

Plan Analyst Building Code Software

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SYSTEM REQUIREMENTS

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

- 1) Microsoft Windows version 95, NT, 98, ME or 2000.
- 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.

QUICK-KEYS

When you press any of the following keys, Plan Analyst will move to that section of the program immediately.

F1 = Help

F2 = Enter new commercial project

F3 = Enter new single family project

F6 = Print report

F7 = Create a correction report using a check list

Shift+F2 = Load commercial project

Shift+F3 = Load single family project

Shift+F4 = Load analysis report

Shift+F7 = Load correction report

Ctrl+F2 = Save project description

Ctrl+F4 = Save analysis report

Ctrl+F7 = Save correction report

TOOL BUTTONS



This button allows you to retrieve previously saved projects. Same as Shift+F2 or F3.



This button is used to save current project. Same as Ctrl+F2.



This button is used to start a new single family project. Same as F3.



This button is used to start a new commercial project. Same as F2.



This button prints the report displayed in the text area. (large white box)
Same as F6.



This button is used to display the analysis report. When you have finished or edited the project description but did not click the yes button when asked "Do you want to create a new analysis report?", you must now click this button to create a new analysis report.



This button is used to go through the checklist to create the correction report. Same as F7.

TEXT BOXES

Report By

Enter Your Name

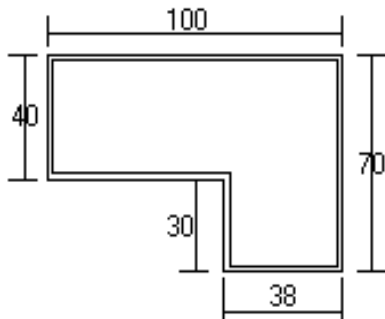
These are used for entering text and numbers. When entering text, the length of the text is limited based on the space available in the report format. When you reach the maximum length, Plan Analyst will beep and not accept additional input. NOTE: When you are entering information into a text box, all standard editing capabilities are available, delete, insert, overtype, 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. (i.e. 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 TEXT BOXES

USING KEYBOARD

<u>PRESS THIS</u>	<u>TO DO THIS</u>
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.

USING MOUSE

<u>DO THIS</u>	<u>TO DO THIS</u>
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 PULL-DOWN MENU

Header Information

If your address or phone number changes, select this to change the header information that you entered the first time that you ran Plan Analyst.

Printer & Font Setup

Since Plan Analyst does not send reports directly to the printer, printing problems will need to be corrected using the Windows Print Manager.

Note: If columns do not line up, your printer is using a proportional font. Change printer settings to a fixed width font. We recommend Courier, size 12 for best results.

Printing problems - solutions

- 1) **Print size too small** - Change font size. We recommend Courier, size 12.
- 2) **Columns do not line up** - The font type selected is proportional not fixed. Change to a fixed width font.
- 3) **Get error every time you print** - 1) Verify that the correct printer is selected. 2) Verify that the font selected is valid for the printer selected. This can become a problem, when you change printers or the network redirects a print job.
Note: When using Windows NT, see page 5 for additional directions.
- 4) **Reports do not fill the page** - When Plan Analyst starts a new code section, it checks to see if there is enough room to place this new section on the current page. If there is not enough room, a new page will be started. This is done to make the reports more readable. This procedure may leave a blank area at the bottom of some pages.

Location of Project Files

Plan Analyst creates a subdirectory called PROJECTS during the setup procedure. i.e. C:\PROGRAM FILES\PA_2000\IBC\PROJECTS

Note: If you have existing files in another directory from a previous version of Plan Analyst that you need to use, you must move them to this new location.

Building Size Limits

Select the size that will allow you to check the majority of the projects in your area. Most users find option number 3 the best for most applications. **Note:** Option number 5 has smaller limits and therefore requires less memory. Use this option if you are experiencing memory problems.

Custom File Names

This option allows you to select the file and title names for additional information that you want to include in the reports. You can use this to include subjects that are not covered by the building code but you are responsible for verifying compliance. i.e. Zoning, Fire Code, Plumbing, etc.

