



CADS A3D MAX

How to extend a structural model



Revision history

Date	Version	Description	Author
10/12/2014	v 1.0	Internal draft for comment	RCH
22/12/2014	v 1.1	Revised version after customer comments	RCH
09/01/2014	v 1.2	Typos etc corrected	RCH

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1 Introduction

Sometimes it may be necessary to extend a structural model which has repeating frames. This can be done with minimum effort using the copy, cut and paste functions in the software. However it is easy to go astray if you do not use these functions regularly so this document shows how to do it using a worked example.

The example consists of a portal frame building which was initially 7 bays long as shown in stick model form in fig 1.

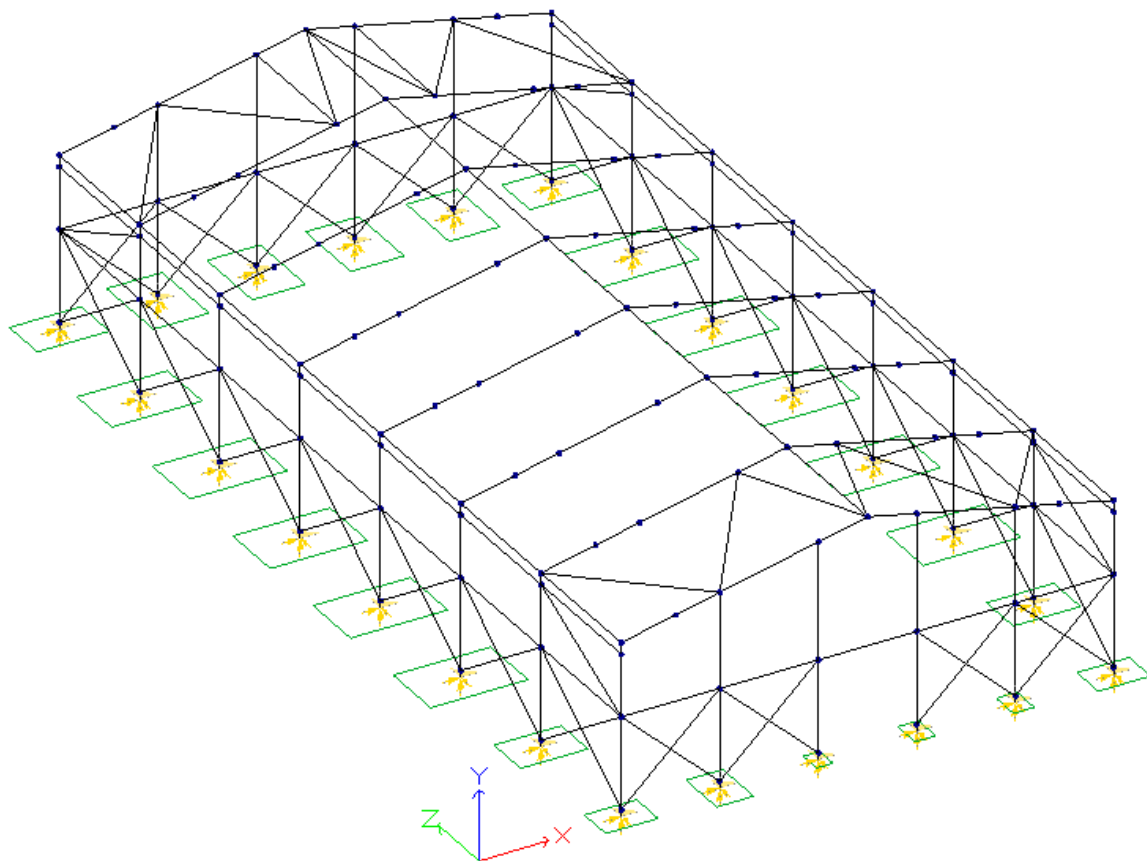


Fig 1 Stick model of original 7 bay structure. Panels and loads omitted for clarity.

After the structural model was created and loaded the client decided to increase the building length by 3 bays. To avoid the labour of creating the model from scratch, the copy, cut and paste functions were used to make the necessary changes as outlined below.

It should be noted that when using the *copy* function, all the items required to be copied should be shown graphically when selecting. eg: if loaded panels are required to be copied, *toggle panels* and *toggle panel loads*. Similarly *toggle supports*. Confirm that the relevant graphics are displayed before making your selection.

However do not show the bases (if these have already been designed) because there is currently a problem with copying these.*

*This problem will be resolved in a program version later than v 4.20

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Use the toggle to
switch OFF base
design objects

In section 2 below the simplest procedure for adding three bays is described. This results in the panel loads for the end three bays being copied to the extension whilst the original end 3 bays remain in place unchanged. If the wind loads on the end panels are different from the internal bays the latter may have to be edited. To avoid the need to edit panel loads the longer procedure in section 3 can be adopted.

2 Simple procedure for adding bays

Step 1: With panels and panel loads selected and shown graphically (if required), select *Top View*. Note that supports must be selected but not base objects. The panel load graphics are not shown here for clarity. Using *enclosing window* selection [left to right window], select as shown below and *Copy* the selection.

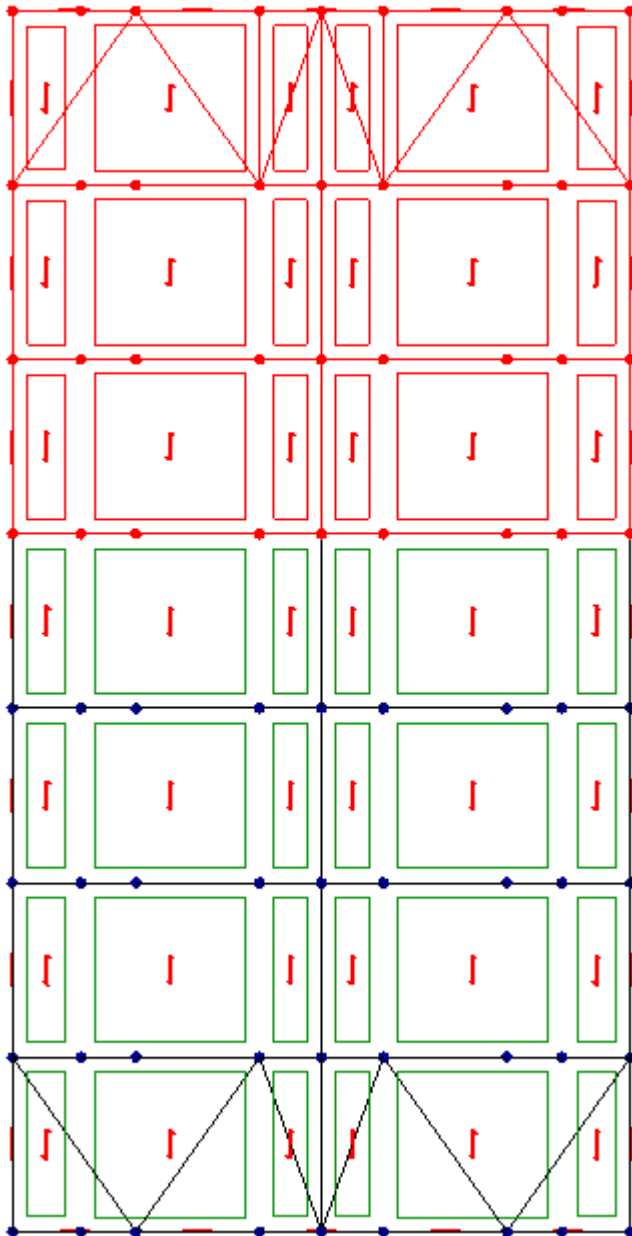


Fig 2.1 Select the end 3 bays. Panel loads omitted for clarity here.

