Structural Engineering Library

Version 5.8

by Michael D. Brooks, S.E., P.E.

A product of

ENERCALC, INC.

ENERCALC

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Foreword

This software system was designed and developed to give the practicing Structural Engineer a tool to rapidly perform structural analysis and design of building components.

The design philosophy has remained the same for the last 20 years.....provide software that is a "fill-in'the-blanks" tool with instant recalculation and review of the results.

We thank the thousands of engineers who have purchased ENERCALC software over the last two decades helping this software develop to where it is today.



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1 Welcome

Welcome To The Structural Engineering Library

You've chosen one of the most respected Structural Engineering software packages available today. In continuous development since 1983, Version 5.8 is the culmination of years of development and refinement from suggestions of engineers worldwide.



The **Structural Engineering Library** is developed with the practicing engineer in mind. Although large complex frames are fun projects, structural engineers spend most of their time designing and analyzing the components of structures. Because most of the buildings worldwide rely on simple beams, columns, foundations, walls, and other small items, this software system will quickly become your best friend. The **Structural Engineering Library** remembers the mathematics, building code provisions, and standard materials you need to perform a detailed and economical design.

Because we feel the simple, repetitive engineering problems are far more common that extensive 3-D frame analysis, this software package is designed specifically for fast, interactive engineering design of building components. We've combined the typical working methods of engineers, national building code provisions, and construction material databases with the principles of structural mechanics into each "calcsheet" program. You will find that these programs operate very much like an electronic calculation pad.....simple fill in the data entries and the entire calculation will be instantly updated for your review.

To add even more power and utility to the system, we've added detailed design sketches and stress diagrams, automatic design and sizing, on-line help system, material databases, and elegant calculation printing to the **Structural Engineering Library**. 6

The **Structural Engineering Library** is designed around a file of calculations called a " **Project**". This single file with the extension "ECW" can hold one or thousands of individual calculations. You add, edit, and delete the calculations in your project file during your in-office design stage. Then, when it's time for submittal to a governing agency, you can print a complete set of calculations.

Because of the ever-expanding number of programs, which we call "Calcsheets ", we invite you to stay in close contact with our World Wide Web site at <u>www.enercalc.com</u>. Maintenance releases, up-to-the-minute technical advise, revised electronic documentation, and new product information will all be provided there FIRST.

ENERCALC has put years of work into this package in support of the highly technical and dedicated service Structural Engineers provide to the people of the world. We continue to enhance this product weekly and are committed to developing this product well into the future.

We extend our thanks for choosing **ENERCALC**, and look forward to using your suggestions to provide you with ever improving tools for your daily work.



2 Warning & Disclaimer

Although it is our intent that the information contained in this manual and accompanying software program is accurate and reliable it is possible that there may be errors, both of omission and commission, that we are not aware of at the time of publication. **ENERCALC Engineering Software** can make no warranties, either express or implied, as to the accuracy or the material in this manual or it's suitability for a specific purpose or application for which is advertised. **ENERCALC Engineering Software**, it's owners, directors, and employees, can offer no guarantee and will accept no liability for damages of any kind resulting from the use of the information contained or generated by this document and the accompanying computer software.

If you do not agree to be bound by these conditions and the conditions contained in the License Agreement contained herein then you may return this manual and software within a sixty (60) day period after receipt and receive a full refund of the License Fee (which excludes packaging and delivery charges).

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3 Getting Started

3.1 Company & Software History

ENERCALC Engineering Software originated as a set of in-house programs in a small engineering office to beat the cost burden of the competitive design profession. In 1981, a set of Lotus 1-2-3 spreadsheet templates were developed to automate the repetitive design of tilt-up and small office buildings. The software proved so much time saving and was so easy to use it was decided to market it in the newly founded microcomputer industry. The entire set of 26 spreadsheet "templates" were named the **Structural Engineering Library** and shipped in three 360K 5 1/4" diskettes and ran on a 4.77 MHz 8086 IBM PC. Typical cost of this state of the art engineering hardware & software system was \$6,000!

As years went by sales of the product increased. For engineers to purchase a technical software system based as an add-on to a spreadsheet program was a testament both to the intelligence of the users and to the easy and simple design of the software package.

In 1986, Lotus Development introduced a package for programmers to link their programs to the very guts of 1-2-3. Called the Add-In Toolkit, it offered a unique opportunity for **ENERCALC** software designers. A decision was made to rewrite all 40 of the current engineering "templates" in the "C" language, and link these powerful programs to simple 1-2-3 "templates". The Lotus 1-2-3 spreadsheets would become data entry/output screens driving powerful processing programs.

Our first application of this technology was **FastFrame** 2-D introduced in 1987. **FastFrame** transformed a simple, off the shelf spreadsheet program into a powerful finite-element analysis system, providing full graphics. Users were amazed that the previously complex batch processed frame analysis systems were reduced to entering a number in a spreadsheet and INSTANTLY the entire frame was recalculated. At the 1987 Lotus Developers Conference in Boston, MA, the actual authors of Lotus 1-2-3 were stunned to see their "business tool" doing complex analysis for multi story buildings (complete with graphics)!

The release of the Version 4 series of the **Structural Engineering Library** in 1990 completed the transformation of all programs to the "C" language (still using the Lotus 1-2-3 interface). New features included material databases, automatic-design algorithms, reference drawing graphics, a project manager, graphics printing, and other accessory features.

With the decline of usage of DOS and Lotus 1-2-3, **ENERCALC** rewrote the entire "user interface" portion that provided the calculation screens and printing. Keeping the same "look & feel" to ease the change for users, our programmers wrote our own user interface program, as simple and fast as 1-2-3, complete with support for hundreds of printers. Version 4.4 for DOS was released in August of 1994, and produced a large increase in ENERCALC's user base. The performance was crisp and fast, the "look & feel"

was even better than 1-2-3, and many of the program capabilities were improved. Version 4.4 for DOS has become known as the "Volkswagen of structural engineering software... simple, enduring, yet designed right to get you almost anywhere

The **Structural Engineering Library 5.0 for Windows** was introduced in 1996 as a completely new rewrite of the legacy systems of the previous 15 years. Although much of the proven "C" language engineering calculation programs are retained, the rest of the system was redesigned and written from scratch for the modern Windows and Pentium based computer systems.

We've completely converted the entire software system to a fresh, new Windows based system. The project manager is the central building point to which dozens of different types of calculations can be combined. The core of your new software has been designed in a totally modular way, where adding new "calcsheets" is a matter of creating new screens and linking the engineering code. You've invested in yet another enduring system, designed from a more fundamental position to ensure a long and productive life.

In the 8 years since then (as this is written in late 2003) the **Structural Engineering Library** has been substantially refined and has seen an enormous in users nationwide. You can be assured that with 20 years of history and a substantial structural engineering software system your decision to standardize on the Structural Engineering Library will be one of your most cost effective decisions and investments.

Sincerely,

Michael D. Brooks, P.E., S.E. President & Founder **ENERCALC Engineering Software**

3.2 Installation

System Requirements & Installation

Before installing the Structural Engineering Library you should have a working knowledge of your computer and its operating conventions. This chapter explains the system requirements and takes you through the steps of installing the software

The Structural Engineering Library Version 5.8 is designed for 32 bit operating systems running Windows 95, 98, ME, 2000, NY and XP.

Fixed Storage Space	:	25 MB	
Processor	:	733 MHz Pentium	or better

Display	: 800x600 w/ Small Fonts, 1024x768 w/Large	е
Fonts (640x480 not supported)		
RAM Memory :	8MB Total RAM Minimum	
Maintenance Releases	: Internet Connection	

Installing the Structural Engineering Library

Individual Computer Installation

Tip: Before starting to install this software, have your ENERCALC assigned "KW" registration number handy.....you will be asked to enter it twice.

To Install.....

- Insert the CD labeled Structural Engineering Library
- From the Start menu, select Run.
- Type "D:\SETUP" for CD-ROM (substitute the appropriate letter of your diskette or CD ROM drive for "a" or "d").
- Follow the instructions on the screen and select the Drive and Directory where you wish the software to be installed. (The installation will default to C:\EC55)
- The Setup program will copy all files to your specified drive and directory.
- The Setup program will create an ENERCALC program folder in your "Programs" section of the [Start] button menu and add the Structural Library icons to it.
- Important Notes about the Installation
- The Structural Engineering Library makes NO CHANGES to the system registry, does not change the PATH variable. It does place one file in your Windows directory named EC_55.INI. This file us used to save hundreds of settings that the Structural Engineering Library used during operation.
- If only part of the program screen is visible you probably do not have the minimum required screen resolution -or- are using a font size that is too large.
- Read the information on "Entering your Product Activation Code" later in this document.

Network Installation

The Structural Engineering Library can be easily installed on a network server and launched remotely from any connected Windows based computer. In this instance the

server must be the only location there the software is fully installed to be in conformance with your agreement in licensing.

Within "Product Activation Code" is your ENERCALC User Registration Number and the number of simultaneous users that are allowed. The program will automatically monitor the license usage for you and limit simultaneous executions to the number of licenses owned.

Installation of the Software on the Server

You will need to install the SEL on the server and start it up ONCE to create a License Password file.

- Identify the drive and directory location on the server where the software will be installed. Please note that all files are placed in that directory. No changes are made to your Windows Registry, no OCX controls are registered, etc.
- If a demonstration version has previously been installed, use the "Remove Structural Engineering Library" option in the ENERCALC program group. Alternately execute the UNINSTX.EXE program in the ENERCALC installation directory and select the log file displayed.
- Give that directory permanent rear/write/deny none privileges.
- Install Structural Engineering Library from CD-ROM or downloaded file.
- Start the **Structural Engineering Library** by using the [Start | Programs | Enercalc | SEL 5.8] icon -or- execute the EC55.EXE file.
- A "Demonstration Version" window will appear. Press the [Cancel] button.
- The "What would you like to do ?" window will appear. Press the [Cancel] button.
- From the main program menu select the "User Information" menu item.
- The "User Information" window will appear with another window that says "Network Installation Alert". Select **[No]**.
- On the window that is displayed, select the "Product Activation Code" tab and enter your PAC. <u>BE CAREFUL TO ENTER THE CHARACTERS CORRECTLY</u>. The PAC <u>will be accepted</u> if entered correctly.
- After entering the last character press [Tab]....the indicator should change to "**Registered**" and the number of simultaneous executions that are allowed will be shown.
- Installation is now complete.

Creating an Enercalc link on the Client computer

To use the Structural Engineering Library on any workstation connected to your server you simply create a shortcut to the executable program on the server. The files will be retrieved from the server and the program will run on the workstation.

IMPORTANT! If the software was previously installed on the client computer:

- Uninstall the software
- Delete a file named "EC_55.INI" that is in your "Windows" directory. A simple way of doing this is to use Start -> Run -> EC_55.INI -> [Enter]. Notepad.exe will automatically open the file. Highlight ALL lines in the file, delete them, and then save the file. This will effectively erase the file.

To create a shortcut to the EXE on the server:

- If a demonstration version has previously been installed, use the "Remove Structural Engineering Library" option in the ENERCALC program group. Alternately execute the UNINSTX.EXE program in the ENERCALC installation directory and select the log file displayed.
- Create a shortcut to the EC55.EXE file on the server. (This is normal Windows usage and will not be detailed here).
- Use this shortcut to start the program.
- A "Demonstration Version" window will appear. Press the [Cancel] button.
- The "What would you like to do ?" window will appear. Press the [Cancel] button.
- From the main program menu select the "**Settings**" menu item. The following screen will be displayed:

Configuration Settings	
General Display Printing & Title Block Network L	imiter Parameters
System of Units : U.S. Standard SI	Metric Continental Metric
Automatic Recalculation after each data entry	
Show "Start-Up Wizard" at program start up ?	
Load Default Values for New Calculations	
System files drive/directory locations:	
Project files	
C:\EC55	
Program DLL's, Databases, Help, User & Limter	Files
C:\EC55	
Default Values file	
CINEC55	

- In the location for Program DLL's, Databases, Help, User & Limiter Files" enter the enter the drive & directory that the computer uses to access the directory on the server where the ENERCALC program files were installed.
- When finished press [OK]. Note! Double-backslash notation " \\ " to specify a computer name is NOT ALLOWED here. You MUST use a drive:\directory notation.
- Select [OK] to close the "Configuration Settings" screen.
- Select File | Exit from the main menu.
- Use the shortcut you created to restart the software. The license information should be automatically located on the server and you should be able to use the software in the normal way. You can now use the shortcut you created on the client workstation to start the SEL.....there should NOT be an "unregistered" message and the program should immediately display the Start-Up Wizard screen.

At this point the drive and directory locations have been saved in a file named EC_55.INI on the client computer in the \Windows or \WINNT directory. This file contains the directory location on the server where all the program files are assumed to be located.

IF YOU HAVE PROBLEMS

- Open the EC_55.INI configuration file by using Start | Run | EC_55.INI.
- Look in the file for these entries:
 - DataFileDirectory_55 DatabaseDirectory_55 DefaultsDirectory_55
- Look at the drive/directory information that is after the " = " sign. DataFileDirectory_55=C:\EC55 DatabaseDirectory_55=C:\EC DefaultsDirectory_55=C:\EC
- These entries should be set to the drive/directory on the server where the ENERCALC programs were installed.

To add an ENERCALC program group and shortcuts....

If the program group WAS NOT prepared in this way, here's how to do it manually:

- Decide where you want to put your ENERCALC icons. You will typically always want to have an ENERCALC item on your Start | Programs list. Because you will be a frequent user of the software, we also suggest that you create an icon on your Desktop.
- Right-Click the Start button.
- Select Open from the pop-up menu.
- Double left-click the Programs icon.
- In the window that is displayed, select File | New | Folder from the menu. A new folder will be created and waiting for you to alter the name below the folder icon. Enter Enercalc .
- Use the Browse button to locate the EC55.EXE application file in your Enercalc directory that was used for installation and double-click on it to select.
- Choose the Next button.
- Type in "SEL 5.8" or a similar name in the Select a name.... entry box and then choose the Finish button.
- Close all the other cascading windows that were opened during this process.
- Choose Start | Programs | Enercalc | SEL 5.8. The Structural Engineering Library should now start-up and you can continue with the discussion on User Information.

To add an ENERCALC shortcut to your Windows Desktop....

You may also wish to have an **Enercalc Structural Engineering Library** icon on your desktop for faster access to the software. This eliminates the cascading menu selections by going through the Start button.

- Clear the screen by reducing all open windows.
- Right-click anywhere over a blank area f the desktop.
- Select New | Shortcut from the pop up menu that appears.
- Use the Browse button to locate the **EC55.EXE** application file in your Enercalc directory that was used for installation and double-click on it to select.
- Choose the Next button.
- Type in "SEL 5.8" or a similar name in the Select a name.... entry box and then choose the Finish button.
- Double-click the icon that has been created. The Structural Engineering Library should now start-up and you can continue using the system.

Uninstalling

To remove the Structural Engineering Library from your hard disk...

• Use the "Remove Structural Engineering Library" selection in the ENERCALC program group off your Start | Programs system menu.

- or -

- Delete ALL FILES in your Enercalc directory <u>except those ending with ECW</u>. "ECW" files are project files which you should review and archive if you may need them in the future.
- Delete the EC_55INI files in your Windows directory.

Moving the SEL to another drive or directory location

If you want to move the software to another drive or directory location you need to modify the EC_55.INI file so that the default locations are changed also. Here's how....

- Write down the new drive letter and subdirectory structure.
- Select Start | Run : You should be viewing a dialog box titled "Run".
- In the data entry area labeled **Open :** enter the filename EC_55.INI and click Ok.

- Windows will locate the file and open it in the Notepad editor for modification.
- Look for a section labeled [SEL Configuration]. Below this division will be three entries (as follows). Change these to the new drive and directory location: DatabaseDirectory_55 = NewDrive:\NewDirectory\ ProjectDirectory_55 = NewDrive:\NewDirectory\ DataFileDirectory_55 = NewDrive:\NewDirectory\

for example: DatabaseDirectory_55 = C:\engineering\programs\enercalc\

3.3 System Overview & Design Philosophy

The **Structural Engineering Library** is a general software tool to assist you in analyzing and designing components in building type structures.

The **Structural Engineering Library** is a collection of programs, we call them "calcsheets", that provide design and analysis of components of buildings. Walls, columns, beams, footings, diaphragms, and other common elements can be thoroughly engineered through the use of the programs in this package. If you are a typical engineer, whose work consists of a monthly flow of small and medium size projects, this package is designed specifically for you.

As an engineer you will find that each program combines the governing code provisions, mathematical analysis processes, and commonly available construction materials into a simple and effective "calcpad" style fill-in-the-blanks program. You can feel partially relieved that the software will consistently perform all the required checks that may be skipped over when doing repetitive hand calculations....especially when fatigue sets in and a deadline is near! You can enjoy the time to do more exhaustive design studies, come up with safer and more economical designs, and enjoy clearly documented calculations for review and archiving.

This software is not a "black box" program. Each calculation is designed to be a "visible calcpad" where you can work with the data and immediately view the resulting calculations. Automatic design is provided in most programs, but is intended to primarily automate tedious iterative tasks.

You, as an experienced structural engineer or architect, can quickly enter and change design sizes and view the results. You use your experience to quickly define a design and do quick modifications to refine it. This software enables you to use your skills for design.

3.4 Product ActivationCode

The **Structural Engineering Library** is shipped to operate in "Demonstration" mode when first installed. This enables the product to be distributed, downloaded, and copied for review purposes without the need to purchase a license.

When in "Demonstration Mode" a window appears every 4 minutes reminding you that you are using a demo. In addition, all printouts have "Unlicensed Demo / Not For Commercial Use" written in the background to deter "real" usage.

License users are given a "**Product Activation Code**" to enter into the program. This password contains your User Registration Number and the number of simultaneous license usage allowed.

Demonstration Version			
	Structural Engin	eering Library - Versio	n 5.8
Thank	you for installing the com	plete Structural Engineering Libr	ary version 5.8.
The "I "Demo	Product Activation Code" to onstration Version" messag	hat is required to remove the ges from the software has not bee	en entered.
Pleas	e select what you want	to do	
Licensed Users > > >	Let me a	enter my <u>P</u> roduct Activation Code	(PAC)
Use as a DEMO > > > >	Let me use	the <u>C</u> OMPLETE package before I	purchase
L	This software is the comp messages that appea software is unlic including co	lete system with timed "Unlicensed r at 5 minute intervals. The printed o censed. Otherwise it is the <u>full worl</u> omplete on-line Windows help for all	Demonstration ∀ersion [®] utput also states the king system, programs.
Purchase Info > > >	Show me how to gurchase a license	Print An Order Form	Cancel
ENERCALC Engin	eering Software, USA 94	9-645-0151 Fax: 949-645-3881	Email: info@enercalc.com

After first installation you will see this screen:

Licensed users should select the top button "**Let me enter my Product Activation Code (PAC)**". This will display the following screen:



Refer to the installation instruction given earlier on about this question.