You are free to select any title and file name. Enter the file name without any extension. i.e. For 'ZONING.ANL', enter 'ZONING'. When you create an analysis report or a correction report, you have the option of including these.

Add/Edit Code Requirements

This allows you to add or revise code requirements for your analysis reports. Scroll through the list of code requirements until the subject that you want to edit is highlighted.

[Edit/Add] Edit or create the requirements using the features described earlier in this manual. **Note:** You can import text from other programs using the Windows clipboard.

[Done] Return to the main menu.

[Delete] Delete the entire file.

Add/Edit Questions for Check List

The available question groups are listed in the box on the left of the edit screen. The questions in the group selected are displayed in the box on the right of the screen. If there are no questions in the selected group, Plan Analyst will indicate that there are no questions. **Note:** When entering questions, do not include the question (?) mark, it will be added by Plan Analyst.

Select Lumber

Wood Grade Selection Table		
<input checked="" type="checkbox"/> DOUG-FIR/LARCH #1	<input type="checkbox"/> NORTHERN SPECIES #1	<input type="checkbox"/> SOUTHERN PINE #2 NDEN
<input checked="" type="checkbox"/> DOUG-FIR/LARCH #2	<input type="checkbox"/> NORTHERN SPECIES #2	<input checked="" type="checkbox"/> SPRUCE-PINE-FIR #1
<input type="checkbox"/> DOUG-FIR/LCH(North)#1	<input type="checkbox"/> NORTHERN WhiteCedar#1	<input checked="" type="checkbox"/> SPRUCE-PINE-FIR #2
<input type="checkbox"/> DOUG-FIR/LCH(North)#2	<input type="checkbox"/> NORTHERN WhiteCedar#2	<input type="checkbox"/> SPRUCE-PINE-FIR(So)#1
<input type="checkbox"/> DOUG-FIR-SOUTH #1	<input type="checkbox"/> REDWOOD #1	<input type="checkbox"/> SPRUCE-PINE-FIR(So)#2
<input type="checkbox"/> DOUG-FIR-SOUTH #2	<input type="checkbox"/> REDWOOD #1 OG	<input type="checkbox"/> WESTERN CEDARS #1
<input type="checkbox"/> EASTERN HEMLOCK #1	<input type="checkbox"/> REDWOOD #2	<input type="checkbox"/> WESTERN CEDARS #2
<input type="checkbox"/> EASTERN HEMLOCK #2	<input type="checkbox"/> REDWOOD #2 OG	<input type="checkbox"/> WESTERN WOODS #1
<input type="checkbox"/> EASTERN SOFTWOODS #1	<input type="checkbox"/> SOUTHERN PINE #1(mxd)	<input type="checkbox"/> WESTERN WOODS #2
<input type="checkbox"/> EASTERN SOFTWOODS #2	<input type="checkbox"/> SOUTHERN PINE #2(mxd)	<input type="checkbox"/> 2400f-2.0E (MSR) spf
<input type="checkbox"/> EASTERN WHITE PINE #1	<input type="checkbox"/> SOUTHERN PINE SS	<input type="checkbox"/> 2400f-1.7E (MSR) spf
<input type="checkbox"/> EASTERN WHITE PINE #2	<input type="checkbox"/> SOUTHERN PINE #1 DEN	<input type="checkbox"/> 2100f-1.8E (MSR) spf
<input type="checkbox"/> HEM-FIR (North) #1	<input type="checkbox"/> SOUTHERN PINE #1	<input type="checkbox"/> 1800f-1.6E (MSR) spf
<input type="checkbox"/> HEM-FIR (North) #2	<input type="checkbox"/> SOUTHERN PINE #1 NDEN	<input type="checkbox"/> 1650f-1.5E (MSR) spf
<input checked="" type="checkbox"/> HEM-FIR #1	<input type="checkbox"/> SOUTHERN PINE #2 DEN	<input type="checkbox"/> 1650f-1.4E (MSR) spf
<input checked="" type="checkbox"/> HEM-FIR #2	<input type="checkbox"/> SOUTHERN PINE #2	<input type="checkbox"/> 1500f-1.4E (MSR) spf

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.

