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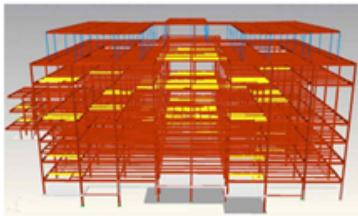
## PTC Product Focus

### Expert Framework Extension Lite in Wildfire 5.0

Recently PTC has been adding more and more great new functionality into every seat of Pro/ENGINEER with the new Lite Modules. Wildfire 4.0 saw the addition of Lite Modules for structural analysis (Mechanica Lite), 2 ½-axis milling, electrical creepage & clearance analysis and Human Factors analysis (Manikin Lite). You can see more about these capabilities here: [Pro/ENGINEER Lite Capabilities Recorded Video](#).

What this article is going to focus on is another great Lite Module included in every seat of Pro/ENGINEER, Expert Framework Extension Lite (EFX Lite). Beginning with Pro/ENGINEER Wildfire 5.0 M020, EFX Lite is now available to all users. But what is EFX? What does it do? See a few examples of EFX users work is shown below:

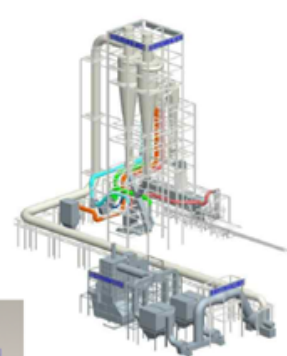
**Structural Steel of an Hospital**



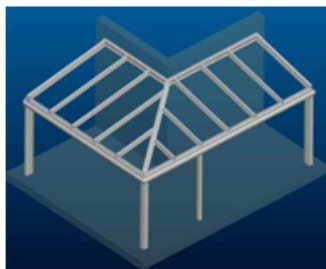
**Stacker/Reclaimer**



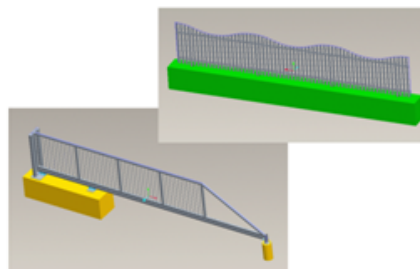
**Plant Layout**



**External Awning**

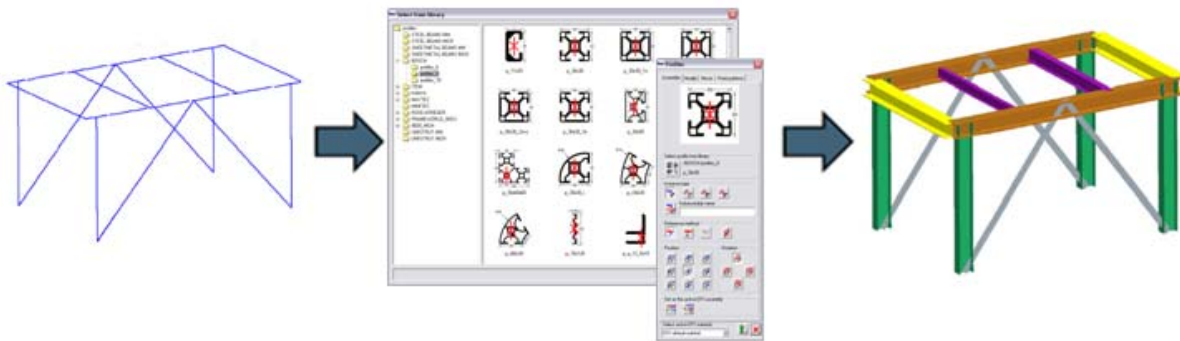


**Fences & Gates**

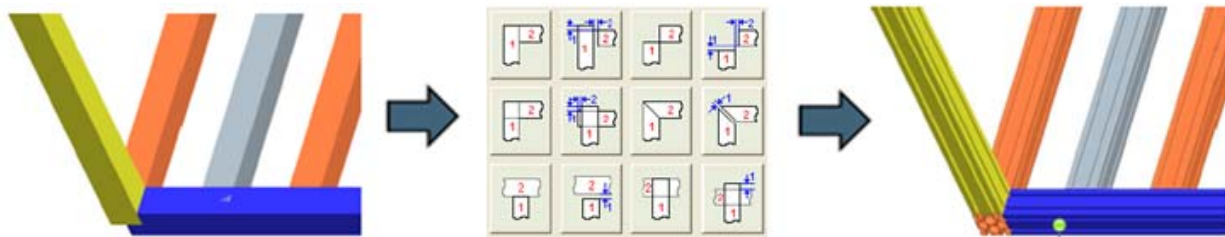


Pro/ENGINEER users leverage Expert Framework (EFX) to design framework assemblies made up of steel beams, aluminum profiles and other types of custom profiles. Customers are using EFX to create industrial machinery, cranes, buildings, assembly lines, conveyor systems, marine structures, roof designs and much more. Essentially all the user needs to do is to create or import the underlying structural shape using Pro/ENGINEER datum curves, where the curves represent the major structural beams. They then use EFX commands to create a framework assembly.

