SOFTWARE REVIEW

INTERGRAPH'S IMAGINEER TECHNICAL, VERSION 2.0

By Cynthia J. Zahn

(The opinions expressed in this review are the author's own and do not represent AISC or Modern Steel Construction in any way.)

AS AN ENGINEER WITH A GREAT DEAL OF EXPERIENCE WITH AUTOCAD, I was asked to review this drawing package for its relative usefulness for the type of detail sketches and plans I have drawn in the past.

Imagineer Technical is Intergraph's 2-D drawing package. It runs under Windows 95 or Windows NT 4.0. It is touted as the drawing tool that bridges the gap between the complicated CAD programs and the simple drawing packages available. I must admit I initially had a difficult time getting started, but this could be blamed on my preference for typing (DOS) commands. Since the program is in a Windows standard environment, all of the commands in Imagineer are mouse driven. There are layers of button control menus and it took a lot of patience and trial and error to determine the function of all of the buttons. However, perseverance paid off and it appears the advantages of this drawing package far outweigh the disadvantages.

After a few hours of experimenting, I found the program to be easy to use and some of the features were great time savers for creating simple details. For multi-paged projects, it is possible to set up a document with multiple sheets. To further facilitate layout, the page border is automatically displayed on the screen (see Figure A). One of the more impressive features was the ability to locate snap points, i.e. endpoints, intersections, midpoints, simply by placing the cursor in the vicinity of the desired snap point. A small symbol appears on the screen indicating which snap point has been located. Figure B displays the endpoint symbol (shown encircled for clarity) that appears when the Line command is activated and the cursor is placed nearby a line endpoint. This feature, called SmartSketch, is a definite time-saver. At times it was necessary to zoom in closer to the desired point in order for it to register, but in most cases the desired point was found easily and accurately with only one click.

Some of the other commands that I use often and which are more easily activated in this program are Trim, Extend, Fillet, changing line type and weight, and dimensioning. After clicking the appropriate buttons, Trim and Extend are activated by simply clicking the segment to be trimmed or extended. The radius for the Fillet command can be entered or sized by moving the cursor. Changing line types and line weights is quickly accomplished in a pull-down menu. Dimensioning is straightforward with an easy to change pull-down menu.

Imagineer has the ability to import existing files from other drawing packages. I imported my AutoCAD files of connection details and discovered a few text location changes. However, the graphics were untouched.

During my limited investigation, I noticed Imagineer lacked a couple of commands that I am accustomed to using. Notably, the Divide command that is used to conveniently place equally spaced bolt holes, is not included and I couldn't find any similar command. Also, the Redraw command is not present in Imagineer; however, it seems to be no longer necessary in the Windows environment. There are generally no blips or other garbage left on the screen to discard.

Imagineer Technical is a viable option for structural engineers creating details and plans. I found it to be a good "middle of the road" software package; reasonably priced and capable of doing straightforward two-dimensional drawing with some great features like SmartSketch that will potentially shorten the required drawing time.