After pressing **[Close]** you will be taken to the screen where you can enter your PAC :

ser Information	Product Activation Code
	Working in Demonstration Mode
PAC	: Product Activation Code : Save
	Note: PAC is case sensitive !
The "Produc	t Activation Code" unlocks the software from "DEMO" mode.
If you have h Your PAC ca	ost your Product Activation Code you can request it via email from support@enercalc.com. In be supplied ONLY if you include the following information
- Suppl - Comp	y your "KW" ENERCALC Registration number any name, address, and contact name
Notel	These items MUST be provided to get your PAC I

NOTE: You can display this window at any time by selecting "User Information" from the main menu or pressing the [Tolls & Settings] button and selecting "User Information.

This entry is where you can enter your Product Activation Code (PAC). Your code is a mixture of upper and lower case letters, numbers, and the "@" and "+" symbol. We have eliminated capital "O"'s and zeros to reduce any confusion about the PAC. Your PAC will be between 12 and 15 characters....the actual number is based on the encryption algorithm used to create it.

After entering all characters either press the **[Tab]** key or the **[Save]** button. If it is entered correctly the screen will change and you will see a registration information screen as follows (your user registration number and license count will be different) :

	Registered License	
Ente	er New PAC	√ <u>O</u> k
	User Registration Number KW- 66 66661	
	License Count 1	
	 Use your REGISTRATION NUMBER for ALL correspondence. "License Count" is the number of simultaneous users allowed. 	

If You Purchase Additional Licenses

If you purchase additional licenses you will be issued a new PAC. In that case you will press the **[Enter New PAC]** button and the following screen will be displayed:



This screen allows you to enter the new PAC. Press [Save] to save it or [Lease Old] to exit this screen without changing your PAC.

NOTE: The Product Activation Code is NOT AVAILABLE FOR VIEWING AFTER IT IS ENTERED. Keep your ENERCALC supplied material with your PAC in a known and safe place. DO NOT GIVE IT TO OTHERS TO USE as that is a violation of your Software License Agreement and immediately voids your license.

3.5 About Our Documentation

Documentation of your software package is essential for your successful and pleasant use of our products. We try hard to supply you, now and on an ongoing basis, detailed information on all aspects of your purchase. To support this commitment, we provide documentation of your software in four forms:

- A printed User's Manual.
- A Windows Help system file named ENERCALC.HLP that is installed with your software. This help system may be accessed using the "HELP" menu item in the program
- A Adobe Acrobat PDF file that contains the entire User's Manual in electronic document format. This PDF file includes a "clickable" table of contents for easy navigation.

 An Internet version of the help system if available at <u>www.enercalc.com/sel_help</u>.

Updating your Documentation

The most up to date documentation for our software products is always available in electronic form.

You have several options....

- Download the latest Adobe Acrobat PDF documentation file here: <u>ftp://www.enercalc.com/sel5.pdf</u>.
- Download the latest Windows Help system file here : <u>ftp://www.enercalc.com/enercalc.hlp</u>.
- Use the Internet edition at <u>www.enercalc.com/sel_help</u>.
- Call our Business Office at 800-424-2252 and inquire if printed documentation is available for purchase.

3.6 User Information

It is important that you enter information about yourself and company into the program. We have provided an entry screen for this by selecting "User Information" from the main menu or pressing the **[Tools & Settings]** button and selecting "User Information".

User Registration Information				
User Information Registration Information	tion			
Note: To change this information	on later, use the Help User Info menu item			
Software Licensee Company	ABC COMPANY INC.			
Software Licensee Name	Software Licensee Name John P. Smith			
Email Address	Johnsmith@abccompany.com			
Voice Phone Number	(123)-456-7890 Fax (987)-654-3210			
Address Line 1	123 Main Street			
Address Line 2				
City	Anytown			
State / Province	CA			
Postal Code	99999			
Country	USA			

This information is used in the Technical Support forms and emails to automatically fill in your identifying information when using those methods for contacting us.

3.7 Technical Support

Enercalc Support Services

ENERCALC is committed to providing customers with quality technical support for our software products. Because the software is of a highly technical nature, technical support questions tend to be more involved in resolution because of the mathematical investigations, code referencing, and common building practices involved in structural engineering design.

We have worked to review our 20 years of software development experience to identify major areas of questions that users experience and have developed a strategy that maximizes 24-hour availability of solutions to our worldwide users. Assistance divided as follows:

60 Day Start-Up Support

For 60 days following your purchase of a new software package we want to make sure you're off to a smooth and successful start with your new investment. Remember that

your purchase is back by a 60 day money back satisfaction period. If you are not satisfied just call our business office at (800) 424-2252 and request a "Return Authorization Code".

To receive technical support simply call or fax Technical Support, include your software registration number and your detailed question.

During this time you can also use our Web based technical support document system and fax-back document service.

Technical Support	(949) 645-0441
Technical Fax	(949) 645-3881

Six months Free Technical Assistance

Included in your purchase of a software license is six months of free technical support and maintenance releases. After that time you will need to subscribe to a yearly Maintenance & Technical Support program.

Yearly Maintenance & Technical Support Program

After 6 months you will be off and working with your software, with any installation and hardware questions a thing of the past. In most cases, you will only encounter questions dealing with the numeric answers you obtain from the software.

Because the software is a mature and thoroughly tested product and thorough documentation provided, answering these questions requires a detailed review of the calculation and data you have entered.

Please contact us directly for policies and pricing for your Yearly Maintenance & Technical Support program.

Fax Your Technical Support Form

We have provided a built-in technical support form where you can enter your question and a complete form will be printed for fax submission to us. Use the "**Help**" menu item and select "**Fax Support**". A window will be displayed with three tabs. Fill in all three as desired, print and fax to 949-545-3881.

Here are images of the screens & printout :

26

our Information	N Your Question Question Category User Number: KW-0600001
Date	31 OCT 03
Name	John P. Smith
Title	
Company	ABC COMPANY INC.
Address	123 Main Street
Address 2	
City	Anytown State CA Zip 99999
Voice	[123]-456-7890 Fax [987]-654-3210
email	Johnsmith@abccompany.com

Your Information	Your Question	Question Category	User Number:	KW-0600001
rourmionnation	1 our guestion	Question Categoly		
Filename	c:\ec55\examples	s.ecw		
Calculation Type	e : General Project I	nformation		
ane	w project ? JPS			iner again w hen i stat
I.				
			¥	
				2

hnical Support Submittal					
Your Information	Your Question	Question Category	User Number	r: KW-0600001	
General Area of Qu C Don"t Agree w C Drawing Graph C Unit Conversio C Database C Project Manag	ith Results C Enten nics C Draw ns C Printe C Gene	ring Data ring Stress Plots put eral	Time Frame Suggestion for Future ONagging Problem Sporadic Behavior OURGENT !		
				it <u>Print</u>	

	Technical Support Request					
Fax this form to 949-640-5463						
Name Title Company Address	Michael D. Brocks ENERCALC P.O. Box 168	Todays Date : 15 APR 0				
City State	Corona del Mar CA Zip 92525					
Voice Fax	(949) 640-5450 (949) 640-5453					
email	mdbrocks@enercalc.com					
Filename Calc Type	 c.'ec/datalexamples.ecw Masonry Wall Design User: KW-0602830, Ver 5.5.0, 17-M 	sy-2001				
Question	How is allowable solal stress calo	Awted ?				

To help you get your questions answered AS FAST AS POSSIBLE when you do not have priority support, please use these guidelines. We are continually building our Knowledge Base of information from the telephone, fax, and e-mail questions that are received.

In addition, the on-line help system included with your software is also being continually updated to include this information. Take the time to occasionally download new versions of the help files from the WWW, or BBS.

The fastest way to contact us is via FAX. Next in line is email.

Because of our schedules for software development and technical support responses, voice calls to technical support will result in slower response times. If you send us a fax, it literally drops in our laps and can be reviewed as soon as possible, email questions get our attention the fastest, as our continuous Internet connection receives mail every three minutes. If you have a question on a program's results, send an email and include the project file (*.ECW files) that contains the calculation. We can view and respond very easily and possible even correct the calculation for you and send it back!

Installation or Printing Questions

These are the most common of repetitive questions received by most software companies. These questions will accumulate in the Knowledge base (see above). Please check one of these areas first, or you may send a message along with a clear explanation of you needs, and fax it to USA 949-645-0441 or via e-mail to mail@enercalc.com. We will respond within 24 hours. (The more detailed information provided with your questions, the faster the response time will be.)

Replacement Diskettes

You may obtain replacement diskettes (current version only) for a small fee. Please use go to <u>www.enercalc.com</u> and select "Order" where you will be able to place your diskette order.

Questions on a Data Item in the program

First, consult the on-line help system provided with your software. This system uses the Windows Help system to read, review, and search for information. Our On-line documentation contains a description for every single data input and output item in the entire software package. Press [F1] and the Help System will display the opening screen for the calculation you are using. Simply navigate down the page or click on a link to locate the item you wish.

If we have not documented the item well, or not provided enough information to answer your question, we want to answer your question and know where more information is needed. We can then update the help system file and make a newer one available for you and others to download. Please call, e-mail, or leave a voice messages with your question for 24-hour response.

Questionable Numeric Calculated Values

If you have a question about how a value is calculated by the software, our technician will need to see very specific information. In these cases, FAX a copy of the calculation printout along with enough descriptive information and hand calculations showing your question or why you could not get the same numbers. This is a very detailed type of technical support, and can take a few days to investigate depending upon the degree of complexity. Please FAX your information and printouts to 949-645-3881.

3.8 Maintenance Releases

Note: Maintenance releases are only available to user subscribing to the yearly maintenance & support program when past their free 6 month support period.

Maintenance releases are prepared between major upgrades and contain corrections to the program, enhancements that are simple in nature and will be appreciated by the user base, updates that give the software more compatibility with new operating systems and common hardware. Also included in maintenance releases are improved ways of supporting the user for a trouble free experience such as improvements to the automated updating system, added databases, etc.

Note! The Structural Engineering Library consists of up to 30 megabytes of files. This option will let you know what the size of the update is and advise you of an estimated time to completion based on your tested Internet connection speed.

3.9 Network Limiter

ENERCALC has never used copy protection in our software products, but we do employ a limiting system that monitors execution of the program. Your purchased software license allows for a specified number of SIMULTANEOUS users to be using the software.

The **Structural Engineering Library** contains programming that records information for the computer currently using the software. Based on the number of licenses allowed (which is encrypted into your Product Activation Code) the software limits simultaneous usage of the software to the number of licenses you have purchased.

What this means is that if you have just one software license, trying to start another program session with one already in progress will result in a message saying the second session is not allowed to begin until the first is terminated.

If you have any problems getting full simultaneous execution of all licenses you have purchased:

Make sure all currently running copies of the Structural Engineering Library are closed. In the installation directory for the software locate and delete the file LIMITER_.ECO.

This file contains the usage information that the software thinks is currently running. This file will be created again automatically the next time it is started.

Note! Do not delete this file when the software is in use. If you do this then the software currently running will close down shortly thereafter.

To access the Network Limiter control screen use the "Settings" main menu selection -orpress the **[Tools & Settings]** button and select "Settings". When the Settings screen is displayed select the tab titled "Network Limiter Information" as shown below....

Configuration Settings	
General Display Printing & Title Block Network Limiter Information	
Number of Users Allowed 1	
System Signals Activity Every 10.00 ★ minutes* Inactive time which allows new user to remotely shut down inactive users 35.00 ★ minutes*	Display a List of Current Users
 When the users interacts with the program it records active use. However, the activity log file is only updated at certain intervals to minimize This value specifies how often the server log is updated to signal activity i This value indicates the length of time a user can be inactive before being forced shutdown. Forced shutdown can occur when another workstation is and another user (the oldest) has been inactive for the number of minutes 	e server access. s taking place. g a candidate for requests access to the soft\ s specified by this entry
	√ <u>C</u> lose

This screen provides two control items that you can modify:

System Signals Activity Every XXX Minutes

This controls how often the program updates the file that tracks all the users. Setting it to a

higher value results in better performance.

Inactive Shut Down Time

This values is the number of minutes a running copy of the Structural Engineering Library can sit untouched (meaning no data entry, tab changes, button presses, etc) before it will be shut down when another user tries to start a session.

This item provides automated management of multiple usage needs when some users leave the software running and have forgotten to shut down.

Display a List of Current Users

This button displays a list of all computers currently using the software. The "Computer Name" field in the list is the computer's name reported by the operating system of the client computer (not the host) that launched the software.

User Name	Computer Name	Start Date	Start Time	Time Logged Or
Administrator	MDBROOKS	31-0CT-2003	2:43:35 PM	0:04
	1		_	
		\mathbf{v}		1
		\sim		v

Using this screen you can selectively delete users as needed.

3.10 License & Copyright

Your use of this software system signifies that you will be bound by the following terms, conditions, and statements.

Disclaimer

Because this software may be used to design components of structures that protect human life, it is CRITICALLY important that you fully understand the intended use and capabilities of these programs. **Only experienced and licensed professional engineers should use this software.**

The authors of this software have tried, to the best of their ability, to correctly combine the principles of structural mechanics, provisions of popular building codes, and typical analysis processes into all the software programs. **Regardless of how thoroughly any software is tested, errors may occur, and the engineer-of-record for a project should thoroughly review the results and must take responsibility for the use of the final calculations.** No software can possibly account for the multitude of factors influencing sound structural design, therefore this software should be considered only an aid to performing numerical calculations.

In no event will ENERCALC Engineering Software, its officers, owners, or employees be liable to anyone for any unfavorable conditions occurring from the use of this software.

If you do not agree with the terms of this disclaimer or the terms of the License Agreement, return this manual and uninstalled program disks to **ENERCALC Engineering Software** within 60 days of purchase for a full refund of software cost and sales tax. Installation of the software by you indicates your acceptance to this disclaimer and License Agreement.

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Software License

This is a legal agreement between you (either an individual or an entity) and **ENERCALC Engineering Software**. By installing the accompanying software, you agree to be bound by the terms of this agreement. If you do not agree to the terms of this agreement, promptly return the uninstalled software and accompanying items to us for a refund.

Grant of License

This license agreement ("License") permits you to "use" one execution of the ENERCALC
Structural Engineering Library (the "SOFTWARE") on a single computer. The SOFTWARE is in "use" on a computer when it is loaded into temporary memory (i.e. RAM) or installed into permanent memory (e.g. hard disk or other storage device) of that computer, except that a copy installed on a network server for the sole purpose of distribution to other computers is not "in use".

When installed on a network server, if the anticipated number of users of the SOFTWARE will exceed the number of applicable Licenses, then you must have a reasonable mechanism (or) process in place to ensure that the number of persons using the SOFTWARE concurrently does not exceed the number of Licenses. If the SOFTWARE is permanently installed on a hard disk or other storage device of a computer (other than a network server) and one person uses that computer more than 80% of the time it is in use then that person may install the SOFTWARE on a portable or home computer so long as both systems are not used simultaneously and the registered owner of the software consents to this activity.

Upgrades

If the SOFTWARE is an upgrade, you may use or transfer the SOFTWARE only in conjunction with ALL prior version(s), and all versions are considered as a single license.

Other Restrictions

You may not rent or lease the SOFTWARE, but you may transfer the SOFTWARE and accompanying written materials on a permanent basis provided you retain NO copies and the recipient agrees to the terms of this Agreement. If the SOFTWARE is an upgrade, any transfer must include the most recent upgrade and all prior versions, and will transfer all rights to future versions to the transferee. You may not reverse engineer, decompile, or disassemble the SOFTWARE, except to the extent applicable law expressly prohibits such foregoing restriction. This software may not be used in a business activity where the primary purpose is to provide others with usage of this software system for a fee, i.e. network availability to those other than the licensee on a timesharing basis.

Dual-Media Software

You may receive the SOFTWARE in more than one medium. Regardless of the type or size of medium you receive, you may use only the medium appropriate for your single-user computer. You may not use the other medium on another computer or loan, rent, or transfer the disks to another user except as part of the permanent transfer (as provided above) of all SOFTWARE and printer materials, nor print copies of any documentation provided in "on-line or electronic form.

Limited Warranty

ENERCALC warrants that the SOFTWARE will perform substantially in accordance with the accompanying written materials for a period of sixty (60) days from the date of receipt. Any implied warranties on the SOFTWARE are limited to sixty (60) days.

No Other Warranties

To the maximum extent permitted by law, ENERCALC disclaims all other warranties, either expressed or implied, including, but not limited to, implied warranties or merchantability and fitness for a particular purpose, with regard to the SOFTWARE and the accompanying printed materials. This limited warranty gives you specific legal rights. You may have others that vary from state/jurisdiction to state/jurisdiction

No Liability for Consequential Damages

To the maximum extent permitted by applicable law, in no event shall ENERCALC be liable for any damages whatsoever (including without limitation, damages for loss of business profits, business interruption, loss of business information, or any other pecuniary loss) arising out of the use of or inability to use this ENERCALC product, even if ENERCALC has been advised of the possibility of such damages. ENERCALC makes no warranties, either expressed or implied, as to the quality and performance of the SOFTWARE, that the calculations contained in the SOFTWARE will meet your requirements, or that the operation of the SOFTWARE will be uninterrupted or error free.

You agree that the SOFTWARE is intended to aid you in performing engineering oriented mathematical calculations, and that the results obtained from the SOFTWARE do not necessarily constitute an acceptable engineering design or analysis. You agree that results of the SOFTWARE shall be reviewed by persons possessing experience and thorough understanding of the engineering principles that apply or might apply to the usage of and results of the SOFTWARE. You agree that ENERCALC, any owner, officer, director, employee or representatives of ENERCALC shall not be liable for any direct, indirect, incidental or consequential damages resulting from a defect in the SOFTWARE, nor for any error of judgment, mistake of fact, or act or failure to act. You waive all warranties imposed or implied by law in connection with the SOFTWARE other than those specifically provided for herein and agree that no agent or employee of ENERCALC has made any warranties or promises, express or implied, other than those expressly contained herein.

3.11 Request for Suggestions

Although our intentions are to provide you with the best product possible it is likely that there may be areas of this User's Guide and software that could be improved to better suit your needs, be made simpler to operate, easier to understand, or support engineering technologies that have emerged since this publication.

To call these to our attention and to offer suggestions for improvement we sincerely request that you send us your thoughts. Please address your comments to:

Michael D. Brooks, P.E., S.E. President ENERCALC Engineering Software

MichaelBrooks@enercalc.com

Post Office Box 188 Corona del Mar, CA 92625



4 Using the Structural Library

4.1 Overview

The **Structural Engineering Library** is a collection of programs, we call them "calcsheets", that provide design and analysis of components of buildings. Walls, columns, beams, footings, diaphragms, and other common elements can be thoroughly engineered through the use of the programs in this package. If you are a typical engineer, whose work consists of a monthly flow of small and medium size projects, this package is designed especially for you.

As an engineer, you will find that each program combines the governing code provisions, mathematical analysis processes, and commonly available construction materials into a simple and effective "calcpad" style fill-in-the-blanks program. You can feel partially relieved that the software will consistently perform all the required checks that may be skipped over when doing repetitive hand calculations. You can enjoy the time to do more exhaustive design studies, come up with safer and more economical designs, and enjoy clearly documented calculations for review and archiving.

This software is not a "black box" program. Each calculation is designed to be a "visible calcpad" where you can work with the data and immediately view the resulting calculations. Automatic design is provided in most programs, but is intended to primarily automate tedious iterative tasks.

You, as an experienced structural engineer or architect, can quickly enter and change design sizes and view the results. You use your experience to quickly define a design and do quick modifications to refine it.