Step 2: Select *isometric view*. Select *Paste*. The cross hairs will attach to the default anchor joint (in this case the left eaves node). Drop this over the eaves node to which it is required to connect and click. The common members and joints will be merged automatically. The anchor joint can be changed during the *paste* operation via right

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click *menu*, if it is not as expected. The menu allows you to select another joint.

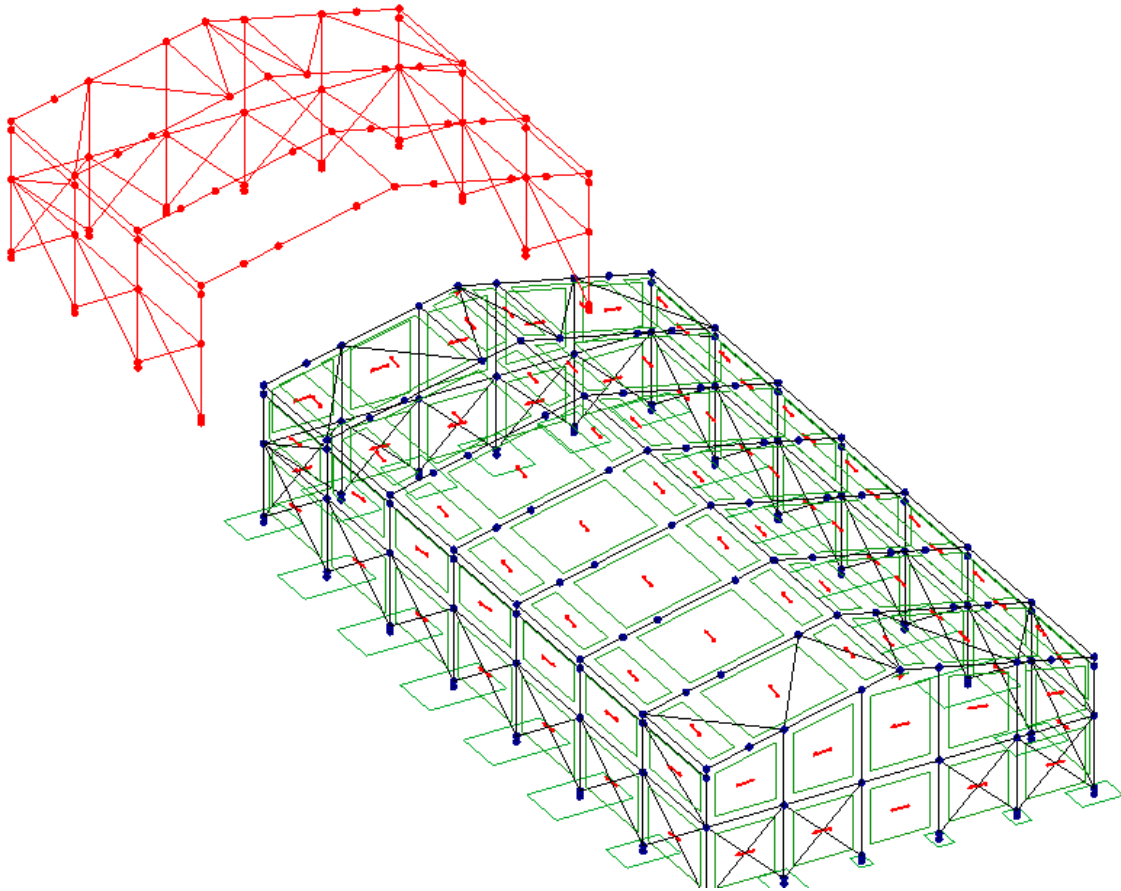


Fig 2.2 Copied part frame about to be placed

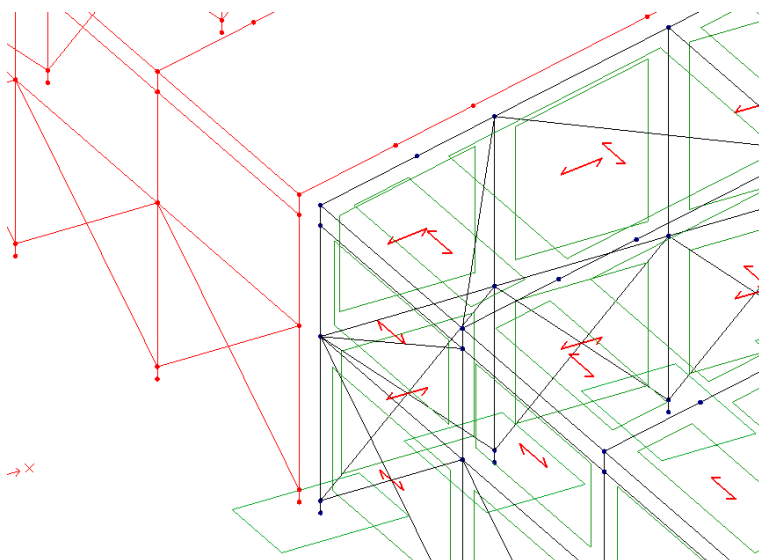


Fig 2.3 Copied part frame being dragged into position

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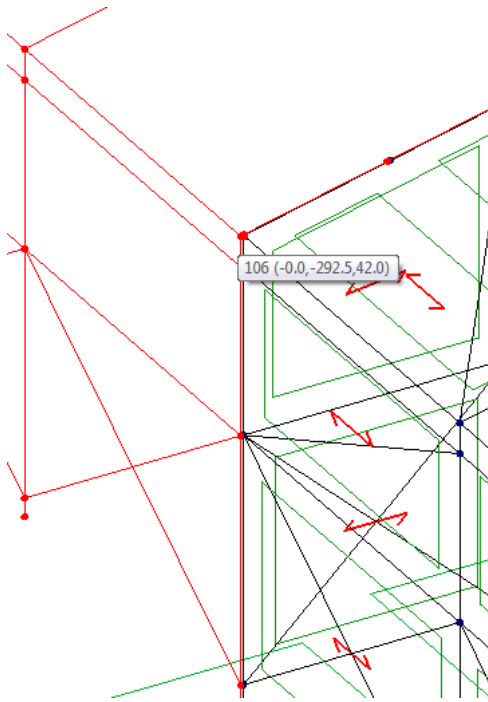


Fig 2.4 Copied frame clicked into place.