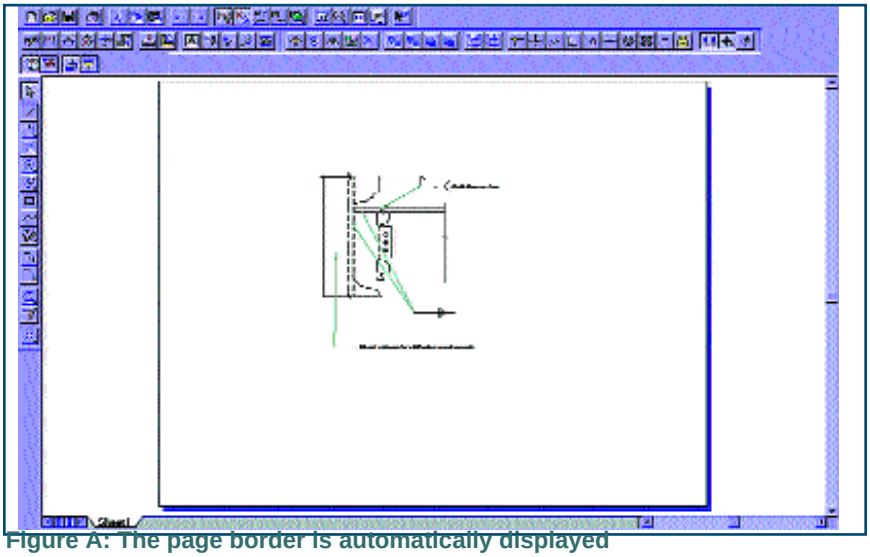

Figure A: The page border is automatically displayed

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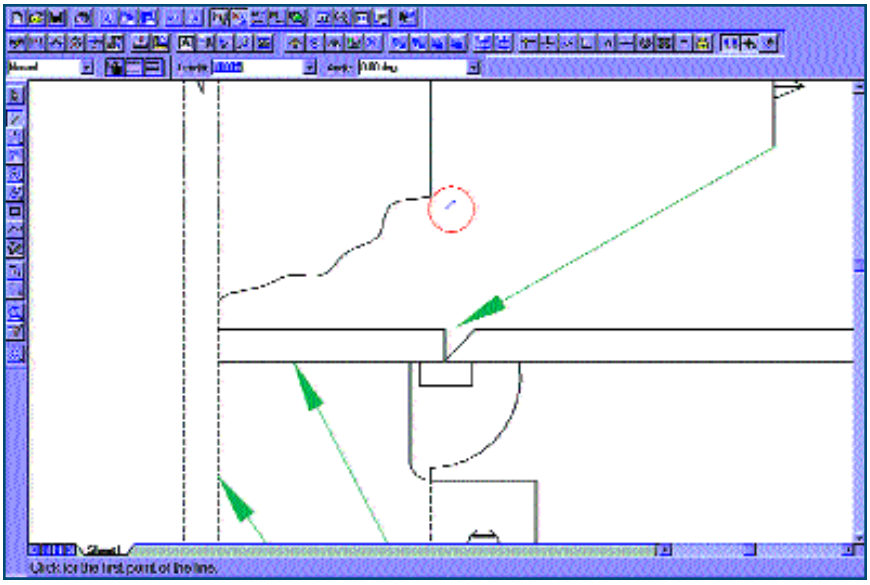

Figure B: The end-point symbol that appears when the line comman is activated and the cursor is placed nearby a line endpoint.

SOFTWARE REVIEW

RAMSTEEL AND RAMFRAME, VERSION 5.03 FROM RAM ANALYSIS

By Jacques Cattan

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THIS IS AN EXCELLENT STRUCTURAL STEEL DESIGN SOFTWARE. The various utilities of the program are launched from within the Ram Manager. The first step is to define the model in the Ram Modeler. The designer can graphically and easily reproduce the architectural drawings floor by floor as shown in Figure 1. In other words, you are simply copying into a structural form the architectural drawings provided. Once all the different floor layouts are defined, you simply stack them up defining splice levels as shown in Figure 2. Lateral systems, such as braces, moment frames or concrete shear walls are very easy to define.

Once the model is saved you can run the RamSteel program within the Ram Manager. This will automatically perform the analysis and select section sizes for all beams, columns and joist. These sections are based on the building code and AISC specification selected by the user. This is where the power of this program shows: no live load reductions need to be performed by the user for beams, girders or columns. The program can handle composite design with camber and deflection criteria set by the user. All three model building codes are available as well as AISC-LRFD and AISC-ASD Specifications. Figure 3 shows the results for one floor of the RamSteel design run. As you can see only gravity beams are designed by this module.

To design columns one must evoke the RamSteel columns module and to design lateral frames one must run the RamFrame program. The column program will design and select columns sizes from three user pre defined groups as shown in Figure 4. The user can try different sizes if desired, this is similar to the beam design module. Unfortunately, in the column module one cannot see the entire structure graphically.

