

Section Wizard is a suite of proprietary computer programs of Research Engineers. Although every effort has been made to ensure the accuracy of these programs, Research Engineers will not accept any responsibility for any mistake, error or misrepresentation in or as a result of usage of these programs.

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INTRODUCTION

The Section Wizard is a general engineering tool that allows users to define sections with a variety of tools, calculate the section properties and stresses under a given loading regime.

The program is a collection of three primary modules and a number of auxiliary programs to aid the user.

GETTING STARTED

There are three stages to using Section Wizard efficiently. First, the program must be installed onto the computer. Second, a suitable security system must be installed and operating correctly. Thirdly, run through the Tutorials described in the online help files.

PROGRAM INSTALLATION

The program is supplied on a CD ROM and with a security device that is either designed for a local standalone installation or a network server installation. Please check which version you have prior to starting your installation. Also check what type of device you have, such as Hasp or Sentry, this information will be needed during the installation process.

For local standalone versions, the security device will need to be connected to the parallel port of your computer and the correct device driver installed.

For network server installations, the security device should be connected to a computer that will be acting as a license server and is running an appropriate license manager software prior to starting this installation.

Start the installation by running SETUP.EXE on the CD ROM and following the instructions presented.

IMPORTANT NOTE FOR INSTALLATIONS ON WINDOWS NT

The installation requires information to be written to the registry and may require device drivers for your security system to be installed. Both of these functions require the installer to have suitable administrative privileges. Please check with your network administrator that you have these rights prior to starting the installation.

INSTALLING SECURITY SYSTEM

To prevent illegal use, the program is secured to be used with a suitably programmed security device. The installation will give you the option to choose to install device drivers for your given security device.

Installations of device drivers may require your computer to be restarted before you can use the program.

If your security system fails check the following:-

- 1) Check that you selected the correct security system when you installed the software. *Solution* - Reinstall the software selecting the correct option during the installation.
- 2) Check that the security device is securely attached to the parallel port. *Solution* - Remove all other devices that are connected to the parallel port such as other dongles and printers and try again.
- 3) Check that the device drivers are installed and operating correctly. *Solution* - Use the Check Security application to check for the security device.
- 4) Check that the security device is secured for Section Wizard. *Solution* - Use the Check Security application to see what applications are available for use with your system. If it has not been secured for Section Wizard, contact your Research Engineers software provider.
- 5) If you still have a problem after checking the above, contact Research Engineers technical support.

SECTION WIZARD OVERVIEW

The three main modules of Section Wizard are Section Builder, Free Sketch and Equivalent Section. Each module provides a range of functions that allow for a comprehensive range of problems to be solved. The primary features of each module can be summarised thus:-

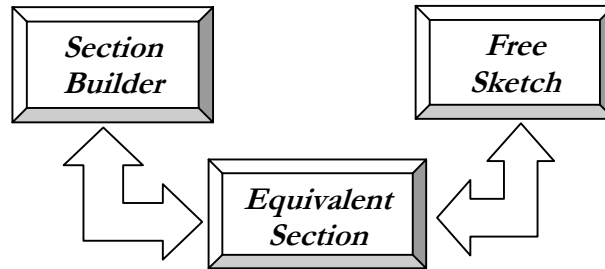
Section Builder: Composite sections are constructed by selecting and combining sections from a comprehensive library of shapes from a wide range of countries, along with plates of any dimension. Individual sections can be utilised or combined together to form a composite section. The geometric properties are calculated and a stress pattern developed under a given load regime.

Free Sketch: This module calculates the geometric properties of any general section defined by an external boundary. Holes within the section can be accommodated. Also, a stress pattern on the section can be displayed when it is subjected to a given loading regime.

Equivalent Section: This module will calculate the dimensions of one of 5 types of section to best fit a given set of properties of area, inertias and elastic moduli.

MODULE LINKS

Each module is independent and can stand alone in it's own right, but it is possible to send data to and from the Equivalent Section to either of the other two modules, thus:-



CO-ORDINATE SYSTEM

All modules use a right handed co-ordinate system. There are two axes systems that are utilised by Section Wizard, the geometric axes which are used to define the section and the principal axes of the section under consideration.

