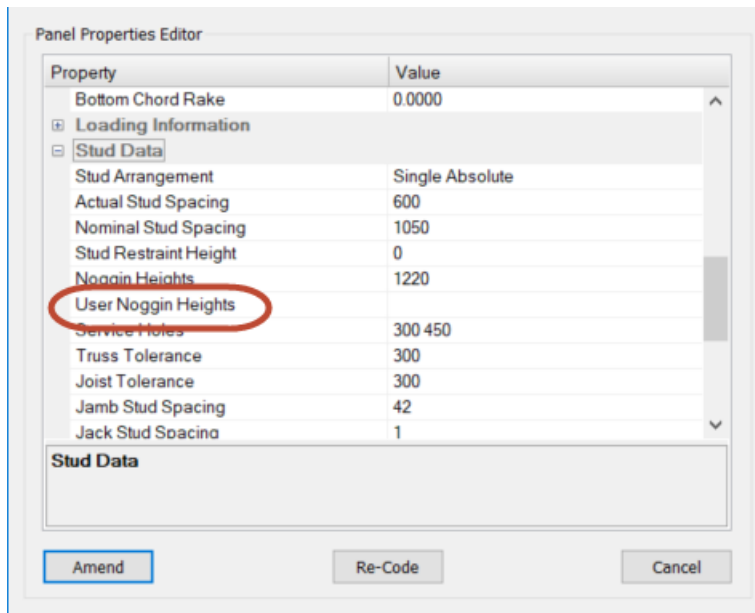
39.8 LI – OPENINGS – NO LINTEL MATERIAL

When listing an opening, an option has been added in 'Lintel Materials' to change to 'None'.



39.9 LI – WALLS – USER NOGGINS

When the user lists (LI) a wall or selection of walls, a 'User Noggin Heights' option is available in the 'Stud Data'. When a User Noggin is applied, any modification to the wall heights will only alter the height of the standard noggins. The User Noggin height will be maintained.



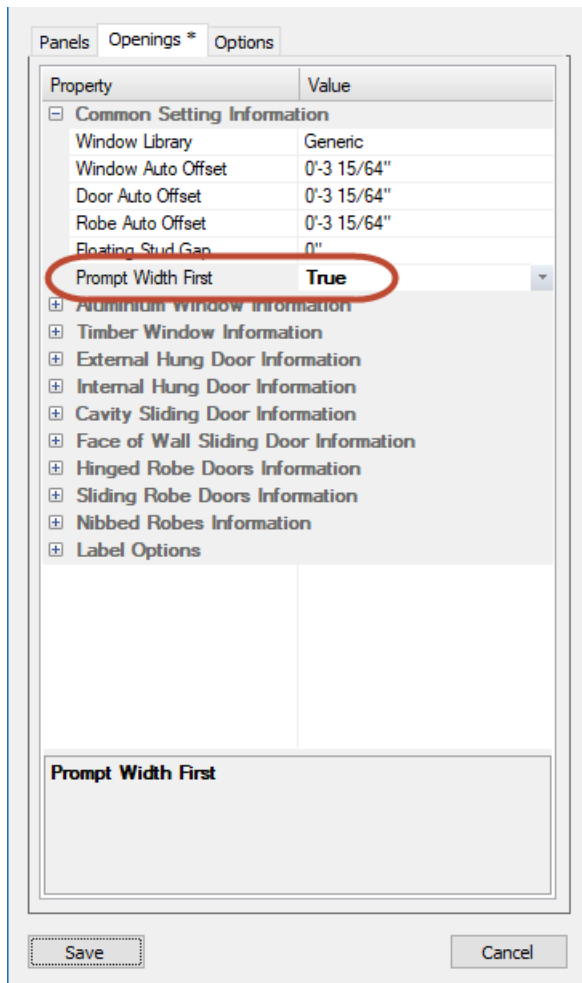
39.10 OPENING INPUT BY POINT OFFSET

When inputting openings, an option has been added to be able to offset the opening from a selected point. The offset distance is to the centre of the opening from the selected point.

Hide, Value, Auto, Centre, Multiple, **Point offset**, Point, or Side or Select Start Point for Opening...< PO >...
Select Direction for Opening Insertion...

39.11 PSET – WIDTH X HEIGHT OPENING INPUT OPTION

An option has been added to allow the user to input openings as Width x Height. By default, it is Height x Width. This can be found in PSET – Openings – Common Setting Information – Prompt Width First, or type 'S' from the opening input command line to go to the settings.



39.12 REF – GLOBAL REFERENCE POINT INPUT

Reference points can be added to the same location in all the borders at once. To do this, hold down the ALT key while placing the first reference point. The first reference point will be the Primary and all the others will be Secondary points.

39.13 RELATIVE LEVELS

If multiple objects that are at various RL heights to each other are listed, changing the relative level of these objects will result in all the selected objects moving the distance difference. This means that if two trusses are listed, one at 2400 and another at 2700, the height in the Truss Editor is based on the first truss selected. Then if that value was changed from 2400 to 3000, the second truss that was originally at 2700 would now be set to 3300mm high. The same rules apply to walls (Floor Level), beams (Top Level only), joists (Relative Level), posts (Top RL and Base RL independently – post length alters to suit) and ceiling panels (Relative Level).

39.14 SHEET SIZE

The standard border now displays the sheet size in the title box.

39.15 WALL DIRECTION MARKER

A wall direction marker has been added to the wall elevation borders. This basically indicates the east-west, west-east, north-south or south-north wall direction. When looking at the plan, north is at the top of the page in every instance. Compass directions cannot be altered.

Quantity Required = 1 Mark as L1			
Bearing	Design Wind Speed:	N2	Design Code:
13'-0"w	Direction:	W-E	
View 1 of 1		Client	

39.16 WALL RH FIRST STUD LOCATION

The first stud in from the right-hand end of a wall frame is spaced to suit the stud centres when using absolute stud spacing. This allows for onsite clearance when erecting and fixing frames together.

40 How To

40.1 GENERAL

40.1.1 RESETALL

Some issues with the software might be able to be rectified by activating the RESETALL command.

This deletes all historical Structure information from the computer's registry, thus all user applied settings will revert back to the default settings as if it was a brand-new install on a clean computer.

40.1.2 A3D - Frames Not Lining Up

If for some reason your trusses, wall and/or joists are not lining up with each other in the 3D Model Space, firstly check that you have inserted your reference markers (REF) on the layouts prior to building your frames. If you are sure this procedure has been followed correctly, try turning off your 3D by activating the A3D command, then turn the individual layouts by using the J3D, P3D and T3D commands.

40.1.3 Aliases – How to Resolve Missing Alias Commands

If the Structure alias commands do not work after loading the software, you can reload them by typing in the DO_ONCE command.

40.1.4 Command Bar Display

If, for some reason your Command Bar has disappeared, there are a number of options to turn it on again.

1. Click anywhere in a blank area of the Status Bar at the bottom of program display. This option is possibly the most common reason the Command Bar may have disappeared in the first place.
2. Press Ctrl+9 to turn it on or off.
3. Right click anywhere on the Menu Bar and select it from the display options.
4. In the Menu Bar go to View – Display and select it from the display list.
5. In the Ribbon menu go to View – Display and click on Command Bar.

40.1.5 Command Line Message (pdfmodulevi_4.02_11.tx)

If the following message continually appears in the Command Bar after installation: 'Application c:\program files\framecad\framecad structure\intellicad 8.4\pdfmodulevi_4.02_11.tx has failed to load, and will be ignored', this generally means that Microsoft's Visual C++ 2010 Redistributable Package has not been installed on the users computer. There are no known issues with not having it installed, but downloading it from Microsoft and installing it will remove the command line message.

40.1.6 Copy

The Copy command uses the standard IntelliCAD COPY command instead of the old Structure MEMBER_COPY command. This means that when copying multi-faceted members such as trusses, all the components must be selected i.e. overhangs and truss markers. This resolves some of the crashing issues associated with the MEMBER_COPY command.

40.1.7 Custom Entities

Some components are created as custom entities. This allows more information to be associated with that component for example property values and/or appearance. E.g. joists are now custom entities and now have the label as part of the entity and show an indicator at the start end of the joist.

Some other examples of custom entities are screw fixings in the elevations and wall studs in the layout.

40.1.8 Data File Updates

Whenever a data file is updated, any setting changes will only be obvious if you change to another data file then change back again in the settings dialogue boxes. Some changes also require the Model Name to be changed to a different model then changed back again.

40.1.9 DET – Detail/Frame Builder

A command called DET has been added which can be used in place of the TTD, PPD and JJD commands. Ensure that the layout you wish to build from is in focus on your screen first and it will build according to Truss, Wall Frame or Floor Layout.

40.1.10 ELEVATIONLINE Command Not Recognised

If the **ELEVATIONLINE** command is not recognised, run the **AECOBJECTS** command and ensure it is set to 'ON'. The program will need to be restarted for any changes to take effect.

40.1.11 Export

Export As...

Exports job to various file formats such as pdf, svg, bmp, wmf, emf, dwf, stl, dae, dgn.

ACNC Export All

Creates xml files from all detailing space tabs at once.

- Type ACNC
- Separate xml files will be created in the C:\Documents\CNC directory for each existing detailing space tab.

CNC Export

Creates an xml file in the C:\Documents\CNC directory from the current detailing space tab.

PDF Export

Creates a single pdf file of the selected borders.