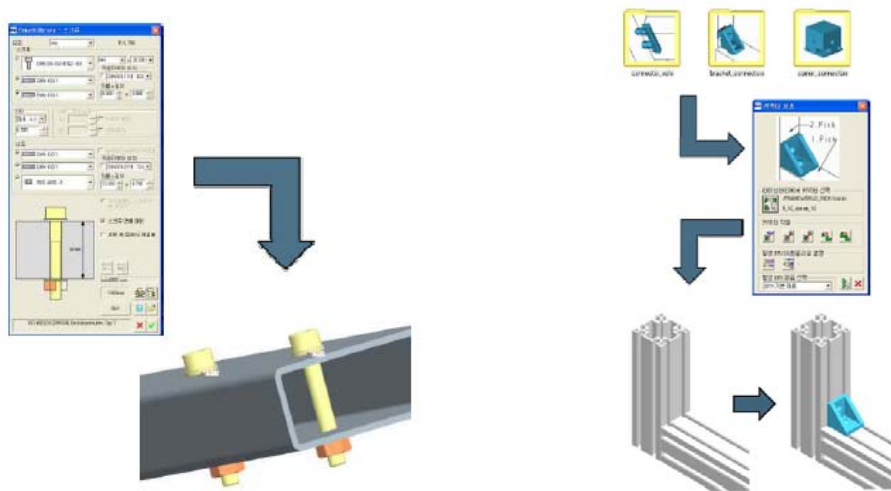
First, EFX allows the user to quickly and easily apply the different beams to the curves.



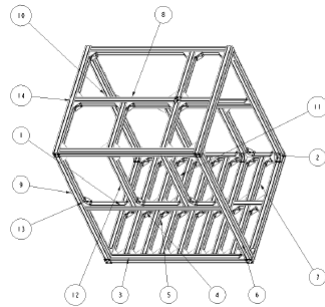
Then EFX helps the user to swiftly define the desired connections between these beams. T-joints, Miter cuts, offsets, cutouts are all created with only a couple of picks.



Users can also automatically define holes, fasteners, brackets, endplates and other connector geometry as desired.

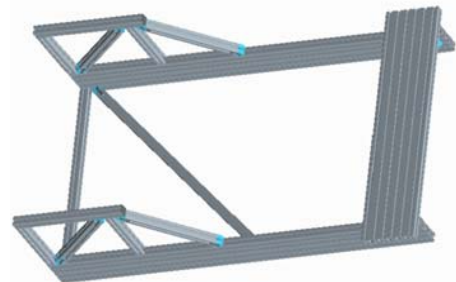
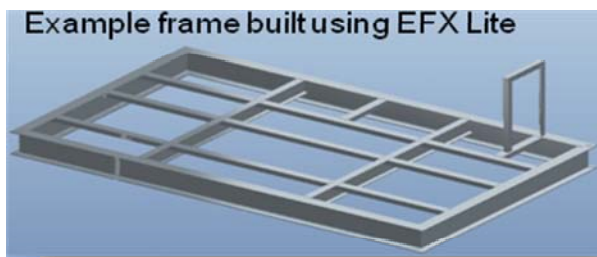


After the model is designed, a user can easily leverage all the power of Pro/ENGINEER to automatically create the Bill of Materials including stock tables. Users can also create weldments regardless of assembly structure and have automatic creation of assembly drawings.



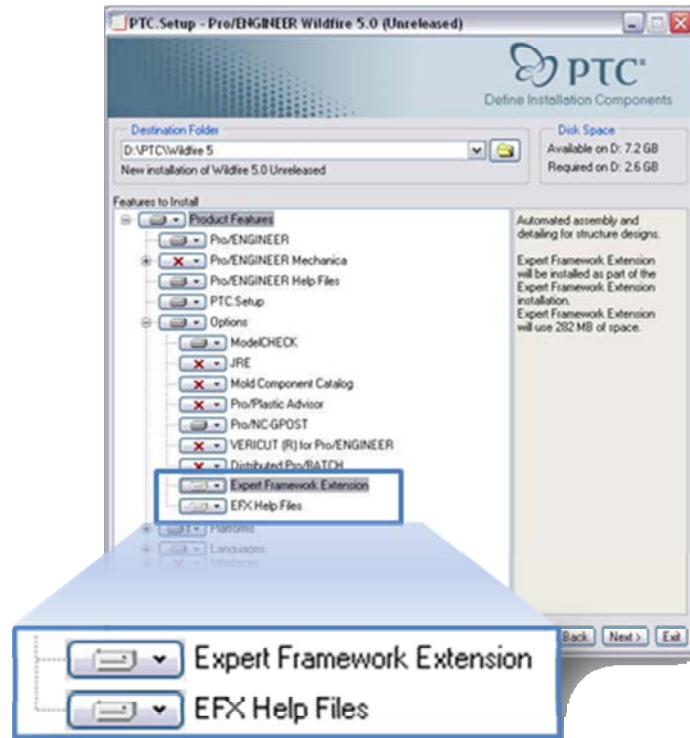
번호	부품명	수량
1	BOSCH 3 842 502 348 88x88	98
2	BOSCH 3 842 529 017 50x50	1
3	MINITEC 20.1010 90x90 L x 1010.0L	3
4	MINITEC 20.1010 90x90 L x 1055.0L	1
5	MINITEC 20.1010 90x90 L x 1402.5L	1
6	MINITEC 20.1010 90x90 L x 1590.0L	3
7	MINITEC 20.1010 90x90 L x 1770.0L	4
8	MINITEC 20.1010 90x90 L x 1900.0L	6
9	MINITEC 20.1010 90x90 L x 2110.0L	2
10	MINITEC 20.1010 90x90 L x 2155.0L	2
11	MINITEC 20.1010 90x90 L x 407.5L	5
12	MINITEC 20.1010 90x90 L x 700.0L	1
13	MINITEC 20.1010 90x90 L x 750.0L	9
14	MINITEC 20.1010 90x90 L x 800.0L	1

