Lesson 7

The Focus of this Lesson is:

- *Input an Endwall-to Endwall Roof Height Change (Low Building for Office, High Building for Manufacturing)*
- *Auxiliary Bracing (Portal Brace)*
- *Straight Columns*
- *Wide Bay Trussed Purlins*
- *Bar Joists*
- *Adding Non-VPCommand Pricing/Weight Information*
- *Adding Additional Purlins for snow build up condition*
- *Soldier Columns*

Lesson Comments:

In this lesson you will be creating a roof height change by using the "*Pre-Defined Shapes*" option under the "*Geometry*" window. A roof height change condition may also be input using separate shapes (either pre-defined or custom) and adjusting the "Floor Position" coordinates.

At the "Common Wall" (the surface where the high and low shapes connect), VPCommand will automatically remove the secondary, covering, and insulation by creating "*Openings*" at the common walls.

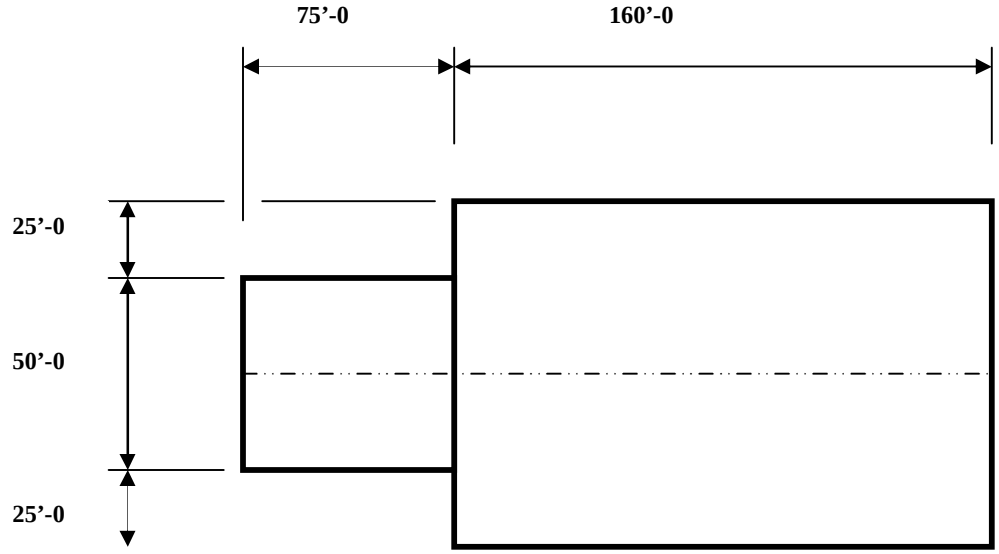
Building Description:

Low Roof:

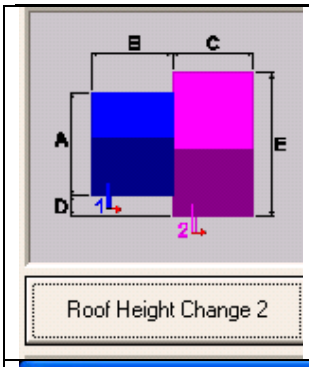
- 50'-0 Wide x 75'-0 Long x 15'-0 Eave Ht.
- 3 bays @ 25'-0
- Rigid Frame interior
- 3:12 roof pitch
- SSR roof, KXL, Leaf Green
- Panel Rib walls, KXL, Arctic White

High Roof:

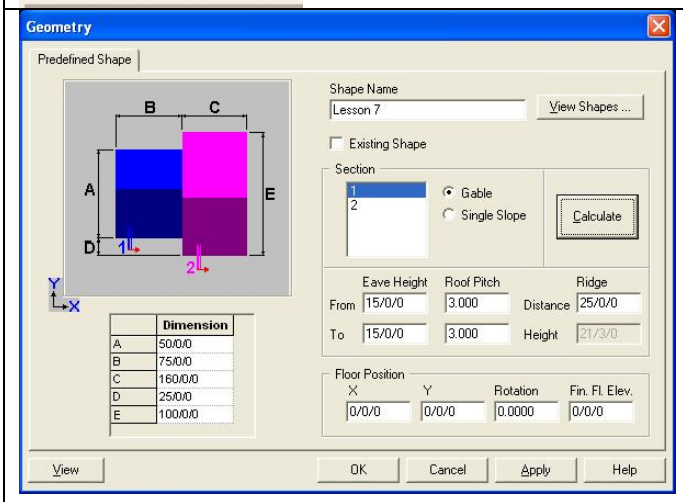
- 100'-0 Wide x 160'-0 Long x 23'-6 Eave Ht.
- 4 bays @ 40'-0
- ½ :12 roof pitch
- SSR roof, Galvalume
- Panel Rib walls, KXL, Arctic White