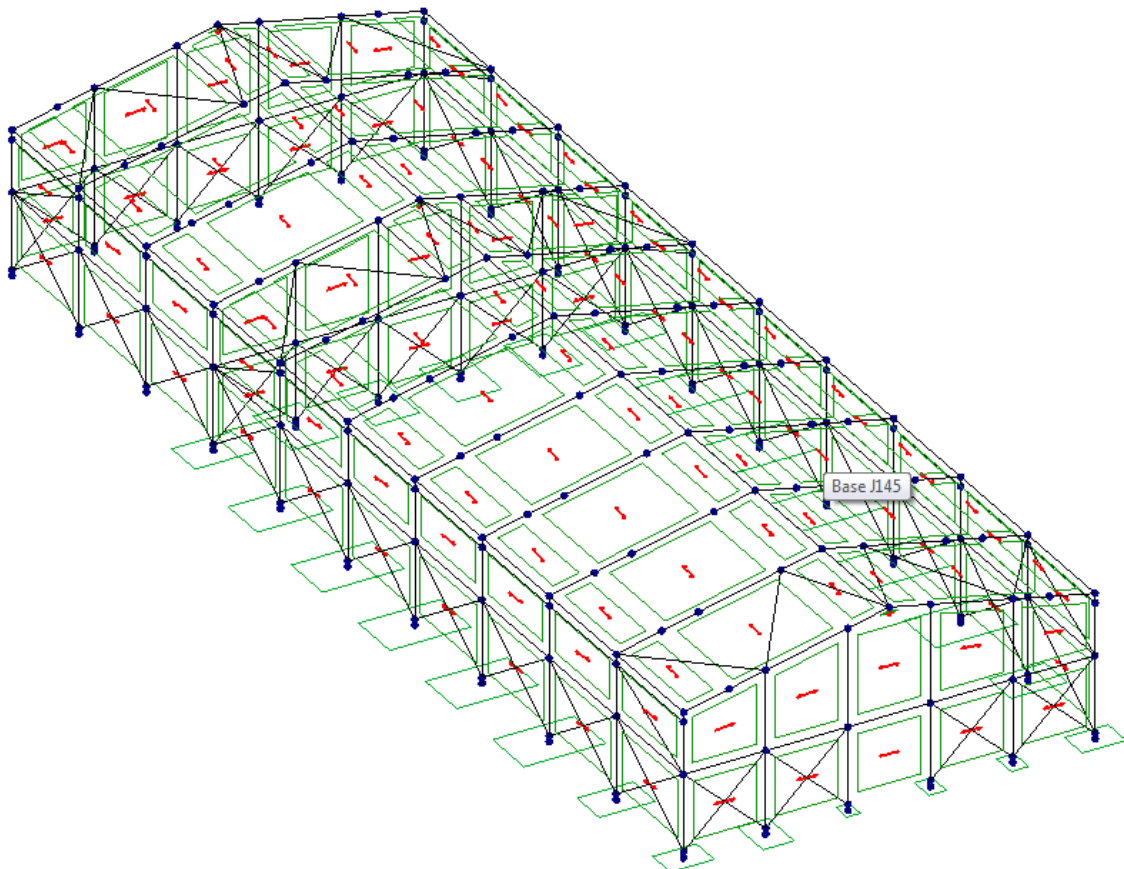


Fig 2.5 Frame with 3 bays added before editing

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- Step 3: In order to delete the internal posts, their supports, bracings and vertical panels from the original end frame (which is now internal), select the frame and select *Partial view* and then *Front view*. Select the items to be removed using *enclosing window* and when satisfied press *Delete*.

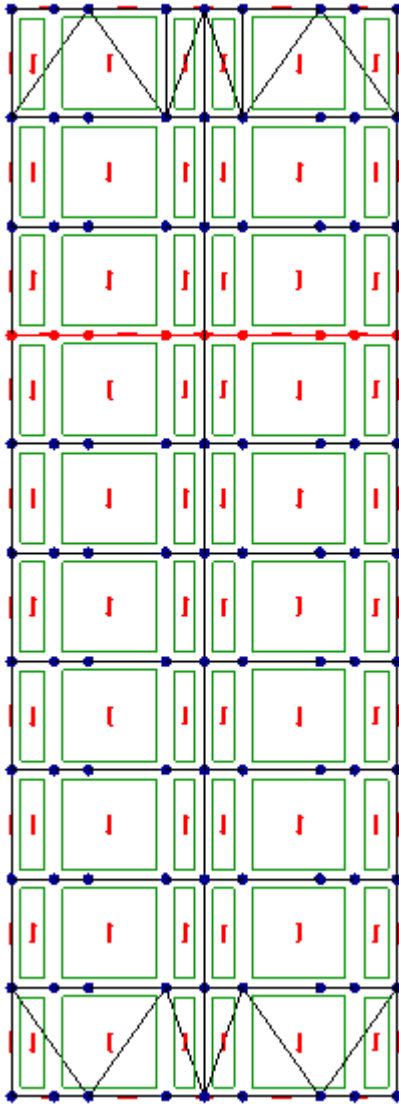


Fig 2.6 Select the original end frame.

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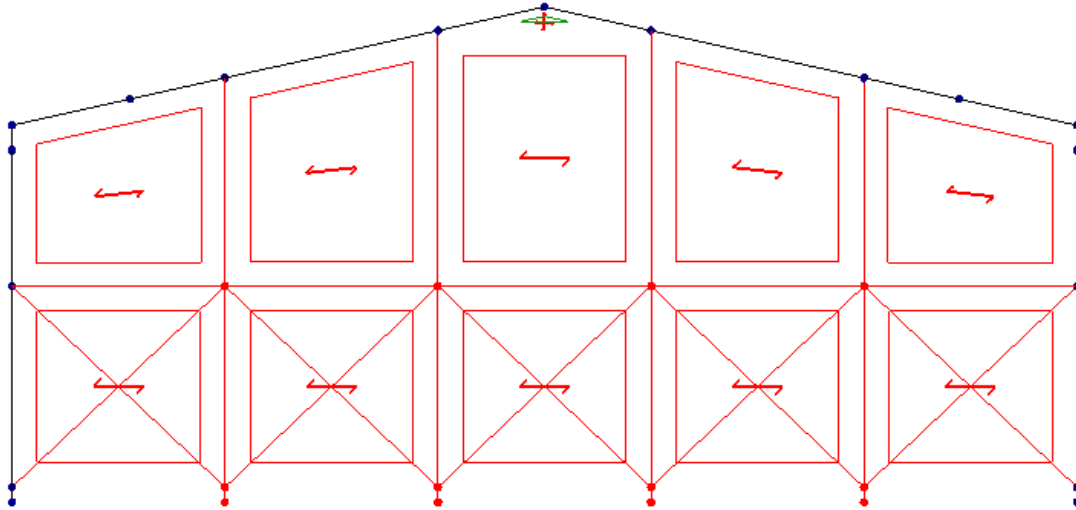


Fig 2.7 Front view of selected frame in *partial view* with superfluous internal members and panels selected for deletion.

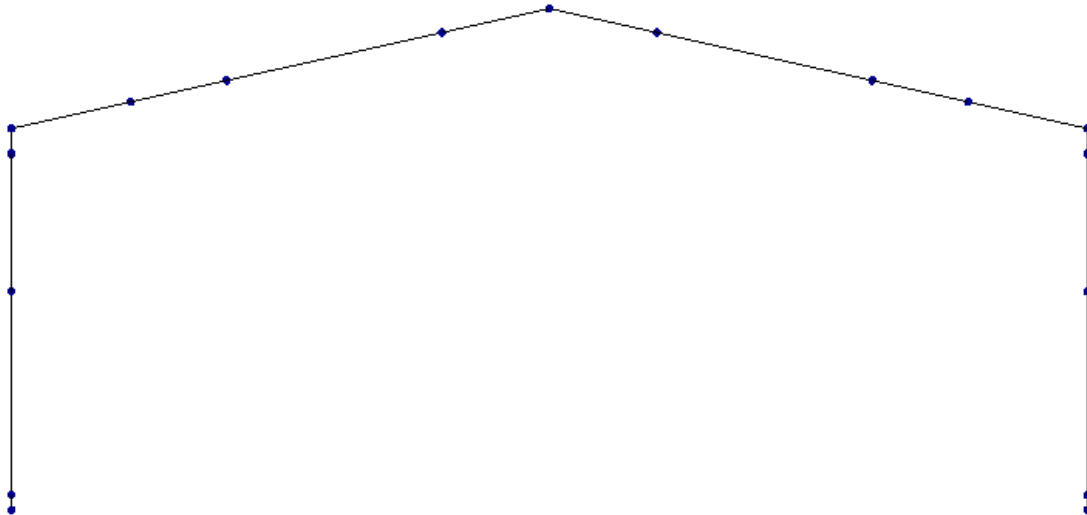


Fig 2.8 Front view of former end frame after deletion of superfluous internal members and panels.

