

TABLE OF CONTENTS

SYSTEM REQUIREMENTS	2
INSTALLING ON A HARD DISK	2
Windows 95, NT, 98, ME, 2000, XP or Vista	2
Using SETUP.EXE	2
Using Start Button	2
Using Computer Icon	2
Running Plan Analyst for the first time	3
IF YOU USE A NETWORK	3
Printing reports	3
NT printing	3
PLAN ANALYST FEATURES	3
Using the keyboard	3
Text boxes	3
Calculator use	4
Entering Dimensions	4
Editing text boxes	4
Using the Windows Clipboard	5
SETUP/ DEFAULTS	5
Header Information	5
Printer and Font Setup	5
Printer problems/solutions	5
Select lumber	5
USE OF COLUMN CALCULATOR	6
USE OF BEAM CALCULATOR	7
Selecting Material	7
Repetitive Member	7
Duration of Load	8
Distribution of Loads	8
Rafter or Joist	8
Input of Span	8
Single span with one uniform load	8
Cantilever	9
Single span with an increasing load	9
Multiple uniform and/or point loads	10
Continuous beam over 2 spans	10
Bearing condition	11

SYSTEM REQUIREMENTS

In order to use Plan Analyst, you must have the following:

- 1) Microsoft Windows version 95, NT, 98, ME, 2000, XP or Vista
- 2) 80486 processor or higher with at least 16Mb of RAM.
- 3) VGA or SVGA monitor
- 4) Hard drive with at least 5 Mb available for Plan Analyst files.
- 5) CD drive. *Used for installation only, not required to run Plan Analyst.*
- 6) Printer set up through Windows print manager.
- 7) Mouse

INSTALLING PLAN ANALYST ON YOUR HARD DRIVE

Before starting Plan Analyst setup

It is important to always exit (close) any other programs (applications) that may be running before installing any new Microsoft based software, including Plan Analyst.

During the setup process, Plan Analyst setup will check your windows directory to determine which libraries need to be added before installing Plan Analyst. If another program is using one of these libraries, Plan Analyst cannot complete the setup process. **Note:** Many systems start programs during the boot process and do not indicate that they are running in the background.

To close programs running in the background

- 1) Press **Ctrl+Alt+Delete** at the same time.
- 2) Select **End Task** to close all programs except 'Explorer'.

Running Setup.EXE

- 1) Insert the Plan Analyst CD in your CD drive, usually drive D:.
- 2) Use either the **Start button** or the **Computer Icon** to run the program '**Setup**'.

Using Start button:

- 1) Click [**Start**] located in the lower left corner.
- 2) Click [**Run...**] on the Task Bar.
- 3) In the box labeled **open:** Type **d:setup** (match location of Plan Analyst disk)
- 4) Press **<Enter>** or click [**OK**] **Note:** You may use [**Browse...**] button.

Using Computer Icon:

- 1) Click Computer Icon
- 2) Double click the CD (**D:**) Icon. (Selection matches location of the Plan Analyst Disk)
- 3) Double-click **SETUP** Icon.

Using Setup.EXE

- 1) Necessary library and setup files will be copied to your hard drive. **Note:** On some computers, you may need to reboot your computer to update libraries and then run Setup again.
- 2) Click the [**OK**] button or press **< Enter >** on the welcome screen. **Note:** This is only a reminder to close/end programs that may conflict with the installation of Plan Analyst.
- 3) If you want to change the location where the Plan Analyst files are copied, click the [**Change Directory**] button and enter the new location.
- 4) Click the button with the picture of the computer on it. 
- 5) Click the [**Continue**] button.
- 6) Wait while files are copied.
- 7) Click the [**OK**] button.

Running Plan Analyst for the first time

The first time you use Plan Analyst, you will be asked to fill out the header information. This must be filled out completely before you can continue. The registration number is on CD jewel case. **Note:** The information entered will be included on all reports. If you need to change this information in the future, use "Header Information" button on the first screen.