But what is the catch? What is the difference between EFX Lite and the full version? The only difference is the scale of the work which you will tackle with it. With EFX Lite, all EFX commands are accessible. You get the full user experience with full access to the entire beams and fasteners library. The only limitation is in the number of EFX components per Pro/ENGINEER session (or assembly therein) that you can create. Those limits are set at: 20 beams/connection-elements with 10 screws/dowels. Working further in the user's favor is the fact that if your designs grow to exceed these limitations, all the work is completely upgradeable to the full EFX version.



## Installation

It is important to note that in order to use EFX Lite, it must of course be installed. First be aware that you must be installing Wildfire 5.0 M020 or later. Next, during the installation, simply include Expert Framework Extension and the EFX Help Files in the installed options. Then continue the installation as you normally would. This will place the proper EFX files and parts libraries in the Pro/ENGINEER loadpoint in a subdirectory entitled simply "efx". The installation menu is shown in the image below.



## More Information on EFX and EFX Lite

To find out more about Pro/ENGINEER's [Expert Framework Extension](#), please visit the main product page on the PTC Website. There are also some handy Tips and Tutorials videos available from PTC.com as well:

- [Creation of a Conceptual Frame - Expert Frame Extension](#): First video in a series of three presentations on the Expert Framework Extension (EFX).
- [Considering Manufacturability - Expert Framework Extension](#): Second video in a series of three presentations on the Expert Framework Extension (EFX).
- [Creating Stairs and Handrails - Pro/ENGINEER Expert Framework](#): Third video in a series of three presentations on the Expert Framework Extension (EFX).

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## **PTC Product Focus**

### **PDMLink 9.1 Options and Variants - 2 Different Approaches**

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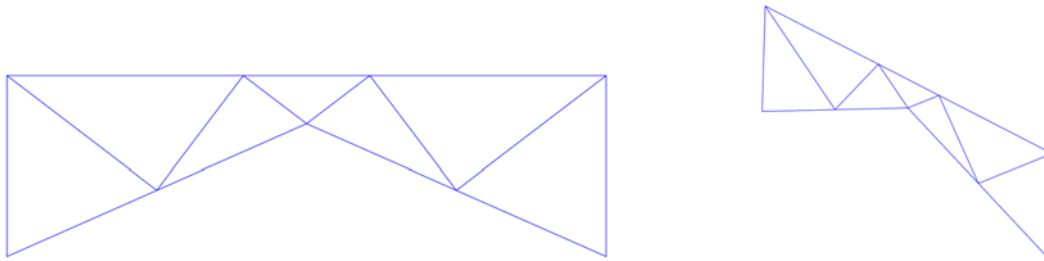
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## Tips of the Month

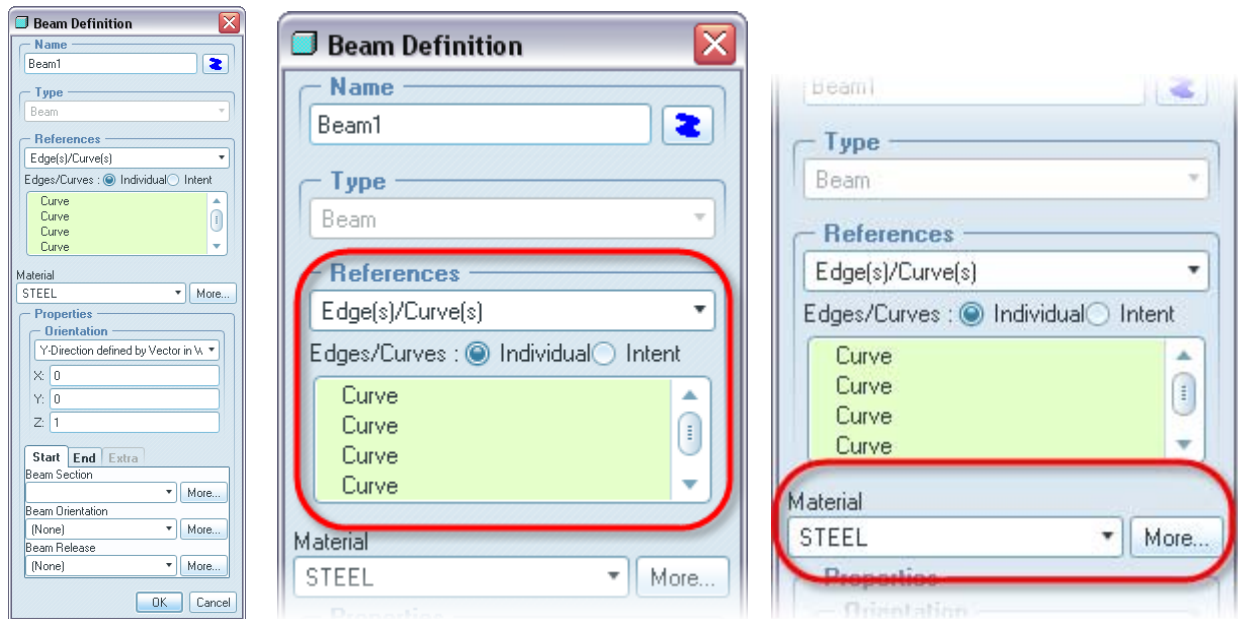
### Using Mechanica for Early Structural Analysis of Frameworks