The "Calcpad" Approach

When the Structural Engineering Library was designed in 1983 our concept was revolutionary....design it like an engineer's calculation pad. When an engineer prepares a calculation the finished product is a neat and organized sheet of paper that follows the design flow from load tabulation, force and stress calculation, to the final adequacy check of the structural component that will satisfy the task.

At the time all other competing program were aging versions of mainframe programs that had been modified to run on microcomputers. Many were the one "batch" design....enter all the data, tell the computer to "run" the program and then open a crude file to review the results. ENERCALC was unique in that the input and output was mixed on the same screen....easy to see at a glance. But the most revolutionary aspect was the tremendous speed it offered to prepare calculations.

This great speed was due to the fact that you could change a number and <u>instantly</u> all the results were available for viewing.

Moving forward the current Version 5.8 for Windows maintains that same fill-in-the-blanks approach with instant recalculation of results. When using one of the 45 calculation modules all data input and output is presented on the same screen and viewed just by selecting a "tab" that groups the information. <u>Whenever you change</u> **an input values the entire module is recalculated and the results immediately visible**. Thanks to efficient programming and fast modern computers incredibly complex structural analysis and design is performed in a split second.

This instant updating also happens when you are viewing graphical sketches of your design or stress diagrams.....after any change the graphics are instantly updated.

A Typical Worksession

In order of occurrence here are the steps in using the software:

Start the program

- 1. "Start Up Wizard" is displayed where you can select to use the last calculation, load the last project, load a recent project, or create a new project.
- 2. A project is selected and you view the "Project Manager". Here you can add new calculations or edit existing calculations.
- 3. Editing or adding a calculation takes you to the calculation sheet for one of the 45 modules.
- 4. Using the calculation sheet you enter data on the left-hand set of tabs while reviewing results and graphics on the right-hand set.
- 5. When your structural calculation is complete print it -or- press save it back into the project.
- 6. You are now back at the project manager where you can add/edit/delete other project calculations.

4.2 Start Wizard

The **Structural Engineering Library** provides a quick start-up selection box to help you get productive as fast as possible. This window offers five selections described below.



Open Last Project File

This item opens the project file you were working on during your previous **Structural Engineering Library** session.

Jump to Last Calculation

Opens the last project file and goes directly to the last calculation you were working on.

Select a recent PROJECT file

A list of recently used files is displayed in the listbox. You can double-click on a file -or- highlight a file and press the [Edit] button. This will open the project file and display it in the Project Manager.

Create a Project File

This is equivalent to selecting File | New from the main menu, and allows you to name a new project file to be created.

Open a Project File

This is equivalent to selecting File | Open from the main menu, and allows you to select a ENERCALC "ECW" project file from a file selection dialog box.

Single Quick Calc

This allows you to immediately select a calculation to use. You can enter data and print your calculation. You can not save a Quick Calc!

Cancel

Closes the window and displays the empty Structural Engineering Library window.

If you would prefer that this window not appear at startup, you can "uncheck" the item **"Show "Start-Up Wizard" at program startup ?** found at the bottom of the screen or by selecting Settings | General | Start Up Wizard.

4.3 Main Window & Menu

The main window in the **Structural Engineering Library** is actually rarely seen! Because you are usually working in the Project Manager screen the main frame & menu are not often seen.

The only activity you can take here is to make one of the menu selections. These will be described below and we want you to know that most of these selections are also available on the Project manager screen and the individual calculation screens using a buttons.

All activity takes place within the ENERCALC - Structural Engineering Library window, which is a standard application frame. When you open an existing or create a new project file, the window displays the project list and calculation currently being "edited".

The main menu allows you to convert calculations from other project files, change general settings, view, add, modify, and delete items in the material databases, and save and retrieve "default" values if a calculation is being edited.



File Menu

The menu contains several options for creating, opening, and saving Project files; converting previous DOS version files to the new format; and starting the Web Update program.

The Structural Engineering Library uses Project files to build sets of calculations. These files have an extension "ECW" (E nerC alc for W indows). These files are highly complex and are maintained by an industrial strength database management system. This file contains your project information and data structures for all calculations types.

With some clever design we have been able to make these files act like miniature disk drives with a 2-tiered tree structure. You can create Divisions that categorize your calculations. This tree structure is what is viewed in the Project Manager window and should not be confused with a view of your hard disk .

The Project File is kept up-to-date at all times EXCEPT when a calculation is being edited. During calculation editing, only the beginning values are contained in the data file; the values you see on-screen are in temporary memory, and will not be saved to the datafile until you select the "OK" button.

Basic functional menu items are as follows. Updated software releases may have

additional choices which will be documented in the on-line help system.

New

Displays a file selection box where you can enter the filename of a new SEL Project file.

Create NE₩ S	tructural Project File	ŝ.		? ×
Savejn:	<u>]</u> enercalc	•		▶
98-003.ecw Bronson.ecv Examples.ecv Parkcity.ecv Sample.ecw Wheaton.ecv	N DW N J DW			
File <u>n</u> ame: Save as <u>t</u> ype:	BarnesNoble Project File (*.ecw)		•	<u>S</u> ave Cancel

Open

Displays a file selection box which lists all files in the current directory that have the standard extension "ECW". You can use this dialog box to navigate to another drive or directory.

Open Project	File		? ×
Look jn:	😋 enercalc	- E e	*
98-003.ec	W		
Bronson.e	CW		
Examples.	ecw		
Parkcity.e	DW		
Wheaton (ecm		
- Whoden			
File <u>n</u> ame:	Parkcity		<u>O</u> pen
Files of <u>type</u> :	ENERCALC Files (*.ecw)	•	Cancel

Last Calculation

This selection takes you directly to the last calculation in the last file used.

Last project

This selection opens the last Project file you were using and displays it in the Project manager.

Check & Install Updates

This selection will launch the automatic Internet based software updating system. The Structural Engineering Library will be closed and the updating program will be started. A screen will be displayed listing the files that need to be updated (or that you are already up-to-date) and a detailed display of the download progress and file status will be presented.

Print Setup

This allows you to select the printer to display for approval when printing the project or single calculation.

Name:	HP OfficeJet		Properties
Status:	Ready		
Type:	HP OfficeJet		
Where:	LPT1:		
Comment			
Paper		- Orientatio	n
Size:	Letter		Portrait
<u>S</u> ource:	Printer Folder Setting	A	C Landscape

Exit

Closes the currently open project file, close the application window, and exits the Structural Engineering Library.

List of Last Used Files

At the bottom of the File menu is a list of the previously used Project files. The most recent to be used is listed at the top, with the earlier used files appearing below. Simply move the mouse over a file you wish to use and click to select it. This list is maintained in the ENERCALC.INI file which you may edit if needed.

s≱ EI	NERCA	LC - Struc	tural En
Eile	Quick	<u>S</u> ettings	Defaults
New	H		
Op	en		
Sa	ле До		
gla	se		
Cor	n⊻ert*.E(CJ	
Prin	nt Setup .		
<u>W</u> e	b Updat	e	
E <u>x</u> it	t		
C:\	EC\EXA	MPLES.EC	W
C:\	EC\EC5	ECW	

Quick

Use this selection when you want to quickly use one of the calculations provided with the Structural Engineering Library. You can use this feature regardless if a Project file is currently loaded. This menu item will be disabled when you are editing a calculation from a project file.

Selecting this menu item displays the standard selection window where you can choose the calculation to use. You can immediately begin using a calculation and print the results. Please check your current version program for capabilities of adding "Quik" calculations to a project calculation file.

Choose Calcsheet/Program		
Button Selects Calcsheet Type Material Type	© New Calculation C Import ∨4.x datafile	X Cancel
Cantilevered Retaining Wall		Analysis Timber
Restrained Retaining Wall		Steel
Tapered Stem Wall Design		Masonry
		Retaining Wall

Settings

This selection displays the Settings window where you can specify how you want your title block to appear, specify a bitmap graphic image to use as a title block "logo", control data and time printing, change system of units, and other items. Please see the Configuration Settings section.

Database Menu Item

The Structural Engineering Library has three basic databases of information, and may contain more in future releases. After selecting the database from the drop-down menu list, you can review the values and add, change, or delete entries as you desire. Here's an image of the Steel Database window.....

Steel Datab	ase							Sect	ion Type to I	Display				_	
AISC 9th	C	AISC 8th		C AIS	0.7fh	C AISC	3.6th	W	HP	JR	с	TS	HSS-T	L	w
Korean								S	м	8	мс	Р	HSS-P	ш	м
Donth Dan	no: la			तन्त्र भ	LT.	. —		WF	BP		JRC				51
n inde staal	ge. Lo		4 1	1	nigi	n =	44 🗡 🔺	n							
(Linits about	uce beam o	epeni													
Class Rang	ge: Lo	W = 1	4 •	∕ ▲	Higi	h =	44 🔻 🔺	Sort	Order o	h a second		~			
(Limits beam	depth by c	lass, i.e.W	12 is clas	s"12"				water	anner (•	Ascendi	ng		Uescena	ing	
ame Area D	epth Widt	h Sx	Ix S	x/Area	Ix/Area	Su lu	Area/Perim	ster		Sec	tion Cou	unt :	293		
- Contraint	and dame	1.1.				an fan de fan i	a.lanninininini								
Name	Area	Deptin	Bf	П	Tw	Sx	k	Sv	lv.	T1	Xca	Yca	_ Sxx / ±		4
2000.000	in2	in	in	in	in	in3	in4	in3	in4	in	in	in			4
V21×57	16,700	21.060	6.555	0.650	0.405	111.111	1,170.000	9.336	30.600	1.640	3.278	10.53	0 1		c.t.
V21x62	18.300	20.990	8.240	0.615	0.400	126.727	1,330.000	13.956	57.500	2.100	4.120	10.49	5	2.00	Teleco
W21x68	20.000	21.130	8.270	0.685	0.430	140.085	1,480.000	15.647	64.700	2.120	4.135	10.56	5		
W21x73	21.500	21.240	8.295	0.740	0.455	150.659	1,600.000	17.022	70.600	2.130	4.148	10.62	0		
W21x83	24,300	21,430	0.355	0.635	0.515	170,789	1,830.000	19.465	81,400	2.150	4.178	10.71	5		
W21X33	27.300	21.020	8.420	0.930	0.580	191,489	2,070.000	22.067	92.900	2.170	9.210	10.81	8		
V21X101	29,800	21,560	12.230	0.800	0.500	220.532	2,420,000	40.356	246.000	3.270	0.145	10.00	5		Insert
V21X11122	32.700	21.510	12,340	0.020.0	0.550	272.002	2,670,000	49,400	205.000	3,200	6.105	10.24	0	-	-
W21×122	20 900	21,000	12.330	1.025	0.600	273.083	2,360,000	43.233	305.000	3.300	6.220	10.04	E .		
W21X132	42 200	21.000	12.440	1.150	0.050	230.007	3,220.000	53.537	276.000	2.240	0.220	11.03	0		Ø
N01-166	40.000	22,000	12.910	1 200	0.720	323,102	A 200 000	20 0.49	425.000	3.340	6.200	11.03	in –		
W21×100	53 600	22,720	12,920	1.300	0.230	416 373	4,200.000	77.280	493,000	3.360	6.250	11.29	0 0		Change
V21v201	59 200	23 020	12 575	1.630	0.030	461 1 29	5 310 000	86 203	542 000	3 380	6.289	11 61	5	-	_
N21-223	65 400	23 350	12 675	1 790	1 000	509 636	5 950 000	96.095	609.000	3 410	6 338	11.67	5		-
A/21x248	72 800	23 740	12 775	1 990	1 100	569 503	6 760 000	108 650	694 000	3.450	6.388	11.87	n ·		1000
M21x275	80 800	24130	12 890	2 1 90	1 220	631 579	7 620 000	121 800	785 000	3 480	6 445	12.08	5		Delete
W21x300	88,200	24,530	12 990	2 380	1 320	691 398	8 480 000	134 411	873.000	3,510	6 495	12.26	5	_	Punto
N21x333	97 900	25,000	13 130	2,620	1.460	768 800	9,610,000	151.409	994,000	3,550	6 565	12.50	io 😪		
W21x364	107.000	25,470	13,265	2.850	1.590	848.057	10.800.000	168.865	1.120.000	3.590	6.633	12.73	5		Y
	110.000	26 020	12 405	3130	1,730	937,740	12,200,000	204,756	1,270,000	3.630	6.203	13.01	0		-
W21x402	1110.000	20.02.0	1 Sec. 10.1	the second se			a second s			the second se	the second se				

Calculator Menu Item

This item gives you access to a calculator.

🖬 Cal	culato	r			-	
						0
Mem:	0					141
Exp	Ln	MC	7	8	9	4
χ2	Lg	M♦	4	5	6	*
π	1/x	M-	1	2	3	÷
1	10x	M+	+/-	0	•	×
* 1	왕님	M	CE	=	+	-
		-	-	_	-	

User Information Menu Item

This item allows you to enter your company information and Product Activation Code. Please see the section titled "User Information" for more information.

Help Menu Item

Please pay careful attention to this menu items contents ! The information accessed by the items in this menu will be constantly added and improved to give you the best possible

resource of help possible. Not only are detailed technical descriptions for all items in every calculation provided, but our ever expanding "knowledge base" of questions and answers discussed with your fellow users worldwide will be a tremendous source of additional information.

Also, complete release notes chronicling all the changes to the software since the release of version 5.0.1 will be provided so you can see the ever changing and developing path of the software system. (See Release Notes below.)

Of special note is the built-in technical support form. With your user information already filled in you can simply type out your question to us, specify the nature and importance level, and print it directly to your internal fax-modem or to a printer for separate faxing.

Main Help System

This item provides access to the main on-line help system as provided with your Windows operating system. Using the Contents, Search, Index, Find, and hypertext links (the underlined text items) you can quickly zero-in on the information you need.

Technical Support Form

When you have a question the fastest way to get an answer is to FAX it to our technical staff at 949-640-5463. To make this as easy as possible, we provide an on-line form where you can type our your question and print it directly to your fax-modem or printer. This form includes all your user information, phone and e-mail contacts, and version number. We know exactly who you are and the current sub-version of the software you have.

	Fax this	form to 949-640-546	3
leme	Michael D. Brocks		
nne Company Address	ENERCALC P.O. Box 188	Todays De	ate : 15 APR 01.
City State	Corona del Mar CA Zip 92525		
Voice Fax	(949) 640-5460 (949) 640-5463		
i lisma	indbrocks@enercalc.com	1	
liename	c lec/datalexamples.ecw		
Calc Type	Masonry Well Design User: KW-0602830, Ver	5.5.0, 17-May-2001	
Question	How is allowable axial	stress calculated ?	

Release Notes

46

This item displays the text file SELNOTES.TXT which contains all the programs revision history.

View SEL 5.0 Release Notes	- - ×
REVISION & FEATURE HISTORY : Structural Engineering Library Version	0 for Windows
ENERCALC Technical Services Voice & Fax on Demand: 714-640-5460 Fax: 714-640-5463 E-Mail: mail@enercalc.com	
>> Version 5.0.6 - June 1, 1998	-
 Recompiled entire system with new version of our development system Changed data entries to stricter numeric entry formatting. In-entry formula evaluation removed 	_
 Bolt Group/Steel Reversed "X" and "Y" direct and torsional shear result columns. The "X" labeled "Y" and vice versa 	was
	ind Find NextOose

About & Version Number

This selection displays the current version, user registration number, user name, company name, build data, and copyright information.

4.4 Project Manager

The Project Manager screen is the central workpoint for the **Structural Engineering Library**. After you have selected or created a project file this screen displays the calculations within that file in the list area shown below (left side, white background). There are several main areas to this screen:

- Current Project File Name
- File management and system access buttons
- Unit Selection Buttons
- Project Info and Project Calculations Tabs
- Calculation List and List Management Buttons
- Individual Calculation Summary & Sketch

NERCALC : EXAMPLES.ECW						
roject. c:\ec\examples.ecw				SaveA:	Close	Project
roject Info Project Calcu	lations Units	US SI Metric A	<u>N</u> ew		<u>T</u> ools & Settings	? Help
Print Copy Calc Calc	- Delete Calc +	Add Edit Calc	ngle Span pan = 40.001	Beam Analysis ft. Left Cant = 10.00)ft, Right Cent. •	= 12.00ft End
ection View Material View	Calc Type View	Bo Esport Bo import M	left = -137.9	7k-ft Mright = -137	57K-10 60k-ft = 49.10k	
Beam Analysis A Rigid Diaphragm Beam Elastic Fdn. Section Properties Pile Group Pole Embedment Seismic Forces	Double Cantilevered Beam Example Problem, 8 Wall Sy Beam with Fixed & Pinned ei I Beam w/ various shapes a Seven pile system w/ X&Y Circular pole with Point & Uni Example Problem,	ystem, One Wall Angled nds titached Ioad eccentricitry iform Loads				
Given a forces Given a forces Given a force of the forc of the force of the force o	Exemple Problem, 5 Story Building 3-Span System, 2 Load Patt Double Cantilevered Beam Example Problem #2, Doubl Four Bay SystemCant. Optim Column Subjected to Additio Vertical Pt & Unif. Loads & Li Illustrating Zone-Nailing Area	erns 0.2 le Cantilevered Beam ,1 Rt Cant, 1 Double Can nize & Beam Design mal Side Load 0.4 ateral Shear & Drag Loai as	9.60 k 4.11 7 k/tt		2.QD k 6.Q 27 k/h 0.20 k/h 31 k/h 1111111111110 0.40 k/h 111	₽ k 6.09 k
Boths in Timber Boths in Timber STEEL CALCS	With Uniform Load, against o Using metal plates @ both s	concrete sides	Mmax @ lei	10.00 ft 40.00. Mmax = 324.38 k-ft at Dmax = -0.2929 in at t = -137.96 k-ft	ft 19.99 ft from left 20.24 ft from left Mmax @ right = -1	12.00 ft

Current Project File Name

In the upper-left corner of the screen you will see the name of the project file currently loaded and available for calculating editing.



• NOTE! Calculations are always kept up-to-date in the project file. After editing a calculation and pressing [Save] within the calculation screen the calculation data is stored back into the file and the Project manager screen is again displayed. However, there is no need to "Save" your file data when using the Project Manager....it is already saved and current in the file.