Click the box beside the lumber name to add or remove a grade. The grades selected will be available in the beam and column calculator. This is done to simplify the beam and column calculator input. You may select up to 9 grades of lumber.

Note: There are 2 lists of lumbers. One for 2x's and 4x's and another for 6x's. The lumber grades available for 6x's are different than grades available for 2x's and 4x's.

To make the use of Plan Analyst faster and easier, select the grade used most in your area for the default for both 2'xs and 6'xs.

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.

Add/Edit Start Comments

You may add a statement that will be included at the beginning of all reports.

Add/Edit Start Comments

You may add a statement that will be included at the beginning of all reports. This is great for adding explanations, procedures or disclaimers. Type the comment that you want included in all reports. This information will be included at the beginning of all reports.

STOP INPUT & CONTINUE LATER

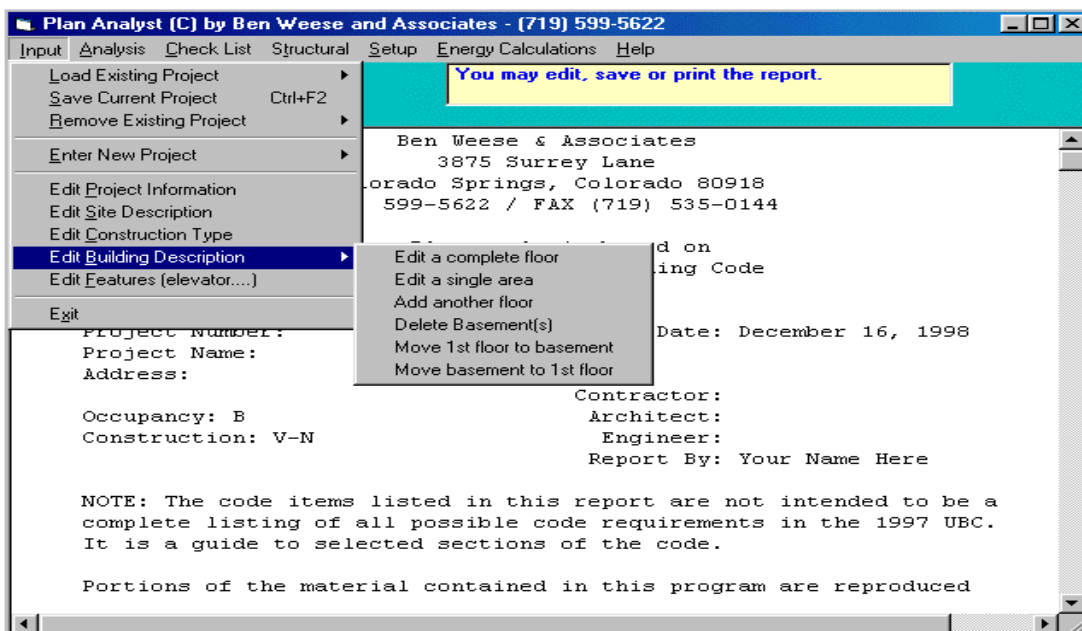
If you need to stop before completing the project description, use the **[Quit]** button on the description of area form. When you click this button, the input procedure will stop and the main menu will return. **Note:** Be sure to save the description before exiting Plan Analyst.

When you are ready to finish the project:

Load in the project description using the standard procedure. A message box will notify you that the description is incomplete. Plan Analyst will continue where you stopped the description input.

USING PLAN ANALYST

EDIT BUILDING DESCRIPTION



To edit the description, you select **Edit Building Description** from the **Input** pull-down menu. You will then be given seven options.

Edit a complete floor - Select this option if you need to add an area or change the total floor area.

Edit a single area - Select this option if you need to change the details for one or more areas.

Add another floor. - Will go through the complete input for an additional floor.

Delete top floor. - Will delete all information about the highest floor.