Lateral frames are designed using the RamFrame program. As in any program one must assign initial sizes to the lateral frame members to allow for stiffness and deflections computations. Defining lateral loads per code is extremely easy and intuitive as shown in Figure 5. Once that is done by a simple click of the mouse one can analysis the structure for any desired load conditions, wind or seismic, in addition reduced live loads and dead load are carried over from the RamSteel runs. Again here is where another strength of the program shows: no need to generate loads manually, let the software do it based on given exposures and masses. Once the structure is analyzed again by a click of the mouse you can select a structural steel design code (AISC-LRFD of course) and a color coded result is shown on the screen allowing the user to review the results and modify the members if necessary.

Analytically, the program can handle P-delta effects as well as dynamic analysis and response spectra. An extensive amount of reports and plots can be generated including complete takeoffs. However, the layout and presentation of printed reports and plots is oriented to the engineer, in other words they contain a vast amount of data but are not ready to be presented to a customer. Overall, I believe this is one of the best structural steel design programs I have reviewed for *Modern Steel Construction* so far and I hope Ram Analysis will continue to improve and complete this software by including base plates, connections and better reporting.

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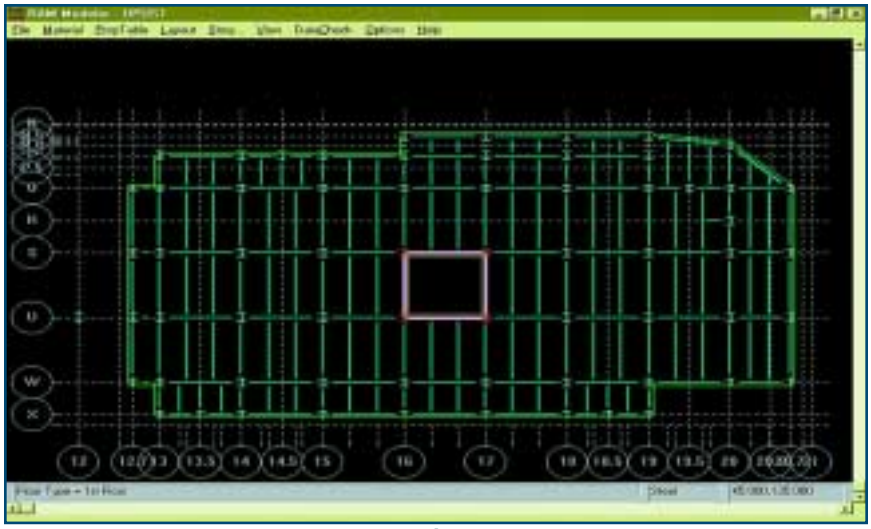
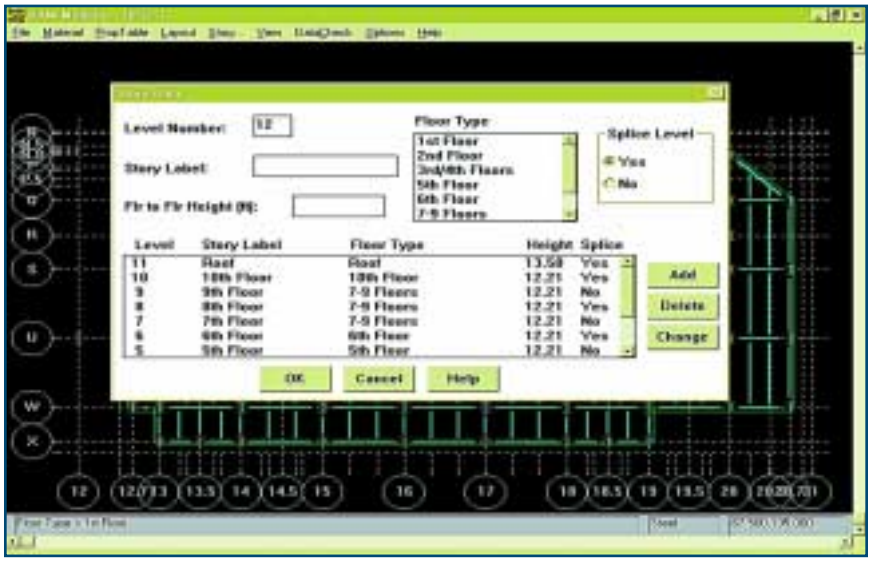
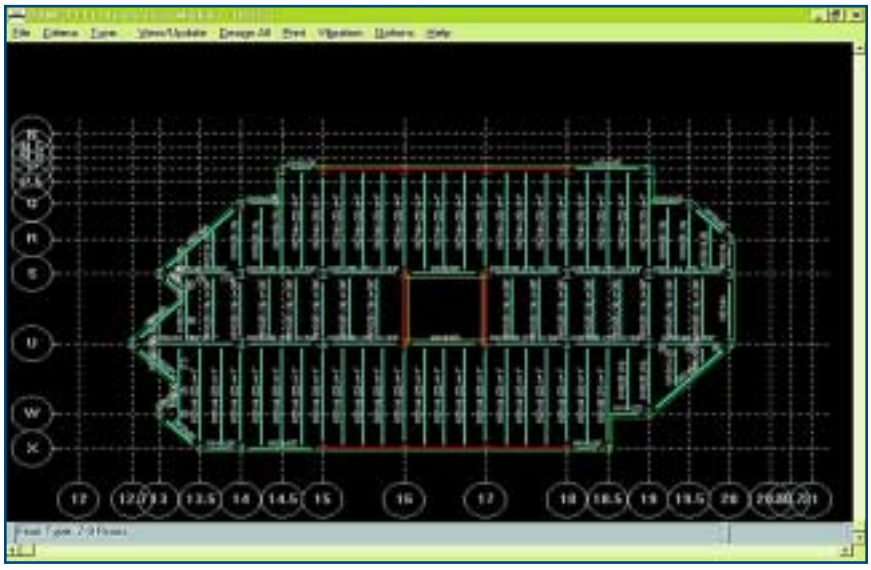