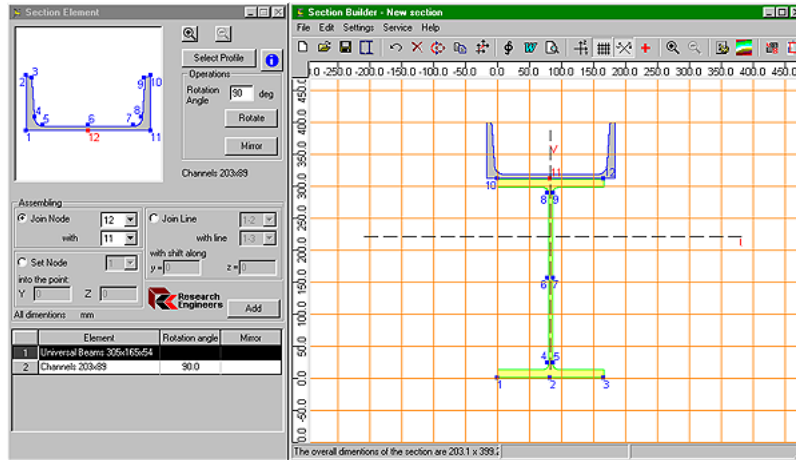
The geometric axes use the labels X, Y and Z. The cross sections that are being considered are defined such that the X axis is along the beam and would thus extend into the screen. The section is therefore in the Y- Z plane, with the Y axis horizontal extending positive from left to right and the Z axis is vertical extending positive from bottom to top.

The principal axes use the labels U and V. The U axis is normally the sections major axis and the V axis is the sections weaker axis.

SECTION BUILDER

OVERVIEW

The Section Builder module is used to calculate the properties of sections built up from an arrangement of cross sections taken from a number of standard tables. This module is composed of two windows. The main *Section Builder* window, which displays the composite section along with a number of tools to manipulate the sections and the *Section Element* dialog box which is used to select the sections to be used and method of locating them onto the current overall section.



Section Element Dialog box

Main Section Builder Window

MAIN SECTION BUILDER WINDOW

The main Section Builder window displays the current composite section. All of the primary commands are activated through the menus along the top of the window. There is also a status bar along the bottom of the window which displays the overall dimensions of the composite section and the location of the cursor when it lies over the main workspace. Additionally a dimension value will be displayed in the status bar by clicking and dragging the mouse across the window.

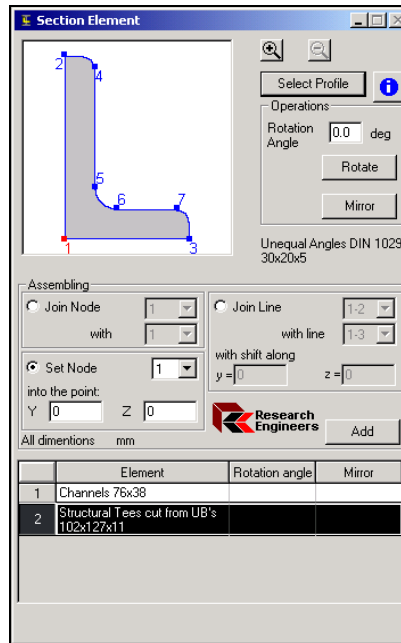
Sections created in the Section Dialog box can be located onto a composite section relative to the nodes of the '*current section*.' A section is made into the current section simply by clicking on it so that it is shown in yellow. Note how the nodes of

the current section are identified as potential locating points for the addition of new sections.

SECTION ELEMENT DIALOG

The Section Element Dialog box is the tool that is used for adding sections into the Main Section Builder window.

The dialog box essentially falls into three parts.



1) The top section is used for selecting the section to be added and orientating it as required.

2) The centre section is used to determine how this section is to fit into the composite section.

3) The bottom section is the Assembly History table. This shows each individual section that has been added into the composite section and how.

Each part of the Dialog box is described below.

SECTION WINDOW

This displays a graphic of the selected section. It displays all the node reference points that can be referred to when locating it onto the composite section. See Orientation of Elements to see these reference points for all the section types considered by Section Builder.

ZOOM IN / OUT

These buttons can be used to increase / decrease magnification on the Section window.

SELECT PROFILE

This launches the 'Select Element' dialog. From here a section can be selected from a standard database or a flat plate of any dimension.

SECTION INFORMATION

This displays a popup window with dimensions of the chosen section.

SECTION OPERATIONS

The selected section can be rotated and unsymmetrical sections mirrored prior to being added into the final composite section.