IF YOU USE A NETWORK

Plan Analyst does not prevent two people from accessing the same file at the same time. If more than one person will be using Plan Analyst at the same time, we recommend that you place separate copies in different directories for each user.

Printing Reports

Printing should work without any adjustments to your network. If you experience problems:

- 1) Check Plan Analyst setup.
- 2) Verify that the network setup for printing is correct.

Note: The most common problem occurs when the network redirects printing to a different printer or changes the settings.

NT Printing

Plan Analyst expects the printer driver to exist on the local computer when you are printing to a network printer. Printing may fail when the network printer is not available.

To avoid this problem, use the following procedure to create a printer for Plan Analyst:

- 1) Start Print Manager.
- 2) From the Printer menu, choose **Create Printer**.
- 3) In the Print To list, select **Other**.
- 4) In the Print Destination dialog box, select **Local Port**.
- 5) In the Port Name dialog box, enter the print share name.

For more information, refer to the PRINTER.WRI file located in your WINNT directory.

PLAN ANALYST FEATURES USING THE KEYBOARD

Enter - Pressing this will accept your selections and move cursor to the next field or screen.

Esc - Pressing this will move the cursor back to the last field or screen. If the cursor is at the first input of a screen, a previous screen will be shown. **Note:** Plan Analyst will move back more than one screen sometimes. This is necessary to keep the description information correct for the calculations that are being done during the input procedure. If the cursor is located at any point other than the first input, it will be moved back to the previous option or input.

Tab - Pressing this will move the cursor to the next input area.

Shift+Tab - Pressing this will move the cursor to the previous input area.

TEXT BOXES

A screenshot of a text box in a software application. The text box has a light blue border and a light blue background. Above the text box, the text "Report By" is displayed in a small font. Inside the text box, the text "Enter Your Name" is displayed in a slightly larger font.

These are used for entering text and numbers. When entering text, the length of the text is limited based on the space available in the report format. When you reach the maximum length, Plan Analyst will beep and not accept additional input. NOTE: When you are entering information into a text box, all standard editing capabilities are available, delete, insert, overwrite, etc. If you need to delete characters and type new ones in their place, highlight the characters to be deleted first. You may do this by using your mouse to:

- 1) Double click the word or
- 2) Drag the mouse cursor over the characters with the left button pressed.
- 3) Then type the new replacement characters.

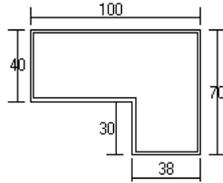
Note: You may also use this method to delete characters or words. Highlight characters/words to be deleted and press the **<Delete>** key.

CALCULATOR USE

When numbers, such as dimensions and square footage, are required, a four function calculator is available.

- + for addition
- for subtraction
- X or * for multiplication
- / for divide

Algebraic logic is used. (ie. division and multiplication are done before addition and subtraction)
There is no need to reach for your calculator.



When asked for the floor area, you can enter: $100 \times 40 + 30 \times 38$ and the floor area will be calculated for you.

ENTERING DIMENSIONS

Dimensions may be entered using:

1. Decimals of a foot or
2. by using the Feet_inches format.

For 10 feet 5 inches, you enter either 10.4167 or 10_5.

EDITING USING THE KEYBOARD

PRESS THIS

TO DO THIS

Left or Right arrow key

Move the cursor one character left or right

**Ctrl+Left arrow key or
Ctrl+Right arrow key**

Move the cursor one word to the left or right

Home or End

Move the cursor to start or to end of text.

Shift+arrow key

Highlight letters

Delete

Erase the character where the cursor is located or erase all highlighted characters

Backspace

Erase the character to the left of the cursor.

EDITING USING THE MOUSE

DO THIS

TO DO THIS

Click

To relocate cursor, click mouse cursor at the new location.

Double click

To highlight a word, double click left button of mouse with cursor on the word.