Ram Figure 1



Ram Figure 2



Ram Figure 3

SOFTWARE REVIEW

ROBOT 97 VERSION 11.5, FROM ROBOBAT

By Jacques Cattan

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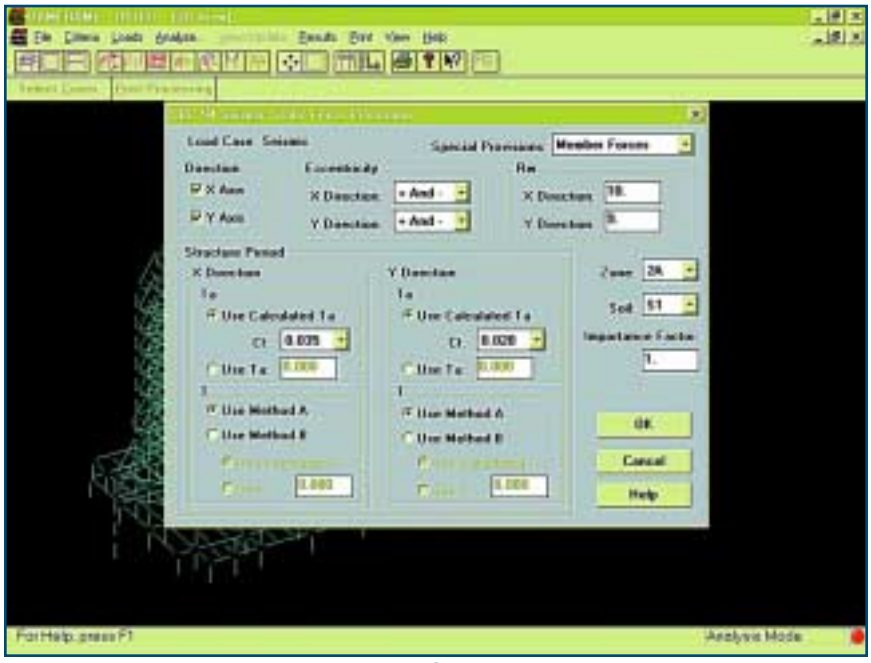
JUST LIKE ROBOT V6 (REVIEWED IN THE JANUARY 1997 ISSUE OF *MODERN STEEL CONSTRUCTION*) Robot 97 is a very complete structural analysis software. In addition to all the advanced structural analysis capabilities of Robot V6, Robot 97 now includes the functional advanced features of a software designed for Windows 95 and Windows NT. Also, it was designed to work with Microsoft Office. In practical terms this translates into the capability of analyzing a structure in the background while working on the model for a new structure, this is not possible in Ram Analysis for instance, it includes familiar features such as menus, enhanced crash protection and auto save features. It also means that Microsoft products such as Word, Excel and Access are used by Robot 97 to produce not only mathematically complete reports that will satisfy the engineer but also professional looking reports that can immediately be used with clients.