File management and system access buttons

The file management buttons enable you to perform various tasks:

I Print	E <u>S</u> aveA:	<u>C</u> lose I	Project
🖄 <u>N</u> ew		<u>T</u> ools & Settings	? <u>H</u> elp

Print : This selection displays a screen where you can select multiple calculations in your project to print. Here is the screen:

oject Calculation Printing Co	ntrol	
	Highlighted Items Are Selected to Print Click To Select Print Item	
Section Material Type		
Section & Calculation Type	Description from Calculation	
E- ANALYSIS CALCS		A Fundad
Beam Analysis	Fixed-Fixed Beam	
Beam Analysis	Double Cantilevered Beam	
- Rigid Diaphragm	Example Problem, 8 Wall System, One Wall Angled	- Contrast
Beam Elastic Fdn.	Beam with Fixed & Pinned ends	- Contract
Section Properties	I Beam w/ various shapes attached	
Pile Group	Seven pile system w/X & Y load eccentricitry	
Pole Embedment	Circular pole with Point & Uniform Loads	
Seismic Forces	Example Problem,	
Wind Forces	Example Problem,	
Multi-Story Column	5 Story Building	Swap
	2.0	
Hulk Coord Timber	3 Beams 2 Cooper Custors 2 Lond Dottoms	E Select
Canadal Timber	3-Span System, 2 Load Patterns	
General Timber	Euspole Problem #2, Double Continuered Room	
Cantilevered Reams	Example Floblem #2, Double Cantilevered Beam Four Bay System : 2 Simple, 1 Bt Cant, 1 Double Cantil	Close All
 Cantilevered Beams 	4 Span Sustem, Cant, Optimize & Beam Design	
 Timber Column 	Column Subjected to Additional Side Load	
- Shear Wall & Ftg	Vertical Pt & Unif. Loads & Lateral Shear & Drag Loads	
Plywood Diaphragm	Illustrating Zone-Nailing Areas	
 High-Load Diaphrac 	m Using Staples	
- Timber Ledger	With Uniform Load, against concrete	Ca Print
Bolts in Timber	Using metal plates @ both sides	
⇒		
- I Steel Beam	Fixed-Cantilevered Beam	Canaal
Multi Span Steel	3 Span System, 2 Load Patterns	
⊢IC Steel Beam w/Torsi	or Single offset point load @ mid-span	

SaveAs : This selection enables you to save the complete current Project File as a totally new file. This is useful when you want to start a new project and use all or part of the existing project's calculations as a basis for starting.

New : This selection allows you to begin a new Project File. After specifying your new project file name the current project is closed, the new project file is created, and then the new file is displayed in the Project Manager.

Open Project : This selection allows you to select another different project file to work with.

Close project : This selection closes the current project file and returns to the main

window that shows just the background and Main Menu.

Tools & Settings : This selection gives you access to various items that provide useful features in the Structural Engineering Library.

Settings Screen	
User Information	
Default Values	
Database	•
Network Users	
Calculator	

Help: This item gives you access to the help system, fax and email support, release notes, and version information.

Calculation Help
Main Help System
Email Support
Fax Support
Release Notes
ENERCALC Web Site
About & Version #
Sales 🕨

Unit Selection Buttons

These buttons allow you to change the system of units being used in the Structural Engineering Library. When changing units the currently highlighted calculation is also modify and the results and graphics to the right will display the new units selected.



NOTE: The internal calculations and variables entered are always stored and processed in inch-pound units. What you see on the screen for input, calculated values, and graphics notations are converted from the internal units to "display" units.

Project Info and Project Calculations Tabs

These two tabs control the display of the contents of the project file. The Project Calculations tab will be discussed in the section below titled "Project Calculation List". When selecting the Project Information tab you will see the screen change to show the following:

50

Project Info Project (Calculations
Job Title	ENERCALC Example Problems
Description	Collection of example problems
Scope of Work	All programs in the Structural Engineering Library
Designer	MDB
Job Number	97-000001
Note! This informat portion of the	ion will be displayed in the upper-right title block area printed on each calculation printout.

On this tab you can enter some information particular to the project file that you are working on.

ENERCALC Engineeri P.O. Box 188 Corona del Mar, CA 9 Voice: 949-645-0151 www.enercalc.com	ng Software 2660		Title : ENERCAL Dsgnr: MDB Description : _{Col} Scope : All p	C Example Problems Job # 97-000001 Date: 9:04PM, 3 NOV 03 lection of example problems programs in the Structural Engineering Library
Rev: 580000 User: KW-0600001, Ver 5.8.0, 10-5 (c)1983-2003 ENERCALC Engin	Sep-2003 eering Software	Single Span B	eam Analysis	Page 1 c:tectexamples.ecw:Analysis Cal-
General Information	ouble Cantileve	ered Beam		
Center Span	40.00 ft	Moment of Inertia	8,352.000 in4	
Left Cantilever	10.00 ft	Elastic Modulus	29,000 ksi	
Right Cantilever	12.00 ft	Beam End Fixity	Pin-Pir	
Uniform Loads				
		- THE PARENCE		* "«ht Cantile»e:

Project Calculation List

When you have created or opened a Project file, the screen displays the main working area for the Structural Engineering Library. On the left side of the screen you will see the tree-structured listing of the calculations in your project file, along with buttons to perform required tasks. On the right side will be a summary area that displays information about whatever calculation is being highlighted in the calculation list.

Print Calc	E Copy Calc	<u> </u>	+ <u>A</u> dd Calc	<u>E</u> dit Calc
Section View	Material View	Calc Type View	<mark>⊟⇔</mark> E <u>x</u> port	Bto Import
Section & Cal	c. Type	Description from C	alculation	<u> </u>
₽	SIS CALCS			
- <mark>- Bean</mark>	n Analysis	Fixed-Fixed Beam		
- 4 Bean - 4 Rigid - 4 Bean - 4 Secti - 4 Pole - 4 Pole - 4 Seisr - 4 Wind - 4 Multi-	n Analysis Diaphraqm n Elastic Fdn. on Properties Group Embedment nic Forces Forces Story Column R	Double Cantilever Example Problem, Beam with Fixed & I Beam w/ various Seven pile system Circular pole with F Example Problem, Example Problem, 5 Story Building	ed Beam 8 Wall System, One Pinned ends shapes attached w/X&Yload eccel oint & Uniform Load	e Wall Angled ntricitry Is
C+ C	er Beam & Joist Span Timber eral Timber levered Beams levered Beams er Column r Wall & Ftq bod Diaphragm Load Diaphragm Load Diaphragr er Ledger in Timber CALCS	3 Beams 3-Span System, 2 I Double Cantilevery Example Problem Four Bay System : 4 Span SystemC Column Subjected Vertical Pt & Unif. L Illustrating Zone-Na Using Staples With Uniform Load Using metal plates	Load Patterns ed Beam #2, Double Cantilev 2 Simple, 1 Rt Cant, ant. Optimize & Bear to Additional Side L .oads & Lateral Sher ailing Areas , against concrete : @ both sides	ered Beam 1 Double Carr m Design oad ar & Drag Loai
	1			
Expand Tree	CALCS	ree SI	· hift Calc Up	

When a calculation is chosen for editing (double-click the item or press Edit) the screen will change and display the calculation.

Calculation Tree Diagram

The project list is a tree-structured diagram. You can use this simple system to organize your calculations by type, group, floor, section, or however you choose. In this reference we will call the major sections Divisions . Clicking the "+" icon to the left of a division will expand and display all the calculations in that division. When so expanded, the "+" icon will have changed to a "-", and clicking the "-" will collapse the calculations and again just display the division title.

EXAMPLES.ECW		
🖙 🛅 Job Information		
- General Information	-	Gener
🗈 🧰 Analysis Calcs		
🕀 🧰 Timber Calcs		
🕀 🧰 Steel Calcs		
🕀 🛅 Concrete Calcs		
🕀 🛅 Masonry Calcs		
🖻 🛅 Retaining Walls		
- Retaining Wall	-	Simpl
- Retaining Wall	:	Compl
- Restrained Wall	:	Inclu

To ADD a Division

Click on the topmost item "Project Calculation Tree" and then select the New button. A dialog will display requesting the title of the division to be added. The division will be added at the end of the list.

To ADD a Calculation into a Division:

If the Division has no calculations, which will mean there will NOT be a "+" icon showing for it, highlight the division and select the New or Copy button

If the Division has calculations already, with a "+" or "-" icon showing, highlight the location where the new calculation should be inserted and select the New button.

When the New button is selected, you will be presented with the typical calculation choice window which is described later. When the Copy button is selected, you will add a new calculation of the same type using the same data as the one currently highlighted.



Expand, Contract Tree & Calculation Movement Buttons

These buttons control the display of the project list and enable you to move calculations around in the project file.



Expand

Expands all divisions to show all the calculations contained. This is equivalent to clicking on all the "+" icons in the list to make all calculations in all divisions visible

Contract

This hides all the calculations and just shows the divisions.

Up & Down Arrow

Only active for calculations Moves the highlighted calculation up or down in the calculation order. When it is the top calculation in a division it moves the calculation to the bottom of the division above. Ditto for moving calculations down.

Project Control Buttons

These buttons control the addition, removal and printing of the calculations (and divisions) in

the current Project file.

Edit : Selects the highlighted item for editing:

- When a calculation is highlighted , the calculation data and program are loaded and the screen is changed to the full calculation view.
- When a division is highlighted a dialog box will be displayed so you can change the division name.
- New : Inserts a new calculation or division in the highlighted location.
- When a calculation or division is highlighted , the program will prompt you for the type of calculation to be added. After your selection the full calculation screen will be displayed and you can create your calc.
- Whether Filename (at the top) is highlighted a dialog box will be displayed so you can ADD a new division name.



Print Calc : This prints the highlighted calculation in the list. If you want to print all or multiple selected calculations in the project use the [Print] button in the "File and System Management" buttons area.

Copy : Uses the calculation type and data from the highlighted item to create a new calculation. The calcsheet is displayed, and when OK is selected to save the calculation, it is inserted at the current highlight location in the project list.

Delete : Will erase the highlighted calculation from the project.

Add Calc : Use this button to add a calculation to your project. After pressing [Add] the following screen will appear and allow you to selection the calculation module to use.

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Edit Calc

This button brings the data for the highlighted calculation from the project file into the program and then displays the appropriate calculation module to allow you to edit the calculation data.

Export Calculation

This selection enables you to make a copy of the currently highlighted calculation into another project file. After pressing you will be prompted for the project file to have the calculation placed in. After the file is selected a miniature list will be displayed that shows all the calculations in that file and lets you select into which position (or division) the calculation should be placed. Here is the "mini" project manager calculation list for the "Export Calculation" selection:

Se	lect Location for Export Calcu	ationsT			
	Please select location for fi	iles to be insert	ed		
1	Division & Calculation Type	Description from	Division	Index	[
			8	0	
	└─ T Concrete Beam	panel leg	2	4	<mark>√∕</mark> <u>O</u> K ₩ <u>C</u> ancel
	14 44 4 ? > >> >			1	

Import Calculation

This selection enable you to bring in a individual calculation from another project file. This item is useful when you are building a new set of calculations and you wish to use previously prepared calculations. One very common user practice is to have a Project File called "StandardCalculations.ECW" where they have saved dozens of typical calculations for their area of practice. When creating a new project set the can simply use this "Import Calculation" feature to bring in the standard calculations.

Here is the screen displayed after you select which file to use:



You will notice that this Import screen allows you to tag multiple calculations for importing!

Individual Calculation Summary & Sketch

On the right hand side of the Project Calculations tab you will see information in both text and graphics form. What is given here is a summary of the calculation that is highlighted to the left.

For the current calculation that you highlight in the calculation lit the program gives you a summary of the input and calculated results plus a sketch showing what the calculation represents. This is provided so you can quickly scroll down your calculation list and locate what you need. Here is a screen image of the summary and sketch area:

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Cantilevered Retaining Wall

4.00ft high wall retaining 4.00ft of soil Allow SP= 2,000.0psf, Active Pressure= 35.00psf/ft Passive Press= 250.00psf, Soil Density= 110.0pcf Soil Slope= 0.00:1, Soil Ht over= 0.00in Wall has 12.0in thick x 3.50ft wide, Toe= 0.50ft, Heel= 3.00ft Top Stem: 8.0in thick Masonry w/#5 @ 32.00in on center 2nd Top Stem: 6.0in thick Masonry w/#4 @ 32.00in on center 3rd Top Stem: 6.0in thick Masonry w/#4 @ 32.00in on center 4th Top Stem: 6.0in thick Masonry w/#4 @ 32.00in on center Bottom Stem: 6.0in thick Masonry w/#4 @ 32.00in on center



4.5 Calculation Screens

The **Structural Engineering Library** "calcsheet" screen shares a common layout and button arrangement for all available programs. There are four main components of a calcsheet, however due to the varied capabilities and scope of the whole Library, some calcsheets may look different.

After double-clicking (or choosing Edit) to select a calculation from the Project Manager calculation tree , the screen is changed to display the calculation sheet (example shown below for the General Timber Beam

calculation).

WENERCALC (1)EC/EXAMPLES.ECW - General Timber Beam Design General Timber Beam Design	
Tools & Settings	Design <u>Print</u> <u>Cancel</u> <u>Save</u>
General Uniform & Trapezoidal Point & Moment Loads 2	Summary Sketch Diagrams Printing Notes
Description Double Cantilevered Beam	Results Stress Calcs Deflections Query
	Beam Design OK
	Max Stress Ratio 0.590 : 1
Center Span 12.000 \$\frac{1}{2}\$ ft 1 0.000 \$\frac{1}{2}\$ ft Left Cantilever 0.000 \$\frac{1}{2}\$ ft 1 Lu 8.500 \$\frac{1}{2}\$ ft	Stress Maximum Moment 29.0 k-ft 1,258.9 psi Allowable 67.1 k-ft 2,910.0 psi
Right Cantilever 4.000 nm t nm t 6.500 mm t nm t Wood Section 5.125x18.0 End Fixity End Fixity Beam Width 5.125 mm t C Fix-Fix C Fix-Fix Beam Denth 10.000 mm t C Fix-Fix C Fix-Fix	Maximum Shear * 1.5 11.2 k 121.7 Allowable 19.0 k 206.3 psi Max Mid-Span Deflection 0.020 in Length / Deflection Ratio 7,246.2 : 1
C Sawn C GluLam C Manuf. or So. Pine	Moment Details Max. Pos Mom 1.90k-ft at 2.745 ft Max. Neg Mom 17.89k-ft at 12.000 ft Max @ Left Support 0.00 k-ft
wood Species 1 Fb : Base Allowable	Max @ Right Support29.03 k-ft Shears Max @ Left Support 1.37k Max @ Right Support 7.48 k
Elastic Modulus	Reactions @ Left Support Dead Load 13.487 k Max 16.311 k @ Right Support
Calc shear at "depth" from support ?	Dead Load 8.908 k Max 12.636 k

The central working area in the calculation screen are the tabbed sheets. There are always two sets of tabs....one for input values and one for results and graphics. These sheets let you quickly switch between working with your data, a sketch of the item you are designing, and a force or stress diagram of applicable values.

General Control Buttons

The buttons across the top of the calculation screen provide various items of functionality.

Tools & 4 Settings	🕈 Help 🗔 Design	🧼 <u>P</u> rint 🗐	X <u>C</u> ancel	✓ <u>S</u> ave
-----------------------	-----------------	-------------------	------------------	----------------

Tools & Settings

This button gives you access to various items that effect the whole Structural Engineering Library. When selecting this button the following pop-up menu is displayed. Please see elsewhere in this User's manual for descriptions of these items :

Settings Screen	
User Information	
Default Values	
Database	•
Network Users	
Calculator	

Help

This item give you access to various items of assistance. Here is the pop-up menu displayed when pressed:



Design

This button is not present in all calculation screens. When the type of calculation allows us t provide a more automated design feature than you simply entering the input values and watching the results a Design button is provided.

This particular program shown in the screen capture is for designing wood beams. The Structural Engineering Library has a database of wood sections, so this button will display a design criteria screen and then automatically check all beam sections and then provide a list of the acceptable ones for your choice for usage.

Design Beam		
Section Type C Sawn C Glued-Laminated C TJ : Parallam C TJ : TimberStrand	Maximum Stress Ratio Minimum Total Deflection Ratio	1.00 🛓 240.0 🛓
C Custom (User Defined)	X	ß
	Cancel	<u>G</u> o

Section	Stress Ratio	Defl. Ratio	Width	Depth 🔺	
3.125x18.0	0.9631	319.0	3.125	18.000	
3.0x19.5	0.9264	389.4	3.000	19.500	
3.125x19.5	0.8896	405.6	3.125	19.500	V
3.0x21.0	0.8607	486.3	3.000	21.000	Salac
3.125x21.0	0.8265	506.6	3.125	21.000	<u>J</u> elect
3.0x22.5	0.8037	598.2	3.000	22,500	
3.125x22.5	0.7719	623.2	3.125	22.500	
3.0x24.0	0.7539	726.1	3.000	24.000	
3 1 25v 24 0	0.7240	756 3	3125	24 000	- X
liet Bu					
t List Dy					Cance
🕻 Stress Ratio 🛛 🔿 D	efl. Ratio 🛛 🔿 Wi	dth 🔿 De	pth		
			- 10 C		

Print

This button starts a printout of this calculation.

Print Preview

This button, which always just appears with an icon of a sheet of paper will display a preview of the calculation printout for you to review before selecting to send it to the printer. Shown below is the top portion of the window that is displayed that will show the preview printout.

Report Prev	iew			
To turn Print use Settings	t Preview On or C s Printing menu ite	No Zoor Across: 1 < Cancel	Print	
	ENERCALC Engineering Software P.O. Box 188 Corona del Mar, CA 92660 Voice: 949-645-0151 www.enercalc.com	Title : ENERCALC Example Problems Job # 97-000001 Dsgnr: MDB Date: 9:47PM, 3 NOV 03 Description : Collection of example problems Scope : All programs in the Structural Engineering Library		
www.enercalc.com Rev: \$80000 User:KV-0600001 Ver 5.8.0 (0-Sep-2003 icit9932000 ENERCALC Engineering Software Description Double Cantilevered Bea		General Timber Beam	Page 1 c:\eo\examples.eow:Timber Cal	
		Beam		
	General Information	Code Ref: 1997 NDS, 2003 IBC, 2003 NFPA	5000. Base allowables are user def	
	Section Name 5.125x18.0 Beam Width 5.125 in Beam Depth 18.00C in Member Type GluLar Bm Wt. Added to Loads Load Dur. Factor 1.250 Ream End Fixity Pin-Pir	Center Span 12.00 ftLu Left Cantilever ftLu Right Cantilever 4.00 ftLu Fb Base Allow 2,400.0psi Fv Allow 165.0 psi Fc Allow Const	0.00 ft 8.50 ft 6.50 ft	

Cancel

This selection exits the calculation without saving the data to the project file and then redisplays the Project Manager.

Save

This selection saves all of the data for this calculation to the project file and redisplays the

Project manager.

Input Tabs

The group of tabs on the left one-half of the calculation screen are called the "Input Tabs". These tabs contain all the input data locations that you will use.

escription	Fixed-Cantilevered Beam		
Center Span .		48.500 🔶	ft
Left Cantilever		0.000 🛔	ft
Right Cantileve	er	7.500 🛊	ft
Lu : Unbraced	Length	16.000 🛓	ft
End Fixity			
C D: D:	C Fix-Fix C Pin-Fix	Fix-Pin	C Fix-Free

You can easily select different tabs and enter the data quickly.

Results & Graphics Tabs

The results & graphics tabs are where all the calculated values are reviewed, a sketch of the item that your input data describes is shown, and where the shear/moment/deflection or other stress diagrams are available.