Now select *Full view* and *Isometric view*. Then select and delete the superfluous roof and side bracings to produce the completed modified structure shown below.

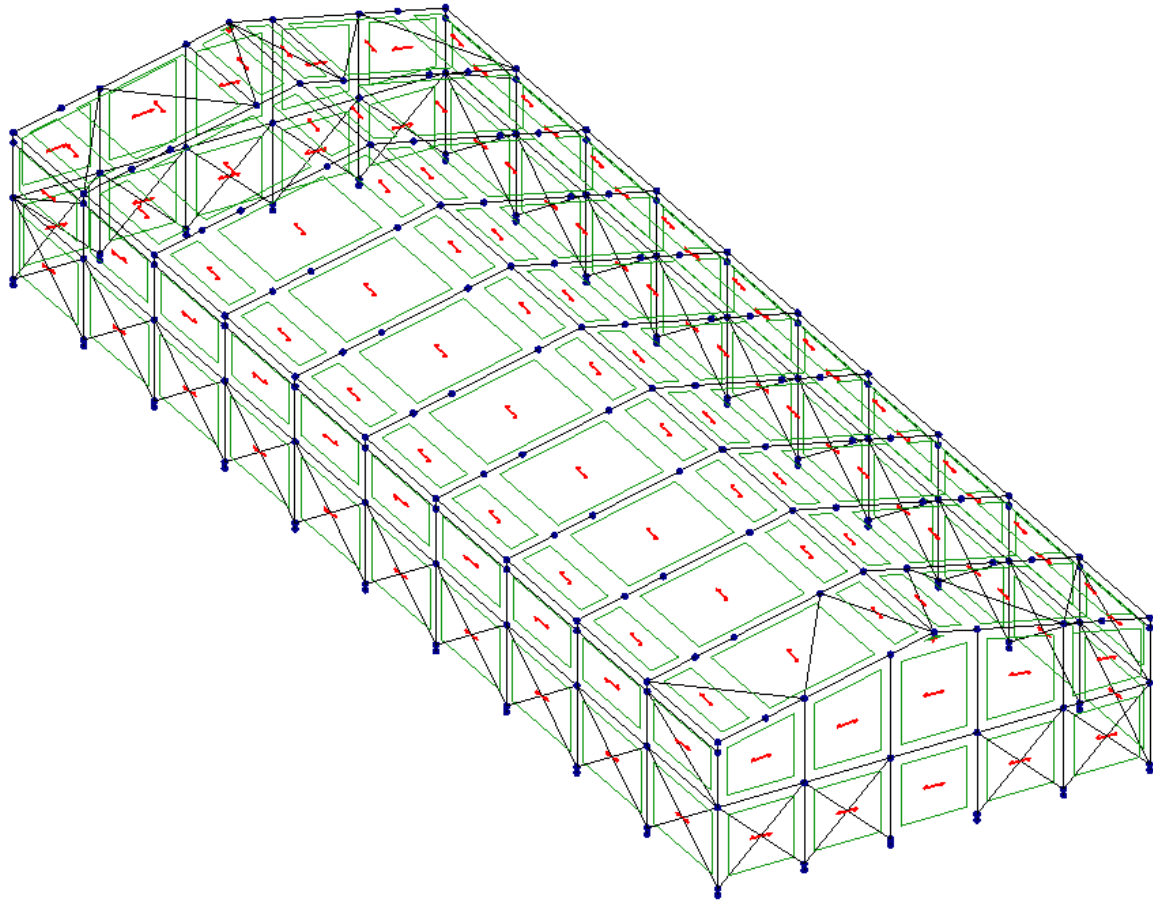


Fig 2.9 Completed modified model.

Check that the relevant supports, members, panels and panel loads are present and correct by selecting the relevant object and right click *properties*. As noted earlier it may be that the wind loads on some of the former end bay panels are no longer correct and should be edited.

3 Longer procedure for adding bays to avoid editing loads and bracing

Step 1: With panels and panel loads selected and shown graphically (if required), select *Top View*. Note that supports must be selected but not base objects. The panel load graphics are not shown here for clarity. Using *enclosing window* selection, select as shown below and *Copy* the selection.

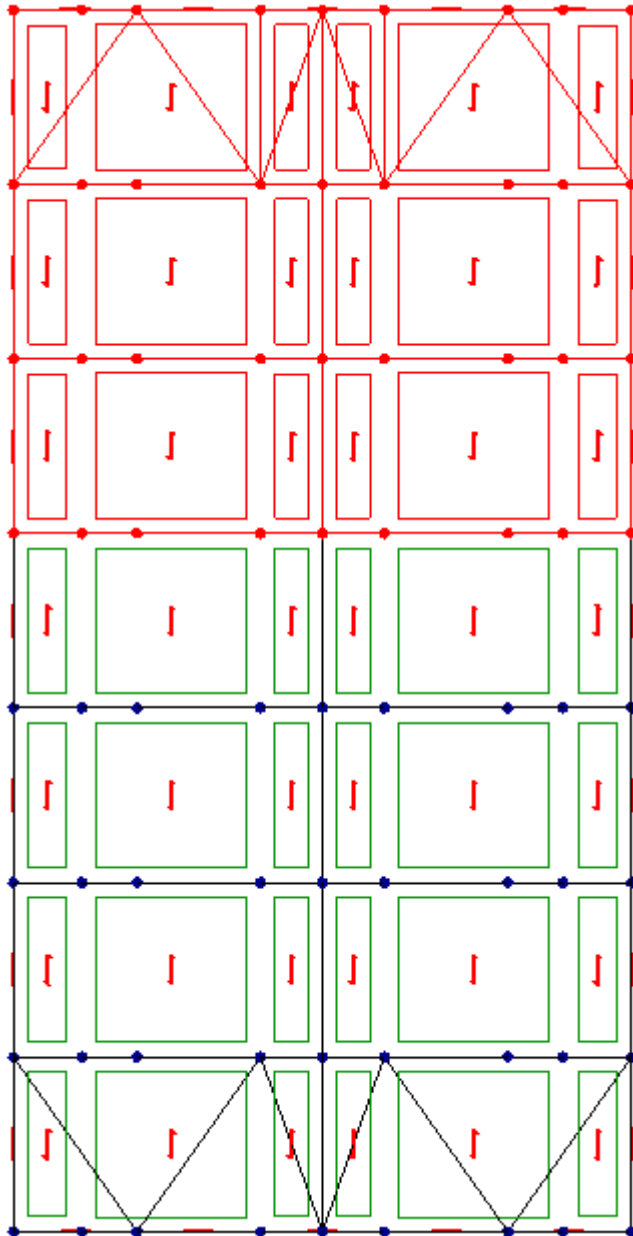


Fig 3.1 Select the end 3 bays. Panel loads omitted for clarity here.