The program is centered around a drop down menu as shown in Figure 6. The menu is designed to walk the user

Ram Figure 4



Ram Figure 5

through the steps of defining, analyzing, checking and designing a structure. Unlike Ram Analysis, Robot 97 still uses a frame approach to a structure and the user has to generate the code loads and reduce the live loads separately, which is time consuming. In so far as generating a mesh the user can use a library of layouts as shown in Figure 7, it includes grids, beams, trusses and frames much like programs previously reviewed.

Once the type and frame elements are input the user can generate lateral loads per the UBC code. Figure 8 shows a typical screen, where a point load is shown, all screens are graphical, tabular and in spreadsheet format unless the user specifies a preferred method of input.

To run the "analysis" the user simply can select analysis from the menu. In the January 1997 issue when I reviewed Robot V6 I wished for a Windows version - I believe I got a feast when it comes to reporting. This program does an excellent job as one can see in Figure 9. Again the user can specify the screen layout, here I took out the spreadsheets and asked for moments and deflections in separate windows, as you can see I selected a particular member (number 7 in this case) and I zoomed in on a particular segment of my model. I can now ask for data at specific points or call on the spreadsheets.

Just like Robot V6 one can ask for stresses in the analyzed section as shown in Figure 10. One can ask for stresses at particular points in the member using cross hairs or along the member. As you can see in Figure 10 you can ask for the geometry of the section and get geometric properties, such as areas, moments of inertia etc.

The written reports are just as excellent as the graphical ones, Figure 11 shows a typical output, users can customize these for graphs or text. Finally, it is worth mentioning that technical support is available on the CD Rom or via the Internet directly at the RoboBAT site. In summary, Robot 97 retains the power of Robot V6 while introducing the power of graphical and advanced operating systems. If they can include load generation and live load reductions per US codes this would be an excellent tool for everyday structural steel design.

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SOFTWARE REVIEW

STRUCTURE ENGINEERING TURNKEY SYSTEM, FROM CAE, INC.