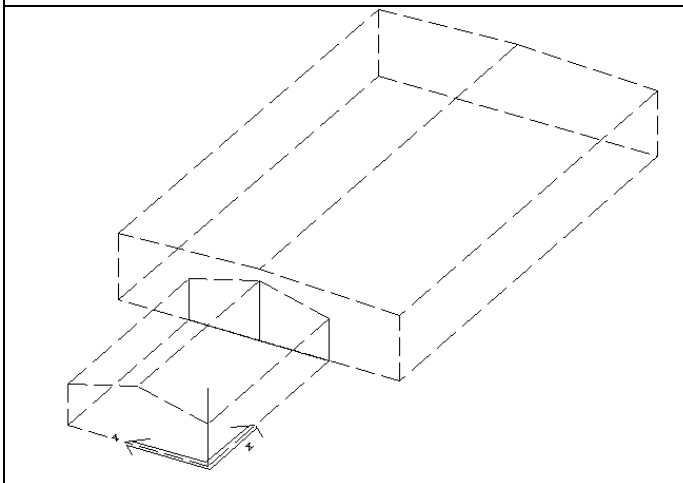
Lesson 7



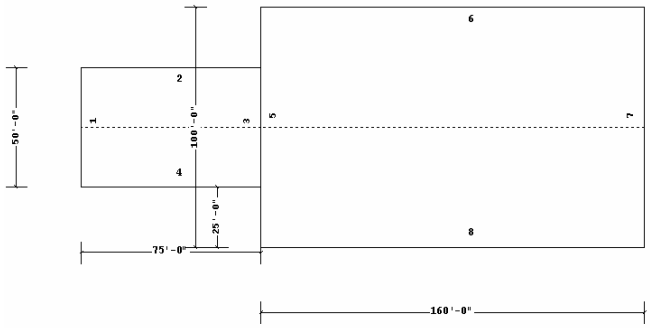
1) Start a "*New*" Project file. Be sure to select a default project. Complete the *General Information* screen as required.
   - "*Insert*" a New "*Pre-Defined Shape*".
   - At the "Geometry" window select the Pre-defined shape that most closely resembles your need.



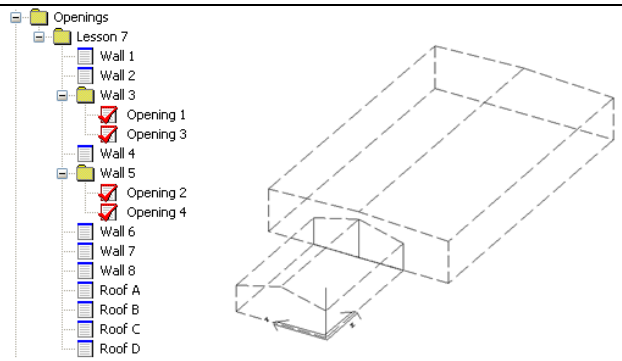
2) Select "Section 1" (Low Roof Office) and complete entry fields as required.
   - Remember, "Red" arrow indicates "To". "Green" arrow is assumed at opposite wall indicating "From".
   - Select "Section 2" (High Roof Manufacturing) and complete geometrical fields as required.
   - After dimensions for both Sections are complete, click on "OK" to accept your data. Note that you may click on the "Calculate" button to verify if input data can create a valid shape.



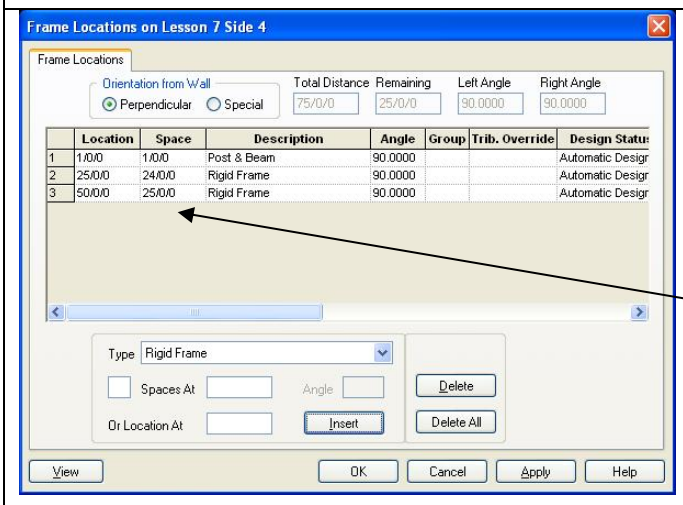
3) The Floor and Section Geometry for both portions are now complete.