Results Tab

This tab is either a single tab or contains a group of sub-tabs that presents all of the calculation information. Here's an image of a Results tab that has a set of sub tabs:

Results Sketch Diagrams	Printing	
Summary Load Combinatio	ons	
	Beam OK	
Maximum Values	Actual	_Allowable_
Moment	505.06 k-ft	535.74 k-ft
Bending Stress	20.22 ksi	21.45 ksi
fb / Fb	0.943 : 1	
	Static Load Case	Governs Stress
Shear	54.869 k	223.996 k
Shear Stress	3.53 ksi	14.40 ksi
fv / Fv	0.245 : 1	
Maximum Center Defl.		-0.670 in
Maximum Left Cant Defl		0.000 in
Maximum Right Cant Defl		0.407 in
Max. Defl.		-0.670in
and a second	A CONTRACTOR OF A CONTRACTOR A	357.9

Sketch Tab

This tab is not present in all calculations. A drawing of the item you are designing will be displayed, possibly with tabs, toggle buttons, or other controls that you can use to manipulate the display of information.

When the Sketch tab is selected, the Print button will start a printout of the sketch only.



Diagram Tab

This tab is not present in all calculations. When available, a length-magnitude diagram of stresses, deflections, forces, column interaction, or other graph will be displayed. Tabs, toggle buttons, or other controls may also be provided so you can manipulate the display of information.

When the Diagram tab is selected, the Print button will start a printout of the current diagram only.



Defaults Menu Item

This selection is only operational when editing a calculation.

For each calculation in the Structural Engineering Library there are initial values stored in a file named DEFAULTS.ECD. When you start a calculation using the Quik menu or the New button for a project file, these initial values are loaded into the data entry areas of the calculation.

Selecting this menu item will ask you whether you wish to Save or Load the default values. Saving the values will use all your current calculation input data as the new, initial, default data. Loading the values will replace all your current calculation input data with the default values stored.

You can do this for all calculations in the Library, and in most cases we recommend you do so to ease your repetitive data entry.

<u>S</u> ave	Current Values as Calcsheet Defaults
<u>L</u> oad	Default Values to Replace Current Data

4.6 Printing

Getting hardcopy documentation of your calculations is absolutely essential. We believe you will find our current calculation reports well designed, concise, and visually appealing. You can print a single calculation or an entire set to any printer you have configured within Windows....be it a Laser printer, fax software, Adobe Acrobat file, or another destination.

We actively request your suggestions for changes or additions to the printouts we provide. Because printouts are so essential to your documentation we want to hear your comments!

Printing a Single Calculation

When editing a calculation this printing button is available.

To print a calculation, just select the Print button showing on the calculation screen . This button starts printing for the current "Main" tab (Calculation, Sketch, Diagram). You will be asked to select/verify the printer to use and the printing will begin.

You can set up the title-block area on your printout by entering data on the Settings window, available on the main menu.



Print a Project

When using the project Manager this printing button is available.

When you select Print from the Project manager a window is opened, all divisions are expanded and you are given a screen with flexible selection of calculations. You select the calculations to print by simply clicking on them. Repeated clicking will toggle the highlight on and off. You can scroll the list up and down and select any or all calculations, or use the Select All, Clear All, and Swap Selections buttons for assistance.

Project Calculation Printing Control	
Highlighted Items Are Selected to Print Click To Select Print Item	
Section Material Type	
Section & Calculation Type Description from Calculation	
ANALYSIS CALCS -La Beam Analysis Fixed-Fixed Beam	▲ <u>E</u> xpand
Image: Second	▼ Contract
Fer Section Properties I Beam w/ various shapes attached Seven pile system w/ X & Y load eccentricitry Fer Pole Embedment Circular pole with Point & Uniform Loads Fer Seismic Forces Example Problem,	
Here Wind Forces Example Problem, 나날 Multi-Story Column 5 Story Building 는 그 TESTER 타 그 TIMBER CALCS	භ S <u>w</u> ap
Imber Beam & Joist 3 Beams Multi-Span Timber 3-Span System, 2 Load Patterns General Timber Double Cantilevered Beam	≣ = <u>A</u> II
General Timber Example Problem #2, Double Cantilevered Beam Cantilevered Beams Four Bay System : 2 Simple, 1 Rt Cant, 1 Double Cant] Cantilevered Beams 4 Span SystemCant. Optimize & Beam Design Column Subjected to Additional Side Load Shear Wall & Ftg Vertical Pt & Unif. Loads & Lateral Shear & Drag Loads Plywood Diaphragm Illustrating Zone-Nailing Areas Wide Load Diaphragm Vertical Pt & Unif. Loads & Lateral Shear & Drag Loads	Clear All
Timber Ledger With Uniform Load, against concrete Bolts in Timber Using metal plates @ both sides F^@STEEL CALCS	🏈 <u>P</u> rint
Image: Steel Beam Fixed-Cantilevered Beam Image: Steel Beam 3 Span System, 2 Load Patterns Image: Steel Beam Steel Beam w/Torsion Image: Steel Beam Single offset point load @ mid-span Image: Steel Beam Image: Steel Beam Image: Steel Beam <td>X Cancel</td>	X Cancel

A Typical Printout

All printouts in the **Structural Engineering Library** are designed to look like a hand calculation would be laid out and orders the information as Input, Summary of Results, Calculated Values & Details. Please see a typical calculation shown below.

ENERCALC Engineering Software P.O. Box 188 Corona del Mar, CA 92660 Voice: 949-645-0151			Title : ENER Dsgnr: MDE Description Scope :	Title : ENERCALC Example Problems Job # 97-000001 Dsgnt: MDB Date: 11:14PM, 26 OCT 03 Description : Collection of example problems Scope : All programs in the Structural Engineering Library			
ww.enercalc.com			ocepter.	rin programs in a	re on a charter and a charter an		
New: 580000 User: KW40600001, Vér 5.8.0, 10-Sep- (c)1983-2003 ENERCAL C Engineering	2003 Ger	neral Footing	J Analysis &	Design	P: c:lec55texamples.ecw:Cond	age rete Cak	
)escription Load	d Offset, M &∨A	long both axes					
Seneral Information			Code Re	f: ACI 318-02, 199	7 UBC, 2003 IBC, 2003 NFP	A 5000	
Allowable Soil Bearing Short Term Increase Seismic Zone	4,50 1.3	0.0 psf 330 0	Dimensions Width along Length alon	X-X Axis ng Y-Y Axis	6.750 ft 10.170 ft		
Live & Short NOT Con fc Fv	nbined 3,00 60.00	10.0 psi 10.0 psi	Col Dim. Al Col Dim. Al Base Pede	ckness ong X-X Axis ong Y-Y Axis stal Heidht	36.00 in 12.00 in 24.00 in 12.000 in		
Concrete Weight Overburden Weight	145 110	.00 pcf .00 psf	Min Steel % Rebar Cent	er To Edge Distan	0.0014 ce 3.50 in		
oads							
Applied Vertical Lo Dead Load Live Load Short Term Load	ad	87.200 k 52.100 k 12.000 k	ecc al	ong X-X Axis ong Y-Y Axis	0.000 in 0.000 in		
Applied Moments Dead Load Live Load Short Term	<u>Creates</u> (pres	Rotation about Y-Y sures @ left & right k-ft 21.500 k-ft	<u>Axis</u> 0	Creates Rotation : (pressures @ 6.20	about X-X Axis top & bot) k-ft k-ft 0 k-ft		
Applied Shears Dead Load Live Load Short Term	(pres	Kotation about Y-Y ssures @ left & right k k 9.000 k	AXIS D	(pressures @	about <u>X-AAXS</u> top & bot) k k 0 k		
Summary					Footing Design	OK	
6.75ft x 10.17ft Fo	ooting, 36.0in Thi	ick, w/ Column S	Support 12.00 x	24.00in x 12.0i	in high		
Max Soil Pressure Allowable	2,575.2 4,500.0	2,735.6 psf 5,985.0 psf	Max Mu Require	Adu 2 d Steel Area	ual <u>Allowacie</u> 5.613 k-ft per ft 0.546 in 2 p	erft	
"X" Ecc, of Resultant "Y" Ecc, of Resultant	0.000 in 0.000 in	5.048 in 2.651 in	Shear St 1-Way	resses <u>V</u> 11	<u>u Vn.*Phi</u> 1.586 93.113 psi		
Y-Y Min. Stability Ratio	22.994 8.D16	1.500 :1	2.4444	2.	3.803 186.226 psi	and	
ooting Design							
Shear Forces Two-Way Shear One-Way Shears	<u>ACIC-1</u> 23.80 psi	ACI C-2 12.04 psi	<u>ACIC-3</u> 10.60 psi	<u>Vn * Phi</u> 186.23 psi			
Vu@Left Vu@Right Vu@Top Vu@Bottom	1.25 psi 1.25 psi 11.59 psi 11.59 psi	0.96 psi 0.30 psi 6.80 psi 4.99 psi	0.84 psi 0.27 psi 5.98 psi 4.40 psi	93.11 psi 93.11 psi 93.11 psi 93.11 psi 93.11 psi			
Moments Mu @ Left Mu @ Right Mu @ Top Mu @ Bottom	ACI C-1 12.69 k-ft 12.69 k-ft 25.61 k-ft 25.61 k-ft	ACI C-2 4.01 k-ft 8.83 k-ft 14.69 k-ft 11.23 k-ft	ACI C-3 3.55 k-ft 7.76 k-ft 12.92 k-ft 9.89 k-ft	<u>Ru / Phi</u> 13.3 psi 13.3 psi 26.9 psi 26.9 psi	<u>As Reg'd</u> 0.55 in2 per 0.55 in2 per 0.55 in2 per 0.55 in2 per	nî nî nî	
4.7 Working with Files

The **Structural Engineering Library** uses a single file to store your project information and all the calculations. This file uses an "ECW " extension to identify it as an **E**ner**C**alc for **W**indows file.

To backup an **ENERCALC** project file simply copy the "ECW" file to the desired backup location.

As the **Structural Engineering Library** advances in capabilities the file formats used will change, but we will always provide conversion programs for your previously saved project files.

General Comments

- Each Enercalc project file contains all information on a project. There are no other files you will need to keep track of.
- Always remember that the Project Manager is showing you the divisions and calculations for your project....it is NOT showing you a disk directory structure.
- There is no "Save" selection on the File menu. After you have selected and edited a calculation, choosing "Ok " save the calculation data bask to the project file.

4.8 Databases

Buildings are constructed using components, i.e. standard steel beams, masonry block, timber sections, reinforcing bars, bolts and connectors. Along with these are allowable stress grades such as A36 steel, Douglas-Fir #1 timbers, or 24F-V8 glued laminated beams.

The **Structural Engineering Library** contains a databases of section properties for common structural steel sections, timber sections (including manufactured lumber), and timber stresses by gradation and species.

Steel Database

Steel Section Database										
-Section Type to Dis	nlav			Steel Databa	se					
		LICC T		C ALCOM	C NOOM	C 4100 74		C Kanaan		
W HP JR	L I	5 H55-I	LWI	• AISC 9th	AISCOM	U AISC/III		I U Korean		
S M B	MC P	HSS-P L	L MT	-						
	IRC		ст	Squa	re Re	ectangular				
HI D	anc		31			-				
Name Area Depth	Name Area Depth Width Sx Ix Sy Iy J									
Section Name	Area	Depth	Wall Thickness	lxx	Sxx	Bxx	Zx 🔺			
	in2	in	in	in4	in3	in	in3 🔄	~ I		
TS2x2x3/16	1.270	2.000	0.18	8 0.668	0.668	0.726	0.8			
TS2x2x1/4	1.590	2.000	0.25	0.766	0.766	0.694	1.0			
TS2x2x5/26	1.860	2.000	0.31	3 0.880	0.880	0.690	1.1	Select		
TS2.5x2.5x3/16	1.640	2.500	0.18	8 1.420	1.140	0.930	1.4			
1S2.5x2.5x1/4	2.090	2.500	0.25	1.690	1.350	0.899	1.4			
152.5x2.5x5/16	3.110	2.500	0.31	3 3.580	2.390	1.070	1.5			
1538383/16	2.020	3.000	0.18	18 Z.600	1.730	1.130	2.1			
153X3X174	2.030	3.000	0.20	2 2 500	2.100	1.100	2.t			
TS25/25/2/16	2 290	3.000	0.31	3 3.000	2.350	1.340	3.0			
TS3 5v3 5v1 //	2.000	3,500	0.10	0 5.290	3.020	1 310	2.5			
TS3 5v3 5v5/16	3,730	3,500	0.20	3 6.090	3,480	1.280	4.5			
TS4v4v3/16	2 770	4 000	0.01	6 590	3,300	1.540	30			
TS4v4v1/4	3 590	4 000	0.25	0 8 220	4 110	1 510	4 4	<u>M</u> odify		
TS4x4x5/16	4 360	4 000	0.31	3 9,580	4 790	1 480	5.9			
TS4x4x3/8	5.080	4,000	0.37	5 10,700	5,350	1.450	6.7			
TS4x4x1/2	6.360	4.000	0.50	12,300	6.130	1.390	8.0			
TS4.5x4.5x3/16	3.140	4,500	0.18	9.600	4.270	1.750	5.0			
TS4 5x4 5x1/4	4 090	4,500	0.25	12 100	5,360	1,720	64			
TS5x5x3/16	3.520	5.000	0.18	8 13,400	5,360	1.950	6.2			
TS5x5x1/4	4,590	5.000	0.25	16,900	6,780	1.920	8.0			
TS5x5x5/16	5.610	5.000	0.31	3 20.100	8.020	1.890	9.7	I X I		
	4	E 000	0.05	an 000	0.110	1.000	11.1			
							لند	Cancel		
Depth Range :					Class Range :					

Timber Database

ood Section	n Database									
elect Ty	pes to Display								Low: 2.0	00 🛓 in
Sa	wn	Glued-Lan	ninated	PowerBe	eam	I∾ s	pecify De	pth <u>R</u> ange	High: 12.0	00 🛓 in
TJ:Pa	rallam	TJ :Timber	Strand	VersaL	am					
TJ: Mic	roLam	LP:Gang-L	am LVL	Custo	m					
Type Name Width Depth Area Ix Sx Iy Sy Ix/Area Sx/Area						a	@ + () - < (Sort Order	
Type	Name	Area	Width Depth	lx	Sxx	Ιv	Sw I	xx / Area	Sxx / Area 🔺	
100		in2	in in	in4	in3	in4	in3			- A
Sawn	4x6	19.250	3.500 5.500	48.526	17.646	19.651	11.229	2.521	0.9167	
Sawn	4x8	25.375	3.500 7.250	111.148	30.661	25.904	14.802	4.380	1.2083	366666
Sawn	4x10	32.375	3.500 9.250	230.840	49.911	33.049	18.885	7.130	1.5417	
awn	4x12	39.375	3.50011.250	415.283	73.828	40.195	22.969	10.547	1.8750	1.1
awn	3-2×3	11.250	4.500 2.500	5.860	4.690	18.980	8.440	0.521	0.4169	
awn	3-2X4	24.750	4.500 3.500	16.080	9.190	25.560	10 500	1.021	0.5835	Insert
awn	3-2X0	29.750	4.500 5.500	1/2 000	22.030	41.770	24 470	4 270	0.9160	-
awn	3-2-10	41 630	4.500 7.250	296 790	6/170	70.240	31 220	7 1 2 9	1.2001	
Sawn	3-2-12	50.630	4 500 11 250	533.940	94 920	85 430	37.970	10.546	1.8748	A
Sawn	6x6	30 250	5 500 5 500	76 255	27 729	76 255	27 729	2 521	0.9167	Change
awn	6x8	41.250	5.500 7.500	193.359	51.563	103.984	37.813	4.687	1.2500	Gridinge
awn	6x10	52.250	5.500 9.500	392.964	82.729	131.714	47.896	7.521	1.5833	
awn	6x12	63.250	5.500 11.500	697.070	121.230	159.440	57.980	11.021	1.9167	-
awn	8x8	56.250	7.500 7.500	263.670	70.310	263.670	70.310	4.687	1.2500	Delet
awn	8×10	71.250	7.500 9.500	535.860	112.810	333.980	89.060	7.521	1.5833	Delete
awn	8×12	86.250	7.500 11.500	950.540	165.310	404.300	107.810	11.021	1.9166	
awn	10×10	90.250	9.500 9.500	678.760	142.900	678.760	142.900	7.521	1.5834	V
Sawn	10x12	109.250	9.500 11.500	1,204.030	200.400	821.650	172.980	11.021	1.8343	- (
awn	12x12	132.250	11.50011.500	1,457.510	253.4801	,457.510	253.480	11.021	1.9167	Cancel
444 4 3		1							<u> </u>	Gunoor

Timber Stress Database

72

pecies		Siz	e Classes to	Show					_
Douglas Fir - Larch		ק ר	2"->4" Th	ick, 2" & Wide	r.	5" x 5" & L	arger	Glued-Laminated	
Ising 1997 UBC/NDS	Stress Values		Beams	& Stringers		Posts & Ti	mbers	Manufactured	
								All stresse	s in PSI
pecies Grade Class F	b Ft Fv F	c - Perp	Fc - Pril E	7	< Sort C	irder 📀	+ 0 -		
Species	Grade	Class	Fb	Ft Fv	Fc-Perp	Fc-Prll	Elastic	Grading Agency	
			Bending T	ension Shear	Comp.	Comp.	Modulus	,	. 4
Douqlas Fir - Larch Douqlas Fir - Larch Douqlas Fir - Larch	Select structural No.1 & Better No.1	2-4 2-4 2-4	1,450 1,150 1,000	1,000 9 775 9 675 9	5 625 5 625 5 625	1,700 1,550 1,500	1,900,000 1,800,000 1,700,000	WCLIB WWPA WCLIB WWPA WCLIB WWPA	Select
Douglas Fir - Larch	No.2	2-4	875	575 9	5 625	1,350	1,600,000	WCLIB WWPA	
Douglas Fir-Larch	Stud	2-4	675	325 9 450 9	5 625 5 625	850	1,400,000	WCLIB WWPA	+
Douglas Fir - Larch	Construction	2-4	1,000	650 9	5 625	1,650	1,500,000	WCLIB WWPA	Insert
Douglas Fir - Larch	Standard	2-4	275	375 9 175 9	5 625 5 625	1,400	1,400,000	WCLIB WWPA	
	Ounty	67	213	175 5	J U2J	500	1,300,000		B
									<u>C</u> hange
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	1 1							•	Cancer

Rebar Area Combination Database

Quantitu	Rar Size	Area A	Areas for Bars Quantities in a Bar
quantity	Dai 5126	0 110	
2	3	0.110	 List Combinations of Two Bar Size
2	2	0.220	
3	3	0.330	
4	3	0.440	Starting Bar Size
0	3	0.000	
2	3	0.000	Ending Bar Size 18
6	3	0.770	
8	3	0.000	Max. # Bars in Group 12
10	3	0.330	<u> </u>
11	3	1.100	
12	3	1.210	
12	3	0.200	6
2		0.200	4
2	1	0.400	Sele
3		0.000	
4		1.000	
9	4	1.000	

4.9 Configuration Settings

The **Settings** main menu selection allows you to specify settings that will effect the entire **Structural Engineering Library**. As the system evolves you will see additional items and tabs on this screen.

General Tab

Configuration Settings	
General Display Printing & Title Block Network Limite	r Information
System of Units : U.S. Standard SI Metri	c Continental Metric
Automatic Recalculation after each data entry	
Show "Start-Up Wizard" at program start up ?	N
Load Default Values for New Calculations	
System files drive/directory locations:	
Project files	
C:NEC	
Program DLL's, Databases, Help, User & Limter Files	3
C:\EC	
Default Values file	
C:\EC	
	√ <u>C</u> lose

System of Units

Allows you to select between standard U.S., System International Metric, and classic Metric units. This setting effects all calculations in all files. Of interest is the fact that ALL calculations are stored internally as pounds and feet. Only the display of units is changed.