By Jacques Cattan

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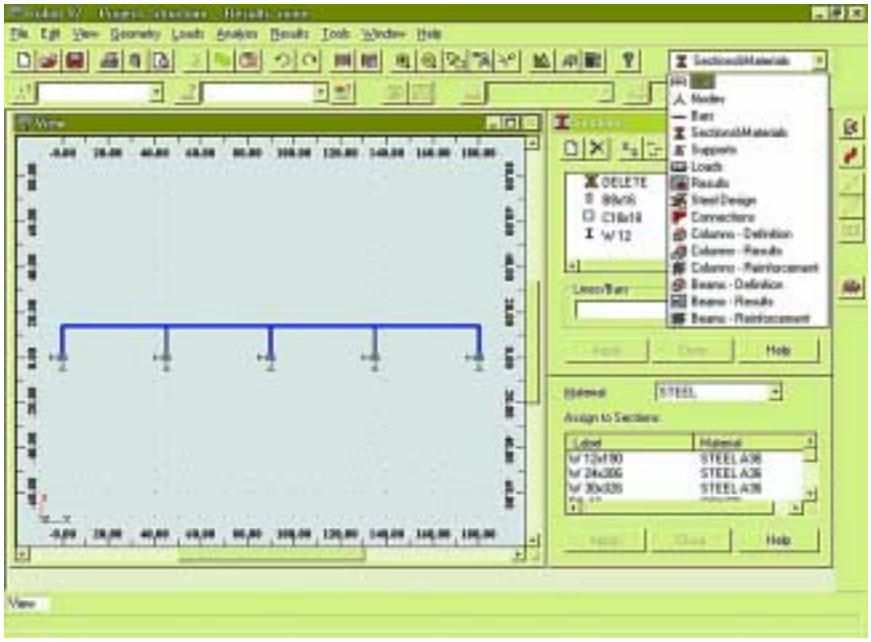
THIS SYSTEM COMES IN A BOX, LITERALLY: The program comes pre-loaded on its own external hard drive. However, the user still has to put a security key in the serial port (since the parallel port is used to access the external hard drive that holds the program); you also have to insert a 3.5" disk to boot to the program (there is an option to setup the boot from your "c" drive if so desired).

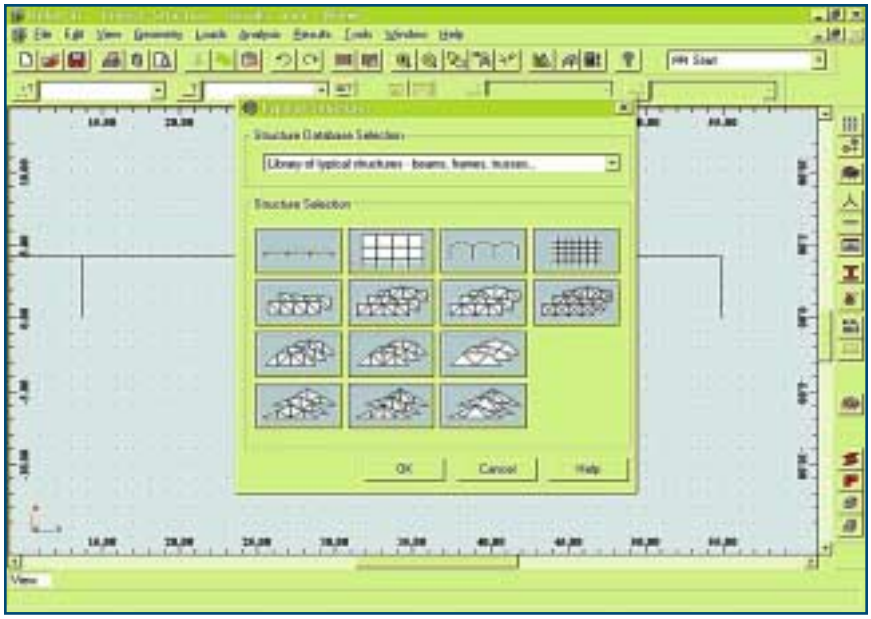
The program is completely DOS-based and I received only parts of the users manual. The manual is huge and cumbersome to use, just like the program itself. I tried to generate and run some meshes but it felt as if I was back in college trying to run a major FEA program on a UNIX machine—it was frustrating and not at all user-friendly.

Unfortunately, I could not capture any screen layouts since I was in DOS. Figure 12, however, shows a screen as published in the manufacturer's brochure.