4) Clicking the cursor in the right hand graphics pane and clicking on the Elevation *View* icon you can display your input length and width dimensions. *Verify that the dimensions* are correct and revise if necessary.
   - Click on the *3DView Icon* to return to the 3D Outline view.



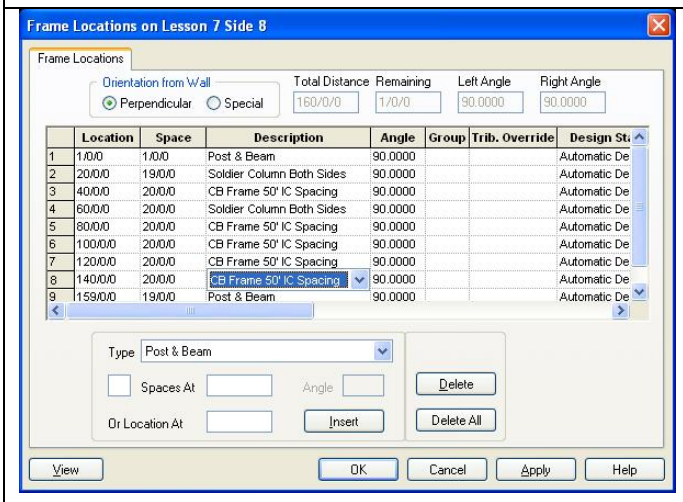
5) The *"Common Wall"* (the area between the high-and-low buildings) is automatically defined as *"Open"*. If you wish these portions to be sheeted, you will need to *"delete"* the openings.
   - Note: The common wall shows *two* openings on each adjacent surface
   - Note: If you regenerate the building you will have to *re-delete* the openings.
   - Note: If you are sheeting the common wall you would need to add *end posts* to support the grits. Ask your *trainer* how you would go about doing this.



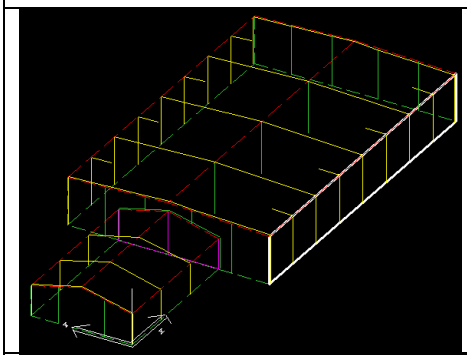
6) *Insert Frames:*
   - This project will have various frame types. The low roof building will have interior rigid frame and the high building will have CB-1 and Soldier Column both sides as interior frames.

7) *Frame locations at low roof building:*
   - Note that you are not placing a frame near the common wall. This frame will be located in the High Building in order for it to become a "*Piggy-Back Roof Height Change Frame*".

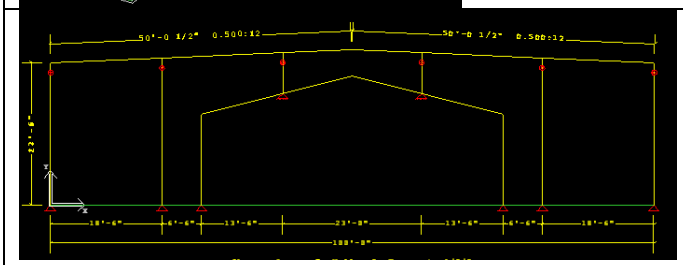
8) For *Roof Height Change* frames you will insert a Post & Beam frame inside the high building (1'-0 in this lesson for a standard outset condition).
   - This will create a *roof height change frame* at the common wall and add it to your frame schedule.
   - The default frame type will be a *rigid frame* at the low section and a *piggy back post & beam* at the high section



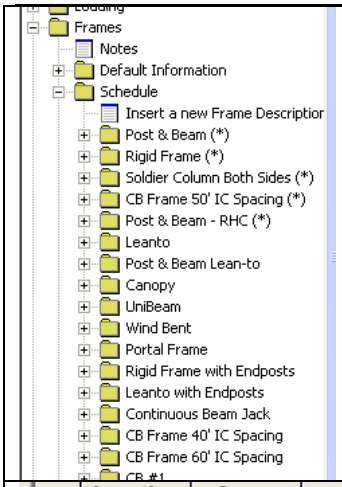
9) When inserting the frames into the high building, you must first make sure a *CB-1* frame type exists in the *schedule*.
10) Complete the *frame location input*. Remember that the roof secondary of the high building will have bar joists spanning 40'-0 bays. Therefore, you must select *"Soldier Columns Both Sides"* to provide for the wall secondary connections at every other bay.
11) Click on OK to close and accept your *frame locations*. *Refer* to the floor plan on *pg.1*.