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Step 2: Select *isometric view*. Select *Paste*. The cross hairs will attach to the default anchor joint (in this case the left eaves node). Drop this over the eaves node to which it is required to connect and click. The common members and joints will be merged automatically. The anchor joint can be changed via right click *menu*, if it is not as expected.

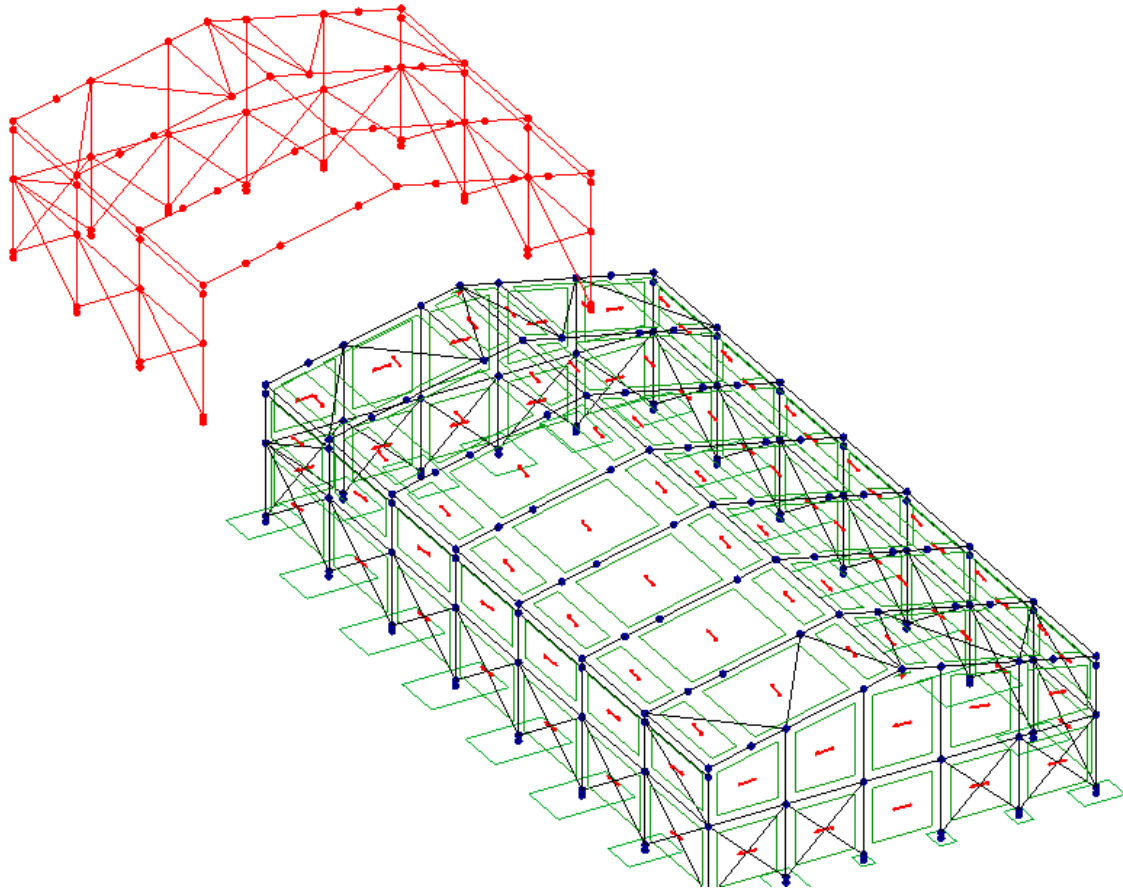


Fig 3.2 Copied part frame about to be placed

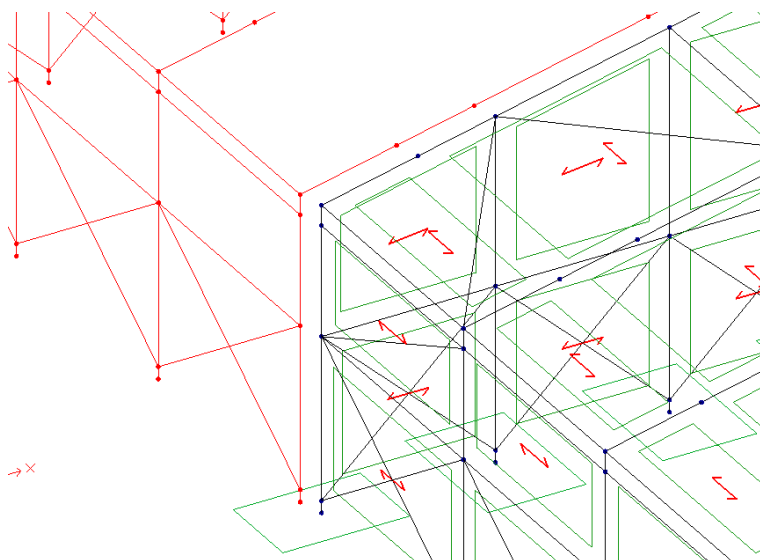


Fig 3.3 Copied part frame being dragged into position

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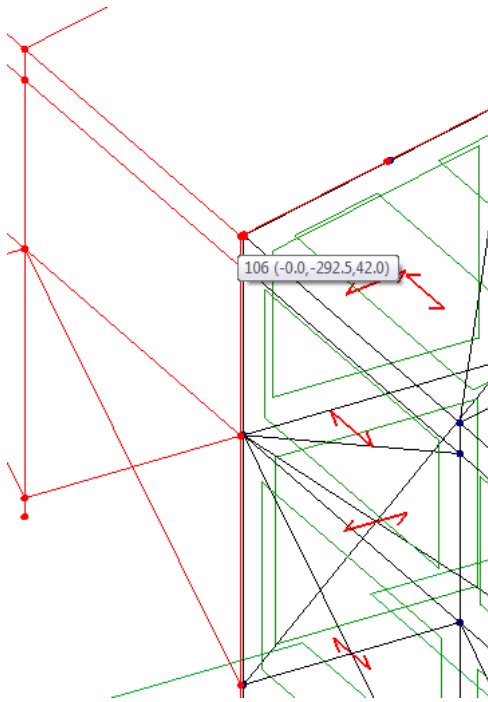


Fig 3.4 Copied frame clicked into place.