VRML Export

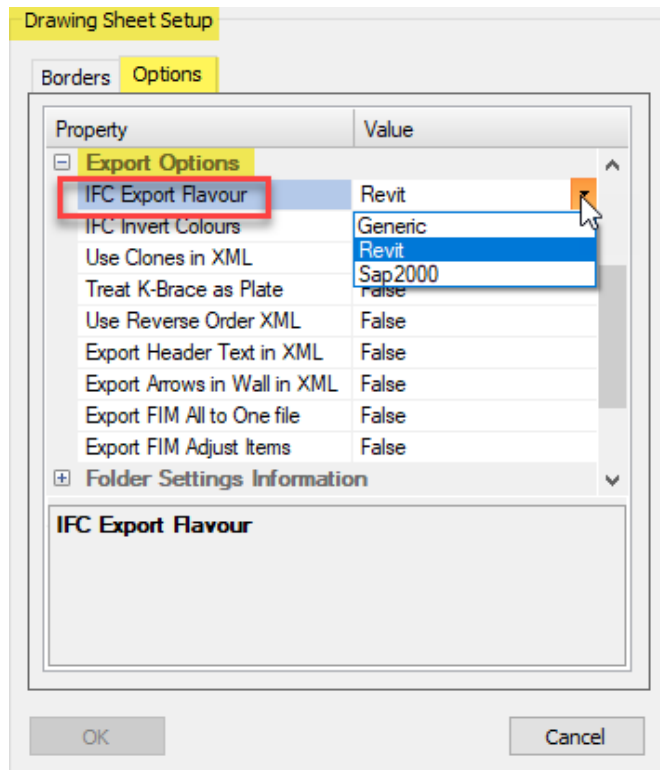
Creates a 3D .wrl file to be viewed in other software (e.g. SAP Enterprise).

- Create a 3D view of the plan in the Model Space by using A3D or T3D/P3D/J3D.
- From the Model Space, use the VRML command.
- A .wrl file will be created in the C:\Documents\CNC directory.

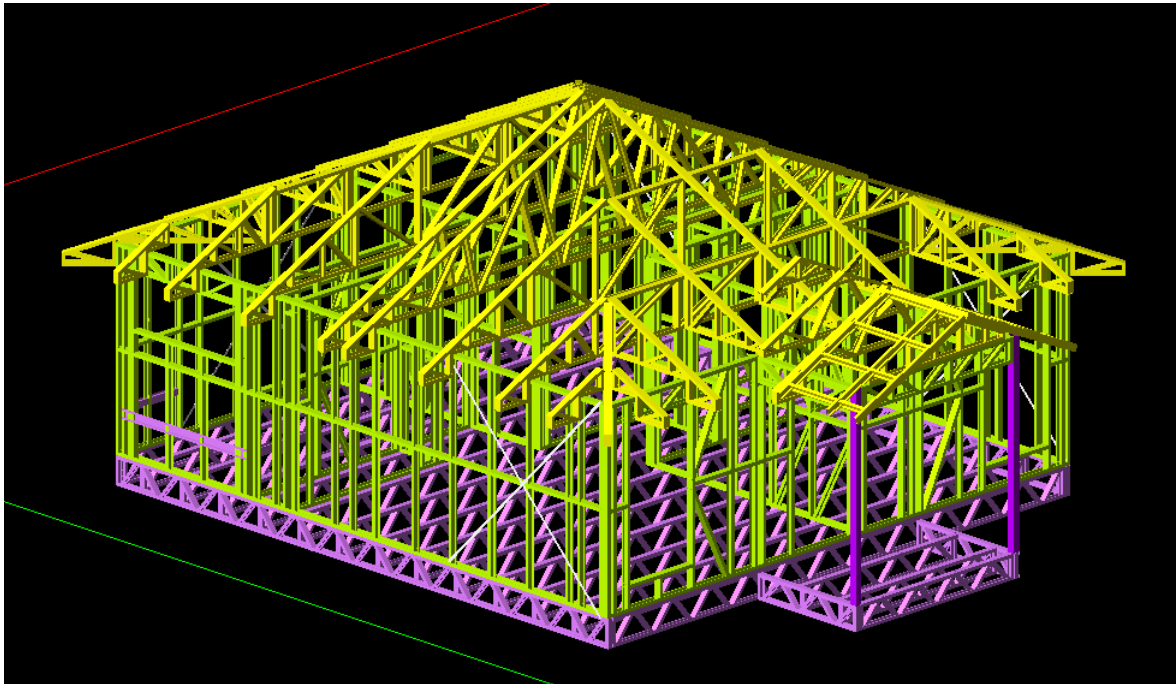
IFC Export

Creates an .ifc file for use in other software (e.g. Tekla, Revit, SAP, etc.)

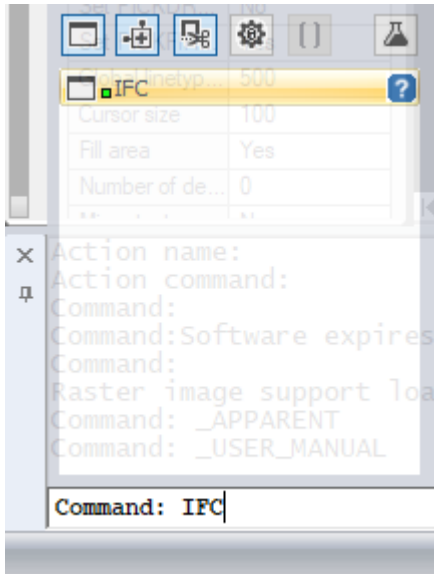
- In the 'BSET' command, go to the 3D Options in the 'Options' tab and select the type of IFC you will be creating. Some trial and error may be required when selecting these options for other programs.



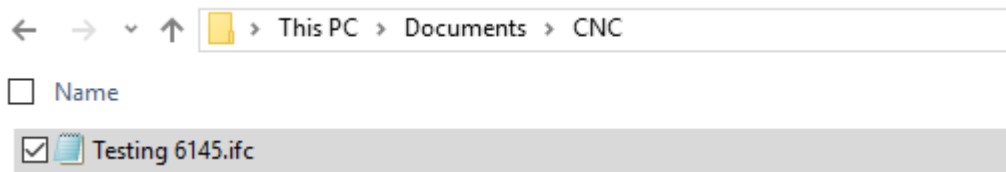
- Create a 3D model using the 'A3D' command in the 'Model' tab



- Activate the 'IFC' command in the 'Model' tab



- The IFC file is created in ../Documents/CNC



- You can now open your IFC with the software you created the model for (REVIT or SAP2000)

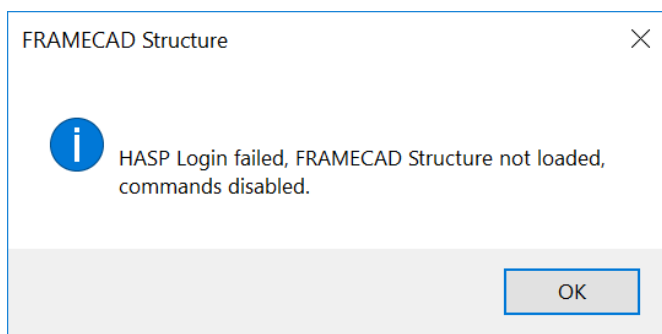
STP Export

Creates an .stp file for use in other software (e.g. SolidWorks).

40.1.12 File Dialogue Boxes Missing

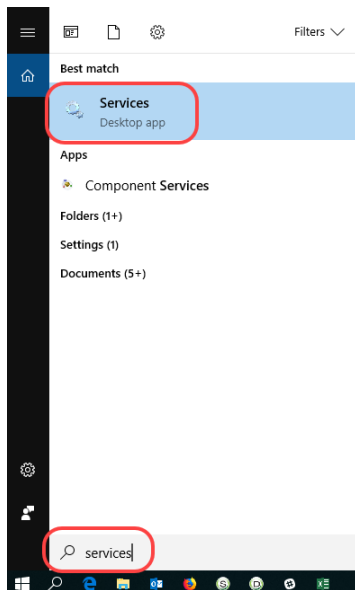
'Save As' or 'Open Drawing' dialogue boxes are missing. Some other dialogue boxes are also affected. To rectify this issue, run the FILEDIA command and set to 'ON' by either typing in 'ON' or '1' in the command line.

40.1.13 HASP Error Messages

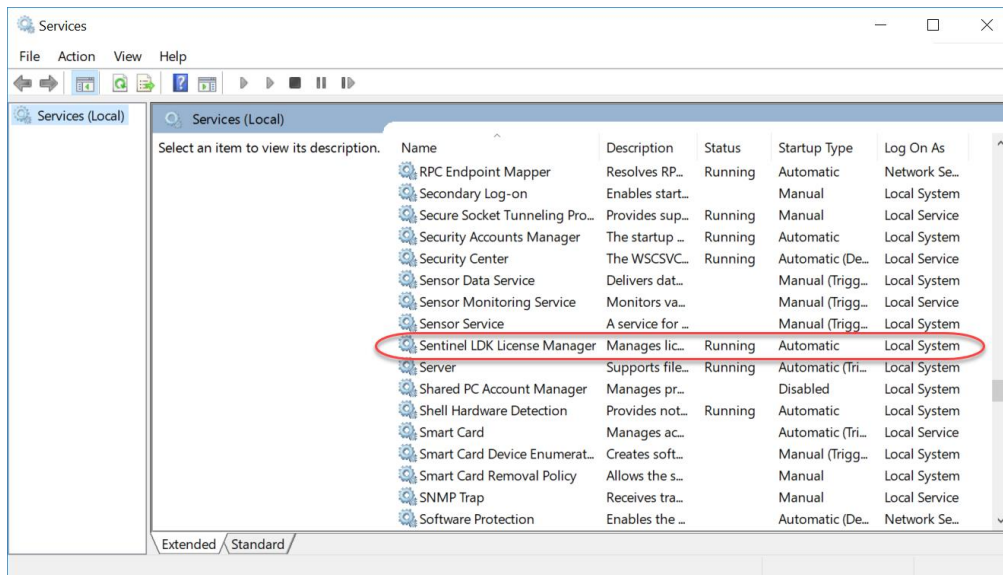


Firstly, check to make sure your hasp is plugged in. If so, try the following procedure.

In the start menu, open 'Services'. The easiest way to do this would be to just open the Windows Start Menu and type 'services', then click on it when it is shown, or if that doesn't work, it can be accessed through the Administrator Tools in Control Panel.