ASSEMBLING OPTIONS

This determines how the chosen section is locating into the final composite section. There are three methods for locating the chosen section:-

- 1) Join Node. Select the node number on the chosen section and the node number on the selected section, both these are highlighted.
- 2) Set Node. Give an absolute location for a selected node on the chosen section to be located on the composite section.
- 3) Join Line. Select a line defined by two nodes on the chosen section to align with a line on the selected section with an additional offset if required.

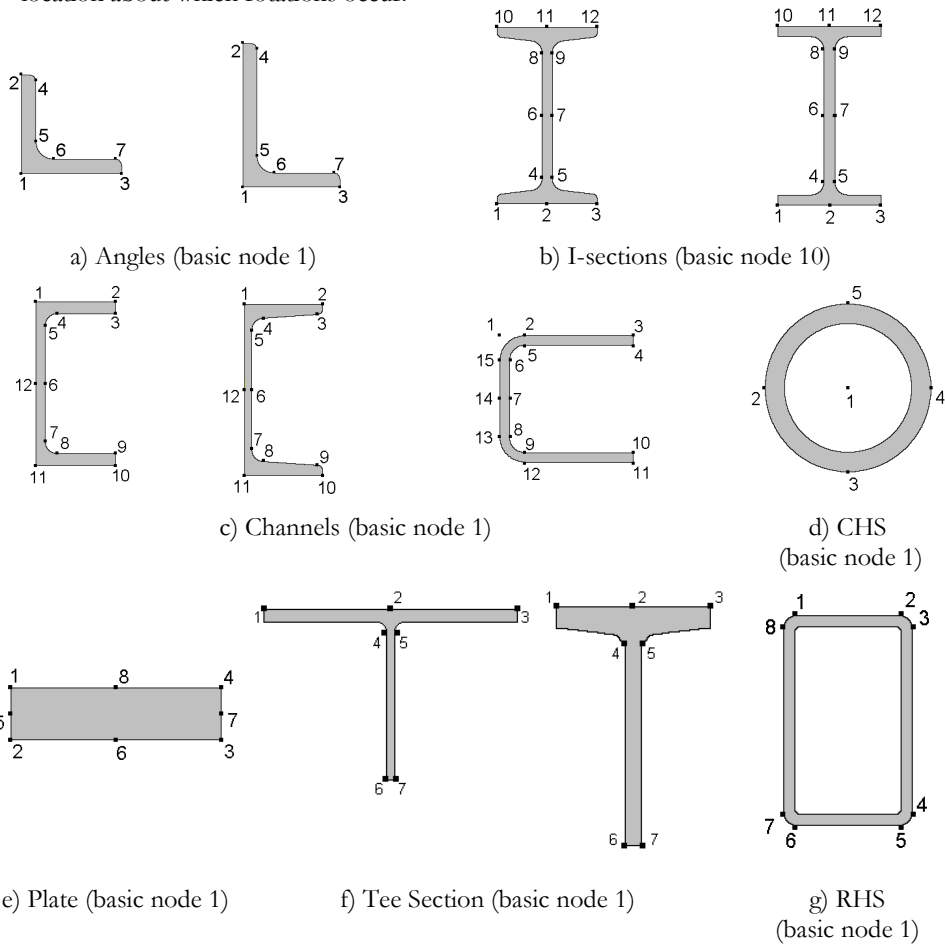
The chosen section is then added onto the composite section by clicking on the Add button.

HISTORY TABLE

This shows each of the sections that constitute the composite section with any rotation and mirror options that have been used in their definition. Clicking on a section in this list will make it the Current Section.

ORIENTATION OF ELEMENTS

The following diagram displays the node locations for the various section types that are available in the section databases. Each section has a *basic node* which is the location about which rotations occur.



MENUS

The Section Builder module has five menus of commands that have the following functions along with it's toolbar shortcut icon:-

FILE MENU

NEW



This starts a new section design. If the currently loaded section has been modified, then the option is given to save it prior to comencing with the new design.

OPEN



This launches the open file dialog box. If the Show Drawing option is checked, then a preview of the section can be displayed prior to opening the file.

SAVE



This launches the Save dialog box if the file has not previously been saved and allows the composite section to be saved. If the file has previously been saved, then that file is updated with the new data.

SAVE AS

No icon This launches the Save dialog box and allows the file to be saved with a new filename whether or not it has been saved previously.

CREATE STANDARD SECTION



This launches the Standard Section dialog box which can be used to quickly generate a composite section based on one of seven options.