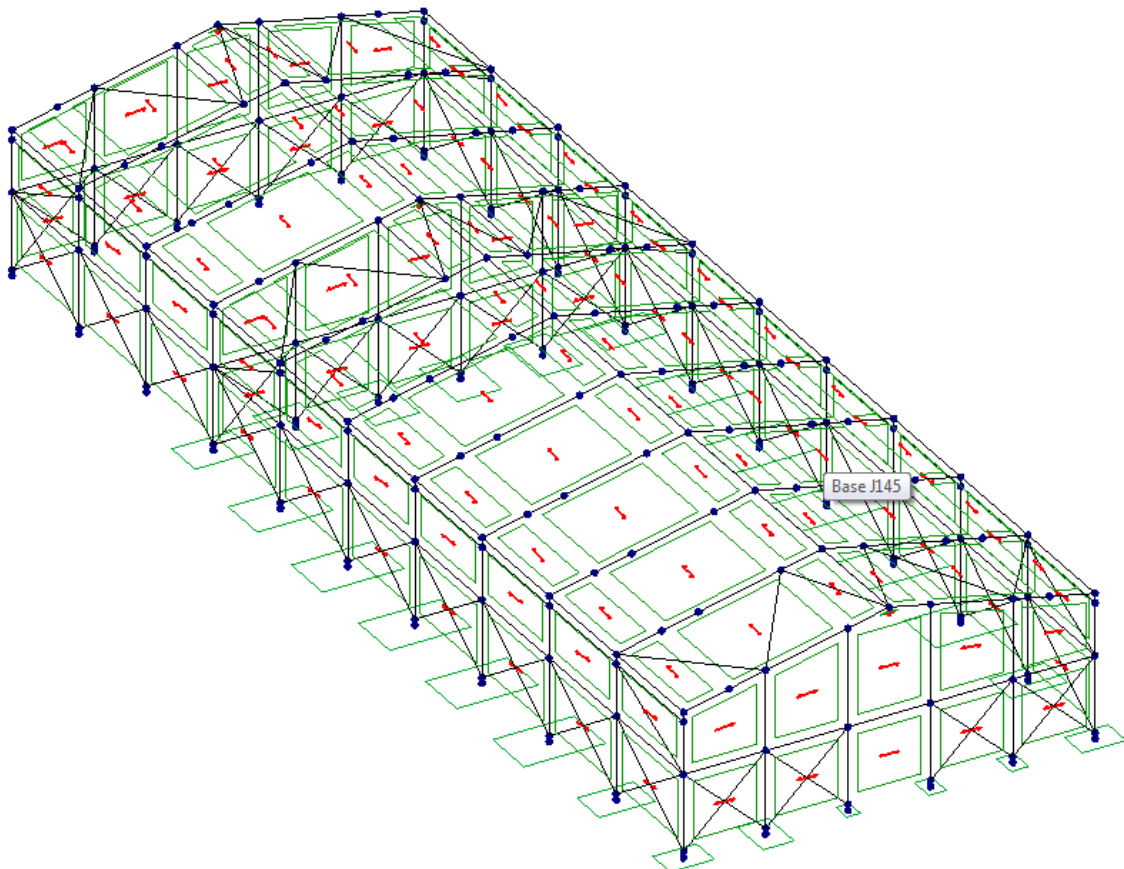


Fig 3.5 Frame with 3 bays added before further editing

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Step 3: Select the original 3 end bays which are now internal as shown below in fig 3.6.

Note this is a *crossing window* selection not including the outer frames. Delete the selection

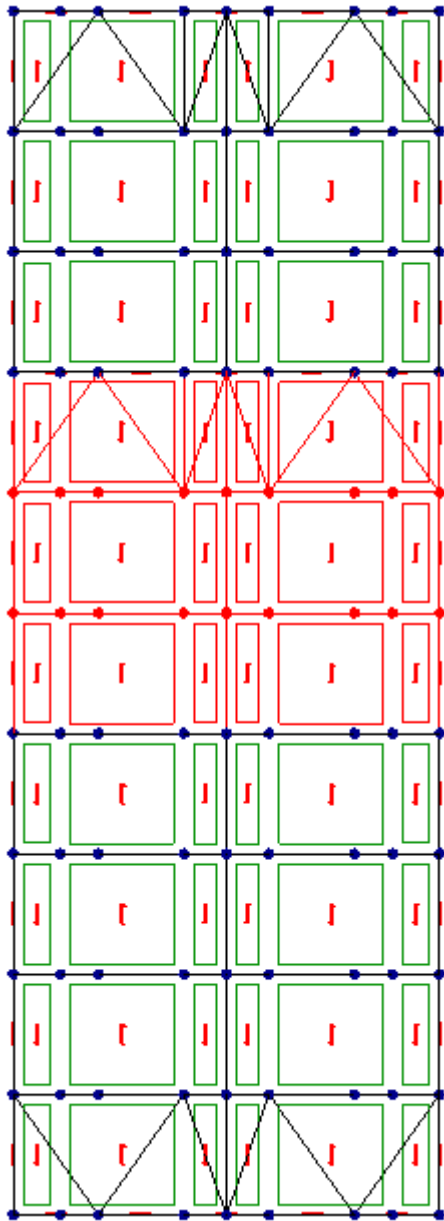


Fig 3.6 Select original 3 end bays not including the outer frames.

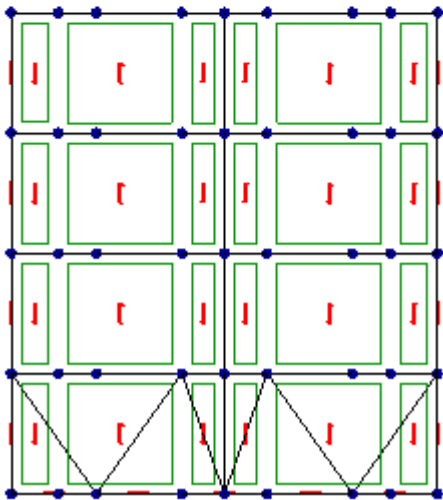
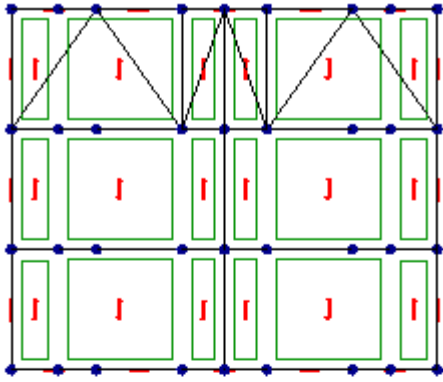


Fig 3.6 Selected 3 bays deleted

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Step 4: Select the remaining internal frames as shown below.

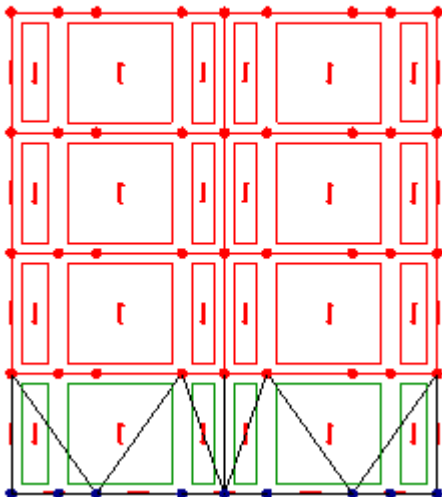
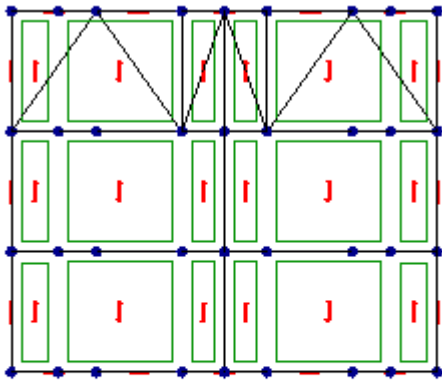


Fig 3.7 Remaining internal bays selected for copying. [enclosing window selection]