Keeping with the earlier theme of designing structural frameworks, perhaps you are in the situation of needing to design a framework structure. Perhaps the strength and rigidity of this structure is quite critical. As the designer you would like to have a good idea of how the design will perform before creating the actual details of the framework. Mechanica offers a great method of looking into this.

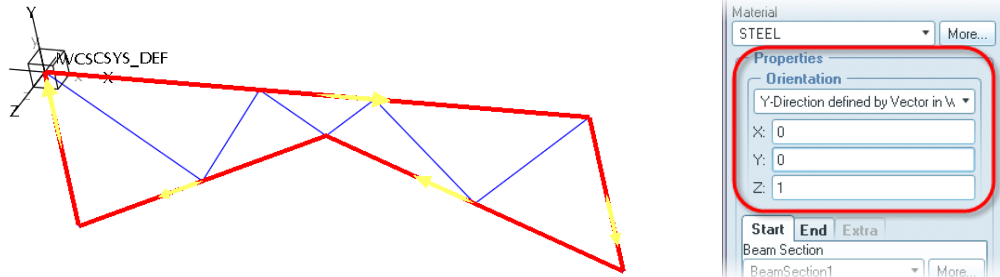
First, inside Pro/ENGINEER, using datum curves, create the basic shape of your framework.



Then take this part into Mechanica Structure **Applications > Mechanica**. Use the Beam tool  to assign beam idealizations. Simply walk down the Beam Definition dialog box to setup your analysis. First select the curves you wish to include in the first set of beams. Then assign the material for these beams by selecting the **More...**. Pick and select your desired material from the Pro/ENGINEER materials library.

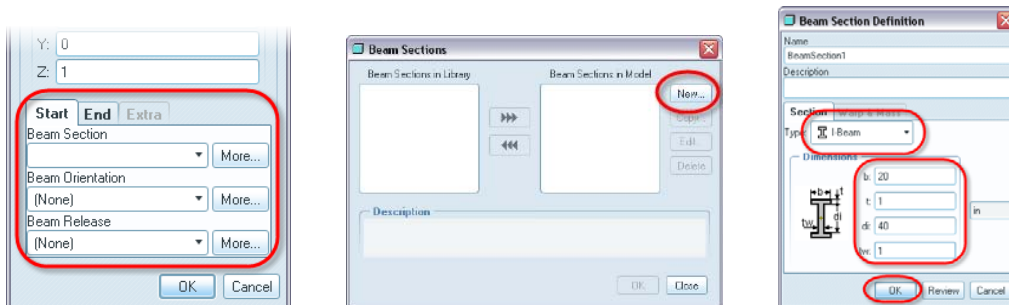


The next step is to assign the Properties of the beams, specifically their type and orientation. To do this, we first need to assign what is known as the “Y-Direction” for our analysis. Display your coordinate system . Note the direction that would be considered “out of the screen” for your selected curve entities (in the displayed case below it is the Z-direction). In the dialog box assign a “1” to that axis and a “0” to the other 2 axes.

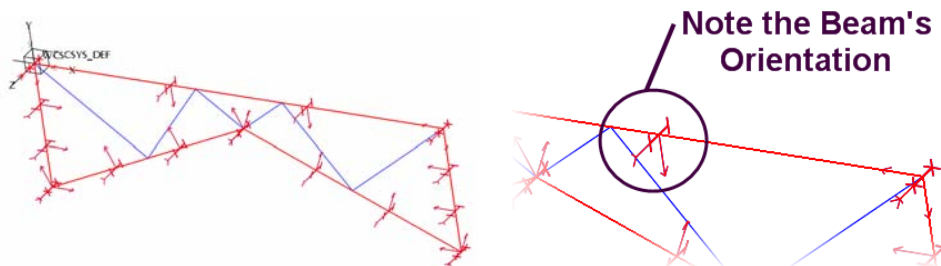


(This may seem counterintuitive as you are assigning the Z-axis as your Y-direction, but trust me, it works.)