Hold Left button and move

To highlight one or more characters, drag mouse cursor over character(s) with the left button pressed.

CUT AND PASTE USING THE WINDOWS CLIPBOARD

Highlight the word or words that you want to move. Press **<Shift> + <Delete>** to move the selected text to the clipboard. Move the cursor to the new location. Press **<Shift> + <Insert>** to place the selected text at the new location.

SETUP/DEFAULTS

Header Information

If your address or phone number changes, click the **[Edit Header]** button on the first screen. This will allow you to edit the header information that you entered the first time you ran Plan Analyst.

Printer & Font Setup

To change, use the "Printer Setup" button on the first screen or change before printing. Plan Analyst uses the Windows default printer. Note: If you change the printer in Plan Analyst, the Windows default printer will be changed to the new selection.

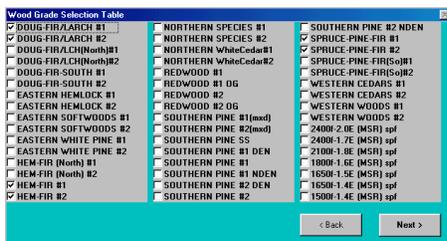
Changing fonts will only affect printed drawing. The information on the screen is very tight and changing the font will cause information to write over other information. If some information writes over other information when you change printer font, try a smaller size.

Printing problems - solutions

1. If some information writes over other information when you change printer font, try a smaller size or a different font.
2. Get error every time you print
 1. Verify that the printer is turned on.
 2. Verify that Windows has the correct printer selected.
 3. Verify that the font selected is valid for the printer selected.

EDIT LUMBER

Plan Analyst is shipped with 6 common lumbers selected. You may change the selected list to match the species and grades of lumber used in your area. To change the lumber list, click the **[Edit Lumber]** button on the first screen.



To make Plan Analyst easier to use, you select only the lumber that is used in your area. Click the box beside the lumber name to add or remove a lumber grade. Grades with a check in the box will show up on the list of available lumbers on the **"Structural information"** form. You may select up to 9 grades of lumber.

On the next screen, select the grade used most in your area for the default. To select, click the name of the lumber that you want to be the default grade.

Shear Increase

It is recommended that 'No increase' is always selected as the default. An increase should only be used when the beam is existing and meets the conditions that allow an increase. The increase can be applied during the input procedure using the beam calculator.

USE OF COLUMN CALCULATOR

The screenshot shows the 'Check Column' software interface. It includes input fields for 'Height of Column Ft. In' (8.6), 'Number of Members' (3), and 'Size of column' (2x4). There is a 'Wind load on 'b' face in (PLF)' field set to 30. Checkboxes are present for 'b face braced with sheathing', 'd face braced with sheathing', and 'Column has a wood plate, joist or beam at the top or bottom'. Under 'Duration Increase', 'Supports floor only or floor and roof 0%' is selected. A list of 'Available Lumber' is shown, including DOUG-FIR/LARCH #1, DOUG-FIR/LARCH #2, HEM-FIR #1, HEM-FIR #2, SPRUCE-PINE-FIR #1, and SPRUCE-PINE-FIR #2. 'Column Construction' has radio buttons for 'Nailed together - b face' (selected) and 'Bolted together - b face'. Buttons for 'Clear', 'Check', 'Show Help', 'Print', and 'Done' are visible. A diagram on the right shows a column with 'Load' at the top, 'Height' on the left, and 'Wind Load' on the right, with 'b-face' and 'd-face' labels.

Procedure:

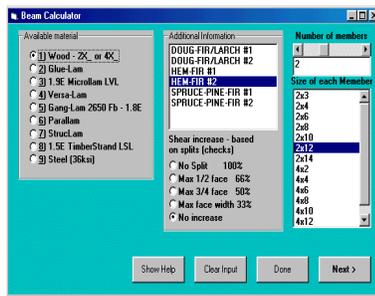
1. Enter the height of the column.
2. Select the number of members in the column.
3. Select the size of each member.
4. Enter the wind load if the column is in an exterior wall.
5. If there is sheathing on the column, select location.
6. Select bearing condition.
7. If column has multiple members, select method used to connect members.
8. Click **[Check]** button.