This can be used when just viewing the project listing or when editing a calculation. If you change units while editing a calculation, the change is made immediately and your calcsheet will be updated to display the new system of units. (The actual calculations and data file are in U.S. Units, and the values are converted as required for screen display and printout. Therefore, if many thousands of changes are made to a calculation, it is possible that input data could

change slightly due to round off error. Conversion factors are typically 3 to 7 significant digits).

Automatic Recalculation

When checked the programs are recalculated immediately after one of the input items is changed.

Show "Start Up Wizard"

Allows you to suppress the initial start-up wizard screen.

Load Default Values at Calculation Startup

Checking this box automatically reads the "default values" from the file DEFAULTS.ECD into the calculation that is being created.

Project file directory

This is the location where the software will automatically look for your project files when a File | Open, File | New, or Files | Save As selection is used.

Database, Defaults, and Help file directory

This specifies where the additional system components are located. This is typically ALWAYS the same directory the EC.EXE and supporting DLL files are located.

Display Tab

This tab enables you to select the display resolution to use for the **Structural Engineering Library**. You can let the program detect which screen resolution you are using and resize to the largest practical size. Alternately you can select the display resolution of your computer monitor and the program will scale it accordingly.

Configuration Settings	
General Display Printing & Title Block Network Limiter Information	
Use this selection to change the default screen display size used.	
Select your screen size in Width x Height (in pixels)	
 Automatic Detection of Screen Display Size 	
C 800 × 600	
C 1280 x 1024	
	Restart Program
NOTE! You must restart this program to have the setting take a	effect properly !
	✓ <u>C</u> lose

The **[Restart Program]** button will exit the **Structural Engineering Library** and restart it in the new chosen display size.

Printing & Title Block

onfiguration Settings General Display Printing & Title Block Network Limite Print Mode Selections Print Graphics with Text Always Display Windows Printer Selection Box ?	r Information What to Print ✓ Title Block
Title Block Line 1 : ENERCALC Engineering Software Line 2 : P.O. Box 188 Line 3 : Corona del Mar, CA 92660 Line 4 : Voice: 949-645-0151 Line 5 www.enercalc.com	Logo File: C:\EC\Help\logo.gif

Print Graphics with Text

Many programs create sketches and diagrams to clarify the meaning of input data. If you select this checkbox those graphics will automatically print along with the text calculation results.

Always Display Windows Printer Selection Box

When you select to print a calculation you must have a printer selected to print to. If you want to use the default printer setup for the computer you are using you can leave this box unchecked. To have the program display a printer selection box each time a printout is requested then be sure to "check" this box.

What to Print

These selections control what to print in the title block area at the top of the printout page.

Title Block

This tab provides you with the entries for defining your own custom title block area on all printouts in the Structural Library.

Title Block

These five entries correspond to the five lines in the upper-left corner of the printout.

Logo File

When specified the graphics file you choose will be printed at the LEFT edge of the title block and the 5 lines of "Title Block" information will be moved to print immediately to the right of the logo. Logos can be Windows BMP, JPEG, GIF, and WMF formats.

When a logo is specified the height is adjusted to fit into the title block area and the right-side "floats" according to the width of the image.

4.10 Building Codes Supported

It is essential that structural engineering software support the adopted building codes in the region where construction is planned. There are numerous research code and governmental adopted building codes adopted throughout the United States of America.

To support all facets of each and every code is beyond the scope of this software.

For structural design all codes base their requirements for material design on the major "research codes" developed my non-profit research organizations: American Institute of Steel Construction, America Concrete Institute, American Forest and Paper Association, American Society of Civil Engineers, the Building Seismic Safety Council for the Federal Emergency Management Agency.

- International Code 2003 International Building Code
- National Fire Protection Association 2003 NFPA 5000 Building Construction and Safety Code
- ASCE STANDARD ASCE 7-02 Minimum Design Loads for Buildings and Other Structures
- Building Seismic Safety Council 2000 Edition Recommended Provisions for Seismic Regulations

These "adopted" building codes refer to the "base" codes to form the bulk of the design specification in each material:

- Wood : ANSI / AF & PA National Design Specification 30 November 2001
- Masonry : ACI 530-02 / ASCE 5-02/TMS 402-2 Building Code Requirements for Masonry Structures
- Concrete : ACI 318R-02 Building Code Requirements for Structural Concrete
- Steel : American Institute of Steel Construction, Manual of Steel Construction, Allowable Stress Design Ninth Edition

Steel : American Institute of Steel Construction, Manual of Steel Construction, Load & Resistance Factor Design, Third Edition

This Structural Engineering Library set of design & analysis programs follows the above codes for the types of calculations that are performed. This is not to say that ALL of the requirements in these codes are support because the various programs MAY NOT CHECK THOSE AREAS of the building code. It is up to the users to determine whether an additional building code provision needs to be reviewed for a particular design.

<u>Loads</u>

Design loads on structures are specified by the adopted building codes and by reference to the base research codes. In this software package you are provided entries to enter the wind or seismic load on the structural element you are designing.

For seismic loads, In nearly all cases you enter the load to be applied AFTER applying any code required factors to the gravity weight of the object where the load originates.

For wind loads you are provided with one program that uses the older UBC approach for wind force calculation on the exposed side of a structure. The detailed wind loading of ASCE-7 is not provided in this program package. Check future versions of the Structural Engineering Library for this capability.



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5 Sample Session

5.1 Getting Started

Getting Started

This section will guide you through a session of preparing and printing a calculation. We will use the General Timber Beam calculation because it contains all the features available in the **Structural Engineering Library**.

This sample session will cover these topics. If you are viewing this in the HTML help system, just click on an item to jump right to the section.

- Starting the program
- The Start Up Wizard
- Creating a Project File
- Entering Project Information
- Setting your Title Block
- Add a General Timber Beam calculation
- Take a look at the Calculation screen
- Entering some data
- Getting beam sections from a database
- Displaying a Sketch
- Displaying a Stress Diagram
- Automatic member design selection
- Printing the calculation
- Saving the Calculation
- Changing Section Names, Adding a Section
- Adding another Calculation
- Creating a Technical Support Question
- Closing the Project File

5.2 Starting the Program

First....let's start the program

To start the Structural Engineering Library, you will need to navigate to the ENERCALC program group from the Start menu.

Click the Windows [Start] button and move upward to highlight the Programs item. Locate the Enercalc program group and highlight it. You will see several selections. Move the cursor to highlight SEL 5.8 and release.

	WinZip	¥ 197	Microsoft Excel Microsoft Word		
420		-	ENERCALC 5.8	• 👻	Remove Structural Engineering Library
Ē.	Programs 🔰		*	3	SEL 5.8 Help
	Documents P				Enercalc SEL 5.8
-	Settings D				User's Guide - PDF
2	Search 🕨	•			Location: CiteCSS

The **Structural Engineering Library** should now begin and you will be viewing the **Start Up Wizard** as described below.

5.3 Start Wizard

The Start-Up Wizard

This window gives you the ability to instantly choose how you wish to begin your worksession. All of these items can also be easily chosen from the main menu after the program has already started.

For this Sample Session we want to create a new Project File. So your next step will be to click the button labeled **Create a Project File**.



The next window to be displayed (see below) will allow you to define the file name and drive & directory location it should be placed in.

We will use the filename Sample and let it reside in the current Enercalc installation directory.

Note: Although you can place the file in other directories, because the Enercalc Project Files can hold 1,000's of calculations for a single project, we recommend just starting the files in the default Enercalc directory.

5.4 Creating a Project File

Creating a Project File

Here's the Create NEW Structural Project File dialog box with the new filename entered. NO FILE EXTENSION is necessary....the program will append it. When the dialog appears as it does below, just click Save and the file will be created.

Savejn: 📄 🗋 E	50	I 🖻 🖆 🔛	
sys Baseplat Basewall Beamanal Beamcol Boltgrup	Cantbeam Circol Crvrtecj Colload Combftg Compbeam	Concbm Databa~1 Diaphrgm Disk1 Elasbeam Embed	
ile <u>n</u> ame: Samp	le at File (Securi)	<u></u>	ve

When a new Project file is created, the next action of the program is to open and display your new project file in the **Project Manager** window. You can see in the screen image below that the empty project file looks rather plain and simple.

NERCALC : 54	mple.ecw											E
oject : c:\	ec\sample.ee	w				۹	Print		SaveA:	Close	Projec	zt
roject Info	Project Calcu	lations	Units	US S	Metric	<u>Alla</u>	New	2	Open Project	Tools & Settings	?	<u>H</u> elp
E Print Calc	Deh Colter Calc	- Delete Calc	+	Add Calc	Edit Calc			_				
ection View	Material View	Calc Type View				Ī						
Section & Ca	Ic. Type	Description from	Calculatio	on								
- SCALCU	LATIONS											
ind al 2000	el e lí											
4447200	144											

Notice that the ONLY item appearing in the calculation list is the word "CALCULATIONS".

This item is called a Section . You can have as many as you like. Sections serve as a way to organize your calculations into logical areas for your convenience . The word Calculations used here can be changed to whatever you choose (as will be seen).

To add a calculation to this project use the **[Add Calc]** button. See the section below on adding calculations, but first we will enter some general information for your project.

5.5 Entering Project Information

Entering Project Information

Select the **Project Info** tab and you will be switched from the Project Calculations tab to the Project information tab :

Project Info Project C	elculations US SI Me	etric
r toject into project c		
Job Title	Sample Session	
Description	This is a guided session to instruct new users in using the Structural Engineering Library software system.	
Scope of Work	Following the User's Guide Sample Session".	
Designer	A New ENERCALC USer	
Job Number	2003-100	
Note! This information portion of the t	on will be displayed in the upper-right itle block area printed on each calculation printout.	

For this sample session you can fill in anything you like and select the Project Calculations tab again.

NOTE! This information is printed in the upper-right corner of your printouts. All Structural Engineering Library printouts have a "Title Block" area that contains your company's information in the upper-left corner and the project information in the upper-right corner. The above project information (and the title block information described in the section next) will look like this on the printouts:

Joseph P. Engineer	Title: Sample Sessio	n Job # 2003-100
GREAT ENGINEERING UNLIMITED	Dsgnr: A New ENERC	CALC USe Date: 10:46AM, 4 NOV 03
123 Main Street	Description : This is a	i quided session to instruct new users in using
Anytown, USA 12345	the Struc	tural Engineering Library software system,
www.greatengineering.com	Scope: Followin	ig the User's Guide Sample Session".
Rev: 580000 User: KW-0600001, Ver 5.8.0, 10-Sep-2003 (c)1983-2003 ENERCALC Engineering Software	Single Span Beam Analysis	Page 1 c:tectsample.ecw:Calculation

Description

5.6 Setting your Title Block

Setting your Title Block

Before continuing on and adding some calculations to the project, we'll show you where to enter your company information to be printed on ALL Structural Engineering Library printed calculations.



Select **Settings** from the toolbar on top of the **Project Manager** screen and select **"Settings Screen**" from the popup menu. The **Configuration Settings** screen will be displayed. Select the **Printing & Title Block** tab and the screen shown below will be displayed. It is here that you can use five lines to customize the printout with your own company information. This information will be printed in the upper-left corner of ALL printouts (see sample previously).

Optionally you can use the Logo File area to specify a graphics file that is your company's logo. Pressing the [....] button lets you use a file selection box to select Windows Bitmap (BMP), GIF, JPG, and WMF types of files.

At this time, please enter some information in all fives lines so you can see it printed later in this sample session. Select the [OK] button when finished.

Print Mod Print Gra Always [e Selections phics with Text Display Windows Printer Selection Box ?	র র	What to Print Title Block Logo Project Information Date & Time Page Number
Title Bloc	k	Lo	go File:
Line 1 :	Joseph P. Engineer] [
Line 2 :	GREAT ENGINEERING UNLIMITED		
Line 3 :	123 Main Street		
Line 4 :	Anytown, USA 12345		
Line 5	www.greatengineering.com		

5.7 Add a General Timber Beam calculation

Adding a Calculation to your Project

To add calculations in the Project Manager, you highlight where you would like the new calculation to be inserted and select the [New] button. At present we have no calculation yet in the Section named "CALCULATIONS", so we will highlight it and press the [Add Calc] button. Please do this now.....



The system will now display a window where you can select to insert a "Section" or a

"Calculation":

se indicate which item yo	ou wish to have inserted here
Insert a <u>S</u> ection	Insert a <u>C</u> alculation
	angol

A "Section" is the high level grouping identified in the Project Calculation list. The item "CALCULATIONS" is a Section.....if you select "Insert a Calculation" from the window shown above the calculation would be placed in the "Section" named "Calculations". Follow along and we will add a calculation and then change the name of "CALCULATIONS" to "2nd Floor Framing".

At this time go ahead and select "Insert a Calculation" from the window. The next screen you see will allow you to select exactly which calculation module type you wish to add:

tton Selects Calcsheet Type	 Source New Calculation Import V4.x datafile 	X Cancel
Single Span Beam	Pole Embedment in Soil	Analysis Timber
Beam on Elastic Foundation	Multi-Story Seismic Loads	Steel Concrete
Rigid Diaphragm Torsion Analysis	Multi-Story Wind Forces	Masonry Dataining Wall
Built-Up Section Property	Multi-Story Column Loads	
Pile Group Analysis		

Material Type change the way all the programs are listed so that Note these two tabs you can have an easier time locating the desired calculation.

The tabs on the right that subdivide the programs further....

Tabs shown when sorting by Material

Analysis
Timber
Steel
Concrete
Masonry
Retaining Wall

Tabs shown when sorting by **Type**



Between the Material and Type tab sheets you can easily find the calculation module you would like to use.

One additional item on the screen is just for long time ENERCALC uses. This selection box that allows you to import calculations from previous versions of the **Structural Engineering Library**.



For this sample session we wish to select the **General Timber Beam** program. Please use the screen and select the button as shown below.

Naterial Type	 Source New Calculation Import V4.x datafile 	Cancel	
		Analysis	
Timber Beam & Joist	Plywood Shear Wall & Footing	Timber	
and Cases Timber Day	Dissured Disabas an	Steel	
Mutti-Span Timber Beam.	Plywood Diaphragm	Concrete	
General Timber Beam	High-Load Diaphragm	Masonry	
		Retaining Wall	
tems of Cantilevered P-	Wood Ledger		
Timber Column	Bolt Groups in Timber		

5.8 Take a look at the Calculation screen

Take a look at the Calculation screen

The Project Manager screen should be replaced with the **General Timber Beam** calculation screen shown below. Please observe the following areas of the screen....they are typical to ALL calculations in the Structural Engineering Library.

ENERCALC cr\EC\sample.ecw - General Timber Beam Design Seneral Timber Beam Design				
Tools & Settings	🔄 Design 🍏 Print		Cancel	✓ Save
Beneral Uniform & Trapezoidal Point & Moment Loads	Summary Sketch Diagrams F	rinting Note:	3	
Description Double Cantilevered Beam	Results Stress Calcs Deflect	ions Query		
		в	eam Design	ок
	Max Stress Ratio	0.000 : 1		
tenter Span	Maximum Moment Allowable	0.0 k-ft 211.9 k-ft	-	Stress 0.0 psi 3,000.0 psi
ight Cantilever	Maximum Shear * 1.5 Allowable	0.0 k 33.3 k		0.0 206.3 psi
Wood Section 5.125x31.5 © Pin-Pin C Pin-Fix leam Width 5.125 ± in C Fix-Fix C Fix-Fix leam Depth 31.50 ± in C Fix-Free	Max Mid-Span Deflection Length / Deflection Ratio		0.000 in 0.0 : 1	
C Sawn C GluLam C Manuf. or So. Pine	Moment Details Max. Pos Mom Max. Neg Mom	0.00k-ft 0.00k-ft	at at	1.000 ft 1.000 ft
Wood Species	Max @ Left Support Max @ Right Support	0.00 k-ft 0.00 k-ft		
b : Base Allowable	Shears Max @ Left Support Max @ Right Support	0.00k 0.00 k		
lastic Modulus	Reactions @ Left Support Dead Load @ Piriti Support	0.000 k	Max	0.000 k
Load Duration Factor	Dead Load	0.000 k	Max	0.000 k

The **Data Entry Tabs** on the **LEFT** half of the screen are where you enter your INPUT values.

The **Results & Graphics Tabs** in the **RIGHT** half of the screen is where you review the calculated values, sketches, stress graphs that result from calculations on your input values.

When you are using ANY of the 45 Structural Engineering Library calculation modules the screen will ALWAYS be laid out like this. This enables you to display the tab on the right side that you want to look at and see how the changes to input data on the left effect it.

5.9 Entering some data

Entering some data

Below is a diagram for the roof beam we wish to design. Please enter the data, as shown on the following screens. Enter the loads and span lengths only....we will be selecting the allowable stresses and members from the internal databases in the following sections.



Here's some pointers for using the data entries...

- Use the [->|] tab key -or- the mouse pointer to select the data item to use.
- To change an entry double-click on it so that the entire number is highlighted, then type in your new value.
- The spin buttons Center Span 24.000 TA ft can be used to increment the values by a standard about to quickly change their value.

General Uniform & Trapezoidal Point & Moment Loads	
Description Double Cantilevered Beam	
Center Span	0.000 🍨 ft
Left Cantilever 8.500 🛉 ft Lu	8.500 🍨 ft
Right Cantilever 6.500 🛉 ft Lu	6.500 🌲 ft
End Fixity	
Wood Section © Pin-Pin	C Pin-Fix
Beam Width 0.000 🛉 in 🔍 Fix-Fix	C Fix-Pin
Beam Depth 0.000 in	C Fix-Free
C Source C Clubon	
C Manuf, or So. Pine	
Wood Species	
Fb : Base Allowable	
Fv : Allowable	
Fc-Perp : Allowable	
Elastic Modulus	
Repetitive Member ?	Г
Load Duration Eactor 1 250	-
Calc shear at "depth" from support ?	R

General Uniform & Trapezoidal Point & Moment Loads										
Uniform Loads Ove	r Full Span									
✓ Auto Calc Beam Weight ? Wood Density 33.00 ♣ pcf										
Dead Load Live Load										
Center Span	360.0 🛊	#/ft	288.0 🛔	#/ft						
Left Cantilever	360.0 🛊	#/ft	288.0 🛊	#/ft						
Right Cantilever	360.0 🛔	#/ft	288.0 🛊	#/ft						
Trapezoidal Loads	Trapezoidal Loads									
	#1	60 T	#2							
DL @ Left	A T	#/ft	<u>*</u> T	#/ft						
DL @ Right		#/ft	<u>*</u>	#/ft						
LL @ Left	25.0 🛔	#/ft	<u>*</u>	#/ft						
LL @ Right	500.0 🛔	#/ft	<u>*</u>	#/ft						
Start Location	37.250 🛊	ft	0.000 🚔	ft						
End Location	54.500 🛔	ft	0.000 🛔	ft						
	#3		#4							
DL @ Left		#/ft	×.	#/ft						
DL @ Right	÷	#/ft	<u>×</u>	#/ft						
LL @ Left		#/ft	Å	#/ft						
LL @ Right		#/ft	A T	#/ft						
Start Location	0.000	ft	0.000 🛔	ft						
End Location	0.000 🗍	ft	0.000 븆	ft						

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General	Uniform & Trapez	zoidal Point & M	oment Loac	s		
Point L	.oads					
	#1	#2	#3		#4	
Dead	3,030.0 🜩	4,245.0 🜩]	A V	lbs
Live	2,824.0 🜩	2,796.0 🛓			A V	lbs
Dist.	-8.500 🜩	54.500 🛔	0.000]	0.000 🌲	ft
	#5	#6	#7			
Dead		A V		lbs		
Live	A I	A V	1	lbs		
Dist.	0.000 🔶	0.000 뢎	0.000 🛔	ft		
Mome	nt Loads					
	#1	#2		ŧ	# 3	2
Dead	8	ŧ	<u> </u>		A T	in-#
Live	8		<u> </u>		A T	in-#
Dist.	0.000	€ 0.0	000 🝨		0.000 🚖	ft
	#4	#5		-	#6	
Dead	3	÷	<u>+</u>		<u>*</u>	in-#
Live	3	÷ [+		<u>*</u>	in-#
Dist.	0.000		00 🔶 🗌		0.000 🔶	ft
	#7					
Dead		🛃 in-#				
Live	1	in-#				
Dist.	0.000	₽ ft				

While you are entering this data we suggest that you select the "**Summary**" tab on the right hand side and then select the "Results" or "Stress Calcs" tab and watch how the values change as you enter your information.