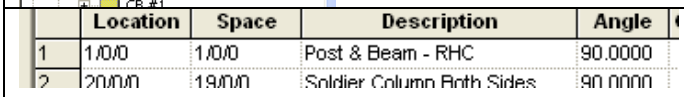
12) Your Graphics Pane will display the frame member segments as shown.



<u>*Roof Height Change Frame Note*</u>: When VPCommand recognizes a frame within 24" of a roof height change condition, it will automatically convert this frame to the "*Post & Beam-RHC*" frame type. Once this frame has been added to the schedule, you may modify it as you would any other frame.



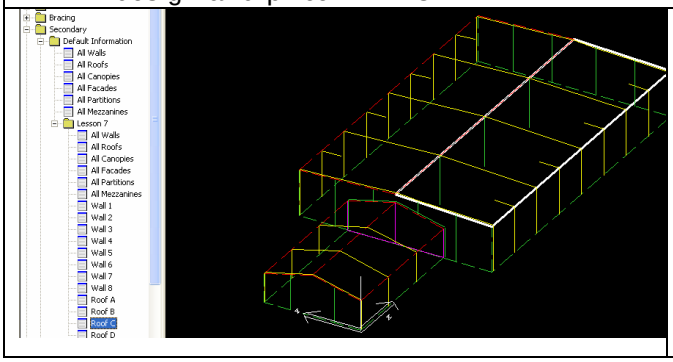
13) *"Refreshing"* the Tree (clicking the cursor in the tree and hitting "F5" on the keyboard or selecting the refresh button from the toolbar) will display the *Post & Beam-RHC* frame type in your schedule.
- This frame can be modified if needed.



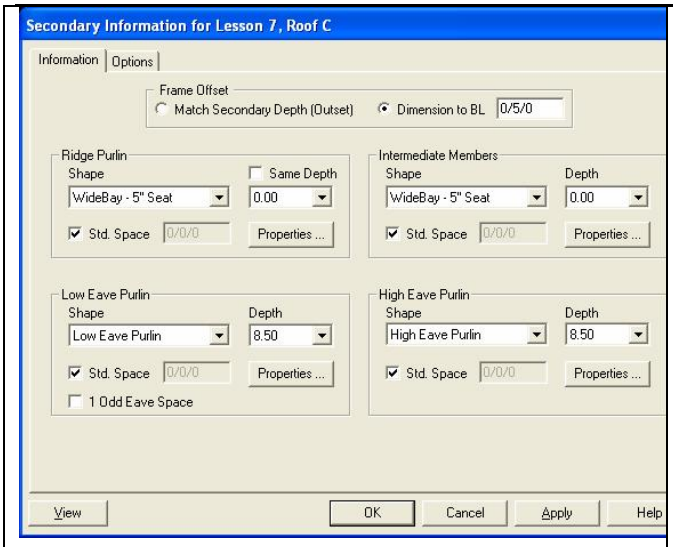
	Location	Space	Description	Angle
1	1/0/0	1/0/0	Post & Beam - RHC	90.0000
2	20/0/0	19/0/0	Soldier Column Both Sides	90.0000

14) The Frame *"Locations"* window has automatically changed your frame to the *"Post & Beam-RHC"* frame.

15) *Change Roof Secondary to Wide Bay truss Purlins:*
- This process will change the roof purlins to be Wide Bay Trussed Purlins (WBTP) in the high building due to the 40'-0 Bay spacing. The sidewall girts have been taken care of by adding "Soldier Column" between the forty-foot main bays. The WBTPs can span forty feet, but the girts cannot. *Remember that since you have WBTPs in the roof, you CANNOT have a screw down roof.* Therefore, don't forget to modify your roof covering at the high roof! VP Command will design and price WBTPs.