To try different options, edit values and click the **[Check]** button again.

Notes:

1. The wind load box only needs to be filled in if you are checking a column in an exterior wall. This is $\frac{1}{2}$ the distance to the next stud on each side of the column that you are checking times the wind load in psf. If the next stud on each column is 16 inches away on both sides and the wind load is 20 psf., the total force on the column would be $\frac{1}{2}$ of 16 plus $\frac{1}{2}$ of 16 or 16 divided 12 times 20. **Note:** Since wind loads are always in psf (pounds per square foot), the stud spacing must be converted to feet by dividing it by 12.
2. You should select 'Load to or from wood plate' if there is a wood plate or sill. This is the most common condition. If this is selected, Plan Analyst will check the bearing and use the lowest value between bearing and buckling. Otherwise, it will only check buckling.
3. If the species and grade of lumber used for this project is not shown, you will need to change the default lumber list in the setup section of the program.
4. The b face is the narrow face of the wood (ie. 2x face of a 2x4)
5. The allowable for columns nailed together is 60% of the allowable for solid wood. The allowable for columns bolted together is 75% of the allowable for solid wood. If the 'b' face is braced, buckling is not a factor in that direction. No reduction is taken.

USE OF BEAM CALCULATOR



Selecting material, grade and size

Wood - 2X, 4X or 6X

This is the default. See the screen above. You select the grade and species of lumber, increase for shear and size. Since the options on this screen were selected in the setup section, you can usually click [**Next >**] without any changes except for the size. The list of lumbers available was selected from a larger list in the setup section of Plan Analyst. If the species and grade of lumber required is not on the list, go back to the main menu and select setup. See select lumber instructions on page 10 of this manual.

Note: When 6X sizes are selected, the list of available lumber grades will change.

After you have verified all of the other information, select the size by double clicking the correct size or click the size then click the [**Next >**] button.

Glue-Lam

If the allowables shown do not match the grade of Glu-Lam specified for this project, you can use the editing features to modify the allowables. **Note:** E, Fb and Fv will default to the last values used.

Microllam , Versa-Lam, and Gang-Lam

Select the number of members and the size. **Note:** You may click the size then click [**Next >**] or double-click the size.

Parallam and 1.5E TimberStrand LSL

Select the size from the list box. **Note:** The number of members is not available due the width of Parallam and TimberStrand products.

StruLam

Select the grade, number of members and the size. **Note:** If the grade is different than shown, you can change it here for this beam only or change the default grade in the setup section of Plan Analyst.

Steel

Plan Analyst includes a list of the most common beam sizes. If you need to check a size not listed, select Size not listed. Another window will be displayed. Enter the 'I' and the 'S' and press <Enter> or click [**Next >**]. Use the tables in your steel book to find the correct 'I' and 'S'.

Repetitive Member

To use repetitive member, click to place a \surd in the box.

The bending allowable for visually graded wood members may be increased 15% when three or more members are in contact or are spaced less than 24 inches on center. Use this when checking joist, rafters or triple beams. **Note:** This will only be displayed when you have selected visually graded wood.

Duration of Load

This option is only available for wood members since wood has the property of carrying substantially greater loads for short durations than for long durations. The allowable bending will be adjusted based on the duration selected. If the allowable bending is 1000 psi and you select 115%, the allowable will be increased 15% to 1150 psi. **Note:** Some areas with heavy snow loads do not allow an increase for duration.

Distribution of Loads

The loads indicated in the code are shown in pounds per square foot. To check a beam, you need to enter the pounds per lineal foot.