Delete basement(s) - Will delete all information about a basement.

Note: The next two options allow you to see the effects of changing the grade (ground line) without going through the entire description procedure again.

Move 1st floor to basement - This will only be available when you have 2 or more floors and no basement.

Move basement to 1st floor - This will only be available when you have a basement.

When you select **Edit a floor or area**, you will see a form with two list boxes. The list box on the left contains a list of floors. Double-click the floor that you want to edit. The list box on the right will then display a list of the areas on this floor. Select the area or Entire Floor to edit by clicking the name. Then click the **[Edit]** button. **Note:** You may double-click the area name instead of clicking the name then the **[Edit]** button.

Note: If you change the floor area of a use, the last area will be adjusted to reflect the new floor area.

AREA INPUT FORM

The first step is to select the use of the area being described.

For area 1 of 1 areas on floor #1

USE OF THIS AREA

If a use is not in the list, select the closest and edit name, sqft/occ., two exits, occ. group, etc

Occupancy Group

Exercising Room
Exhibit Room
Fire Station
Gymnasium
Hanger
Health-care Center
Library
Hospital
Hotel/Motel
Jail
Kitchen
Locker Room
Manufacturing
Mechanical Room
Non-habitable Area
Nursing Home
Office
Other Occupancy
Parking Garage
Police Station
Repair Garage
Sales Room
Storage/Stock Room
Swimming Pool
Warehouse
Woodworking Area

Name of Area: Warehouse

Floor Area: 6000

Remaining Area = 6000

Square Feet/occupant 500

Two exits over ___ occupants. 30

Accessory use area? (Not in total of occ.)

Hallway or corridor in this area?

Part of area/suite # (10 max)
0

Storage of material including but not limited to:

Explosives, fireworks, black powder, etc.(H1)
Class I, II, III-A under pressure, Combustible Dust, etc.(H2)
High fire or physical hazard, flammable liquids, solids, etc.(H3)
Corrosives, toxics, irritants, health hazards, etc.(H7)

Quit Input
< Back
Next >

Note: Every possible use is not listed. To avoid including our own interpretations, the list is limited to names that are used in the code. When a use is not on the list, choose one that has the same number of occupants per square foot and has the same special conditions.

Toilet rooms are a good example, this use is not listed in the occupant load tables so it is not on our list.

The occupant load factor could be interpreted many ways. 100 sqft/occ in small offices, 50 sqft/occ in large offices (like locker rooms), or even 15 sqft/occ in assembly building where lines may form.

After you select the use, some occupancies will need additional information. This form shows additional questions to complete the occupancy classification of this area. For some uses, a list box is added when the area could be used several different ways or the material used or stored in this area could affect the occupancy classification.

Accessory use area? - There is no default for accessory use area. This must be interpreted for each project. i.e. A conference room used by employees only or by employees and clients that could meet in the employee's office could be

considered as accessory. If the same conference room is used to bring in a group of people for a sales meeting or training that do not work in this area of the building, you may not want to consider it as an accessory use area.

Part of area/suite # - If you do not use this option, you will only see the exiting for each room/area entered and the entire floor. If you have several areas that share an exit system, (ie. two offices and a conference room) enter the same number for these 3 areas and the report will include the exiting for each area, the combined area/suite, and the entire floor. **Note:** You will be asked for the name of this area/suite at the end of the input for this floor.

SAVING PROJECT DESCRIPTION

It is a good practice to save the project description before continuing, but if you don't, Plan Analyst will ask you if you want to save the description before it deletes your project description. To save your project description, press **<Ctrl+F2>** or click the save button.

The project file name must be a valid Windows name. **Do not add an extension or path.** The path that you selected during installation or through the use of the setup section will be used. Valid characters for file name are:

A through Z,
0 through 9,
and _ ^ \$ ~ ! # % & - @ ' ` () { }

SAVING FILE PROBLEM CAUSES AND SOLUTIONS

- 1) Using an unacceptable character as part of the file name. See acceptable list on page 12. The most common problem is caused by including a period.
- 2) Including the path name or extension with the file name.
- 3) Make sure that the path name in the setup section of Plan Analyst is a valid name and that the directory exists.
- 4) If you are saving files to a floppy disk, make sure that the disk is formatted, in the disk drive.