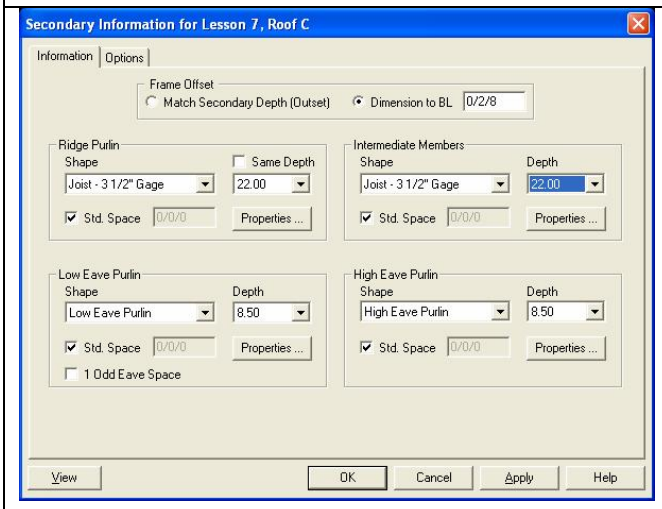
16) Single-click the *Secondary / Default Information / Shape Name / Roof C* file from the Tree, which will "highlight" in the right hand graphics pane.
- This will verify that you are selecting the correct surface for modification.
- Double-click on Roof C to access the *"Secondary Information…"* window.



See the end of this lesson for further information on WBTP.

17) At the *Secondary Information* window specify the seat depth.
- Input 5" Dimension to BL under the *Frame Offset* option.
- You will then be modifying the "Shape" button at "First Girt or Ridge Purlin and Intermediate Members fields to be a *"WideBay – 5" Seat."* Eave member can remain a standard *eave purlin* due to the outset wall condition.
- Uncheck the *"Same Depth"* check box so that the correct eave purlin depth can be selected.
- Select "0.00" in the *"Depth"* field to allow VP Command to design the required member depth.
- If this roof had a *high eave condition* we could specify WBTP for that condition in the *lower right* corner of this window.
- Select *OK* to accept your input.

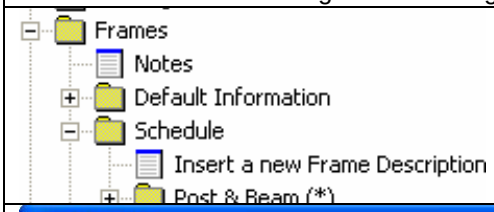
18) *Repeat this procedure for Roof D.*



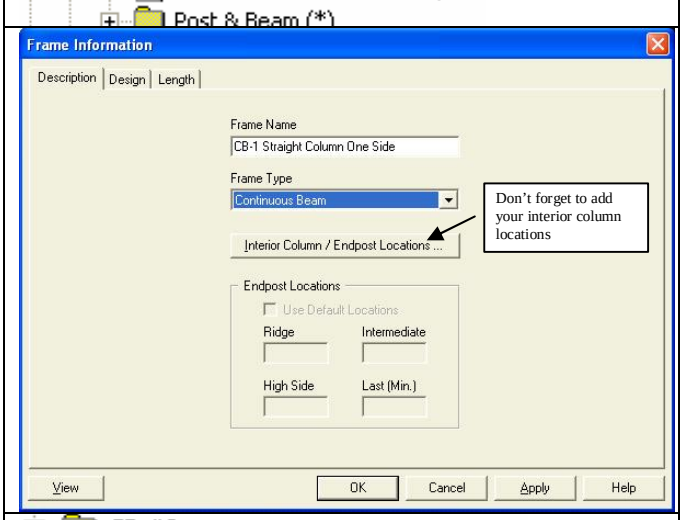
FOR REFERENCE ONLY

19) Modifying Roof Secondary to be *Bar Joists:*
- *Note: This is for REFERENCE ONLY*. You have applied VP's Wide Bay Trussed Purlins (WBTP) in the previous step. For future reference if you are not using {WBTPs) you may set the roof secondary to bar joist using a process similar to that shown above for WBTP.
- The bar joists can span forty to sixty feet, but the girts cannot so you must use *"Soldier Columns"*. Remember that if you have bar joists in the roof, you CANNOT have a *screw down* roof.
- Since VPCommand designs and prices the buildings for a bar joist system but does not price the actual bar joist, you will need to add these through the *additional pricing* option.

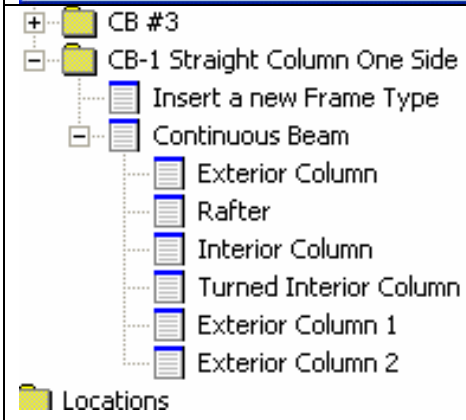
20) Making *ONE Exterior Column Straight:* This process will allow you to specify only ONE column as straight.
- The procedure is to add a new frame type to the frame schedule specifying a column as straight and using this frame type where desired