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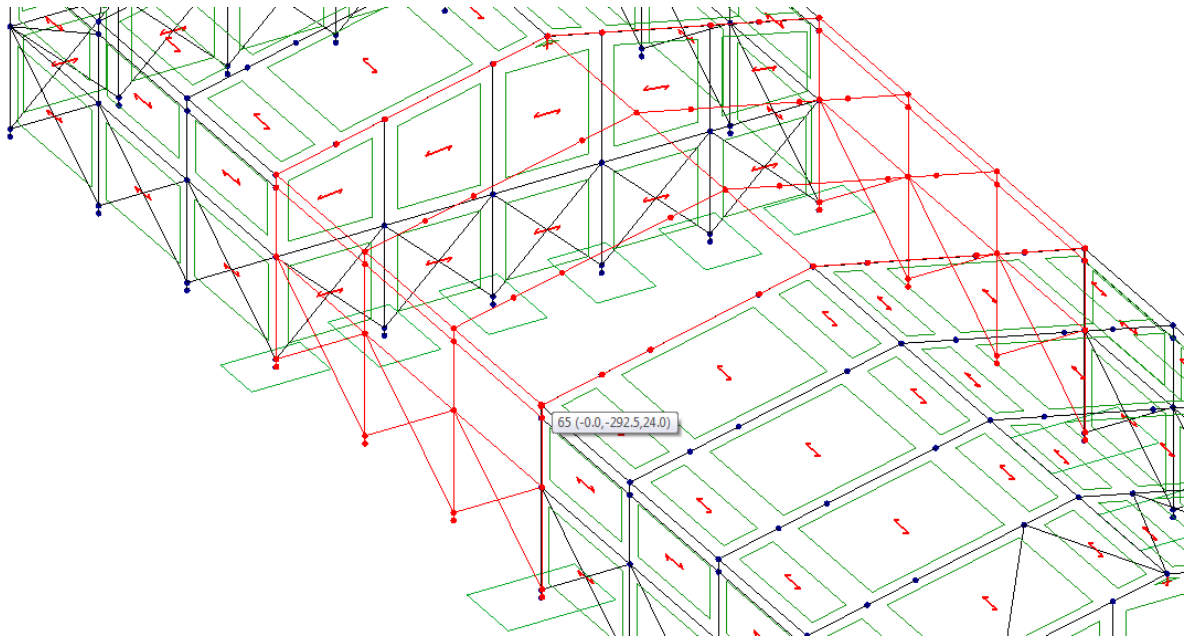


Fig 3.8 Selected copied internal frames pasted into position

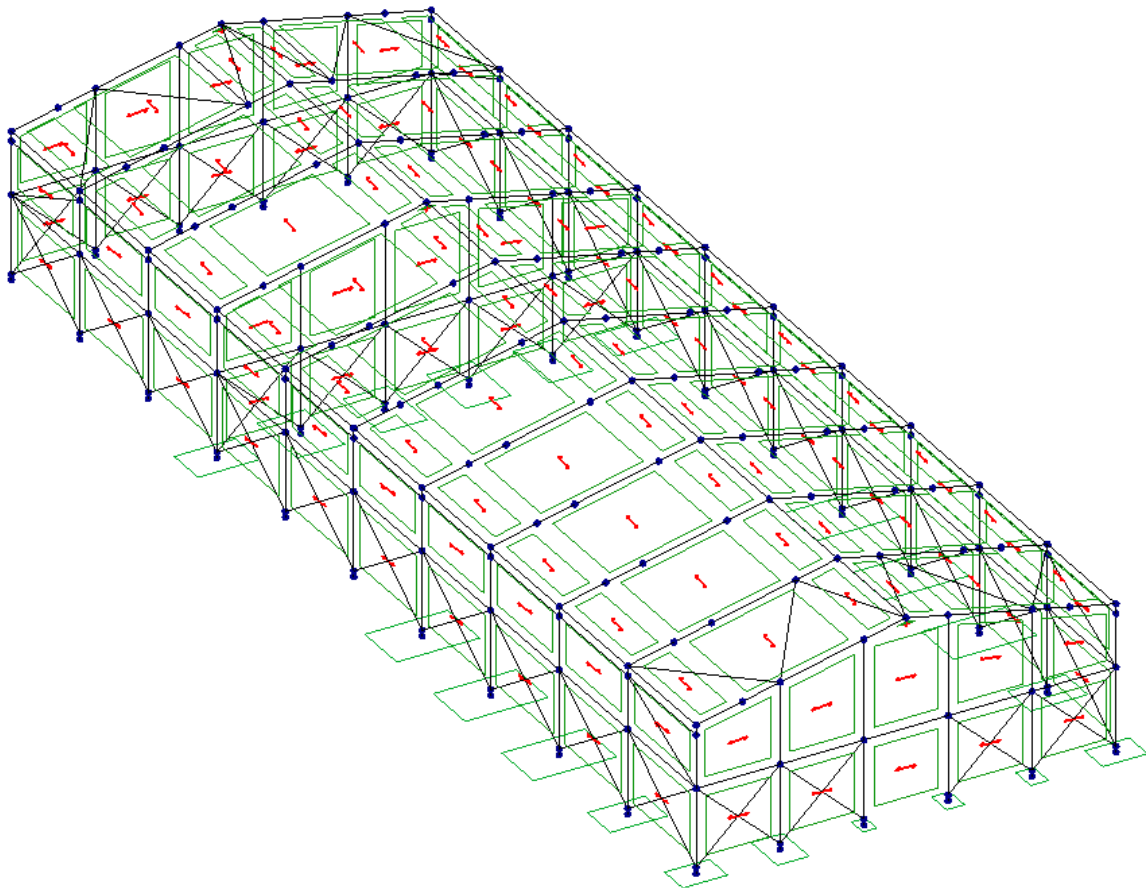


Fig 3.9 Extended frame before editing

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Step 5: In order to delete the internal posts, their supports, bracings and vertical panels from the original end frame (which is now internal), select the frame using *enclosing window selection* and select *Partial view* and then *Front view*. Select the items to be removed using *crossing window selection* and when satisfied press *Delete*.

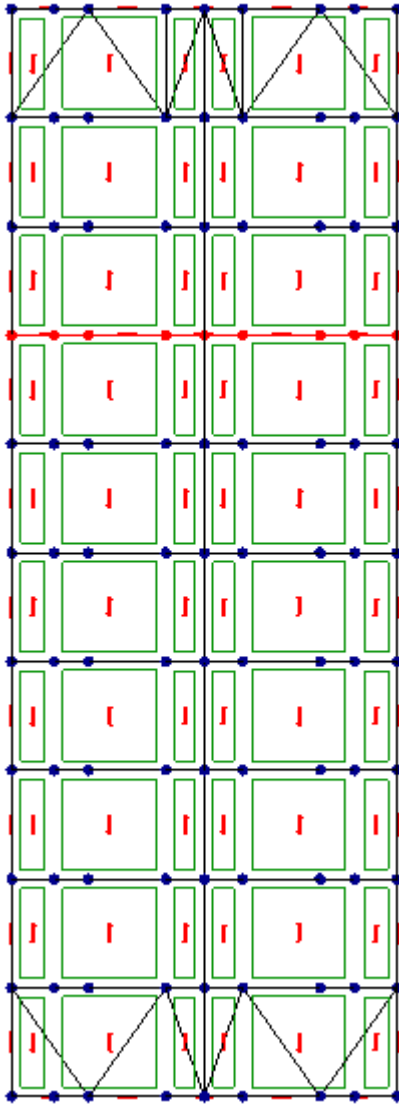


Fig 3.10 Select the original end frame.