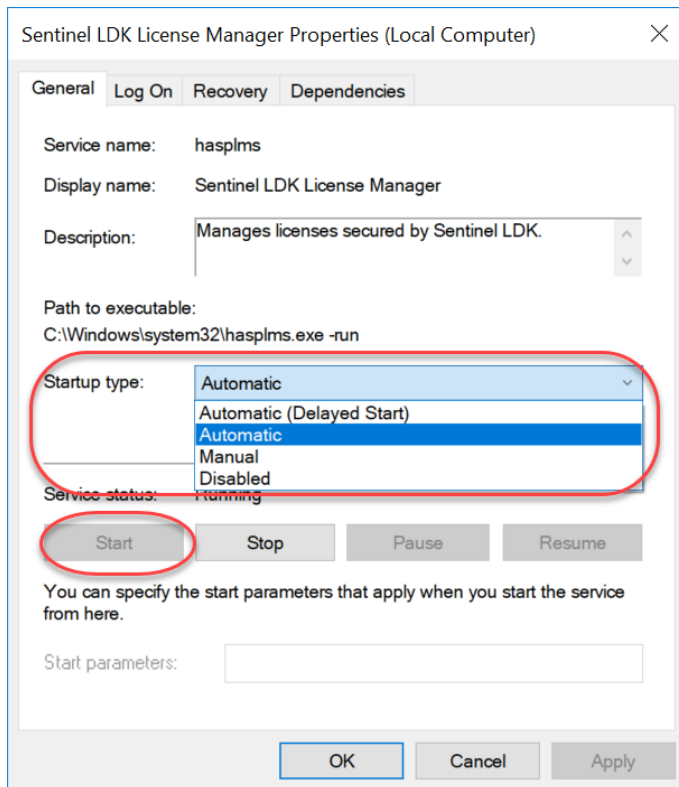


In the list which appears, find 'Sentinel LDK License Manager'.



Look at the 'Status' column. It should say 'Running'.

If it doesn't, double click on the line, and in the 'Startup type' field select 'Automatic', then press the 'Start' button.



Finally click OK and close the window.

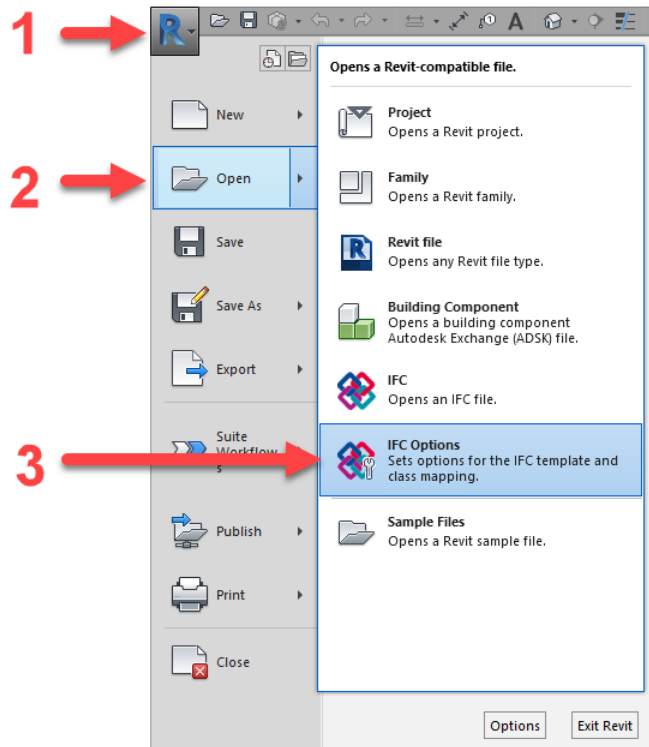
40.1.14 How to Input Imperial Measurements

Imperial measurements are generally shown as 8'-6 1/2", but must be typed in as 8'6-1/2" when inputting values on the command bar.

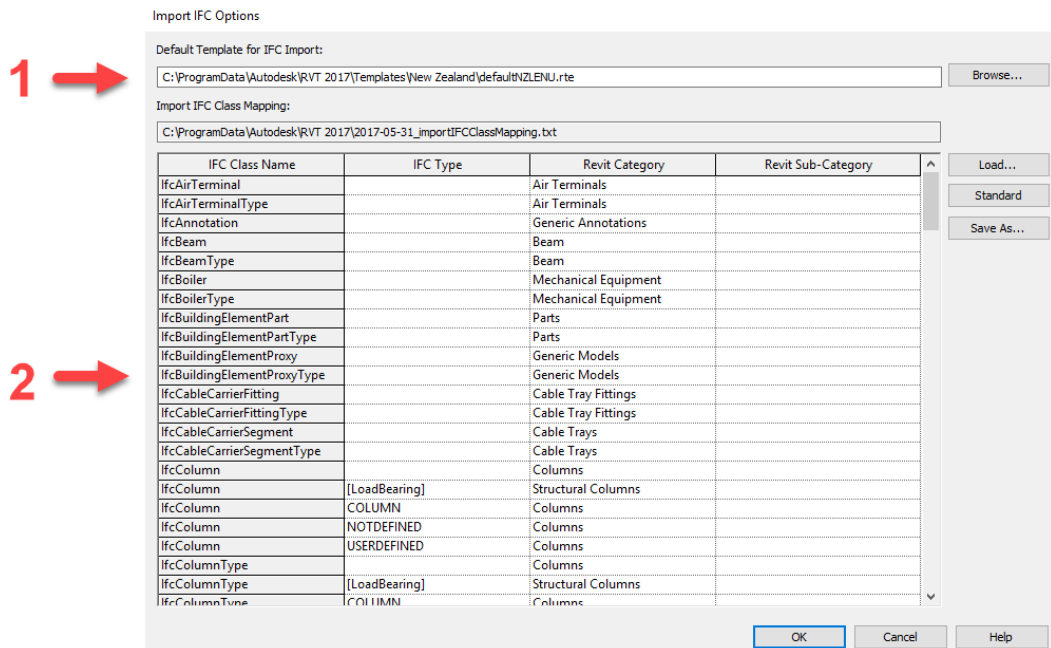
You can't include a space as the space bar performs the same function as the Enter button or right mouse click.

40.1.15 Importing IFC file into REVIT

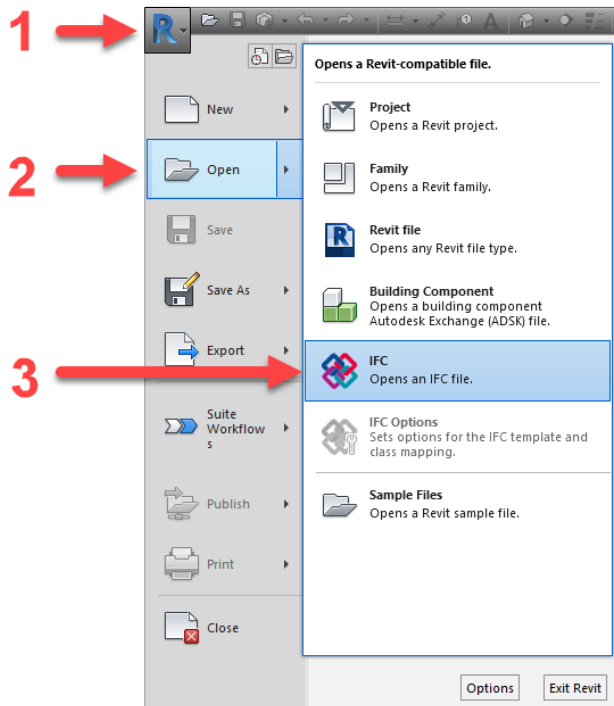
1. If you haven't before, define the IFC Import Options to a setting that matches the type of structures and BIM model you are trying to achieve. To do that, select the "R" button (1) then select the right arrow next to 'Open' (2) and select 'IFC Options' (3) as shown below.



2. In the IFC Options dialogue box, select the template to use for IFC Imports (1) and define the Revit Category to use for each IFC Class / Type (2)



3. Once all your settings are defined, import the IFC file. To do that, select the "R" button (1) then select the right arrow next to 'Open' (2) and select 'IFC' (3) as shown below.



40.1.16 Labelling Issue

Wall, beam, truss and joist labels must never start with an 'X' as X is the default value used for unlabelled frames.

40.1.17 Menus – How to Resolve Missing Menus

If the Structure menu is missing from the menu bar when loading the software, you can reload it by activating the DO_ONCE command.

40.1.18 Move

The Move command uses the standard IntelliCAD MOVE command instead of the old Structure MEMBER_MOVE command. This means that when moving multi-faceted members such as trusses, all the components must be selected i.e. overhangs and truss markers. This resolves some of the crashing issues associated with the MEMBER_MOVE command.

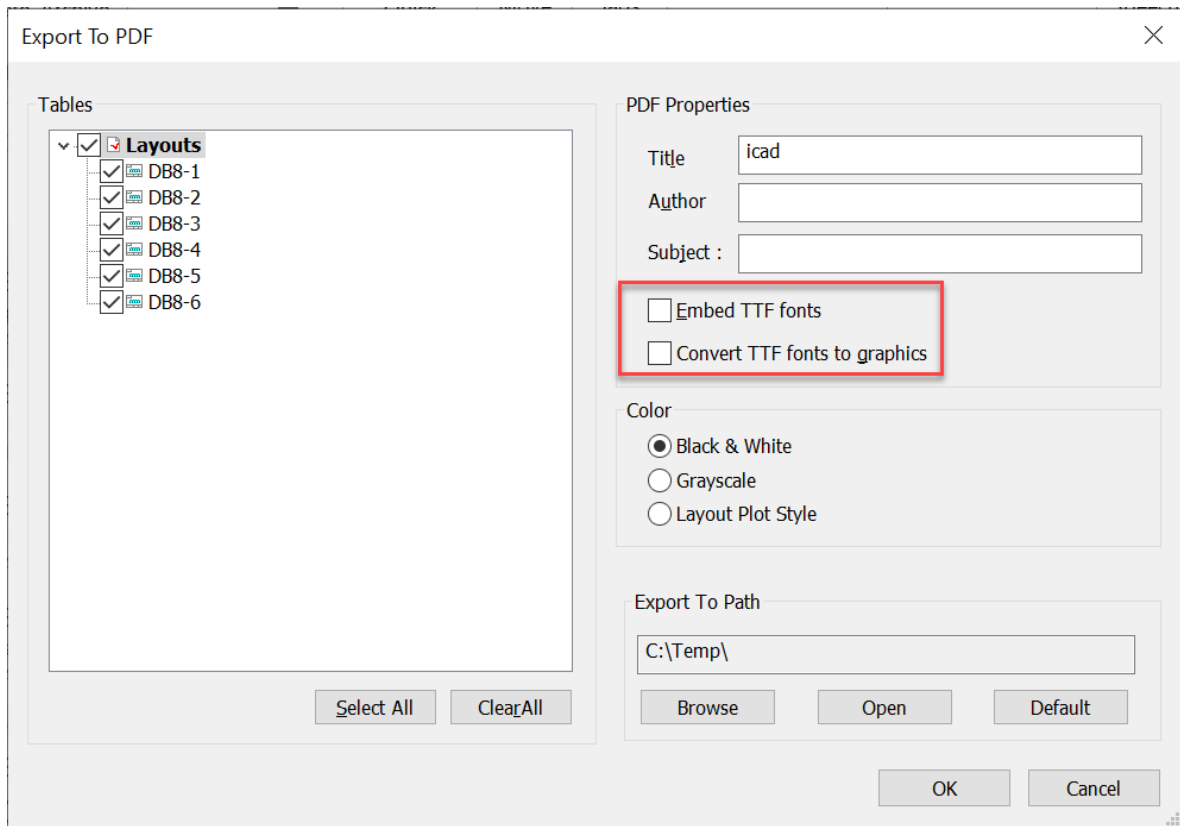
40.1.19 PCB (Calculate Wind) Not Working

Ensure you have reference markers (REF) on your plans.