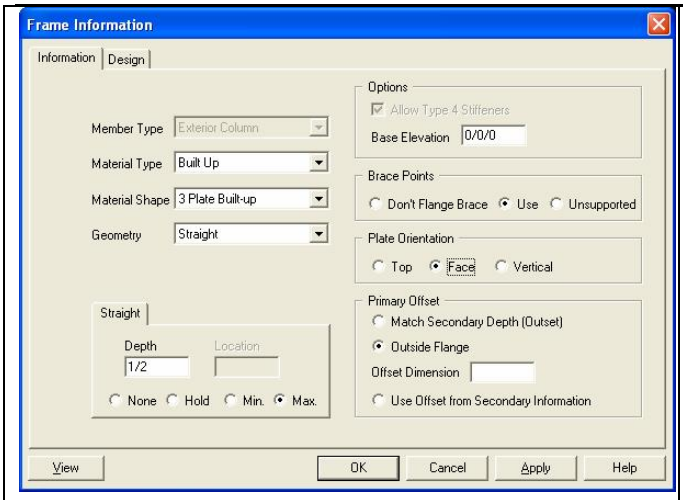
21) From the Tree, Open the Frames / Schedule folder;
- Double-click the *Insert a new Frame Description* file.



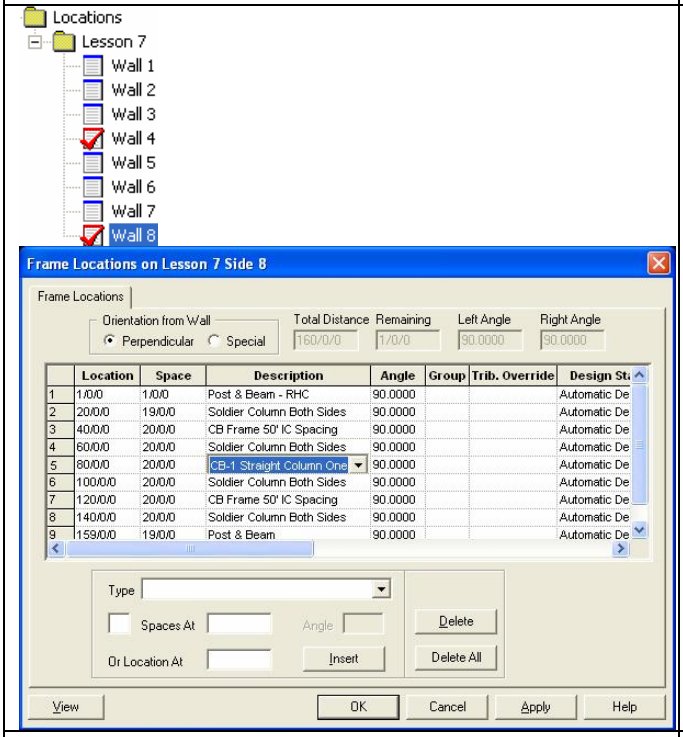
22) At the *Frame Information* window, give your new frame a name you can relate to in the Frame Name window.
- Select a frame type from the Frame Type window. For this exercise, we will be specifying a straight column on a *CB-1 frame*. Don't forget to add the interior columns!
- Click on *"OK"* to accept your changes.



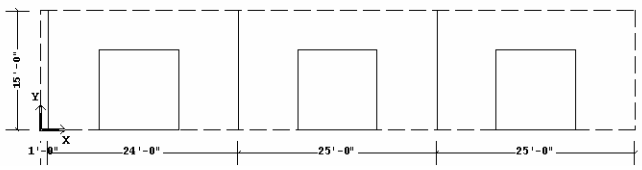
23) Hit the *"F5" key to refresh* the tree. Your new frame type has been added to the schedule and is ready for use in your shape.
- Open the *Frames/Schedule* Folder, Open the folder for "your new frame", and click the plus sign to open *"Continuous Beam".*
- Double-click the file for *Exterior Column #1*. The #1 column is the column at the wall that you located this frame along (the Along wall). The #2 column is at the opposite wall. For this exercise, we will modify a CB frame in the high building to make the front column straight.



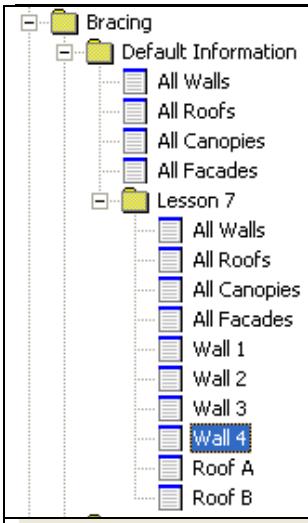
24) At the Geometry field, select *straight* from the pull down list. The straight tabbed folder becomes active to allow for further *column restrictions*. Input is in *feet / inches /sixteenths*.
- You may also specify a *maximum depth* of the column if you plan on boxing the column in or if you have interference concerns.
- Because the column will be held straight we need to specify a *face bolted* connection.
- Click on *OK* to accept your changes.