PREVIEW



This displays the section as will be drawn in the report. See Report option above.

REPORT

This performs the calculations as in the Calculate command above, but formats and sends the data to the Report Type option defined in the Misc. sheet of the Preferences dialog. See Settings Menu below.

EXPORT STAAD USER TABLE

No icon This allows the current section data to be used to create STAAD External User tables. There are two types of database that can be created, either a Prismatic Section or a General Section. Selecting either command will ask for a name of file to be used. If the filename chosen exists already, then the current section will be added to the bottom of the file.

SEND

This sends the current file as an attachment to an e-mail using your e-mail system.

RECENT FILES

No icon This displays the last 4 sections that have been opened. Click on the name to load that file.

EXIT

No icon This offers the user the option to save the current composite section if it has been modified since it was last saved and then closes the Section Wizard program.

EDIT MENU**UNDO**

This undoes the last modification that has been made. The program supports multiple undo.

DELETE

This removes the currently selected section from the composite section.

SHIFT, ROTATE ELEMENT

This offers the user options to displace the currently selected section by a relative dimension or rotation about its basic node. See section Orientation of Elements for the basic node of each section type used by Section Builder.

SHIFT CO-ORDINATE CENTRE

This option is used to relocate the origin of the geometric axes relative to the composite section. There are three options:-

- 1) Set it to the current centre of gravity
- 2) Set it to a given node on the current section.
- 3) Set it to a given Y, Z co-ordinate.

COPY ELEMENT

Offset dimensions in the Y and Z axes and a number of times the section is to be copied is used to generate 1 or more copies of the selected section.

SETTINGS MENU**PREFERENCES**

This opens the Program Settings dialog box. This has four tabs which cover the following options:-

- 1) *Units*. Select the units for angles, section dimensions, section properties, axial forces and moments, as well as the number of decimal places and whether or not to use an exponential form.
 - 2) *Databases*. Select the range of databases that are referred to by the program. See Appendix 2: Section Databases for a current list of available database sections.
 - 3) *Miscellaneous*. Select the language, Report settings such as the template document, whether the documents should use Word 7 or Word 97 file formats, the paper size and font. Set whether documents should be sent direct to the printer or into Word for editing. Additional options determine the number of vertices to be created by a circle, option to snap to grid and whether the ends of vertices are indicated by a circle or not.
- Stress Scale*. This sets the colours of the maximum compression and tension stresses and the colour these grade to for zero stress, along with the number of bands to be displayed

GRID SETTINGS

This sets the spacing of the grid that is displayed if the Grid option is toggled on.

GRID

This toggles whether the grid is displayed or not.

CO-ORDINATE AXES

This toggles whether the co-ordinate axes is displayed or not.

PRINCIPAL AXES

This toggles whether the principal axes is displayed or not.

CENTRE OF GRAVITY

This toggles whether an icon that shows the location of the centre of gravity is displayed or not.

ZOOM IN

Increases the scale of the diagram.

ZOOM OUT

Decreases the scale of the diagram.

TOOLS MENU

CALCULATE



This performs the calculations to establish the section profile information and presents the results in a dialog box. The values are calculated using the methods described in Appendix 1: Definitions of Geometric Properties. To change the units see the Preferences option in the Settings Menu. To print the values, see the Report option in the File Menu.

STRESS CONTOUR



Displays a graded colour pattern over the composite section based on a loading regime of axial load and moments about the principal axes. Extreme positive and negative values are displayed on the diagram. The stress at any location on the section is displayed on the status bar as the cursor hovers over that location. By clicking on the section an additional label of the stress at that location is also added.

FREE SKETCH



This launches the Free Sketch module of Section Wizard and closes the Section Builder module.

FIND EQUIVALENT SECTION



This launches the Equivalent Section module and passes it the current composite section data.

FORMULA CALCULATOR



This launches the Section Wizard, Formula Calculator module. See the section Additional Modules for more information on this module.

WINDOWS CALCULATOR



This launches the Microsoft Windows calculator.

UNIT CONVERTER



This launches the Section Wizard, Unit Converter module. See the section Additional Modules for more information on this module.

HELP MENU

HELP TOPICS



This launches the Section Wizard help document.

HOW TO USE HELP



This launches the Windows general help document.

ABOUT SECTION BUILDER



This displays a dialog that gives information about the version of Section Builder that is being used.