5.10 Getting beam sections from a database

Getting information from the databases

We trust that entering those numbers was a trivial task. You've just experienced part of the advantage of using the Structural Engineering Library ...simply entering data into a form.

We still have two critical items to specify.....the stress properties of the wood member to use and the physical size of the beam.

First, let's retrieve the stress properties. For this sample we want to use Douglas-Fir glued-laminated timber of type 24F-V8. Please follow these steps...

Display the General Tab General and click on the Wood Species Wood Species button. The following database window will be displayed.

ou stress patabase		Siz	e flasses to	Show						
species				CIL OF A		-			Charles	
-All Species-			2"->4" 11	iick, 2" 8	Wider		O XO &L	arger	Glueo-Laminated	
Jsing 1997 UBC/NDS St	tress Values		Beams	& String	ers	F	Posts & Tir	nbers	Manufactured	
						< Sot Br	des co		All stresses	in PSI
pecies Grade Class Fb	FR FV F	c · Perp	Fo - Pil E	1				• 0-		
Species	Grade	Class	Fb Bending T	Ft ension 1	Fv F Shear	c-Perp Comp	Fc-Prll Comp.	Elestic Modulus	Grading Agency	1
Aspen	Select structural	2-4	875	500	60	265	725	1,100,000	NELMA NSLB	Select
Aspen	No.1	2-4	625	375	60	265	600	1,100,000	NELMA NSLB	2 crock
Aspen	No.2	2-4	600	350	60	265	450	1,000,000	NELMA NSLB	
Aspen	No.3	2-4	350	200	60	265	275	900,000	NELMA NSLB	
Aspen	Stud	2-4	475	275	60	265	300	900,000	NELMA NSLB	+
Aspen	Construction	2-4	700	400	60	265	625	900,000	NELMA NSLB	
Aspen	Standard	2-4	375	225	60	265	475	900,000	NELMA NSLB	Insert
Aspen	Utility	2-4	175	100	60	265	300	800,000	NELMA NSLB	-
Beech - Birch - Hickory	Select structural	2-4	1,450	850	100	715	1,200	1,700,000	NELMA	05
Beech - Birch - Hickory	No.1	2-4	1,050	600	100	715	950	1,600,000	NELMA	2
Beech - Birch - Hickory	No.2	2-4	1,000	600	100	715	750	1,500,000	NELMA	Change
Beech - Birch - Hickory	No.3	2-4	575	350	100	715	425	1,300,000	NELMA	Turningo
Beech - Birch - Hickory	Stud	2-4	775	450	100	715	475	1,300,000	NELMA	
Beech - Birch - Hickon	Construction	2-4	1,150	675	100	715	1,000	1,400,000	NELMA	-
Beech - Birch - Hickory	Standard	2-4	650	375	100	715	775	1,300,000	NELMA	
Beech - Birch - Hickon	Utility	2-4	300	175	100	715	500	1,200,000	NELMA	Delete
Cottonwood	Select structural	2-4	875	525	65	320	775	1,200,000	NSLB	There was not a second
Cottonwood	No.1	2-4	625	375	65	320	625	1,200,000	NSLB	
Cattonwood	No.2	2-4	625	350	65	320	475	1,100,000	NSLB	X
	No.3	2-4	350	200	65	320	275	1,000,000	NSLB	
Cottonwood						0.0.0	000	1 000 000	A LOL D	Cance

By default ALL timber stress types are displayed. We want to display ONLY the glued-laminated sections for Douglas Fir.

Change the check boxes for Size Classes to Show to be ONLY Glued-Laminated

e Classes to Show		
2"->4" Thick, 2" & Wider	5" x 5" & Larger	Glued-Laminated
Beams & Stringers	Posts & Timbers	Manufactured

Change the Species drop list to show Douglas-Fir.

Spec	cies	
Do	uglas Fir	-
Using	All Species	
	Douglas Fir E-Bated Southern Pine	
	Hem Fir	
	Hem Fir / Softwood	
Specie	Willamette	6

The result of these choices will be a list of stress grades as shown....

	pecies Grade Class Fb Ft Fv Fc · Perp Fc · Prll E								
1	Species	Grade	Class	Fb	Ft	Fv	Fc-Perp	Fc-Prll	Elastic
				Bending	Tension	Shear	Comp.	Comp.	Modulus
I	Douglas Fir	16F-E6	GLB	1,600	1,000	165	650	1,600	1,600,000
l	Douglas Fir	20F-E6	GLB	2,000	1,150	165	650	1,650	1,700,000
I	Douqlas Fir	22F-E5	GLB	2,200	1,100	165	650	1,650	1,700,000
l	Douglas Fir	24F-E10	GLB	2,400	1,300	165	650	1,750	1,900,000
l	Douglas Fir	24F-E12	GLB	2,400	1,200	155	650	1,600	1,900,000
I	Douglas Fir	24F-E13	GLB	2,400	1,250	165	650	1,700	1,800,000
	Douglas Fir	24F-E18	GLB	2,400	950	190	650	1,600	1,800,000
	Douqlas Fir	24F-V8	GLB	2,400	1,100	190	560	1,650	1,800,000

Highlight the last entry Douglas-Fir 24F-V8 as shown and select the [Select] button. Immediately the stress information area on the General Tab will be updated to reflect your selection....

Wood Species	Douglas Fir, 24F - V8)
Fb : Base Allowable .		2,400.0 뢎 psi
v : Allowable		190.0 🍨 psi
Fc-Perp : Allowable .		560.0 🔶 psi
Elastic Modulus		1,800.0 뢎 ksi

Next, let's retrieve the data for a 5-1/8" x 24" Glu-Lam Beam

Display the General Tab General and click on the Stress Wood Section button. The following database window will be displayed.

elect Ty	ypes to Displa	UV VI					Low: 2.00 to in				00 🛓 in
S	awn	Glued-Lan	ninated		Power	Beam	P 3	фесну не	thru Raufte	High: 12.	00 🖣 in
TJ: P	arallam icroLam	TJ :Timber	Strand		Vers Cus	aLam tom					
ype Na	me Width Dep	th Area Ix	\$x	ly	Sy b	k/Area Sx/An	18	@ + (o. «.)	Sort Order	
Type	Name	Area	Width De	pth	bx.	Sxx	N	SW	bx/Area	Sxx / Area 1	
		in2	in	in	in4	in3	in4	in3			1
รัสพท	4x6	19.250	3.500 5	.500	48.52	6 17.646	19.651	11.229	2.521	0.9167	
Sawn	4x8	25.375	3.500 7	.250	111.14	8 30.661	25.904	14.802	4.380	1.2083	Select
Servin	4x10	32.375	3.500 9	.250	230.84	0 49.911	33.049	18.885	7.130	1.5417	
Sawn	4x12	39.375	3.50011	.250	415.28	3 73.828	40.195	22.969	10.547	1.8750	1.00
Sawa	3-2x3	11.250	4.500 2	.500	5.86	0 4.690	18,980	8.440	0.521	0.4169	- -
Sawn	3-2x4	15.750	4.500 3	.500	16.08	0 9.190	26.580	11.810	1.021	0.5835	Incent
Sawn	3-2x6	24.750	4.500 5	.500	62.39	0 22.690	41,770	18.560	2.521	0.9168	Tuser
Sawn	3-2x8	32.630	4.500 7	.250	142.90	0 39.420	55.050	24.470	4.379	1.2081	
Sawn	3-2×10	41.630	4.500 9	.250	296.79	0 64.170	70.240	31.220	7.129	1.5414	Δ
Sawn	3-2x12	50.630	4.50011	.250	533.94	0 94.920	85.430	37.970	10.546	1.8748	100
Sam	6x6	30.250	5.500 5	.500	76.25	5 27.729	76.255	27.729	2.521	0.9167	Change
Sawn	6x8	41,250	5.500 7	.500	193.35	9 51,563	103,984	37,813	4,687	1.2500	
Sawn	6×10	52.250	5.500 9	.500	392.96	4 82.729	131.714	47.896	7.521	1.5833	
Sawn	6x12	63.250	5.50011	.500	697.07	0 121.230	159.440	57.980	11.021	1.9167	-
Sawn	8x8	56.250	7.500 7	.500	263.67	0 70.310	263.670	70.310	4.687	1.2500	Delete
Samu	8×10	71.250	7.500 9	.500	535.86	0 112.810	333.980	89.060	7.521	1.5833	Delete
Sawn	8x12	86.250	7.50011	.500	950.54	0 165.310	404.300	107.810	11.021	1.9166	
Sawn	10×10	90.250	9.500 9	.500	678.76	0 142.900	678.760	142.900	7.521	1.5834	
Sawn	10x12	109.250	9.50011	.500	1.204.03	0 200.400	821.650	172.980	11.021	1.8343	~
Sam	12x12	132.250	11.50011	.500	1,457.51	0 253,4801	,457.510	253.480	11.021	1.9167	Canad
	ad a dead and	- Constanting		warmed and							Cancel

Change the check boxes for **Select Types to Display** checkboxes to be ONLY Glued-Laminated

ect Types to Dis	play	
Sawn	Glued-Laminated	PowerBeam
TJ : Parallam	TJ :Timber Strand	VersaLam
TJ: MicroLam	LP:Gang-Lam LVL	Custom

The result of this choice will be a list of glu-lam beams. Navigate the database using the scroll bar and highlight the $5-1/8" \times 24"$ beam as shown below.

Type Nar	me Width Depth	Area Ix	Sx ly	Sy Ix//	Area Sx/Are	a	@ + C	. < :	Sort Order	
Type	Name	Area	Width Depth	lx .	Sxx	lv.	Sw b	∝/Area	Sxx / Area 🔺	
		in2	in in	in4	in3	in4	in3			
GLB	5.125x13.5	69.188	5.12513.500	1,050.785	155.672	151.438	59.098	15.187	2.2500	
GLB	5.125x15.0	76.875	5.12515.000	1,441.406	192.188	168.264	65.664	18.750	2.5000	Select
GLB	5.125x16.5	84.563	5.12516.500	1,918.511	232.547	185.091	72.230	22.687	2.7500	
GLB	5.125x18.0	92.250	5.12518.000	2,490.750	276.750	201.917	78.797	27.000	3.0000	
GLB	5.125×19.5	99.938	5.12519.500	3,166.769	324.797	218.743	85.363	31.687	3.2500	+
GLB	5.125×21.0	107.625	5.12521.000	3,955.218	376.688	235.570	91.930	36.750	3.5000	Incort
GLB	5.125x22.5	115.313	5.12522.500	4,864.746	432.422	252.396	98.496	42.187	3.7500	Insen
GLB	5.125x24.0	123,000	5.125.24.000	5.904.000	492.000	269.223	105.063	48.000	4.0000	
GLB	5.125x25.5	130.688	5.125 25.500	7,081.628	555.422	286.049	111.629	54.187	4.2500	A
GLB	5.125x27.0	138.375	5.12527.000	8,406.281	622.688	302.875	118.195	60.750	4.5000	
GLB	5.125x28.5	146.063	5.12528.500	9,886.605	693.797	319.702	124.762	67.687	4.7500	<u>Change</u>
GLB	5.125×30.0	153.750	5.125.30.000	11,531.250	768.750	336.528	131.328	/5.000	5.0000	
GLB	5.125X31.5	161.438	5.125.31.500	13,348.860	847.547	353.355	137.895	82.687	5.2500	
GLB	5.125×33.0	169.125	5.125.33.000	15,348.090	930.188	370.181	144.461	90.750	5.5000	
GLB	5.125X34.5	104500	5.125.34.500	17,537.580	1,016.671	387.008	151.027	99.187	5.7500	Delete
GLB	5.125X36.0	109.100	5.12536.000	19,926.000	1,107.000	403.834	157.594	117107	6.0000	
	5.125X37.5	100.075	5.125.37.500	22,521.970	1,201.170	420.000	104.100	100 750	0.2500	1
	5.125X39.0 E 12E-40 E	133.075	5.125.39.000	25,334.160	1,299.000	437.490	170.730	120.750	0.5035	× I
	5.125X40.5 E 19EV/9.0	207.503	5.12540.500	20,371.200	1,401.050	454.310	102 050	1.47.000	0.7500	~
	0.120242.0	L 10.200	0.12042.000	007.000	1,000.700	471.140	103.000	197.000	1.0000	Cancel



Select the button. Immediately the beam size information area on the General Tab will be updated to reflect your selection....

Wood Section	5.125x24.0	Pin-Pin	C Pin-Fix
Beam Width	5.125 in	C Fix-Fix	C Fix-Pin
Beam Depth	24.000 🛊 in		C Fix-Free

5.11 Displaying a Sketch

Displaying a Sketch

We now have a calculation with span lengths, loads, allowable stresses, and a beam size. It's time we review our sketch to make sure we have entered the critical span and load information correctly. Select the Sketch Tab and the working area of your screen will be replaced with a simple diagrammatic sketch of the beam you are designing.



5.12 **Displaying a Stress Diagram**

Displaying a Stress Diagram

In addition to the Sketch of the beam design we can also display several stress diagrams. Selecting the **Diagrams** tab will display the Shear/Moment/Deflection diagram shown below.

Of special interest are the checkboxes that control the location of live load for the analysis shown in the graphic. Because this program automatically moves the live load around on the beam to obtain the governing values of shear, moment, and deflection on each span for the final calculation results, there really is no single load case that represents the beam analysis.

By selecting the live load locations here you can view the detailed stress variations produced by each load application.



5.13 Automatic member design selection

Automatic member design

An additional feature of many of the Structural Engineering Library programs is automatic selection of sizes that satisfy your specified design criteria.

Select the **Summary / Results Tab** again and take a look at the stress ratio. From the partial screen image below you can see that our $5-1/8" \times 24"$ size guess was pretty close, but it is still overstressed (by 1.6%).

1 .		
Results Stress Calcs Deflect	tions Query	
	Overstressed in	Bending !
Max Stress Ratio	1.578 : 1	
		Stress
Maximum Moment	160.6 k-ft	3,916.3 psi
Allowable	101.7 k-ft	2,481.6 psi
laximum Shear * 1.5	25.3 k	205.4
Allowable	29.2 k	237.5 psi
Aax Mid-Span Deflection	-5.99	94 in

Rather than randomly trying other sizes from the database, we will use the **Automatic Design** function to select an optimum member size for us. When you select the Design Button a screen is displayed that allows you to set the design criteria.

📜 Design	
Design Beam	
Section Type Sawn © Glued-Laminated © TJ : Parallam C TJ : TipherShared	Maximum Stress Ratio 1.00 * Minimum Total Deflection Ratio 240.0 *
C Custom (User Defined)	Cancel Go

On this screen please set the "Section Type" to Glued-Lamininated, Maximum Stress Ratio = 1.0, and a Minimum Total Deflection Ratio to 240. When these items are set you can press the [GO] button and the software will automatically search the built-in Wood Section Database for all the sections that satisfy this criteria using the beam, load, and stress grade information you have selected.

You can see we have select Glued-Laminated type beams and set the maximum stress ration to 0.97.....that will give us a slightly conservative design with no member suggested that is over 97% of full stress. We'll select [GO] and after a brief moment the following screen will be displayed.

Notice how the members can be listed in different orders: Stress Ratio, Deflection Ratio,

Section	Stress Hatio	Defl. Hatio	Width	Depth 🔺	
5.125x37.5	0.7227	253.8	5.125	37.500	
5.125x39.0	0.6769	284.6	5.125	39.000	
5.125x40.5	0.6360	317.8	5.125	40.500	4
6.75x34.5	0.6355	256.2	6.750	34.500	Coloct
5.125x42.0	0.5994	353.4	5.125	42.000	Jelect
8.75x31.5	0.5985	248.7	8,750	31,500	
6.75x36.0	0.5891	290.0	6.750	36.000	
10.75x30.0	0.5519	259.3	10,750	30.000	
8 75v33 0	0.5507	284 5	8 750	33,000 🚬	X
ort List Bu					
Jit List Dy	127	12			Cancel
🖲 Stress Ratio 🛛 🔿 D	efl. Ratio 🛛 🔿 Wi	dth 🔿 De	pth		

Width, or Depth. This allows you to review the beam sizes that pass your criteria in different ways.

We will highlight the **5.125 x 37.5** beam and press the **[Select]** button. The final design (with General Tab) showing looks like this....

ENERCALC c:\EC\sample.ecw - General Timber Beam Design				
General Timber Beam Design				
Tools & 😚 Help	🔄 Design 🥩 Print		Cancel	✓ <u>S</u> ave
General Uniform & Trapezoidal Point & Moment Loads	Summary Sketch Diagrams	Printing Note:	3	
Description Double Cantilevered Beam	Results Stress Calcs Deflect	ions Query		
		в	eam Design	ок
Center Span 48.000 ♣ th Lu 0.000 ♣ th Left Cantilever 8.500 ♣ th Lu 8.500 ♣ th Right Cantilever 6.500 ♣ th Lu 6.500 ♣ th	Max Stress Ratio Maximum Moment Allowable Maximum Shear * 1.5	0.723 : 1 164.7 k-ft 227.9 k-ft 24.0 k	-	Stress
Wood Section 5.125x37.5 C Pin-Pin C Pin-Fix Beam Width 5.125 ★ in C Fix-Fix C Fix-Pin Beam Depth 37.500 ★ in C Fix-Free	Max Mid-Span Deflection Length / Deflection Ratio	45.5 %	-1.612 in 357.2 :1	2010 001
C Sawn & GluLam C Manuf, or So. Pine	Moment Details Max. Pos Mom Max. Neg Mom	164.68k-ft 40.38k-ft	ət at	24.377 ft 0.000 ft
Wood Species Douglas Fit, 24F - V8	Max @ Left Support Max @ Right Support	-74,76 k-ft -69,69 k-ft		
Fb : Base Allowable 2,400.0 ★ psi Fv : Allowable 190.0 ★ psi Fc-Perp : Allowable 560.0 ★ psi Flastic Modulus 1 900 ★ psi	Shears Max @ Left Support Max @ Right Support Reactions	17.58k 18.93 k		
Repetitive Member ?	@ Left Support Dead Load	16.249 k	Max	29.299 k
Load Duration Factor 1.250 Calc shear at "depth" from support?	Dead Load	16. 480 k	Max	33.139 k

4

104

5.14 Printing the calculation

Printing the calculation

Okay...congratulations! You've created a project file, added a calculation, entered data, retrieved database information, performed an automatic design, and viewed some graphics. It's time to print this calculation and take a look at what we have provided you with for your documentation.