25) From the Tree, at the *Frame / Locations* folders.
- Open the folder for your shape, double click the "along wall" for these frames to access the *Frame Locations* window.
- At the Frame Locations windows, select the *Description* field from the Grid List and select your frame type from the list.
- Frame numbers as listed at the left of the Grid List are *numbered from left to right* as you are standing outside your shape facing the selected wall.
- Click on *OK* to accept your changes.

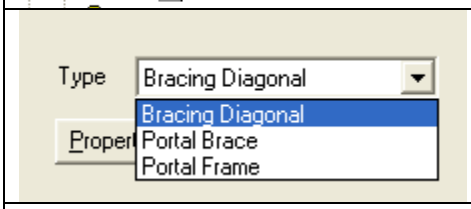


26) *Framed Openings:*
- Add a *10 x 10* framed opening for overhead doors, centered in each bay of Wall 4 in the low building.
- Remember to refer to the *help* screens as needed!



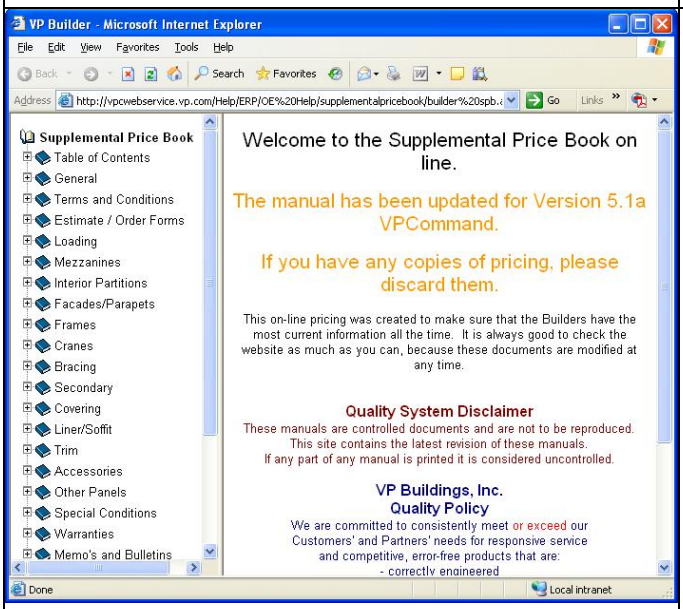
27) Modifying Bracing: This process will allow you to specify "Portal Bracing" (portal brace or portal frame) on a specific wall surface. Note that after you added Framed Openings in Step 7, the Diagonal Bracing was automatically generated.

- Select Bracing/Default Information/Shape Name/Wall 4. This will change the bracing on the *front wall of the low building* from Diagonal Rods to a *Portal Brace*.



28) Select pull down list and choose Portal Brace

29) Don't forget Covering, Trim, Insulation, etc. as required!

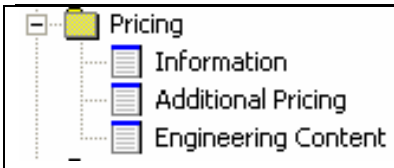


30) *Additional Pricing:* Some items may need to be priced using the VPCommand *Supplemental Price Book.*

- To access the Supplemental Price Book you can use the *Order Entry* software.
- Go to *Help / Online Help* and you will see the link to the Sup Price Book. (Your computer must be connected to the *internet* to access this information)

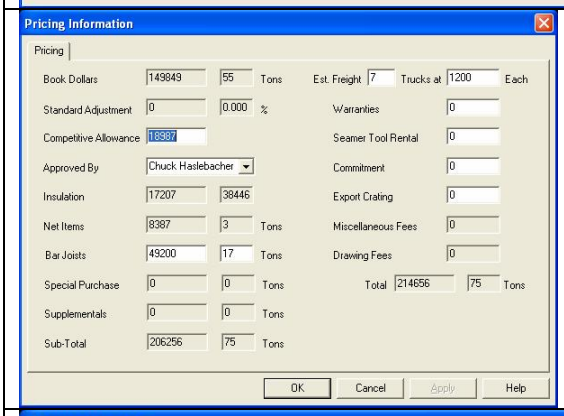
31) After you have input your project, run an Input report to verify information is correct.

- You may then use the *Run* Run All function to design, detail and price your building file.