40.1.20 PDF (PDFEXPORT) Bad Fonts

The fonts on pdf exports appear as hieroglyphics rather than proper text. This is due to the fact that fonts are not embedded into the pdf. As a result, the device that you try to view the pdf on may not have the matching fonts installed in it. This is a bigger issue with Apple devices as Apple choose not to conform with anyone else.

In the PDF dialogue box there is an option to tick on 'Embed TTF Fonts' and 'Convert TTF fonts to graphics'. Tick the first option to see if this resolves the issue. Failing that, try the second option as well. The only downside is that the file size of the pdf will increase.



40.1.21 PDF (PDFEXPORT) Not Working

In version 8.1.100.9 and later, the border logo had been updated which may cause issues with the PDF command for some users with custom borders. This also depends on how the custom border has been created. In these cases, you will need to send the file through to FRAMECAD to be edited.

The use of 'Splines' within custom border logos or any imported details will also cause issues with the PDF functionality. Splines must be converted to polylines.

40.1.22 REF – Multiple Reference Marker Placement

To add reference markers to every border in the same location, hold the 'Alt' key down while placing the Primary marker.

40.1.23 Reactors

Various reactors have been added to the software which automatically perform tasks in the background that previously had to be undertaken manually by the user.

Below is a list of some of these reactors and what they do:

Borders – If a border is deleted, the view names are updated to reflect the new quantity and sequence.

Editor – In Detailing Space, the cutting lists in each border are updated whenever a command is ended.

Reference – Deleting a reference point marks the drawing as being out of date. The PUA function is automatically activated.

Stud – The stud locking prompt is activated whenever a stud is copied, moved, mirrored, etc.

Tab – Renaming a tab automatically renames the borders within the tab.

Truss – Using the standard CAD erase tool on a truss also removes all entities associated with that truss (i.e. works the same as the SE command). Changing the length of a truss (longer or shorter) by stretching increases or decreases the span.

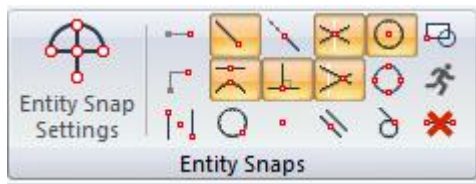
Truss Support – Deleting a support from a truss in detailing space automatically fails the truss. The truss needs to be re-engineered.

Wall – Using any editing command on a wall looks at all associated parameters of the wall and adjusts them accordingly, e.g. if a sloped wall is shortened using the MT, ME or MF commands, the height at that end of the wall will automatically adjust to suit.

Wall Detail – Erasing members in a wall frame also deletes the associated entities (screws, labels, etc).

40.1.24 Resolve Graphics Performance Issue

Sometimes the graphic performance of the program becomes erratic. A known cause of this is having too many entity snap options selected. When initially selecting entity snaps, it always pays to only select those which you will commonly use. Here is a recommended list of options.

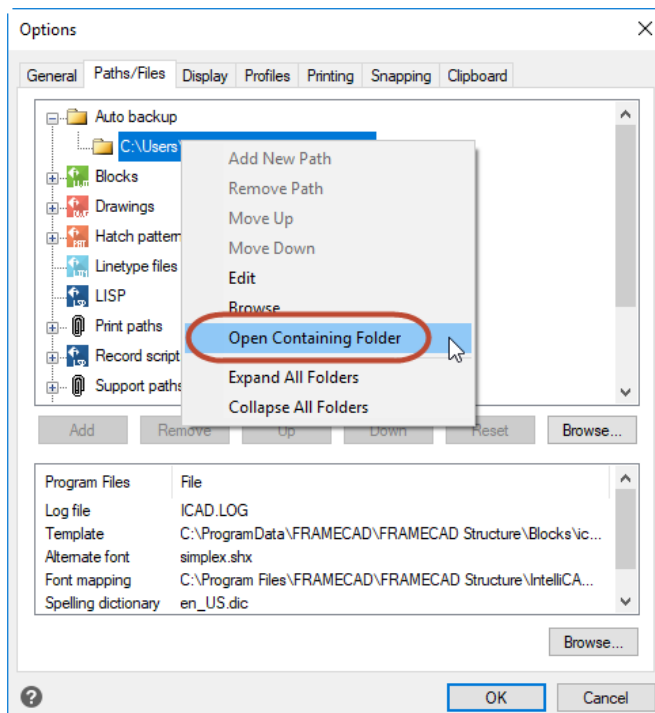


Note that these options will automatically change during the detailing process depending on the command that is initiated.

40.1.25 Restoring an 'AutoSave' Drawing

To restore an 'AutoSave' drawing:

- Go to Tools – Options on the menu, go to the Paths/Files tab, expand the 'Auto backup' section, right click on the directory location displayed and select 'Open Containing Folder'.



- Find the file of the appropriate name. Sort the files in order of 'Type' if this makes searching easier. You will be looking for files under the 'SV\$ File' type.
- Copy the file to the directory where you would normally keep your job files.
- Change the files extension name from '.SV\$' to '.dwg'.
- Open the file as normal in Structure.

40.1.26 Open and Save As... Dialogue Boxes Gone

The user is not able to use a dialog box to select files for opening or saving. In these cases, rather than seeing the dialog box, they are prompted to manually enter the full file path and name of the drawing or file they want to open at the command line.

In most cases, we've noticed that the system variable tends to reset when a file crashes during closing, or when the application runs into an error during shut down or saving. When that happens, **FILEDIA** changes back to "0," and the next time you try to open a file, you're prompted to enter a file name and path rather than select.

To fix the problem, either launch a new drawing, or double click on an existing drawing to get to the command line and type in **FILEDIA** to set it back to "1."

40.1.27 Scroll Between 3D Views

Use VV to scroll between various 3D views.

40.1.28 SECTION MARK

Cross section markers can be added to a drawing using the **SECTION_MARK** command.

40.1.29 SECTIONLINE Command Not Recognised

If the **SECTIONLINE** command is not recognised, run the **AECOBJECTS** command and ensure it is set to 'ON'. The program will need to be restarted for any changes to take effect.

40.1.30 SHOW – Engineering Failures

To show engineering failures press return while in the command.

40.1.31 STRIP – Strip Entity Property Intelligence

Strips any of Structures' entities of all property intelligence.

This is useful when copying walls or beams to another layout for set out purposes, e.g. using walls or beams on a joist layout for better clarity when inputting joists. If these members are left as they are, you end up with a double up of members in the job. You must not combine walls, trusses and joists on the same layout plan as it will cause issues with labelling, frame building and reporting.

Exploding entities does not remove the data. If you explode them, you end up with a series of individual lines that still contain entity data. Stripping the data from these entities also leaves them as complete polylines.

40.1.32 SUM – Report Summary

Provides a material summary report for all the individual tabs and a total job summary.

40.1.33 -TTD – Truss Builder (Silent)

This command allows the user to re-engineer a given truss from within the elevation view (detailing space).

What this means is that when modifications are made to a truss in elevation view (detailing space), the user can then re-engineer the truss without bringing up the Truss Builder dialogue box, which can result in the truss reverting back to its original state prior to any modifications when clicking on the Update button.

It also allows you to build trusses from the layout while by-passing the Truss Builder dialogue box.

40.1.34 Using Viewports (Standard IntelliCAD usage not directly related to Structure usage)

The maximum number of viewports that can be opened in one tab is 64, which is the same limitation as AutoCAD. However, there is also a 'SETVAR' called 'MAXACTVP' which also limits the number of viewports (value must be between 2 and 64). By default, the 'MAXACTVP' is set to 48. To increase its quantity to the maximum, just type 'MAXACTVP' in the command line and increase the quantity as required. Should more viewports be required, I would suggest that the user starts off a new tab, as there is no way around the 64 limitation.

40.1.35 VM – Make View

In addition to being able to make new views in Detailing Space, use the following steps to update a wall, joist or truss frame in the detailing space.

This assumes that the wall, joist or truss frames have already been built and you need to rebuild one or more frames but don't want to re-export all the frames again. The reason for this could be because too much editing has already been carried out on a number of existing frames.