Please remember that you have previously entered project information, title block information, and of course now you have a valid engineering calculation to print.

You have two printing options in the Structural Engineering Library: **Print Preview** and **Print**. Here are the printing buttons to use:



The [Print] button sends the printed calculation report directly to the printer. The other button with the page symbol displays the printout in a window and allows you to review it before sending it to the printer.

The "Print Preview" window looks like this. If you are satisfied with it just press the

Print button to send it to the printer.
port Preview turn Print Preview On or C e Settings Printing menu ite	C Page Widt 📀 759	C No Zoor <u>A</u> cross:		Cancel	Print	
Joseph P. Engineer GREAT ENGINEERIN 123 Main Street Anytown, USA 1234 www.greatengineer	G UNLIMITED 15 ing.com		Title : Sampl Dsgnr: A Nev Description : Scope :	e Session w ENERCALC US This is a quided the Structural En Following the Us	Se Date: 12:42PM session to instru igineering Library ser's Guide Samp	Job # 2003-100 4, 4 NOV 03 pt new users in using y software system. ple Session".
Rev: 580000 User: KW-0600001, Ver 5.8.0, 10 (c)1983-2003 ENERCALC Enc)-Sep-2003 pineering Software	General Ti	imber Beam		c:lects	Page 1 sample.ecw:Calculation
General Informatio	on	Code Ref. 1	1997 NDS, 2003 IB	C, 2003 NFPA 50	DOO. Base allowal	bles are user def
General Informatic Section Name Beam Width Beam Depth Member Type Brn Wt. Added to Load Dur. Factor Beam End Fixity Wood Density	5.125x37.5 5.125in 37.50Cin GluLar Loads 1.250 Pin-Pir 33.00Cpcf	Code Ref: Center Sp Left Cantil Right Can Douglas F Fb Base A Fv Allow Fc Allow E	1997 NDS, 2003 IB ever 8 ilever 6 i'r, 24F - V8 ilow 2,4C 19 56 1,8C	C, 2003 NFPA 50 .00 ftLu .50 ftLu .50 ftLu 00.0 psi 00.0 psi 00.0 psi 00.0 ksi	000. Base allowat 0.00 ft 8.50 ft 6.50 ft	bles are user def
General Informatic Section Name Beam Width Beam Depth Member Type Brn Wt. Added to Load Dur. Factor Beam End Fixity Wood Density Full Length Unifor	5.125x37.5 5.125in 37.50Cin GluLar Loads 1.250 Pin-Pir 33.00Cpcf m Loads	Code Ref: Center Sp Left Cantil Right Can Douglas F Fb Base A Fv Allow Fc Allow E	1997 NDS, 2003 IB ever 8 tilever 6 i'r, 24F - V8 Ilow 2,4C 19 56 1,8C	C, 2003 NFPA 5(1.00 ftLu 1.50 ftLu 1.50 ftLu 10.0 psi 10.0 psi 10.0 psi 10.0 psi 10.0 psi	000. Base allowal 0.00 ft 8.50 ft 6.50 ft	bles are user def
Ceneral Informatic Section Name Beam Width Beam Depth Member Type Bm Wt. Added to Load Dur. Factor Beam End Fixity Wood Density Center Left Cantilever Right Cantilever	5.125x37.5 5.125in 37.50Cin GluLarr Loads 1.250 Pin-Pir 33.00Cpcf m Loads DL DL DL	Code Ref: Center Sp Left Cant Douglas F Fb Base A Fv Allow Fc Allow E 360.00 #/ft 360.00 #/ft	1997 NDS, 2003 IB an 48 ever 8 tilever 6 ir, 24F - V8 19 56 1,80 LL 288.00 LL 288.00 LL 288.00	C, 2003 NFPA 5(1.00 ftLu 1.50 ftLu 1.50 ftLu 1.00 psi 10.0 psi 10.0 psi 10.0 ksi 0.0 ksi 0.0 #/ft 0. #/ft 0. #/ft	000. Base allowal 0.00 ft 8.50 ft 6.50 ft	bles are user def
General Informatic Section Name Beam Width Beam Depth Member Type Bm Wt. Added to Load Dur. Factor Beam End Fixity Wood Density Wood Density Full Length Unifor Center Left Cantilever Right Cantilever Trapezoidal Loads	5.125x37.5 5.125in 37.50Cin GluLar Loads 1.250 Pin-Pir 33.00Cpcf m Loads DL DL DL	Code Ref: Center Sp Left Canti Right Can Douglas F Fb Base A Fv Allow Fc Allow E 360.00 #/ft 360.00 #/ft	1997 NDS, 2003 IB ever 8 tilever 6 i'r, 24F - V8 Ilow 2,4C 19 56 1,8C LL 288.00 LL 288.00	C, 2003 NFPA 5(1.00 ftLu 1.50 ftLu 1.50 ftLu 10.0 psi 10.0 psi 10.0 psi 10.0 ksi 10.0 ksi 10.0 ksi 10.0 ksi 10.0 ksi	000. Base allowal 0.00 ft 8.50 ft 6.50 ft	bles are user def

To continue, simply press the Print button and the standard Windows print dialog will be displayed. Select your printer and you will receive a printout looking very similar to the one below.

oseph P. Engineer Geat Engineering Unlimited 234 Main Street, 22nd Floor nytown, USA 92625			Title : Sample Job Job # 98-0010 Dsgnr: MDB Date: Description : Sample Job description Scope : Teach fundementals of the Structural Library					
0) 432-6959 Fax	: 432-65	969						,
/ 505001			Genera	Timber	Beam			Page
Description (Glu-Lam	Beam #1						
General Informa	tion				- Contraction (Co			
Section Name	5.125x2	8.5	Cente	r Span	24.00 1	tLu	4.00	ft
Beam Width		5.125 in	Left C	antilever	7.25 f	ftLu	4.00	ft
Beam Depth		28.500 in	Right	Cantilever	9.50 t	tLu	4.00	ft
Member Type	(GluLam	Dougl	as Fir, 24F	- V8			
Bm Wt. Added	to Loads		Fb Ba	se Allow	2,400.0 (psi		
Load Dur. Fact	or	1.000	Ec All	ow.	560.0 /	pei		
Beam End Fixi	ty	Pin-Pin	E		1,800.0	ksi		
Wood Density		34.000 pcf						
Uniform Loads								
Uniform Loads (Over Full	Span	200 00 ##		240.00 ##			
Left Cantiles	ior.	DL	360.00 #/ft 360.00 #/ft		240.00 #/ft			
Right Cantil	ever	DL	360.00 #/ft	LL	240.00 #/ft			
Trapezoidal Loa	ds	1998		253.64				
#1 DL @ Left		36.00 #/ft	LL @ Left	24.	00 #/住	Start Loc	15.000 f	
DL @ Right		96.00 #/ft	LL @ Right	76.	00 #/ft	End Loc	33.500 ft	E
Point Loads								
Dead Load	3,030.0	lbs 3,0	30.0 lbs	lbs	lk	06	lbs	lbs
Live Load	2,824.0	lbs 2,8	24.0 lbs	lbs	lk	05	lbs	lbs
distance	-7.250	ft 33	3.500 ft	0.000 ft	0.000 ft	0.00	0 ft	0.000 ft
Summary	2						Bear	n Design OK
Span= 24.00ft, L	eft Cant=	7.25ft, Right C	ant= 9.50ft, Bean	n Width = 5.1	25in x Depth =	28.5in, Ends are	Pin-Pin	
Max Stress R	atio		0.739 : 1					
Maximum Ma	mont		-0116.0	Ν	Aaximum She	ear * 1.5	17	.3 k
Allowable	e		123.3 k-ft	8	Allowable		24	.1 k
Max Positive M	oment	6 17 k	-ft at 10.9	39 0	Shea	ar @let	1	10.35 k
Max. Negative M	Aoment	-50.45 k	-ft at 24.0	000 ft	onot	@ Rig	ht	13.12 k
Max @ Left Sup	port	-59.12 k	-ft		Cam	ber: @ Lef	ft	0.310 in
Max @ Right Su	pport	-91.14 k	-ft			@ Ce	nter	0.179 in
Max. M allow		123.34		Reaction		@ Rig	pht	0.599 in
fb 1,576.3	8 psi	fv	118.19 psi	Left DL	9.95 k	Max		18.56 k
Fb 2,133.2	3 psi	Fv	165.00 psi	Right D	L 13.41 k	Max		23.70k
Deflections								
Center Span	1	Dead Load	Total Load	i Left	Cantilever	Dead Lo	ad	Total Load
Deflection	5	0.119 in	0.028 i	in I	Deflection	-0.20	07 in	-0.511 in
Location		13.388 ft	19.265 1	ft	Length/Defl	841	.0	340.6
Length/De	fi	2,417.9	10,213.43	Righ	t Cantilever			
				1	Deflection	-0.35	99 in	-0.898 in
					Length/Defi	571	2	253.9
983-98 ENERCALC			c-locisam.	nie eow Roof	Framina	KW-06099	99 Ver 5 0	6 15-Jul-1998

5.15 Saving the Calculation

Saving the Calculation

The only BIG DANGER up until this point is that YOU DATA IS NOT SAVED. You have added a calculation to the project file, but everything at this moment is stored in the computers RAM memory. A power outage or sever system lockup would loose your current calculation.

So to save this new calculation back to the project file, press



Immediately the screen will return to the Project Manager screen, and you see that a "General Timber Beam" calculation item has been added below the Section named "CALCULATIONS" :

Project Info Project Calculations	UNITS US SI Metric	Project Settings ? Help
Print Calc Copy Calc Delete Calc	+ Add Calc	General Timber Beam Design Span= 48.00ft, Left Cant= 8.50ft, Right Cant= 6.50ft Poem Width = 6 125 in x Darth = 27.5 in
	Bt⇔ Export Bt⇔ Import	End Fixity is Pin-Pin
Section & Calc. Type Description from	Calculation	Density= 33.00pct, Load Duration Factor = 1.250 Eb = 2.400.0pci, Ev = 190.0pci Ec = 560.0pci
		Max Span Moment= 164.7k-ft. M-left= -74.8k-ft. M-right= -69.7k-
General Timber Double Cantilevi	ered Beam	Max Defl: @ Center= -1.6123in, @ Left Cant= 0.7737in, @ Rig!
		Left Reaction= 29.30k, Right Reaction= 33.14k

Congratulations! You calculation is now secure and you have a real Project file with an actual calculation!

5.16 Changing Section Names, Adding a Section

Editing the Section Name

Let's do a little more work here and edit the Section name "CALCULATIONS" and add a Section in our project file.

Edit the Section Name

To edit a Section name you simply highlight the name and use the "Edit Section" button. When you highlighted a Section the [Edit Calc] button changes to read [Edit Section].

	E Print Calc	Conv Calc	Delete Calc	+ Add Edit Section	
	Section View	Material View	Calc Type View	Export Export	
1	Section & Calc. Type		Description from C	alculation	
	E- 🗐 CALCUI	LATIONS			
	🗆 🗏 🛛 Gene	eral Timber	Double Cantilever	ed Ream	1

After you press the [Edit Section] button you can use a small window where you can rename the Section:

nter Section Title	
Sections Title : 2nd	Floor Framing
X Cancel	🖌 ок
•••	

Please enter "2nd Floor Framing" and press [OK]. You will notice that the Section name "CALCULATIONS" has been replaced with "2ND FLOOR FRAMING".

	Section View	Material View	Calc Type View	Export	Exp Import
	Section & Calc. Type		Description from Ca	alculation	
1	E- @ 2ND FLOOR FRAMING				
	🖵 🖁 General Timber		Double Cantilevere	ed Beam	

Now we will enter a NEW Section name. In this case we will use a name of '3rd Floor Framing". To do this highlight the section maned "2ND FLOOR

+	<u>A</u> dd Section
---	------------------------

. Select "Insert a Section"

FRAMING" and press the Add Section button on when asked and then enter the name "3rd Floor Framing" and press [OK]. Your Project Calculation list should look like this.

Section View	Material View	Calc Type View	Export	<mark>B</mark> ⇔ Import	
Section & Calc. Type		Description from Calculation			
- 3RD FLOOR FRAMING					
È- ^(™) 2ND FLOOR FRAMING └─ 🖁 General Timber		Double Cantilevere	d Beam		

5.17 Adding another Calculation

Adding another Calculation in the new Section by using [Copy Calc]

Similar to how we added our first calculation, we will now add another calculation in the 2nd Floor Framing section by making a copy of your current General Timber Beam calculation and then move it up into the 3rd Floor Framing section.

• First, highlight the "General Timber Beam" calculation



- The [Copy Calc] button will read all the data from the highlighted calculation and create an entirely new calculation and display it as a calculation to edit.
- When the General Timber Beam calculation module is opened change the Description item to read as shown below:

Description	3rd Floor Cantilevered Beam		
	*		

• Next press the button to save this new calculation back to the project file. The Project Manager will appear as follows:

Project Info Project Calculations Units US SI Metric					
Print Calc	Copy Calc	— <u>D</u> elete Calc	+ Add Calc Edit Calc		
Section View	Material View	Calc Type View	Export Import		
Section & Cal	c. Type	Description from Calculation			
- 🗇 3RD FLC	OOR FRAMING				
- 🖁 Gene	ral Timber	3rd Floor Cantilevered Beam			
Gene 🖌	ral Timber	Double Cantilever	ed Beam		

The final step is to move this new calculation up into the "3rd FLOOR FRAMING" section. This is easily done by using these buttons:



One click of the "Shift Calc Up" button while the new calculation is highlighted will move it up and the Project Calculation list will appear like this:

9	Section View	Material View	Calc Type View	Export	B ⇔ Import
	Section & Cal	lc. Type	Description from Cal	culation	
	E-				
	🗌 🖵 🖁 General Timber		3rd Floor Cantilevere	ed Beam	
	È- ⁽ ⊇ 2ND FLOOR FRAMING └─ 🖁 General Timber		Double Cantilevered	Beam	

5.18 Creating a Technical Support Question

Creating a Technical Support Question

The occasion routinely arises that you will have a question about the software system. We have found in our 20 years in the software business (as of 2003) that certain bits of information are essential. Among these is YOUR name, company, user registration number, and the version number of the software you are using.

To make it easy for you to give us all this AND state your question, the Structural Engineering Library has a built-in technical support form that you can merely type in your question and print it out. By faxing it to us we can easily know who you are, know if you need to acquire a maintenance release, and easily read your questions.

By selecting **Help** | **Tech Support Form** from the main menu you can use the form shown below to enter your question. When finished, the completed for prints as shown in the second image shown below.

Technical Supp	ort Sube	nittal		
Your Informe	ation	Your Question	Question Category	User Number: KW-0609999
Filename Calculation	n Type:	C\EC\SAMPLE.EC\ Single Span Beam	N Analysis	
Question	In this The Yo The Qu sugesti	area you can type in our Information tab ha restion Category tab on for future use.	your question. as all of your user informatic let's us know more about th	on. ne urgency or if the question is just a
				Print Quit

Here's the printed form ready fox transmission.....

	Technical Support	ort Request					
	rechnical Suppo	on Request					
	Fax this form to	949-640-5463					
Name : Mi Title :	chael D. Brooks	Todays Date	: 13 OCT 98				
Company: EN Address : P.0	IERCALC Engineering Software D. Box 188	User # :	KW-0609999				
City : Co State : CA	rona del Mar Zip 92625	I sugggest you a	dd				
Voice : (94	19)-640-5460 19)-640-5463	Please add a design progr	Please add a cold formed stee design program!				
email : mo	ibrooks@enercalc.com						
Filename : C:	EC\SAMPLE.ECW						
Calc Type: Sir	ngle Span Beam Analysis						
KV	V-0609999, Ver 5.0.6, 15-Jul-1998, Wir	132					
Question	In this area you can type in your question.						
5	The Your Information tab has all of your user information.						
	The Question Category tab let's us know a sugestion for future use.	w more about the urgency or	if the question is j				

(c) 1983-98 ENERCALC

5.19 Closing the Project File

Closing the Project File

Well....it's time to close out our worksession. Although all the data is safely saved in the project file already, you will want to know how to load a different project file. It's easy.....

• Select the

button from the Project Manager screen

• Select File | Open from the main menu

Close Project

• Select the ECW file you wish to use next. In this case we will select the EXAMPLES.ECW file that is supplied with your software system This file contains example calculations for ALL calculations in the Structural Library, and are the calculated used in each chapter. Here's an image of the project list....

roject: [c:\ec\examples.ecw					🧼 Prin		SaveAs	Close Project		
Project Info Project Calculations Units US SI Metric				Metric	曲 <u>N</u> ew	-	<u>O</u> pen Project	Tools & Settings	? 1	Help
Print Calc	Material View	Calc Type View Description from	Add Calc	Edit Calc	General 1 Span= 12 Beam Wi End Fixity Density= Fb = 2.40	imber B 00tt Righ dth = 5.12 is Pin-Pir 34.00pct 10psi Ev	t Cant= 4.00 t Cant= 4.00 5in x Depth b Load Durati = 165 Bosi F	an t = 18.in on Factor = 1.250 ic = 625.0nsi	D	
ANALY A	SIS CALCS m Analysis d Diaphragm m Elestic Fdn. tion Properties Group a Embedment smic Forces i-Story Column R R CALCS ber Beam & Joist i-Span Timber erel Timber tilevered Beams ber Column ar Wall & Fig vood Diaphragm H-oad Diaphragm H-oad Diaphragm H-oad Diaphragm H-oad Diaphragm Ser Lefter	Fixed-Fixed Bea Double Cantilevy Example Proble Beam with Fixed I Beam with Fixed I Beam with variou Seven pile syste Circular pole with Example Proble S Story Building 3 Beams 3-Span System, 1 Outble Cantilew Example Proble Four Bay System 4 Span System, Column Subject Vertical Pt & Unif Illustrating Zone- r Using Staples With Uniform Loc Using metal plate	m ered Beam m, 8 Wall System, One 1 & Pinned ends is shapes attached m w/X & Y load eccen i Point & Uniform Loads m, m, 2 Load Patterns ared Beam m#2, Double Cantileve h: 2 Simple, 1 Rt Cant, 1 Cant. Optimize & Beam ed to Additional Side Lo Loads & Lateral Shea Nailing Areas ad, against concrete es @ both sides	Wall Angled tricitry Double Can Design ad r & Drag Load	Max Spain Max Defi Left Read	Moment @ Center tion= 16.3	= -17.8k-ft, M r= 0.0199in, (1k, Right R	Heft= 0.0k-ft, M+ @ Right Cent-0. eaction= 12,64k	ight= -29.1 1834in	0k-ft