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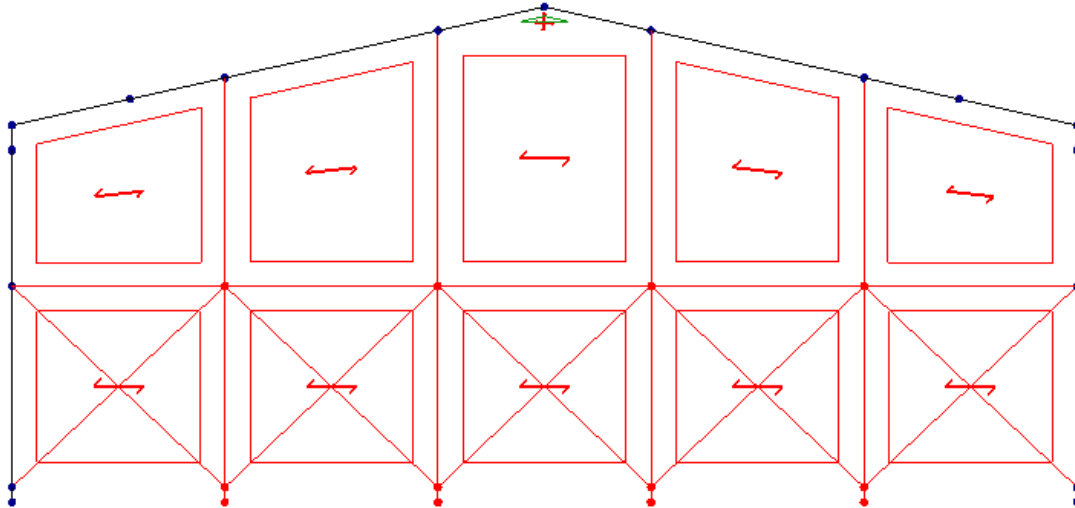


Fig 3.11 *Front view of selected frame in partial view with superfluous internal members and panels selected for deletion.*

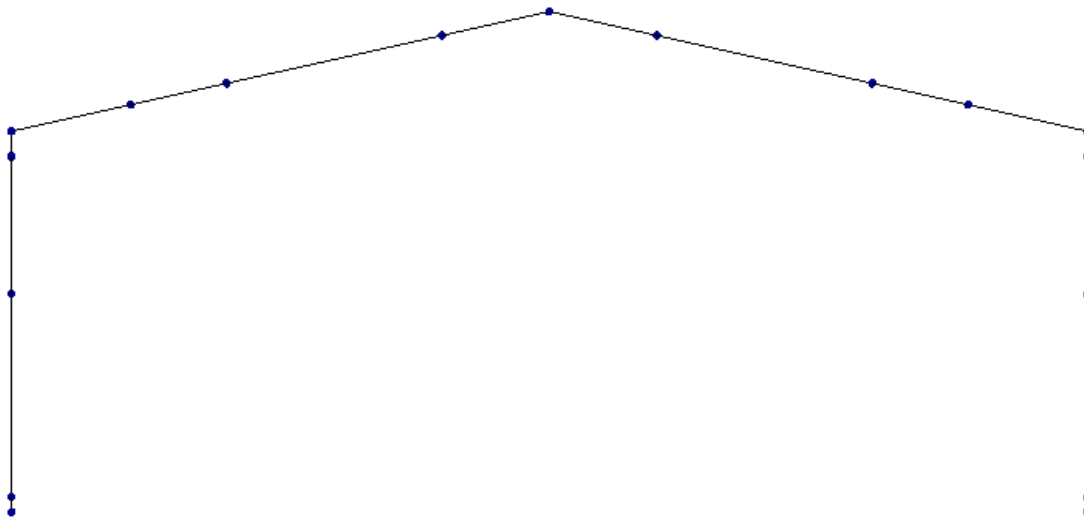


Fig 3.12 *Front view of former end frame after deletion of superfluous internal members and panels.*

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Step 6: Now select *Full view* and *Isometric view* to see the completed modified structure shown below.

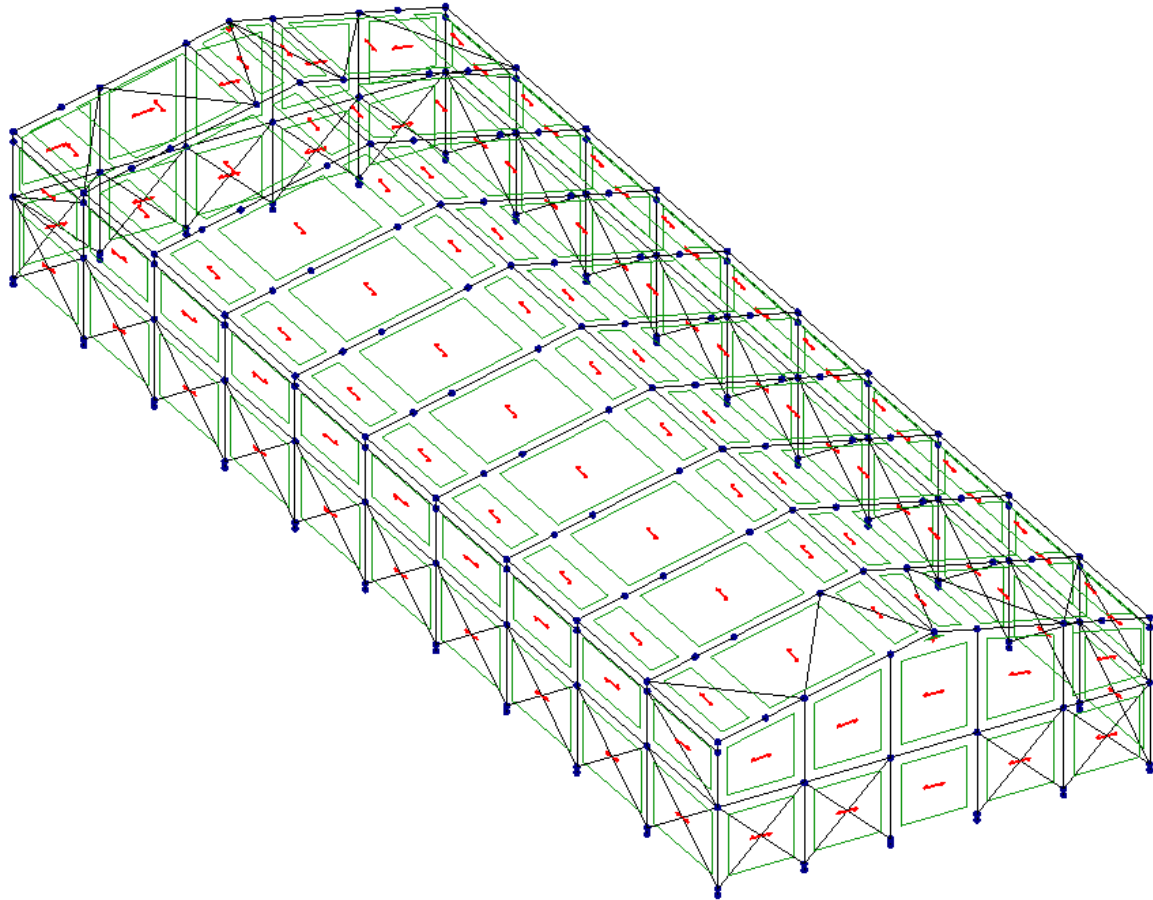


Fig 3.13 Completed modified model.

Check that the relevant supports, members, panels and panel loads are present and correct by selecting the relevant object and right click *properties*.

END