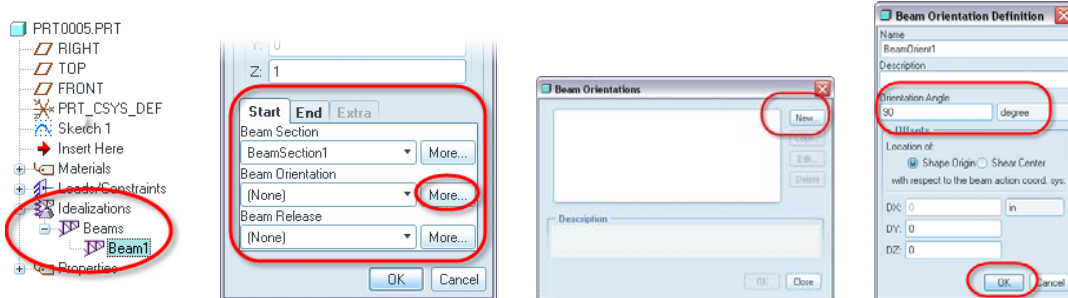
Now you will define what type of beams you will be using. Select the **More...** button next to **Beam Section**, then **New...** in the next dialog. This will bring up a window for defining the shape of your beam. Select the **Type** (I-Beam, Rectangle, Channel, etc...) and provide the dimensions of the section.



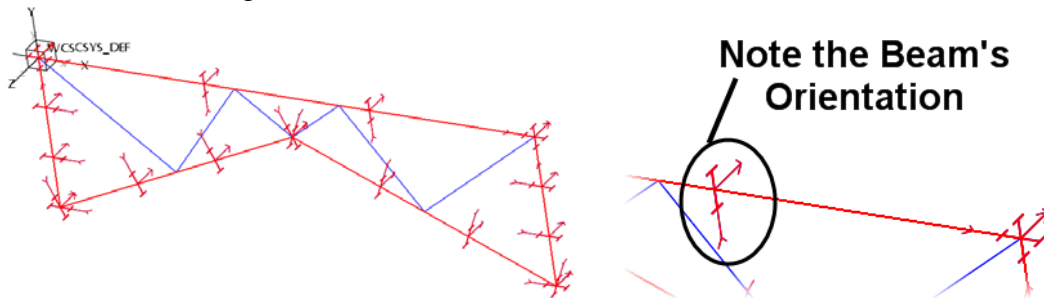
Select **OK** in all the dialog boxes to see the result.



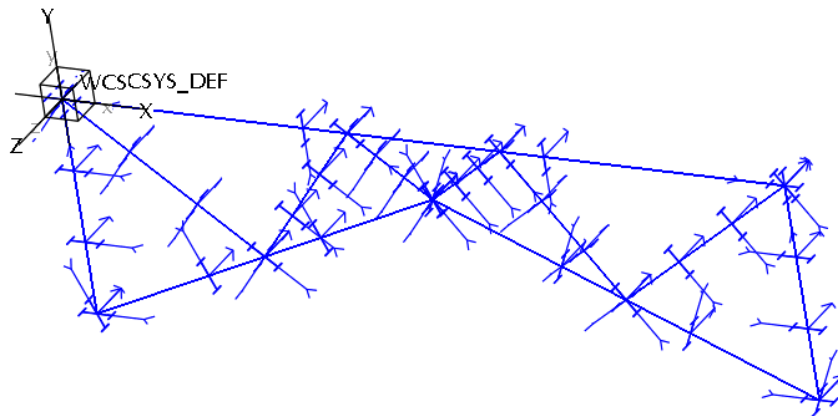
To adjust the orientation of the beams, select the Beam Idealization either in the graphics window or in the Model Tree under 'Idealizations'. **Right Mouse Button > Edit Definition.** Select the **More...** button after Beam Orientation. Select the **New...** button in the next dialog. Now assign the appropriate angular change to your beam. (In this case we will change its orientation by 90°).



Select **OK** in all the dialog boxes to see the result.




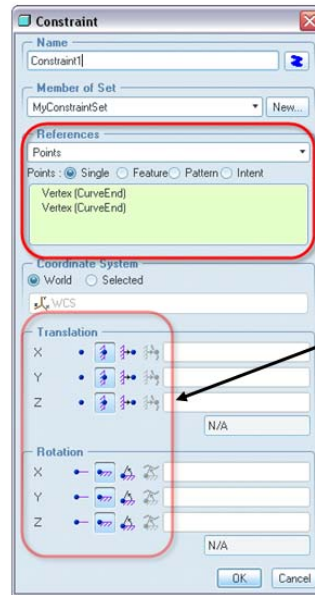
You can repeat this procedure to assign the same or different beam cross-sections and orientations to the remaining segments of your design. Once you have assigned Beam Idealizations to all your entities (as in the model shown below) you can assign loads and constraints.