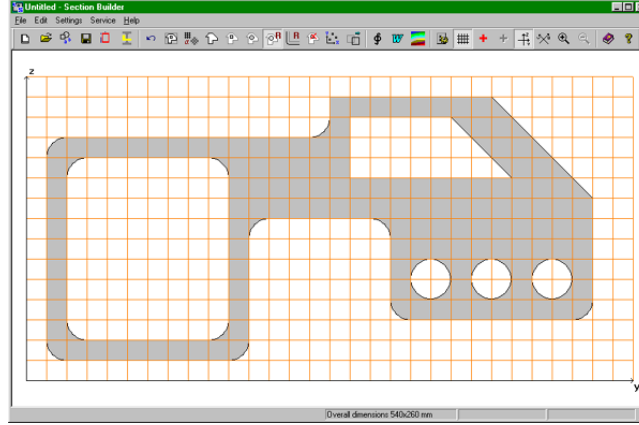
TOOLBAR

There is a toolbar is fixed to the top of the Main Section Builder Window that provides a shortcut to a number of the most commonly used commands in the Section Builder module. See the menu items above to see the commands that each icon provide a shortcut to.

FREE SKETCH

OVERVIEW

The Free Sketch module allows the user to create sections with an outer boundary of any shape with a number of internal openings if required.



The scope of the section is determined by first setting the overall dimensions of the workspace to extend to at least the maximum dimensions of the section that is to be considered. A grid is then placed within this workspace, which if selected in the options, can be snapped to in order to accurately locate the co-ordinates of the boundary nodes.

An outer boundary can now be defined by selecting the option from the Edit menu or the toolbar. Click around the grid to define the boundary with a double click on the final node to complete the boundary definition. To move a defined boundary point, click on it and double click on its new location. New nodes can be introduced into vertices between nodes by clicking on the boundary line and double clicking on a new location.

Holes can be placed into the body of the section by selecting an option from the edit menu or from the toolbar.

The outer boundary and any non-circular internal boundary can be re-defined by selecting the Vertices command from the Edit menu and entering the required co-ordinates into the table.

Free Sketch data files can be saved in either one of two formats. <filename>.CNS is a binary file format which is the most compact and preferred way to store files. Alternatively, files can be stored as <filename>.CON, stores the file in an ASCII format which can be opened and edited by any text editor, such as Windows Notepad.

MENUS

The Free Sketch Module has five menus of commands that have the following functions:-

FILE MENU

NEW



This starts a new section design. If the currently loaded section has been modified, then the option is given to save it prior to commencing with the new design.

OPEN



This launches the open file dialog box. If the Preview option is checked, then a preview of the file will be displayed prior to opening it.

SAVE



This launches the Save dialog box if the file has not previously been saved and allows the composite section to be saved. If the file has previously been saved, then that file is updated with the new data. Note that a Free Sketch file can be saved in one of two formats *.CNS and *.CON. See the section on Free Sketch Overview for more information on filetypes.

SAVE AS

No icon This launches the Save dialog box and allows the file to be saved with a new filename whether or not it has been saved previously.

CLOSE

No icon This closes the current section and leaves Free Sketch ready to start a new file or open an existing file.

PARAMETRIC SECTIONS

This launches the Parametric Section dialog box that allows sections to be created quickly based on a section type (18 different types currently available) and a number of key dimensions.

REPORT

This performs the calculations as in the Calculate command below, but formats and sends the data to the Report Type option defined in the Misc. sheet of the Preferences dialog. See Settings Menu below.

IMPORT DXF / DWG

No icon This command imports cad files in the AutoCAD *.DWG or more general *.DXF file format. The following entity types are supported:-

- 3DFACE
- SOLID
- TRACE
- LINE
- POLYLINE
- LWPOLYLINE
- ELLIPSE
- CIRCLE
- ARC

Note that files that are to be imported are such that all the vertices are in a single plane and form closed areas.

EXPORT STAAD USER TABLE

No icon This allows the current section data to be used to create STAAD External User tables. There are two types of database that can be created, either a Prismatic Section or a General Section. Selecting either command will ask for a name of file to be used. If the filename chosen exists already, then the current section will be added to the bottom of the file.

SEND

This sends the current file as an attachment to an e-mail using your e-mail system.

RECENT FILES

No This displays the last 4 sections that have been opened. Click on the name
icon to load that file.

EXIT

No This displays the last 4 sections that have been opened. Click on the name
icon to load that file.

EDIT MENU**UNDO**

This undoes the last modification that has been made. The program supports multiple undo.