ADDITIONAL FEATURES

This screen allows you to select features to be included in your report. ie. stairs, elevator, ramp, penthouse, etc. Just select the items by clicking them with the mouse. When they are selected, there will be a ✓ in the box.

CREATING THE ANALYSIS REPORT

When the project description is finished, the analysis report will be created automatically for you.

EDITING THE ANALYSIS REPORT

To review the report, use the arrow keys, [**Page Up**], [**Page Down**], or click the scroll bar on the right side with the mouse.

You may edit the report using the features described in the **EDITING TEXT BOXES** section of this manual.

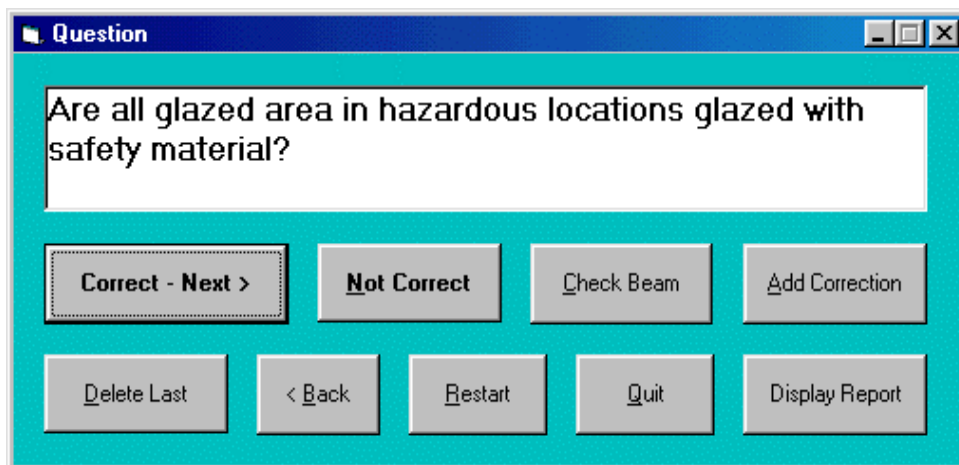
PRINTING ANALYSIS REPORT

To print the analysis report on your printer, click the tool button with the picture of a printer on it.

NOTE: If columns are not lined up, your printer is set to use a proportional font. For correct column alignment, use fixed width fonts.

CREATING A CORRECTION REPORT

To create a report showing what needs to be changed on the plans before they comply with the code, you must go thru the customized checklist. To do this, press <F7>, click **Use Check List - Create Correction Report** under the **Check List** pull-down menu on the main screen or use the Tool Button with the check mark on it. The following screen will be displayed:



If you select:

[Correct - Next >] or press <Enter>

This indicates that this item is correct on the plan and the next question will be shown.

[Not Correct]

This indicates that there is a problem on the plans and the following window will be displayed. This information is used to create the correction report.

Correction report comment input

Enter the sheet(s) where the correction is required.
ie. A-3, All, General, etc.

Enter identification
ie. Door number(s), section number, room name/number, name of item, etc.

Comment 1 of 100 (max)

Description of required correction

Glazing in this hazardous location is required to be glazed with safety material. – Sec. 2406.3 & 2406.4

You will then be asked to enter the sheet number(s) where the problem exists. This could be A-1, All, A1 & A5, etc. This will help the person reading your report to locate the problem. You will also be asked for an identification, this could be a door number, section number, grid line, room name, etc. This will help people using your report to find the problem on the sheet indicated. The description of the problem will also be shown. You may edit the correction description before pressing **<Enter>** or clicking **[Next >]**.

Note: You may make permanent changes to the comments using the setup section of Plan Analyst.

Next, you will be asked if you have another one. If the same problem occurs at another place, press **<Y>** or click **[Yes]**. The same question will be asked again. If you press **<N>**, press **<Enter>** or click **[No]**, then the next question will be asked.