While this might be a very powerful finite element analysis software program, I don't recommend it as an everyday structural steel design program. It needs major improvements in many areas. Though the idea of a pre-loaded hard drive is original, most people find it quite easy to walk through a Windows setup procedure.



Robot Figure 6



Robot Figure 7

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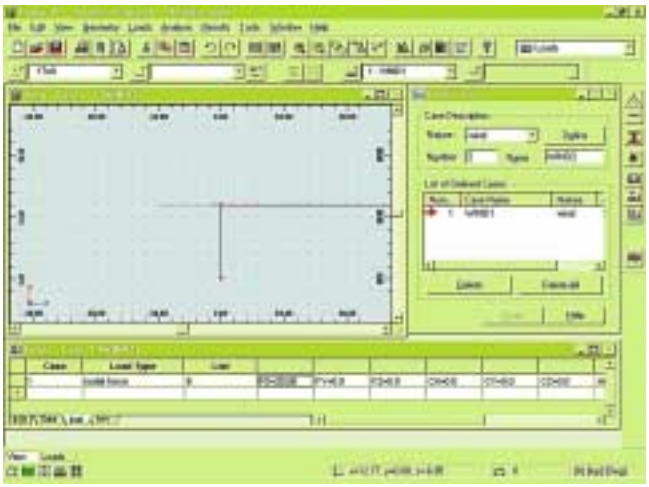
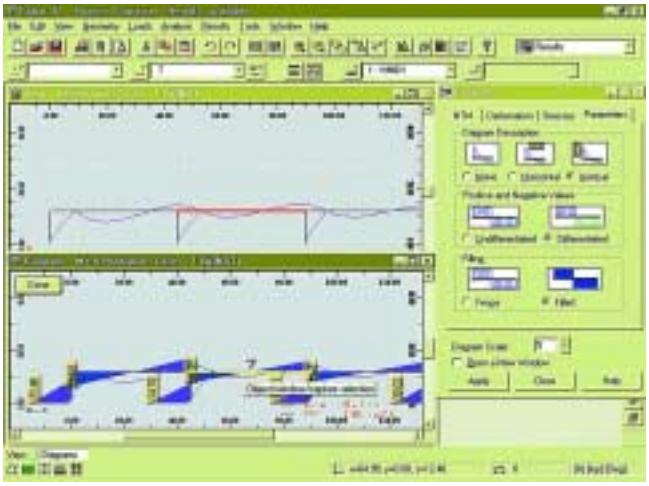
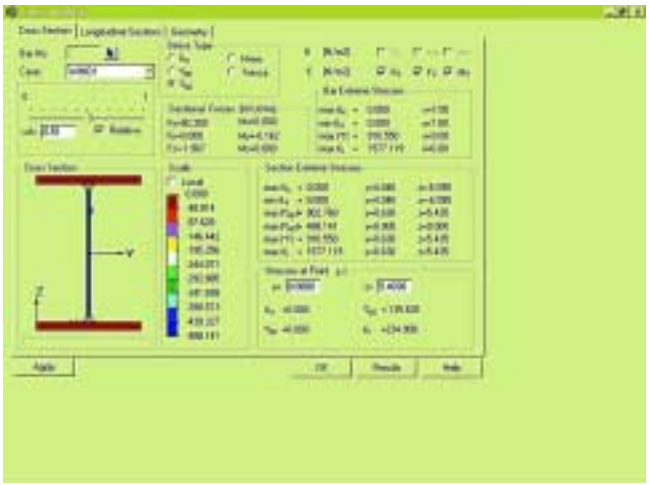


Robot Figure 8

Robot Figure 11



Robot Figure 9



Robot Figure 10

If you have any comments or feedback on these reviews, please send them to either Jacques Cattan, Cynthia Zahn or Scott Melnick at Modern Steel Construction, One East Wacker Dr., Suite 3100, Chicago, IL 60601-2001 or email Jacques at Cattan@aiscmail.com, Cynthia at Zahn@aiscmail.com or Scott at Melnick@aiscmail.com.