OVERALL DIMENSIONS

This specifies the size of the workspace that will be required to create the section. The minimum it should be set to is the overall dimensions of the section, but can be set larger.

EXTERNAL BOUNDARY

This option is used for drawing the outer boundary of the section. Clicking in the workspace will create a node on the boundary. If a grid has been defined and the 'Snap To' option set in the Preferences, then the nodes will snap to the nearest grid intersection.

CIRCULAR EXTERNAL BOUNDARY

No This will create a circular external contour with a specific radius. This
icon option is only available before an external boundary has been defined.

POLYGON HOLE

This command is used for creating internal openings within an external boundary. Clicking inside the boundary creates a node on the contour. Double clicking on the last node will complete the boundary.

CREATE CIRCULAR HOLE

This command is used to create a circular hole within the external boundary by clicking once to define the centre of the hole and double clicking on a point on the circumference of the hole.

CREATE CIRCULAR HOLE WITH FIXED RADIUS

This command is used to create a circular hole within the external boundary by defining its radius and clicking to define the centre of the hole. Multiple holes with the same radius can be defined by repeatedly clicking within the same boundary.

DELETE HOLE

This command is used to delete any hole by clicking within the hole.

FILLET

This command is used to convert sharp corners to smoothed corners by defining a radius which is fitted into the corner. This command can be used on both the external boundary and any non-circular internal holes.

MOVE

This command is used for graphically relocating nodes that define the section. Once selected, click twice on the workspace to define a rectangular selection window. All the nodes that occur within that window become selected. Click within that selection rectangle and drag it to a new location and click to complete the relocation.

Note that Circular holes are selected if the selection window passes through the centre of the hole.

NODE COORDINATES

This command opens the Co-ordinates dialog box. This displays the Y and Z values for each co-ordinate that is used to define the outer boundary and any non-circular internal holes. Modifications can be made to the values in the table and applied to the section by clicking on the Apply button.

COORDINATES ORIGIN

This command relocates the origin of the geometric axes. Either specific values for the Y and Z offset can be given, or it can automatically be set to the centre of gravity by clicking on the 'Shift' button.

Note that the origin must remain within the overall dimensions of the workspace.

SETTINGS MENU

PREFERENCES



This opens the Program Settings dialog box. This has three tabs which cover the following options:-

- 1) *Units*. Select the units for angles, section dimensions, section properties, axial forces and moments, as well as the number of decimal places and whether or not to use an exponential form.
- 2) *Miscellaneous*. Select the language, Report settings such as the template document, whether the documents should use Word 7 or Word 97 file formats, the paper size and font. Set whether documents should be sent direct to the printer or into Word for editing. Additional options determine the number of vertices to be created by a circle, option to snap to grid and whether the ends of vertices are indicated by a circle or not.
- 3) *Stress Scale*. This sets the colours of the maximum compression and tension stresses and the colour these grade to for zero stress, along with the number of bands to be displayed

GRID SETTINGS



This sets the spacing of the grid in the Y and Z directions and can include an angle of rotation if required.

GRID



This option toggles between turning the grid from being displayed or not.

CO-ORDINATE AXES



This toggles whether the co-ordinate axes is displayed or not.

PRINCIPLE AXES



This toggles whether the principal axes is displayed or not.

CENTRE OF GRAVITY



This toggles whether an icon that shows the location of the centre of gravity is displayed or not.

SHEAR CENTRE

This toggles whether an icon that shows the location of the shear centre is displayed or not.

ZOOM IN

Increases the scale of the diagram.

ZOOM OUT

Decreases the scale of the diagram.

TOOLS MENU**CALCULATE**

This performs the calculations to establish the section profile information and presents the results in a dialog box. The values are calculated using the methods described in Appendix 1: Definitions of Geometric Properties. To change the units see the Preferences option in the Settings Menu. To print the values, see the Report option in the File Menu.

STRESS CONTOUR

Displays a graded colour pattern over the composite section based on a loading regime of axial load and moments about the principal axes. Extreme positive and negative values are displayed on the diagram. The stress at any location on the section is displayed on the status bar as the cursor hovers over that location. By clicking on the section an additional label of the stress at that location is also added.

SECTION BUILDER

This launches the Section Builder module of Section Wizard and closes the Free Sketch module.

FIND EQUIVALENT SECTION

This launches the Equivalent Section module and passes it the current section data.