[Check Beam]

Selecting this will allow you to check a beam without losing your place in the checklist. See instructions later in this manual for use of the beam calculator. After you have finished using the beam calculator, you will be returned to the same question.

[Add Correction]

The procedure is the same as described in **[Not Correct]**. The only difference is that a standard comment is not supplied so you must type in your own comment. This is to allow you to add requirements that may be unique to this project. Local requirements that need to be checked regularly should be added to the check list using the set-up section and will be displayed each time you use Plan Analyst.

[Delete Last]

Occasionally, after you add a correction, you discover that it does not apply. Selecting this button will delete the last item added to the correction report. If you discover that you want to eliminate an earlier correction, leave it and complete the report. You can eliminate it easily using the “Edit/Delete Current Correction Report Item” under the Correction Report pull-down menu after you have completed the report.

[< Back]

If for any reason you want to back up, use this button. This will back you up one question at a time.

Note: This will only back up within a group of questions. ie. within Exit Questions, Fire Questions, etc. If you need to go back further, use [Restart].

[Restart]

This will return you to the first question. If you have already selected items for the report, you will be asked if you want to delete the items already selected. If you select **[Yes]** you will be starting the entire report over. You would only select this if you need to redo the entire report. If you select **[No]**, items you select will be added to the report that you are working on.

[Quit]

This will end the checklist and return you to the main menu. This is useful when you know that you have all of the corrections that you need and don't want to continue thru the rest of the questions. You may save, review, or print the report just the same as if you continued through all of the questions.

[Display Report]

This will display the correction report during the checking process. This is good for reviewing the comments selected before you continue through the check list.

Note: You cannot edit reports using this screen.

After you have completed the report, the report will be shown on the main screen. You may print, save or edit the report at this time. If you want to edit this report before saving or printing, you may edit the report using the features described in the ‘**EDITING TEXT BOXES**’ section of this manual or you may edit or delete individual comments using “Edit/Delete Current Correction Report Item.” under the “Check List” pull-down menu. If you are only changing the wording or format, the best way is to edit the screen. If you are adding or deleting comments, the best way is to use the “Edit/Delete Current Correction Report Item.” under the “Check List” pull-down menu. Item numbering and formatting will be taken care of for you.

Existing reports may also be modified. Use “View/Print Existing Correction Report (file)” to change wording. Use “Modify Existing Correction Report (file)” to add or delete comments.

USE OF ENERGY CODE CHECK

Using this form, you can quickly find the U_o (combined thermal transmittance value) for walls using equation 1 in section 502.2.1 and 502.3.3 of the CABO Model energy code.

Note: You can also use this form to solve equation 2 for roofs with skylights.

You may enter as many as four different types of walls and as many as three different types of

windows or doors for each type of wall.

Wall R- _____ Used to input the R-value of insulation in the wall. May include insulation within the wall and/or sheathing.

Const R- _____ Additional R-values for wall construction. This defaults to one since many wood framed walls are in this range. You may edit to any value that you choose.

Area of wall _____ **Note:** Enter the total wall area including area of openings listed below. The window and door areas will be subtracted from this number. This makes input faster and easier.

U-Window/door _____ This value will be found in the manufacture's information about the doors or windows being used. The value is usually between .3 and 1.2 based on the insulation value of the window or door. Windows or doors with lower values (U_g or U_d) have better insulation values.