Symbols used for pounds per square foot:

pounds/square foot

psf

#/sq.ft.

#/ft²

Symbols used for pounds per lineal foot:

pounds/foot

plf

lbs/ft

#/ft

For simple spans with uniform loads, one-half of the load goes to each support.

RAFTER OR JOIST

The pounds/foot is the spacing of the rafter or joist times the pounds per square foot. For a rafter spaced at 16 inches on center and supporting 30 pounds per square foot, the plf would be 30 X 1.3333 or 40 plf.

BEAM

For a beam supporting one end of a 12 foot floor joist, the plf would be 12 divided by 2 times the pounds/square foot, the plf on beam would be 12/2 X 30 or 180 plf.

INPUT OF SPAN

Span may be entered using the Feet_Inches format or using decimals of a foot.

For	Enter	For	Enter
10'-0"	10 or 10_0	10'-6 "	10.5 or 10_6
10'-1"	10.0833 or 10_1	10'-7"	10.5833 or 10_7
10'-2"	10.1667 or 10_2	10'-8"	10.6667 or 10_8
10'-3"	10.25 or 10_3	10'-9"	10.75 or 10_9
10'-4"	10.3333 or 10_4	10'-10"	10.8333 or 10_10
10'-5"	10.4167 or 10_5	10'-11"	10.9167 or 10_11

1) Single span with one uniform load

This is the most common loading condition. You can also use this for multiple span beams since it will be conservative.

LOADING

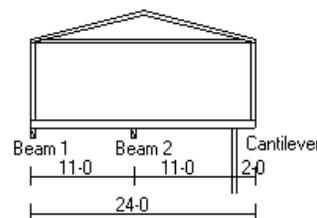
	ROOF	FLOOR
LIVE	30 psf	40 psf
DEAD	15 psf	10 psf

Weight of wall = 10 psf, height = 8'

Note: psf = Pounds per square foot

Span of Beam #1 = 9 feet

Span of Beam #2 = 8 feet



Load on Beam #1

This beam supports roof, wall, and floor loads. The beam supports 1/2 of a 24 foot roof truss plus an 8 foot high wall plus 1/2 of a 11 foot floor joist.

Live = $24/2 \times 30 + 11/2 \times 40 = 580$ plf
 Dead = $24/2 \times 15 + 8 \times 10 + 11/2 \times 10 = 315$ plf
 Span of beam = 9 feet

Load on Beam #2

This beam supports 1/2 of an 11 foot floor joist from each side. This would be 1/2 of 11 plus 1/2 of 11 or a total of 11.

Live = 11×40 or 440 plf
 Dead = 11×10 or 110 plf
 Span of beam = 8 feet

Example of rafter input

Live (snow) Load = 30 psf
 Dead Load = 15 psf
 Spacing of rafters = 24" or 2'
 Span of Rafter = 14'-6"
 Live = 30×2 or 60 plf
 Dead = 15×2 or 30 plf
 Span = 14.5 or 14_6

2) Cantilever

You may enter uniform loads and/or a point load at the end of the cantilever. With the easy editing, you can quickly check several load combinations. ie. All loads to get maximum stresses and reactions or uniform dead loads and full end load to see if there is an uplift problem (empty house with full snow on the roof).

Example

The floor joist on the right side of the section is cantilevered 2 feet and supports a wall and a roof. The plf on the cantilever is the load times the spacing of the joist. The load at the end is the weight of the wall plus 1/2 of the roof times the spacing of the joist. If the floor joists are spaced at 16" o.c.

plf on cantilevered joist (span and cantilever)