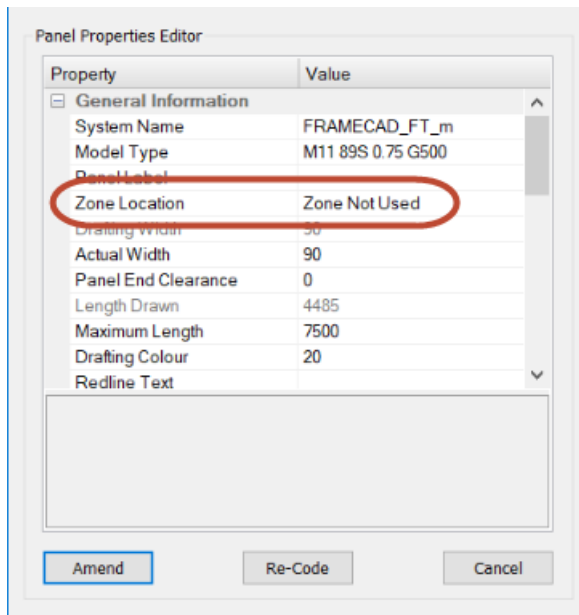
- Re-export the required frame(s) to a new tab.
- Delete the old frame from the border in the initial tab.
- Copy the new frame into its place.
- Type VM then press Enter.
- Enter the number of the border view.
- Select the view area by selecting the opposite corners of the border.
- Delete the new tab.

40.1.36 X – Previous Zoom

Enter 'X' to go to the previous zoom.

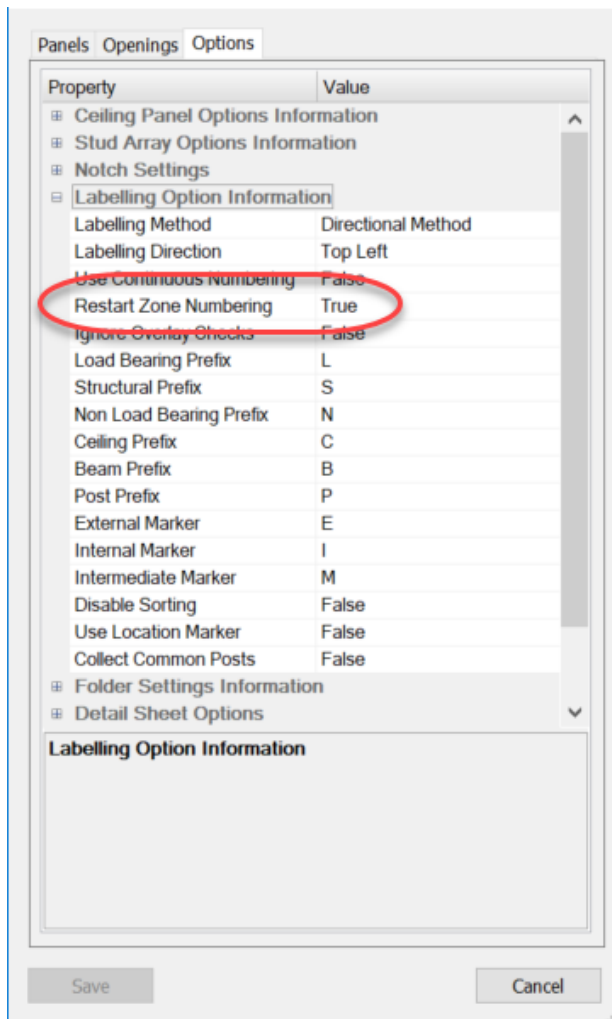
40.1.37 Zone Grouping for Walls and Joists

When Listing (LI) walls or joists, the listing dialogue box shows an option in General Information called 'Zone Location'. This allows a selection of entities (walls or joists) to be grouped into areas.



To use this, select and list (LI) a group of walls or joists, then in the Zone Location, overwrite 'Zone Not Used' with a label that best describes the location of the selected frames, e.g. Unit1. Select the next set of frames and type in Unit2. When you perform a PPD or JJD, these frames can then be filtered by zone when building. The zone label will be shown in front of the panel or joist label in the elevation views.

In PSET – Options – Labelling Option Information, you can set 'Restart Zone Numbering' to 'False' to have continuous numbering through all zones, i.e. all numbers will only be used once and not repeated.



Note: Do not start the zone location description with 'Z' or 'X'. Description length is limited to 6 characters and spaces will be eliminated.

This option is ideal for large commercial or multi-unit buildings.

40.1.38 ZZ – Toggle Tabs

Switches between current tab and last active tab in a job.

40.2 FLOOR DETAILING

40.2.1 Add or Amend Floor Beams

- Make sure you have the correct System Name selected in the PSET settings.
- Activate the ADD command and go to the Joist tab
- Ensure you have the correct System Name selected
- Hold the ALT key down and left mouse click on 'Member*'. This will open a Floor Beam Editor dialogue box. Please contact your system administrator if access is denied.
- Add or amend floor beams as required.

- Click on Add/Amend.

Adding or amending floor beams will create a new user data file in the C:\ProgramData\FRAMECAD\FRAMECAD Structure\Library directory with the same name as the System Name selected but with 'USER' at the end of the name. Any information within this data file will take precedence over the parent data file.

40.2.2 Adjusting Floor Joist Web Spacing

Floor Member Editor - Web Spacing

When changing the depth of a joist, the user must List (LI) the joists and change the web spacing under Material Information. This should be changed to be equivalent to the joist depth to achieve an approximate web angle of 45°. The default web spacing is set to 300mm.

40.2.3 Automatically Hide Layout Layers on PPD (PSET – Options)

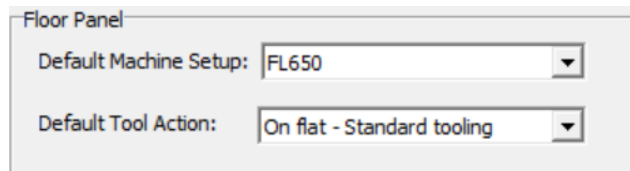
Detail Sheet Options:

'Hide After to CAD' gives the option to hide (or leave unhidden) the following layers: Opening Label, Panel Brace, Panel Opening, Panel Stud. Leaving these layers hidden allows for an uncluttered plan for easier viewing on site by the framing erector.

40.2.4 Deep C Floor Joists – Creating XML File to Send to Detailer

When detailing a deep C floor layout in Structure, you must create the XML file from within the layout space. You don't need to build (JJD) the deep C joists as there is nothing to build. The only reason you may wish the JJD them is to get engineering results.

Then, when importing the XML file into the Detailer software, make sure that you have set the **Floor Panel** option in the **XML Import** dialogue box to use the correct machine setup:



40.2.5 Detail Sheet Border Size

'Border Sized to Fit' option added which makes all the floor joist elevation borders the same size if preferred. The 'Detail Sheet Options' can be found on the 'Others' tab in JSET.

40.2.6 Floor Member Summary – No Ceiling Batten Material Displayed

If you require ceiling batten material to show in the Floor Member Summary, you must make sure that you have set the Ceiling Batten Spacing value in the Joist Settings (JSET).

40.2.7 Move Joist Labels

To move a joist label in v8.1.8 and later, the user can select the grip on the centre of the label and move it horizontally or vertically. Also, the STRETCH command can be used by dragging a right to left selection box over the label and moving it by base point and displacement point or distance.

Likewise, if a series of labels needs to be moved, use the STRETCH command and select all the required labels.

40.2.8 Opening Joist in Detail Space from the Layout

When listing (LI) a joist on the layout, the option to 'Go to detailed beam' in the Floor Member Editor will open the joist elevation in Detailing Space.

40.3 WALL DETAILING

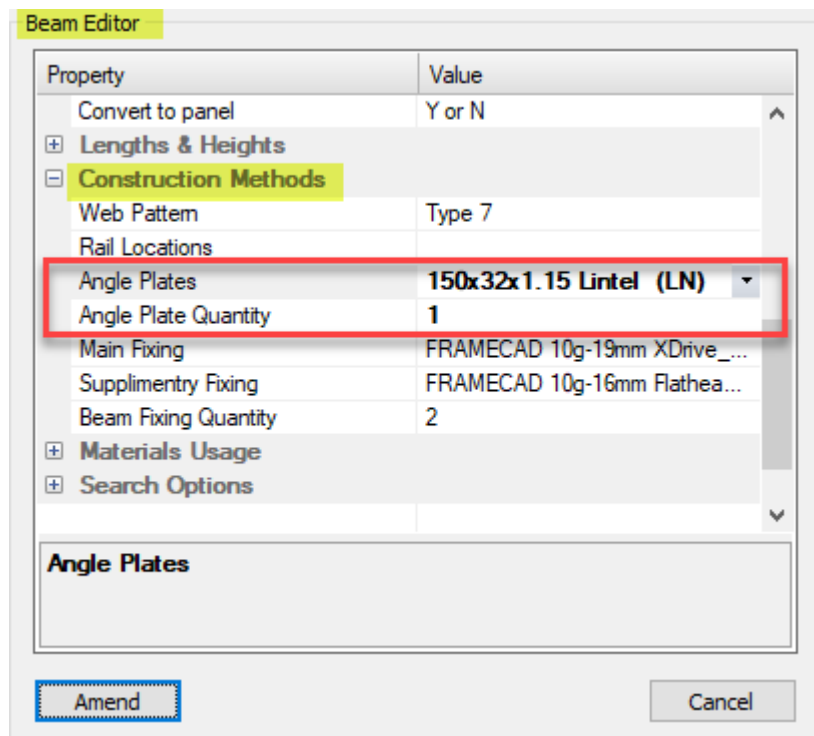
40.3.1 Add Lintel Plates to a Frame

Lintel plates can be added anywhere within a wall frame in Detailing Space by drawing a line and using the ADD command to code that line as a 'Lintel'.

Note: Lintel plates over openings should only ever be added or changed by listing the opening and making the change in the 'Construction Methods' section of the Opening Editor.

40.3.2 Add Lintel Plates to a Webbed Beam

Lintel plates can be added to a webbed beam in 'Construction Methods' in the Beam Editor when listing (LI) the beam.



40.3.3 Add or Amend Beams in Data File

- Make sure you have the correct System Name selected in the PSET settings.
- Activate the ADD command and go to the Beam tab
- Ensure you have the correct System Name selected
- Hold the ALT key down and left mouse click on 'Beam Name*'. This will open a Panel Beam Editor dialogue box. Please contact your system administrator if access is denied.

Property	Value
General Values	
System Name	FRAMECAD_FT_m
Beam Category	Webbed
Beam Name*	Webbed Beam
Model Type	Default
Beam Top RL	2750
Beam Base RL	2450
Beam Height	300
Beam Width	90
Drafting Colour	50
Treats as Non Structural	False
Detail This Item	Yes
Creation Options	
Creation Method	By Points

- Add or amend beams as required.
- Click on Add/Amend.