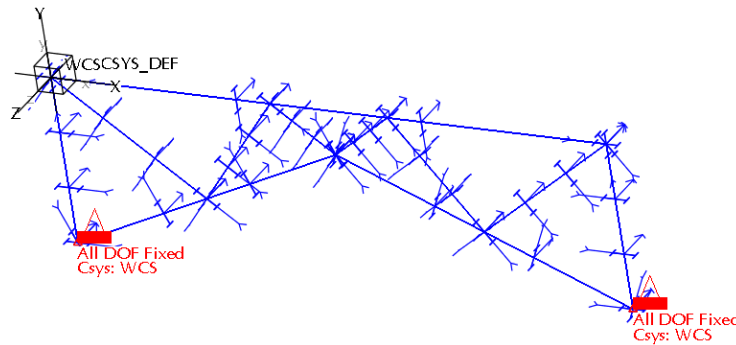


While there are many different methods of constraining a design, we will step through one simple method.


- Select the **Displacement Constraint** . Change the References selection to **Points**. Pick the points on your model that will be constrained in your beam structure. (You can create datum points to site the exact location.)
- (In the case below we have completely constrained the bottom 2 points.)
- You can allow additional degrees of freedom in your constraints if necessary by altering the toggles at the bottom of the dialog.
- When finished, select **OK**.

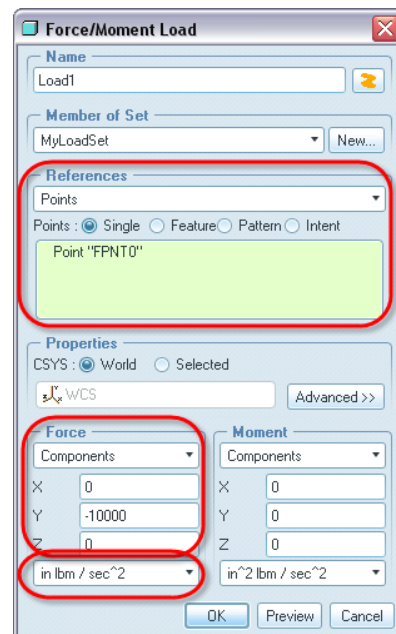


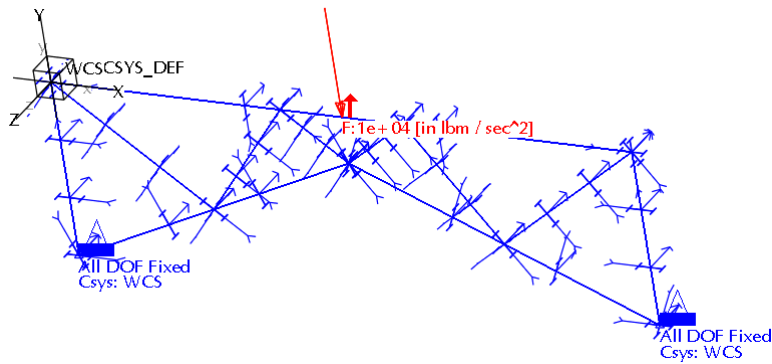
The 6 degrees of freedom of a constraint can be locked or released to properly represent your model.





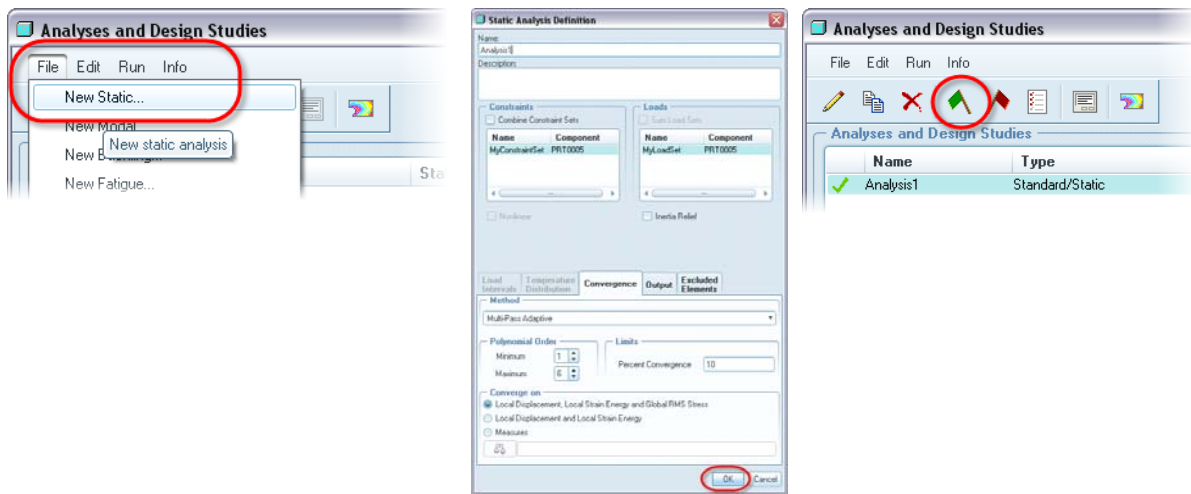
While there are many different loading cases we could apply to a design, we will step through one simple case.

- Select the button **Force/Moment Load** .
- Change the References selection to **Points**.
- Pick the points on your model where you wish to apply your loading case. (Again you may want to create datum points for exact location).
- Define the Force/Moment to be applied in the bottom of the dialog box assigning the proper X, Y & Z components of the Force/Moment. Simply use negative to reverse the direction. Be certain to assign the proper units of your load as well.
- When finished select **OK**.