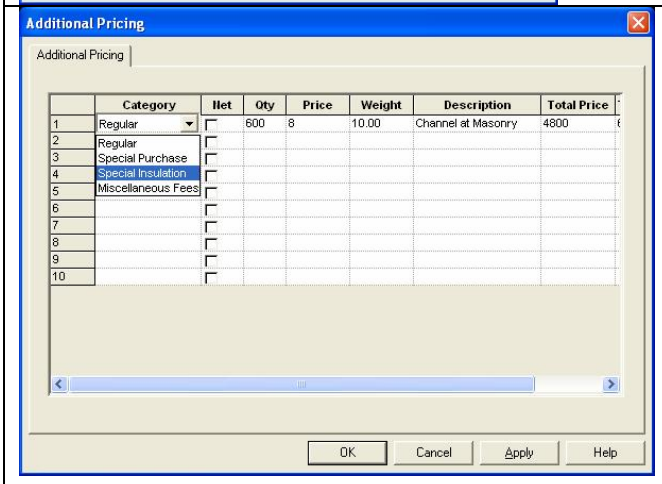


32) Once the project has been run, open the file in the *building editor*.
- To access the additional pricing field open the pricing folder.
- Double click on *Information*

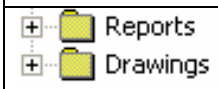
33) This warning message is to notify you that there may be items on the pricing report that require user input.



34) Complete the *Bar Joist* field as required.
- Note that you may enter other information as well to be reflected on your *Pricing Report.*
- Click on *Apply* to see the updated pricing information.
- Click *OK* to close the screen.



35) The *Additional Pricing* file under the Pricing folder is used to add items that VPCommand does not price or that are not available through VPCommand.
- These items may include, among others, Facades, Mezzanines and Crane material, special doors, windows, etc.
- You may also enter information for *unpriced* items.
- You can use the *VPCommand Supplemental Price Book* to obtain this information or obtain it with the assistance of your Service Center.



36) Run any desired Reports and Drawings.

For those who wish to know more:

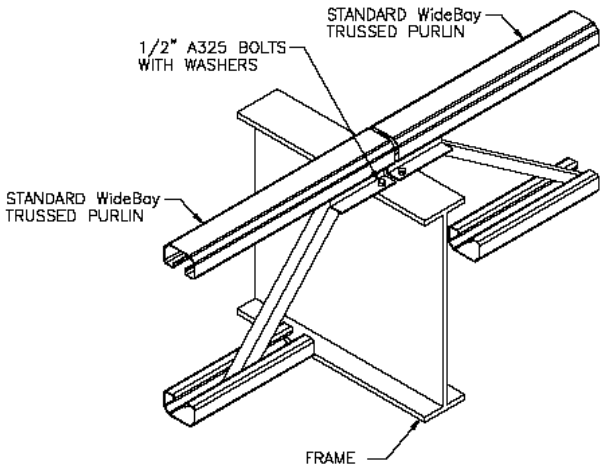
Wide Bay Trussed Purlin

Wide Bay Trussed Purlins (WBTP) are an excellent means of spanning bays up to 60'-0 in length. WBTP are used with a floating roof system (SSR or SLR), Panel Rib is not allowed.

Wide Bay Trussed Purlins consist of two roll-formed chord sections welded to a bent tube web configuration. All web sections are at 45 degree angles from the chords with the exception of the first and second web sections from either end of the Wide Bay member. All Wide Bay members have a 5" seat depth at each end.

Standard material is Gray prime-painted steel (other colors available with up charge). The chord sections are formed from 55 ksi steel that vary in thickness from 0.059" to 0.120" (17 to 11 gage). Chords are limited to a maximum length of 70'-0". The web material is formed from 46 ksi structural tube structural tube in thickness of 0.065" to 0.120". Seats are made from 0.1345" 55 ksi materials.

Wide Bay Trusses Purlins are offered in depths of 18" to 40" at 2" increments. The minimum wide bay space is restricted by the web geometry of the wide bay member. A minimum of two full top chord panel spaces are required.



Below are the maximum and minimum bay spaces by WideBay depth.

WideBay Depth	Minimum Bay Space	Maximum Bay Space
18"	11.08 ft.	32 ft.
20"	12.08 ft.	36 ft.
22"	13.08 ft.	40 ft.
24"	14.08 ft.	44 ft.
26"	15.08 ft.	48 ft.
28"	16.08 ft.	52 ft.
30"	17.08 ft.	56 ft.
32"	18.08 ft.	60 ft.
34"	19.08 ft.	60 ft.
36"	20.08 ft.	60 ft.
38"	21.08 ft.	60 ft.
40"	22.08 ft.	60 ft.