Adding or amending beams will create a new user data file in the C:\ProgramData\FRAMECAD\FRAMECAD Structure\Library directory with the same name as the System Name selected but with 'USER' at the end of the name. Any information within this data file will take precedence over the parent data file.

If you are unable to access the Beam Editor, go to your Licence Manager (VER) and see if Sub Edit Feature 2005 is Enabled.

Property	Value
Last IRX Version	
Initial IRX Version	9.1.2.5
Cad Module Version	9.1.440.0
Platform	64 bit
Operating System	10.0
Licence Information	
Expiry Date	27 Mar 2020
(2000) Main Software	Enabled
(2003) Cad Software	Enabled
(2001) Print Feature	Enabled
(2002) Save Feature	Enabled
(2005) Sub Edit Feat...	Enabled

Hasp Cancel

If it is Disabled, you can request it through MyFramecad Care - <https://my.framecad.com/FCADCare>.

40.3.4 ADD – Beam Heights

The level to the underside of beams is displayed in the **ADD – Beam** dialogue box and the **Panel Coding Editor** when changing a wall to a beam. Changing this value will not alter the Top Level, it will only change the beam height value.

Property	Value
General Values	
System Name	FRAMECAD_FT_m
Beam Name*	Webbed Beam
Model Type	Default
Beam Top Level+	2930
Beam Base Level+	2630
Beam Height+	300
Beam Width+	90
Beam Type	Webbed
Drafting Colour	1
Creation Options	
Creation Method	By Points

40.3.5 Changing the Panel Properties of a Detailed Wall

You need to change the material, height, nog location, etc. (i.e. most of the parameters that are greyed out when listing a wall panel from the Panel Builder).

- List the wall in the framing layout
- Make the necessary changes
- Run the PUA command in the layout
- Go to the wall panel in the detail sheet
- PPD the wall
- List the wall in the Panel Builder by double clicking on the wall label in the left-hand column
- Click on the 'Amend' in the Panel Properties Editor
- Click on 'Update' at the bottom left of the Panel Builder

40.3.6 Check Load Path onto Walls

The Load Path (LP) command provides a centre line overlay of the trusses or floor joists over wall frames. To use this command:

- Centralise the wall framing layout on your screen.
- Type LP and Enter. The view will zoom out to display all the borders.
- Click within the border that contains the trusses or floor joists.
- The view will zoom back into the initial layout with the truss or joist centrelines overlaid.
- If these lines are yellow, then this indicates that all the loads are being transferred correctly.
- If the lines are red, this indicates that no loads are transferred.
- Type LP again to turn the lines off.

Note: If walls are set as "Structural", then the truss or joist lines will show as being red. The loads are still being transferred but only as evenly distributed loads, not as concentrated loads.

40.3.7 Defined Door Input

For users that prefer to use the 'Defined Door Input' options as shown in the Design - Panels/Walls – Layout menu, not all the available options are listed here. Any other required options must be accessed from the 'Opening' tab in the ADD command. Double click to select the required option.

40.3.8 Detail Sheet Border Size

'Border Sized to Fit' option added which makes all the wall elevation borders the same size if preferred. The 'Detail Sheet Options' can be found on the 'Misc' tab in PSET.

40.3.9 How to Erase Lintel L Plates and Leave Member Screws

If you delete a lintel L Plate from an opening using the **SE** command, all the screws on the members underneath the plate will also be removed. To stop this from occurring, use the **E** erase command instead.

40.3.10 Inserting Webs into Wall Frames (IW)

- If a member is inserted vertically (or within 5° of vertical), it will snap into place as a vertical stud member.
- If a member is inserted horizontally (or within 5° of horizontal), it will snap into place as a horizontal web member.
- If a member is inserted diagonally from one existing member intersection and then to another existing member intersection, the member will snap to the selected member at a predetermined dimple to dimple distance. Note: this only works if there are fasteners present on the existing members.

40.3.11 MB vs MC on Raking Walls

Do not use the MB (MEMBER_BREAK) command on raking walls. Only the MC (MEMBER_CUT) command will work properly to maintain the correct heights.

40.3.12 Opening Commands

The following commands are used in conjunction with the parameters set in the PSET – Windows options. When a door leaf size is entered into the relevant command, the set clearances are added to create the correct trim opening size in the wall frame.

Alias		PSET Category
AR	Archway Opening (or Square Set Opening)	Nibbed Robe Information
CS	Cavity Slider (Pocket Slider)	Cavity Sliding Door Information
ED	External Door	External Hung Door Information
FS	Face Slider or Surface Slider	Face of Wall Sliding Door Information
R1	Robe Door (Single Door)	Hinged Robe Door Information
R2	Robe Door (Double Bi-fold Door)	Hinged Robe Door Information
R3	Robe Door (Triple Bi-fold Door)	Hinged Robe Door Information
PA	Passage Door (Standard Internal Door)	Internal Hung Door Information
S2	Internal Slider x2	Sliding Robe Door Information
S3	Internal Slider x3	Sliding Robe Door Information
S4	Internal Slider x4	Sliding Robe Door Information

40.3.13 Opening Input by Point

All opening inputs have a 'P' option for placement. This allows the user to select a point which centrally locates the opening on that point.

40.3.14 Openings – Label Options

Label Location – allows the door/window type label to be placed either before the door window size (Pre Fixed) or after the size (Post Fixed). E.g. Pd760 or 760Pd. There is also an option to either leave a space between the label and the size or omit it.

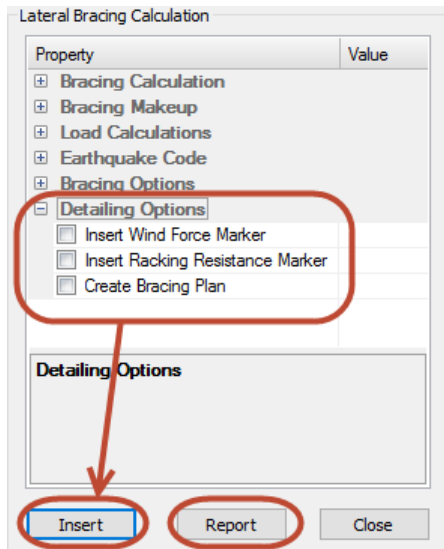
The screenshot shows the 'Openings' tab in the FRAMECAD software interface. The 'Label Options' section is expanded, showing a list of properties and their values. The 'Label Location' property is set to 'Post Fixed' and the 'Omit Spaces' property is set to 'False'. The 'Label Options' section is currently empty.

Property	Value
Sliding Robe Doors Information	
Nibbed Robes Information	
Label Options	
Label Location	Post Fixed
Aluminium Windows	Aw
Aluminium Doors	Ad
Timber Windows	Tw
Timber Doors	Td
User Windows	
User Doors	
External Doors	Ed
Single Sidelight	Sl
Double Sidelight	Sl's
Passage Doors	Pd
Cavity Sliders	Cs
FOW Sliders	Fs
Hinged Robes	Hr
Sliding Robes	Sr
Nibbed Robes	Nr
Archways	Ar
Omit Spaces	False

Label Options

Save Cancel

40.3.15 PCB – Panel Calculate Brace



A bracing report can be generated with all the values for the Current Layout and values for each individual wall. The brace report option has been removed from its previous location in the Detailing Options and given its own button at the bottom of the dialogue box.

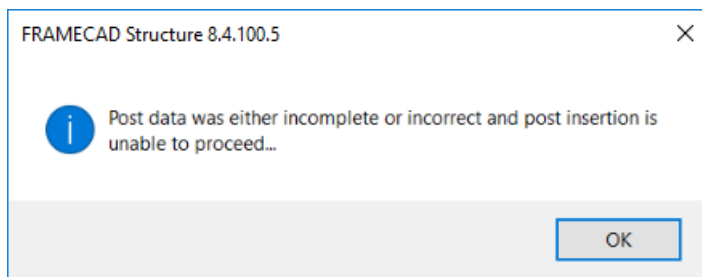
The Insert option is used to input one of the options selected in Detailing Options or, if nothing is selected, will allow the user to input braces. PIB is also used to input braces without having to activate the Bracing Calculator.

40.3.16 Panel Labelling Options (PSET – Options – Labelling Option)

Labelling Method:

- Traditional Method (old) - Labels all walls from the top left-hand corner of the framing layout in a diagonal direction towards the bottom right.
- Directional Method (new) - Labels the external walls anti-clockwise from the corner of the layout as indicated by the 'Labelling Direction' (walls may be labelled in a clockwise direction if the start walls are lapped differently). Internal walls are then labelled from the same corner then towards the opposite corner of the layout.

40.3.17 Post Input Error Message



The above message will appear under the following circumstances:

- Post width is less than 25mm
- Post depth is less than 25mm
- Post height is less than 500mm
- Post spacing is less than 500mm

- Post weight is less than 0.25kg

40.3.18 Resetting Stud Data

To reset the stud data on a wall(s):

- List the wall or walls.
- Go to the 'Stud Data'.
- In 'Stud Arrangement' select 'Auto'. The Actual and Nominal Stud Spacing will change to 0.
- Select 'Amend' to apply.

40.3.19 SB – Show Brick

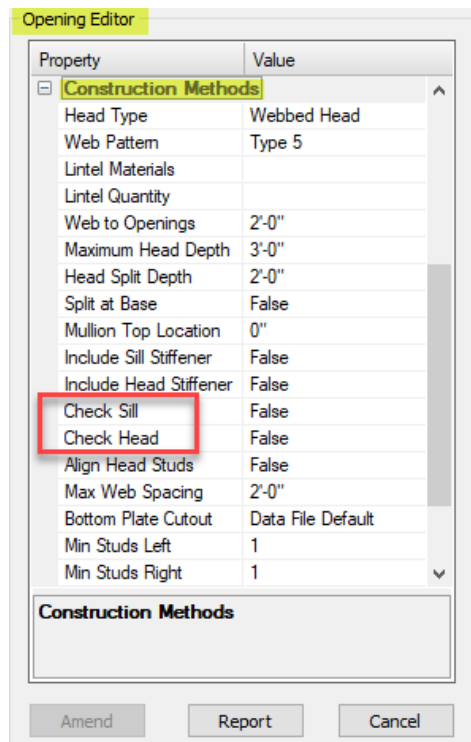
This command provides a temporary visual representation of brick veneer (shown as half courses) along a wall to determine whether opening locations are correct in relation to the brick veneer setout. These brick sizings are set in the Brick Gauge options in the Panels tab in PSET.