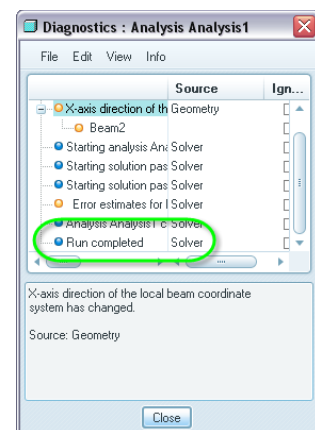




The design is now ready for a static analysis. Select the **Mechanica Analyses/Studies** icon  from the toolbar. In the dialog box select **File > New Static**. The default settings in the Static Analysis Definition dialog box should be fine for our purposes so select **OK**. Then select the **Run Icon**  in the toolbar.

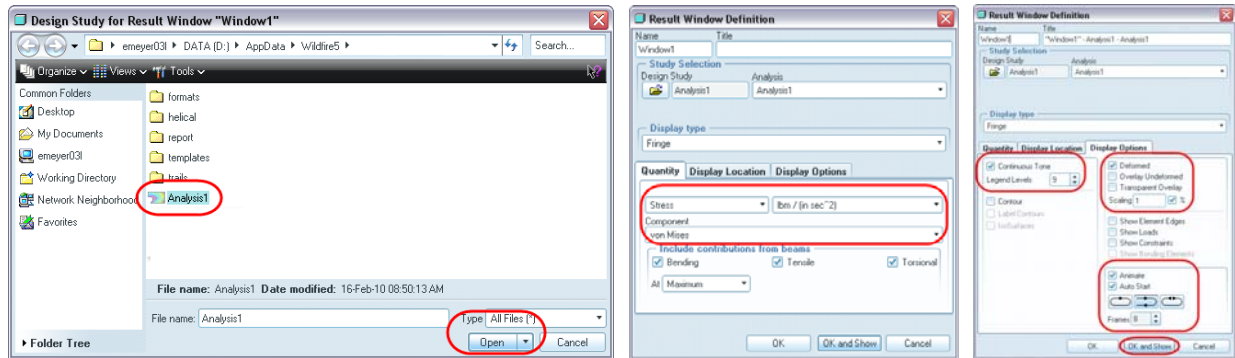




Now Mechanica will solve your analysis. If using Wildfire 5.0, a Diagnostics window will appear and provide you feedback on your model and the analysis you are performing. It will also tell you when the analysis run is completed, which should not take much time at all. Mechanica solves for an accurate answer very quickly.

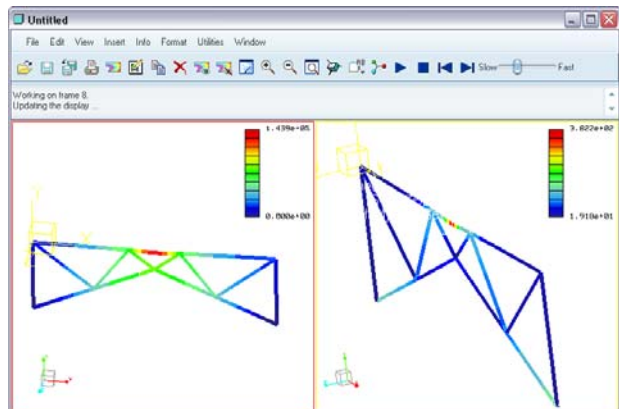
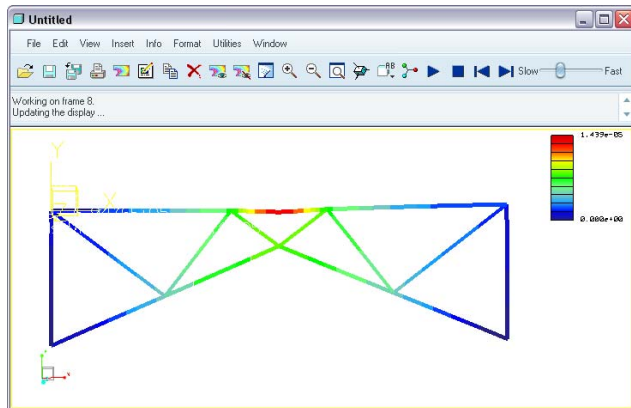
It should be noted that unlike some other analysis tools, Mechanica users can continue working on their model while the computer is working on the solution to your analysis. The analysis runs in the background and does not tie up the Pro/ENGINEER & Mechanica Interface.



Once the “Run completed” appears in the dialog, select **Close** on the diagnostics window. Now review your results. Select the **Results** icon . In the new interface that appears, select the **Results** icon  and select your analysis (by default it will be named “Analysis1”) > **Open**. You then define what you want to see in the results. Most commonly users set the Quantity to either Stress or Displacement, being certain to set the appropriate units display and component. Select the **Display Options** tab, toggle on **Continuous Tone**, **Deformed** (set the **Scaling** to “1”) and toggle on **Animate**.