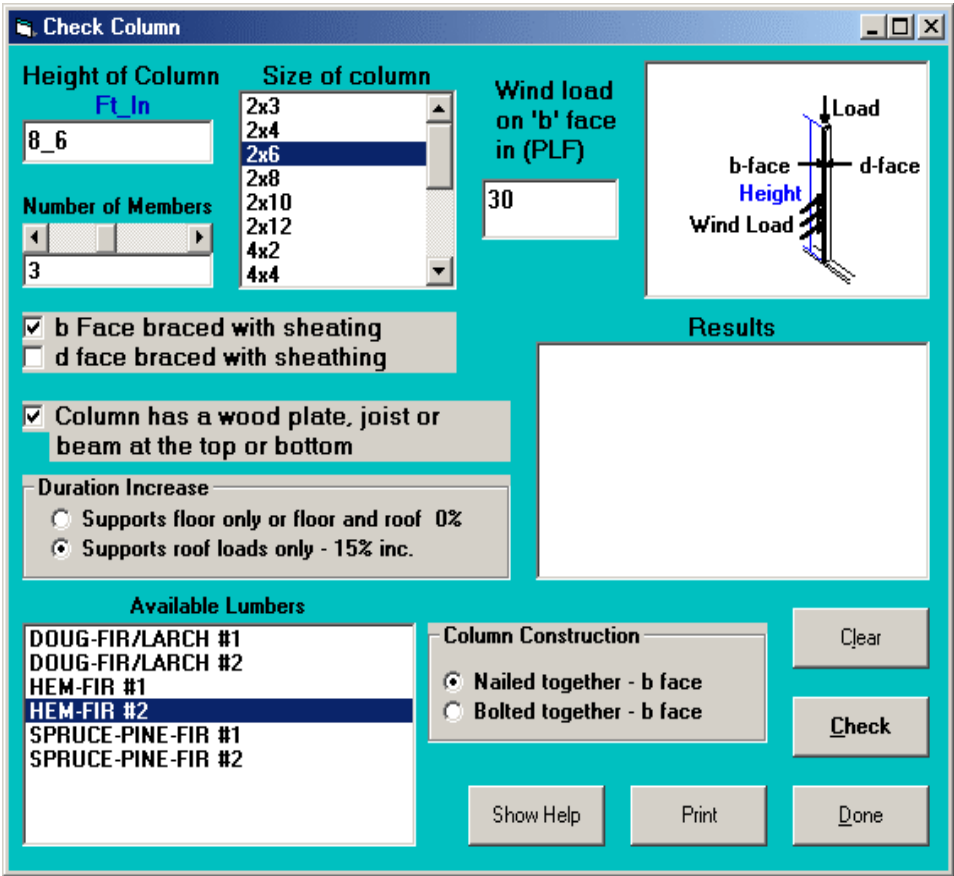
Total Area _____ This is the total area of all windows or doors that have the U-value listed to the left of this number. **Note:** Don't forget that you can use the built in calculator for the area input.

[Clear] This button resets values to initial values. Use when starting a totally new calculation.

[Check] This button will use the equation in Section 502.3.2 to calculate U_o and show the results in the gray box in the upper right corner of the form. Compare this value to the allowed value in Table 502.2.1a. Check local code enforcement for maximum values allowed. **Note:** You may change any value and click the **[Check]** button again. This allows you to check different conditions quickly. You can see the effect of changing window(s) or insulation in just seconds. This makes it a great design tool as well as a checking tool.

[Quit] Returns you to the main menu.

USE OF COLUMN CALCULATOR



To use the column calculator, select **Structural** from the main menu and then select **Column Calculator**.

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 a exterior wall.
5. If there is sheating 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.

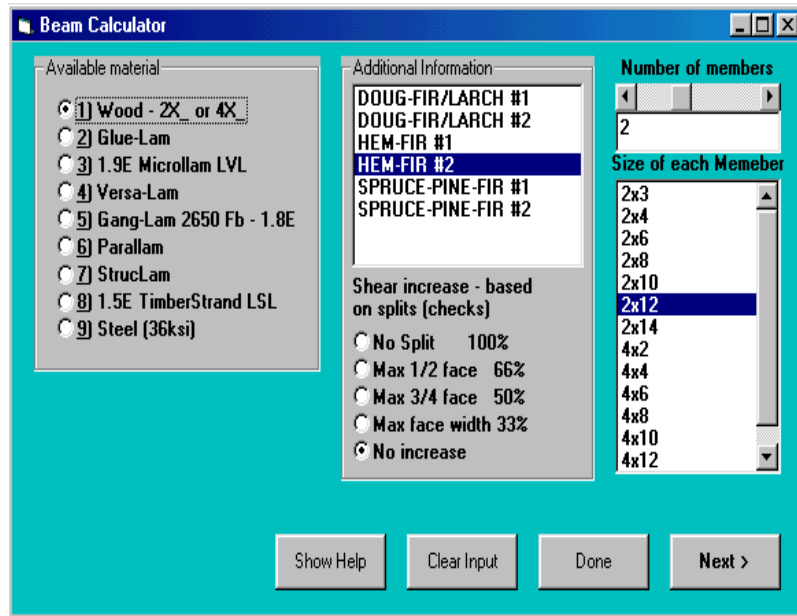
To try different options, edit values and click the **[Check]** button again.