40.3.20 SH – Show Heights

This command allows the user to view all the walls on a layout infilled with a different solid colour for each different height.

40.3.21 Sill and Head Check

When listing an opening, there is a face wind bending check option that can be activated by setting the Check Sill and Check Head options to 'True'. This can be found in the 'Construction Methods' section. If required, the software will automatically add a boxed sill and/or head stiffener.

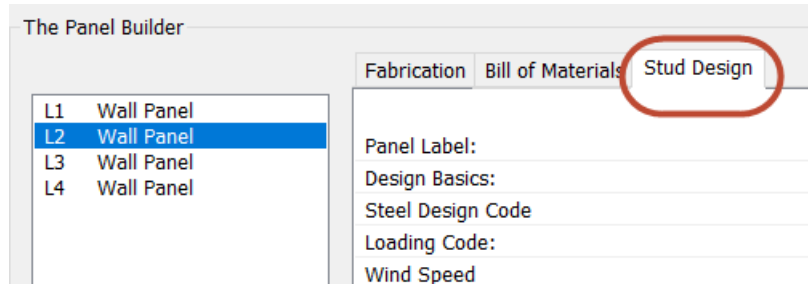


40.3.22 Staggered Nogs to Tab Over Studs

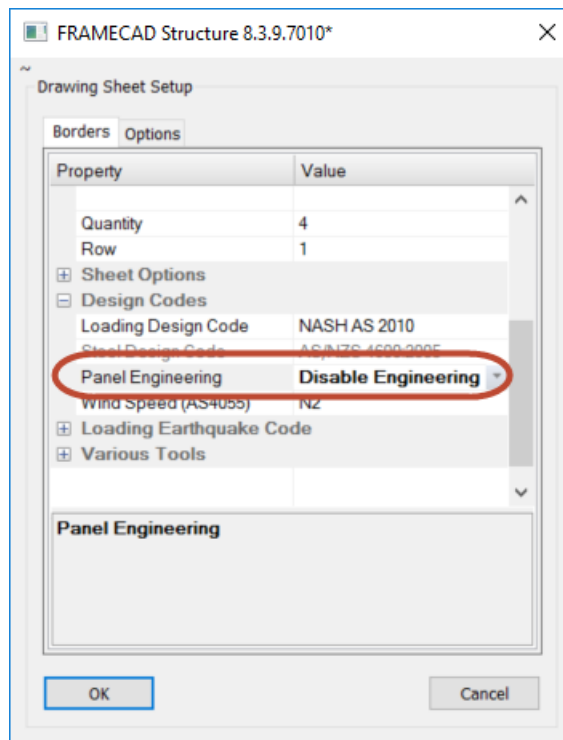
Getting staggered nogs to tab over studs can only be achieved in our Detailer software by changing the Tool Actions to 'On flat – Plate over Stud tooling' in the job or plan configuration settings.

40.3.23 Stud Design

The wall stud design calculations are found in the Panel Builder.



If this tab is not displayed, it means that you probably have the Panel Engineering disabled in the Drawing Sheet Setup (BSET).



40.3.24 Update a Wall in the Detail Sheet When Making Changes to it in the Layout

If you have already built (PPD'd) all your walls and now you need to modify one wall in the layout, use the following steps to update the built wall in the detail sheet.

- make changes to the wall in the layout
- list the modified wall in the layout and select 'Go to detailed panel' go to the detail sheet elevation view for that wall
- PPD the wall from the detail sheet to go to the Panel Builder view
- double click on the panel name in the left-hand column of the Panel Builder to list it
- click on 'Amend' to amend it to the changes as made in the layout
- click on 'Update' to update the view in the detail sheet elevation.

40.3.25 Wall Girder Loads

The wall design now evaluates girder load on an opening and includes this load when designing the header. However, this load is still treated as a uniformly distributed load and not a point load therefore an engineer will still be required to check the header or supporting girder truss design for the point load.

A girder load warning message is only applied to the opening header if the supported area on the girder truss is greater than twice the girder truss spacing.

40.3.26 Wall Location (External/Internal)

You can now amend and set a panel in the 'Loading Information' properties when listed, as 'Internal' or 'External' without it being automatically overwritten by its physical location as determined by the software.

40.4 ROOF DETAILING

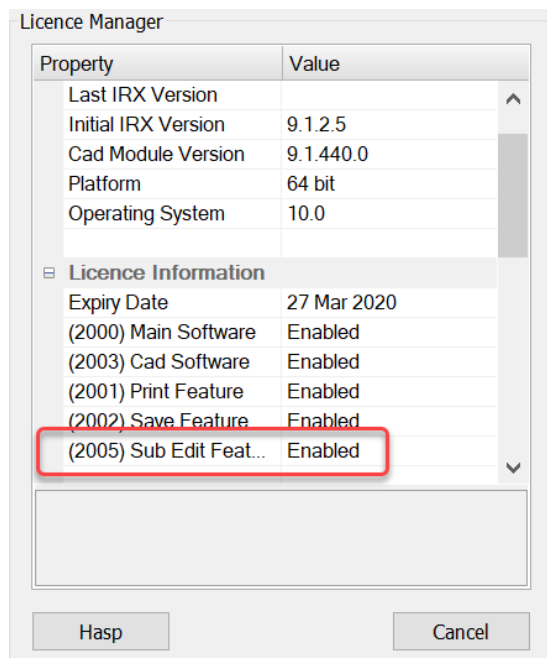
40.4.1 Add or Amend Roof Loads

How to make permanent changes or additions to required roof load types e.g. adding Clay Tiles. Any temporary (or one off) changes should be made in the 'Loads' section of the TSET settings.

- Ensure you have the correct System Name selected
- Hold the ALT key down and click on 'Roof Load*'. This will open a Roof Load Editor dialogue box. Please contact your system administrator if access is denied.
- Add or amend roof loads as required.
- Click on Add/Amend.

Adding or amending roof loads will create a new user data file in the C:\ProgramData\FRAMECAD\FRAMECAD Structure\Library directory with the same name as the System Name selected but with 'USER' at the end of the name. Any information within this data file will take precedence over the parent data file.

If you are unable to access the Roof Load Editor, go to your Licence Manager (VER) and see if Sub Edit Feature 2005 is Enabled.



If it is Disabled, you can request it through MyFramecad Care - <https://my.framecad.com/FCADCare>.

40.4.2 ADD – Truss Members in Detailing Space

This command allows the user to input new chord, web or rail members into a truss either by point to point input or by entity (coding a line).

Also see IW in the "FRAMECAD Structure Reference Guide" under 'Editing Commands'.

40.4.3 Detail Sheet Border Size

'Border Sized to Fit' option added which makes all the truss elevation borders the same size if preferred. The 'Detail Sheet Options' can be found on the 'Options' tab in TSET.

40.4.4 Gable End Roof Type Truss Locations

There is a data file option to locate the first truss back from the gable end truss, either to the face of the truss or to the centre of the truss. This is a data file setting – please create a ticket in MyFramecad to request any data file changes.

40.4.5 Importing Inline Gable Trusses to Detailer When Using a Back to Back Truss System

The purpose of this is for those users that make 'back to back' trusses (LC) but require gable end trusses to be created as standard 'on flat' inline trusses (LE). This means that all the trusses can be exported from Structure then imported into Detailer together in the one XML file.

When exporting trusses from Structure using the standard FRAMECAD_FT data file, the gable end trusses are imported into Detailer using the 'Miscellaneous' frame type – all other trusses use the 'Truss' frame type. This change allows the user to modify the machine settings of gable trusses independently of other trusses.

Users who have custom data files and wish to have this feature implemented will have to submit a request through the MyFramecad website.

40.4.6 Lengthening and Shortening Trusses Using the ST Command

If a truss is lengthened by using the ST command, what this does is to increase the span of a truss, therefore the trusses heel heights are maintained, the pitch is maintained, and the overall height of the truss is increased, i.e. the apex of the truss is moved.

If a truss is shortened by using the ST command, the apex position and pitch is maintained but the end shortened is going to be a 'cut off' or 'stop end'. Therefore, in effect the heel height is increased on that end of the truss.

40.4.7 Parallel Chord Girder Trusses

When a parallel chord truss supports other oncoming trusses, it will act as a girder. The additional roof area load is added and it's spacing is disregarded. Note: if the parallel chord truss sits on a support line running parallel to it, then the oncoming trusses will load onto the support line and not the parallel chord truss.

40.4.8 Setting the height of truncated trusses

Whenever you manually insert or move a truncated truss you will need to change the height of the horizontal top chord. To do this, you need to list the truss using the LI command, go to the 'Height Information' and click on the button to the right of the Truss Height. You will then be prompted to 'select the truss for reference' – this is the truss that you intend changing the height of. Then you will be prompted to 'select a point for height calculation' – this is the heel line (or support line) of the trusses/rafters which run over the top of the truncated truss.

Note: This operation will not work if you list the truss by double clicking on it. You MUST LI, then select the truss.