Once satisfied with your Window Definition, select **OK and Show**. The resulting window should display an accurate portrayal of the performance of your design. Explore the tools available to you under the **Format** and **Info** Menus such as **Model Max**, **Model Min**, **Dynamic Query** and formatting of the Legend. Note that to use most of the tools in the Info menu you will need to **turn off** the **Animate** setting. To do this, or to alter any of the Window Definition settings, select the **Edit Definition** icon . You can also add multiple windows by defining a new Window Display using the **Results** Icon .



Now that you know this method, you can make alterations to the design's original structural shape or change the type and orientation of your beams until you have a design that performs to your specifications. Of course it is recommended that you still test your final detailed design, but this method can quickly and easily put you on the right path to a structural framework design that meets your exact needs and specifications.

## More Information on Pro/ENGINEER Mechanica

This example provided a basic understanding of one use case for Pro/ENGINEER Mechanica. To learn more about leveraging this terrific analysis/optimization tool, go to PTC.com and look up [Pro/ENGINEER Mechanica](#). Alternately, if you want to hone your Mechanica skills or simply learn the basics, take one of the courses available on this topic at [PTC University](#).

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### Tips of the Month

**PDMLink – Multi-Level Bill of Material Compare Report**

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## Announcements

### PTC Tips & Techniques Newsletter Archives

Did you miss an issue? Can't find that awesome technique you read about? Fear not, you can click on the link below and go through our Customer PTC E-Newsletter archives.

[Customer Care Zone](#)

### PTC Tips & Techniques Webcasts: Work Smarter. Not Harder.

Click below to see regularly scheduled Tips & Techniques technical Webcasts that are designed to provide you with the most popular time-saving tricks that Pro/ENGINEER users of all skill levels will find useful. Get more out of your maintenance dollars!

[Tips & Techniques: Work Smarter Not Harder!](#)

### Special Hardware offers for PTC Customers

- <http://www.hp.com/go/ptc>
- <http://www.hp.com/go/ptcworkstation>

### PTC Sponsored Events

- <http://www.ptc.com/company/news/events/index.htm>

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Explore what is new with the Pro/ENGINEER Wildfire family!

<http://www.ptc.com/go/showcase>

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Also visit <http://social-product-development.blogspot.com/>

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### **E-PROFILES IS HERE!!**

We have been eagerly anticipating the debut of the new electronic version of Profiles Magazine and now it is here! This new web site will supplement the print edition of the magazine and will provide new useful features not feasible with paper media. e-Profiles will provide you with 24x7, worldwide access to key information previously available exclusively in the print version. "Tips & Tricks," a popular feature pioneered by Pro/USER, has also moved to the web and will be expanded as the site matures.

Please take a few minutes to check out this new web site. We don't think you will be disappointed.

<http://profilesmagazine.com/>



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## Upcoming Events & Training Class Schedules

Upcoming, 2010                      Your local Pro/Engineer User Groups  
<http://www.ptcuser.org/rugs/>

June 6 – 9, 2010                      Orlando, FL USA  
PTC/USER World Event  
<http://www.ptcuser.org/>

### Events

Our seminars and conferences seek to provide you with relevant information regarding product development trends in your industry as well as innovative software learning experiences. Think of them as a constructive day off where you can share experiences and swap ideas with your peers.

If you can't manage to get away, we'll bring it to you. Check back often for regularly scheduled live webcast events.

[You're Invited to Attend...](#)

Please visit the [PTC Education Services](#) website for the latest training information including course descriptions, schedules, locations, and pricing.

- Attend a course at any PTC Center and receive a **free** copy of Pro/ENGINEER Wildfire Student Edition!

<http://www.ptc.com/services/edserv/index.htm>

### Live Instructor-Lead Virtual PTC Training Courses

Virtual Classrooms provide interactive learning with a trained PTC instructor in convenient and manageable sessions that last approximately 4 hours over a series of days. It's easy to join a class right from your desk using a phone or voice-over IP technology.

Sessions are performed just like a traditional ILT (including interactive exercises where you and the instructor can work on lab exercises together) and feature some of our most popular ILT courses. These sessions cover the exact same material as the traditional ILT in-center courses. Also look for some of our most frequently requested mini-topics delivered in the same format that are only an hour - two hours in duration.

If you have any questions about these sessions or would like to see getting other courses, not on this list, on the schedule please feel free to contact me for more details. They are a great way to bring training to you without you having to worry about location or being out from work for long stretches.

You can register for these sessions just as you would for any normal ILT class either by:

1. calling order admin at <http://www.ptc.com/services/edserv/training/registra.htm> or
2. you can go to PTC University directly at <http://www.ptc.com/learning> and submit a registration request directly. All you have to do is search the catalog by typing in “virtual” in the search field and you will see a listing.

## PTC

**Note:** This PTC E-Newsletter will continue to be used for the following:

- 1) Inform you on events related to PTC products (user groups, conferences, training schedules, etc.)
- 2) Educate you on solutions that are available at PTC
- 3) Tips & Techniques using PTC Products

**Note:** These messages are compiled in the local PTC office and will be distributed via e-mail.

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