FORMULA CALCULATOR

This launches the Section Wizard, Formula Calculator module. See the section Additional Modules for more information on this module.

WINDOWS CALCULATOR

This launches the Microsoft Windows calculator.

UNIT CONVERTER

This launches the Section Wizard, Unit Converter module. See the section Additional Modules for more information on this module.

HELP MENU**HELP TOPICS**

This launches the Section Wizard help document.

HOW TO USE HELP

This launches the Windows general help document.

ABOUT FREE SKETCH

This displays a dialog that gives information about the version of Free Sketch that is being used.

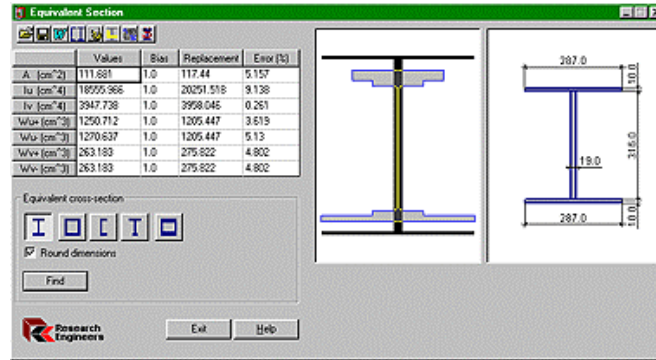
TOOLBAR

There is a toolbar is fixed to the top of the Free Sketch Window that provides a shortcut to a number of the most commonly used commands in the Free Sketch module. See the menu items above to see the commands that each icon provide a shortcut to.

EQUIVALENT SECTION

OVERVIEW

As the name suggests, the Equivalent Section module finds a best fit solution from the table of values of area, inertia and elastic moduli. The data can either be entered directly into the table, or generated from the Section Builder or Free Sketch modules, or from the Standard Section toolbar command.



The Equivalent Section module then finds the best fit on one of the following 5 section types:-

- 1) I Section, with independent dimensions for the top and bottom flanges
- 2) Rectangular Hollow Section, with separate dimensions for the side walls and the top and bottom flanges.
- 3) I Section, with the same sizes for the top and bottom flanges.
- 4) Rectangular Hollow Section, with the same thickness for the flanges and the side walls.
- 5) Channel Section.

Each of the values can be weighted for importance by setting a bias for that value. The larger the bias, the more the program will attempt to match that value rather than any of the others.

TOOLBAR

The commands for Equivalent Section are access from the icons on the toolbar that runs along the top of the program window. These commands are as follows:-

OPEN



This launches the open file dialog box. If the Preview option is checked, then a preview of the section can be displayed prior to opening the file. Either Section Builder *.SEC files or Free Sketch *.CNS files can be opened.

SAVE



This launches the Save dialog box if the file has not previously been saved and allows the Equivalent Section, section to be saved. If the file has previously been saved, then that file is updated with the new data. Files are saved in the Section Builder *.SEC format.

REPORT



Once an equivalent section has been 'found', the data displayed in the table and a dimensioned drawing will be sent to a report formatted to the Report Type option defined in the Misc. sheet of the Program Preferences dialog. See Preferences below.

CREATE STANDARD SECTION



This launches the Standard Section dialog box which can be used to quickly generate a composite section based on one of seven options. This is the same option that is available in the Section Builder module.

PREFERENCES

This opens the Preferences dialog box. This has three tabs which cover the following options:-

- 1) *Units*. Select the units for angles, section dimensions, section properties, axial forces and moments, as well as the number of decimal places and whether or not to use an exponential form.
- 2) *Databases*. Select the range of databases that are referred to by the program. See Appendix 2: Section Databases for a current list of available database sections.
- 3) *Miscellaneous*. Select the language, Report settings such as the template document, whether the documents should use Word 7 or Word 97 file formats, the paper size and font. Set whether documents should be sent direct to the printer or into Word for editing. Additional options determine the number of vertices to be created by a circle, option to snap to grid and whether the ends of vertices are indicated by a circle or not.

LAUNCH SECTION BUILDER MODULE

This launches the Section Builder module of Section Wizard and creates section based on the section that was 'found'.

LAUNCH FREE SKETCH MODULE

This launches the Free Sketch module of Section Wizard and creates section based on the section that was 'found'.