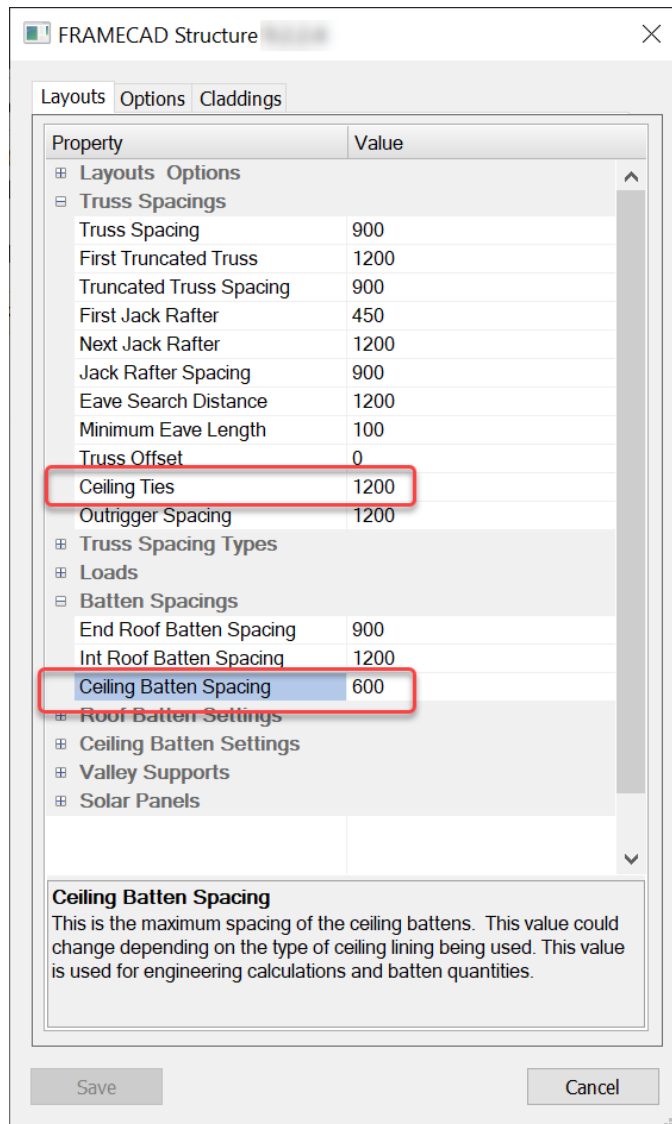
40.4.9 TSET – Truss Spacing Types – Truncated Girder Truss

When the 'First Truncated as Girder' is set to 'True', the first truncated truss generated for a hip end will be a girder truss instead of a standard truss. As a result, web members will be aligned with the oncoming hip end trusses and the loads will be calculated using the 'Additional Area' method.

Use this option for roofs with heavy loads or roofs where supported jack trusses are cantilevered past the support line.

40.4.10 Truss Bottom Chord Restraints

Bottom chord restraints are determined by what is set in TSET – Layouts – Batten Spacing – Ceiling Batten Spacing. If this value is set to zero, then the Ceiling Tie value will be used (TSET – Layouts – Truss Spacings – Ceiling Ties), i.e. the Ceiling Batten Spacing will take precedence over the Ceiling Tie value.



40.4.11 Truss Labelling

If experiencing issues with truss labelling at any stage, try using the PUA command first.

40.4.12 TS (Truss Solar) – Solar Panel Input

This command allows the user to input a solar panel (or similar panel) on top of roof trusses. Size and weight settings can be found in TSET.

40.4.13 TTD – Existing detailed trusses not working

If the 'DEFPOINTS' layer is turned off, the software does not bring up the truss as it doesn't find the reference point.

40.4.14 TUP or LP – Blank Screen on Input

If the TUP or LP command is activated, and the plan zooms out to a blank screen when requested to select a location border or source border, this generally means that there is an entity on the plan that exists a very great distance away from border location. If this is true, then follow the process below:

- Type 'e' for ERASE.
- Type 'all' to select all entities in the drawing. A quantity of entities selected will appear in the command bar.
- Type 'r' to remove selection
- Select entities to remove from selection. The quantity of selected entities will be subtracted from total.
- Press Enter to erase the remaining selected entities.

40.4.15 TUP – Truss Uplift Plan Values

When a truss uplift is plan is created but you don't wish to display all the values below a certain value.

The minimum value can be set in the truss settings 'Report Options' which is in the TSET Options tab.

This is useful if you only wish to display values above a set value for clarity when selecting hold down fixings.

40.4.16 User Truss Creation

User trusses are trusses that follow a roof profile. This is only applicable to truss top chords. Generally, User trusses are an option where a smaller roof block attaches to the end of a hip roof or in other various colliding hip type roofs.

40.5 SMART PANELS

40.5.1 Add an opening into a smart panel

- Draw a rectangle of the required size and location within the smart panel.
- Type MJ (MEMBER_JOIN) and select the panel.
- Hold the ALT key down and select the opening polyline. All framing in the opening will be subtracted from the panel.

Note: This process can also be used to create notches in the corners and edges of panels.

40.5.2 Rake a smart panel

- List (LI) the smart panel
- Under AEC Basics, change the '3D Raking Angle' to the desired pitch.
- Change the '2D Raking Direction' to suit the required pitch direction. The arrow indicator on the panel will change to suit.

40.5.3 Not Initialized

- Run AECOBJECTS and set to 'On'.

- Restart program.

41 Structure Menu & Commands

Structure:

Detail/Frame Builder	DET (TTD/PPD/JJD)
Framing Item / Member Item	ADD
List Item	LI
Reset CAD Environment	DO_ONCE
Reset All (Reset program to default settings)	RESETALL
Software Version	VER
Spool Print	SP
BIM Attach	BIMATTACH
Create FIM Layout	CREATELAYOUT

Settings:

Border Setup	BSET
Floor Settings	JSET
Panel Settings	PSET
Truss Settings	TSET

Panels/Walls:

Bath Nog	PBN
Build Studs	PBS
Calculate Bracing	PCB
Defined Door Input	<i>See Below</i>
Insert Brace	PIB
Lap Beam	PLB
Load Path	LP
Opening Input	ADD
Opening to Brick	PFB
Panel Auto Break	PAB
Panel Builder	PPD (or DET)
Panel Input	PD (or ADD)
Panel Notch	PN
Panel Rake	PRA
Panel Stack	PST
Panel Stack – Insert Wall	IW
Show Brick	SB
Show Heights	SH
Special Noggin	PSN
Stud Array	PSA
Stud Array Copy	PSC
Update All (Re-Engineer Walls)	PUA
User Defined Door	UD
User Defined Window	UW

Defined Door Input:

Aluminium Door	AD
Aluminium Window	AW
Archway Opening (Square Set)	AR
Cavity Slider	CS
External Door	ED
Face Slider	FS
Passage Door	PA
Robe Door x1	R1
Robe Door x2	R2
Robe Door x3	R3
Internal Slider x2	S2
Internal Slider x3	S3
Internal Slider x4	S4

Trusses:

Add Point Load	TPL
Add Support	AS
Box Gutter	BG
Box Member	BM
Code Member	CM
Code Roof Line	RL
Code Support Line	SL
Convert to Hexagonal End	CTH
Create Roof Lines	CRL
Insert Web	IW
Rebuild Eaves	TRE
Roof Shape Input	RS
Solar Panel	TS
Truss Builder	TTD (or DET)
Truss Builder (Silent – Re-engineers without going to Truss Builder)	-TTD
Truss Layout Input	TD
Truss Uplift Plan	TUP

Joists:

Code Support Line	SL
Floor Recess	FR
Floor Sheet Input	FSD
Floor System Wizard	FD
Joist Builder	JJD (or DET)
Joist Builder (Silent – Re-engineers without going to Joist Builder)	-JJD
Joist Layout Input	JD (or ADD)
Joist Service Hole	JSH

Smart Panel:

Ceiling Panel	SC
Floor Panel	SF
Roof Panel	SR
Panel Builder	SPD

Editing:

Add Support	AS
Box Member	BM
Break Member	MB
Copy Member	C
Copy Layer	CL
Crossing Member	MX
Cut Member	MC
Divide Member	MD
Extend Member	ME
Fillet Member	MF
Inherit Properties	IP
Insert Web	IW
Join Member	MJ
Lengthen Member	ML
Mirror Member	MI
Move Member	M
Offset Member	MO
Update Member	MU
Reverse Frame or Member	RF or MR
Section Mark	SM
Special Erase	SE

Miscellaneous:

Copy to Model Space	C3D
Centered	CTR
Copy Posts	CC
Copy View	CV
Create Support Lines	CSL
Explicit Tool	ET
Find Item	FFIND
Gridline	GL
Insert Detail	ID
Integrity Check	IC
Label All	LA
List Item	LI
Quick Text Input	QT
Reference Point	REF
Revision Cloud	REV
Show Orientation or Engineering Failures	SHOW

Steel Profiles	SS
Temporarily Hide Entity	TEMPHIDE
Text to CNC	TEXT_CNC

Dimension:

Aligned Dimension	DA
Dimension Guidelines	DG
Horizontal Dimension	DH
Line Dimension	DL
Linear Dimension	DM
Ordinate Dimension	DO
Vertical Dimension	DV

Reports:

Beam Summary	POB
On Page Joist Accessories	JOA
On Page Opening Summary	POO
On Page Panel Accessories	POA
On Page Joist Summary	JOS
On Page Panel Summary	POS
On Page Post Summary	POP
On Page Rafter Summary	ROS
On Page Roof Area	RA
On Page Summary	OR
On Page Truss Accessories	TOA
On Page Truss Summary	TOS
Report	REP
Summary Report	SUM

View:

All Layouts 3D	A3D (or 3D)
Clear Border	CB
Copy View	CV
Go To View...	V
Initial View (View Restore)	VR
Joist 3D	J3D
Layout / Detail Toggle	ZZ
Make View	VM
Move View	MV
Next View	VV
Panel 3D	P3D
Previous View	X
Smart Panel 3D	S3D
Truss 3D	T3D

Layer Control:

Copy Layer	CL
Current Layer	LC
Erase Layer	LE
Freeze Layer	LF
Isolate Layer	IL
Layer Show All	LS
Temp Layer Add	LX
Temp Layer 1 to 5 Add	LX1,...LX5
Temp Layer Toggle On/Off	LT
Temp Layer 1 to 5 Toggle On/Off	LT1,...LT5
Temp Layer Toggle All On/Off	LTA
Visual Controls	VC

Exports:

ACNC Export All	ACNC
CNC Export	CNC
Export As...	EXPORT
IFC Export	IFC
PDF Export	PDF
STP Export	STP
VRML Export	VRML

Help:

Engineering Guide	
Procedures Guide	
Reference Guide	
Release Notes	
Software Version	VER
Updates and How To's	

Refer to the Structure Reference Guide for more detailed information on each command.