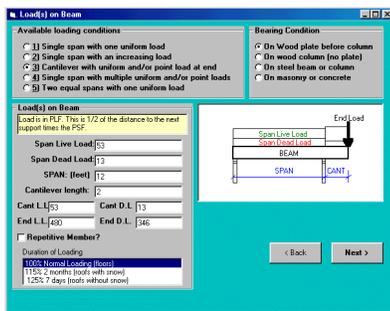
Live = $40 \times 1.3333 = 53.333$ plf

Dead = $10 \times 1.3333 = 13.333$ plf

Load at end of cantilever

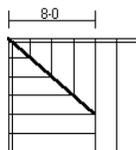
Live = $12 \times 30 \times 1.3333 = 480$ pounds

Dead = $12 \times 15 \times 1.3333 + 8 \times 10 \times 1.3333 = 346.6666$ pounds



3) Single span with an increasing load

The most common use for this option is for the corner rafter of a hip system or for a valley rafter. This loading condition starts at zero and increases to a maximum at the other end.



Hip (corner) rafter
 Live (snow) Load = 30 psf
 Dead Load = 15 psf

The easiest way to find the span when the rafter is at 45 degrees is to multiply the setback by 1.414. The span of this hip rafter is 8 times 1.414.

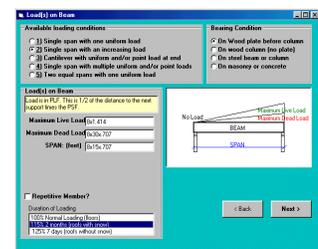
Rafter span = $8 \times 1.414 = 11.312$ feet

Since the rafter is at a 45 degree angle to the loading, we can reduce the load. This reduction is the $\sin(45)$ or 0.707. The maximum load on this hip rafter is:

Live = $8 \times 30 \times .707 = 169.68$ plf

Dead = $8 \times 15 \times .707 = 84.84$ plf

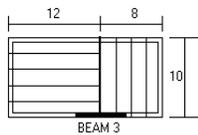
Span = 11.312 feet



Multiple uniform and/or point loads

This is good for a beam that supports another beam plus rafters and/or joists. It is also good for beams supporting joists and/or rafters that vary in length. Another use is for a beam that supports rafters on part of the beam and supports joists on the other part of the beam.

Framing Plan (Top view)



Beam #3 spans 6 feet between supports. The load changes direction 3 feet from the left end of beam #3. This beam (header) has 2 different plf loads and one point load. The point load is the load from the beam or girder labeled 'A'.

For the 1st 3 feet, the uniform load is the psf times the spacing of the trusses.

For the last 3 feet, the uniform load is 1/2 of the span of the trusses times the psf.

PLF on the first three feet $LL = 2/2 \times 30$ or 30 plf

$DL = 2/2 \times 15$ or 15 plf

PLF on the last three feet $LL = 10/2 \times 30$ or 150 plf

$DL = 10/2 \times 15$ or 75 plf

POINT LOAD at A

Using the distribution rules explained earlier in this manual. We will use 1/2 of the beam/girder span and 1/2 of the span of the joist that it is supporting.

Total point load

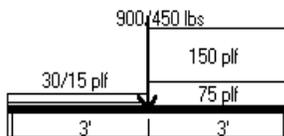
$LL = 10/2 \times 12/2 \times 30 = 900$ pounds

$DL = 10/2 \times 12/2 \times 15 = 450$ pounds

The following form shows the input for this beam

5) Continuous beam over two spans

The input for this beam is the same as for the simple span beam shown before. For the span, **enter the distance between supports, not the total length.**



Bearing Condition

Bearing Condition

- On Wood plate before column
- On wood column (no plate)
- On steel beam or column
- On masonry or concrete

- 1) **On Wood plate before column** - Bearing size will be based on the F_c perpendicular for default wood species/grade. This procedure is used for all beam material.
- 2) **On Wood Column (no plate)** - Plan Analyst will check the required bearing size for the beam material and for the wood column and use the greater of the two.
- 3) **On steel beam or column and on masonry or concrete** - The minimum bearing will be based on the beam material.

Note: For all conditions, when the required bearing is smaller than the code or manufacture's minimum, the minimum bearing is used.