EXPORT STAAD USER DATABASE

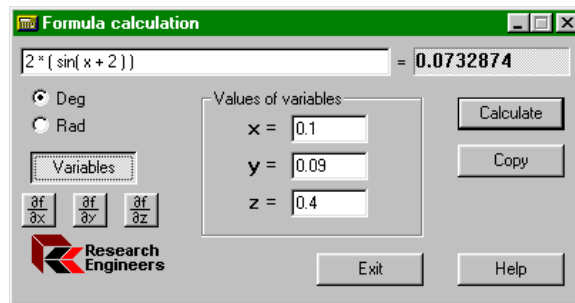
This allows the current section data to be used to create STAAD External User tables. There are two types of database that can be created, either a Prismatic Section or a General Section. Selecting either command will ask for a name of file to be used. If the filename chosen exists already, then the current section will be added to the bottom of the file.

ADDITIONAL MODULES

There are two other modules that are supplied with Section Wizard. As with the three primary modules, these modules can also be used as standalone programs in their own right.

FORMULA CALCULATOR

The Formula Calculator provides users with a simple tool to solve equations that can contain up to three variables, X, Y and Z



To use variables in the equation, ensure that the **Variables** button is depressed and enter the value for the variable in the required cell. To solve the equation click on the **Calculate** button.

Note also that once defined, a function can be differentiated with respect to one of the variables by clicking on the appropriate button, **df/dx**, **df/dy** or **df/dz**.

Consider the partial differentiation of the following equation:-

$$f = 2 * (\sin(x + 2)) + y^2$$

$$df/dx = 2 * \cos(x + 2)$$

$$df/dy = 2*y$$

Click on the **Copy** button to copy the result of the equation to the clipboard so that it can be pasted into other Section Wizard modules or other MS Windows applications.

The Formula Calculator supports use of the operators:- +, -, *, /, (,), and ^.

The Formula Calculator supports use of the following functions:-

floor	—	the greatest whole number not exceeding the given one;
tan	—	tangent;
sin	—	sine;
cos	—	cosine;
asin	—	antisine;
acos	—	anticosine;
atan	—	antitangent;
exp	—	exponent;
ceil	—	the least whole number exceeding the given one;
tanh	—	hyperbolic tangent;
sinh	—	hyperbolic sine;
cosh	—	hyperbolic cosine;
log	—	natural logarithm;
log10	—	common logarithm;
abs	—	absolute value;
sqrt	—	square root.

UNIT CONVERTER

The Unit Converter module provides the user with a tool to quickly convert values in one unit to another quickly.

There are conversion sheets for Length, Area, Volume, Force, Angle, Pressure and Moment. To operate the converter, simply enter the known value in the appropriate cell and press the 'Enter' key on the keyboard for the values in all the other cells to be calculated.

APPENDIX 1: SECTION DATABASES

Section Wizard is supplied with 5 databases from a number of sources. The sections that are available in each of these databases are as follows:-

ARBED

Equal Angles Euronorm 56-77 Unequal Angles Euronorm 57-78 European I-beams (IPE) European standard beams (IPN) European wide flange beams (HE) European wide flange beams (HL) Wide flange columns (HD) Wide flange bearing piles (HP) American wide flange beams (W) British universal beams (UB) British universal columns (UC) Channels with parallel flanges European standard channels

ASTM

Equal Angles Unequal Angles H-Piles Miscellaneous Shapes American Standard Shapes Wide Flange Shapes Miscellaneous Tees American Standard Tees Wide Flange Tees American Standard Channels Miscellaneous Channels Pipe Extra Strong Pipe Double-Extra Strong Pipe Tube Steel (Square) Tube Steel (Rectangular)

BRITISH STANDARD SECTIONS

Universal Beams
Universal Columns
Universal Bearing Piles
Rectangular Hollow Sections
Circular Hollow Sections
Square Hollow Sections
Joists
Equal Angles
Unequal Angles
Channels
Structural Tees cut from UB's
Structural Tees cut from UC's

DIN

Equal Angles DIN 1028
Unequal Angles DIN 1029
Beam DIN 1025
IP DIN 1025
IP DIN 1025 (9%)
Channels DIN 1026
Circular Hollow Sections DIN 2448
Rectangular Hollow Sections DIN 59410
Square Hollow Sections DIN 59410

OVERSEAS SECTIONS

ASTM W Shapes (Universal beams and columns)
IPE Shapes (European universal beams)
HE Shapes (European universal beams and columns)
Rectangular Hollow Sections
Circular Hollow Sections
Square Hollow Sections