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

To use the beam calculator, select **Structural** from the main menu and then select **Beam Calculator** or select the Check Beam button while going thru the checklist.



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.

StrucLam

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.

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

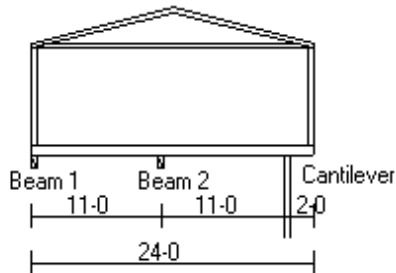
Span may be entered using the Feet_Inches format or using decimals of a foot.

<u>For</u>	<u>Enter</u>	<u>For</u>	<u>Enter</u>
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.

$$\text{Live} = 24/2 \times 30 + 11/2 \times 40 = 580 \text{ plf}$$

$$\text{Dead} = 24/2 \times 15 + 8 \times 10 + 11/2 \times 10 = 315 \text{ plf}$$

$$\text{Span of beam} = 9 \text{ feet}$$

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.

$$\text{Live} = 11 \times 40 \text{ or } 440 \text{ plf}$$

$$\text{Dead} = 11 \times 10 \text{ or } 110 \text{ plf}$$

$$\text{Span of beam} = 8 \text{ feet}$$

Example of rafter input

$$\text{Live (snow) Load} = 30 \text{ psf}$$

$$\text{Dead Load} = 15 \text{ psf}$$

$$\text{Spacing of rafters} = 24" \text{ or } 2'$$

$$\text{Span of Rafter} = 14'-6"$$

$$\text{Live} = 30 \times 2 \text{ or } 60 \text{ plf}$$

$$\text{Dead} = 15 \times 2 \text{ or } 30 \text{ plf}$$

$$\text{Span} = 14.5 \text{ or } 14_6$$

2) Cantilever

Load(s) on Beam

Available loading conditions

- 1) Single span with one uniform load
- 2) Single span with an increasing load
- 3) Cantilever with uniform and/or point load at end
- 4) Single span with multiple uniform and/or point loads
- 5) Two equal spans with one uniform load

Bearing Condition

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

Load(s) on Beam

Load is in PLF. This is 1/2 of the distance to the next support times the PSF.

Span Live Load: 53

Span Dead Load: 13

SPAN: (feet) 12

Cantilever length: 2

Cant L.L. 53 Cant D.L. 13

End L.L. 480 End D.L. 346

Repetitive Member?

Duration of Loading

- 100% Normal Loading (floors)
- 115% 2 months (roofs with snow)
- 125% 7 days (roofs without snow)

Diagram: BEAM with SPAN and CANT sections. Loads: Span Live Load, Span Dead Load, End Load.

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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)

$$\text{Live} = 40 \times 1.3333 = 53.333 \text{ plf}$$

$$\text{Dead} = 10 \times 1.3333 = 13.333 \text{ plf}$$

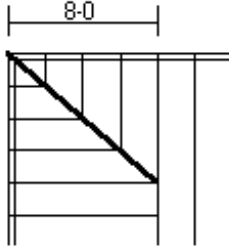
Load at end of cantilever

$$\text{Live} = 12 \times 30 \times 1.3333 = 480 \text{ pounds}$$

$$\begin{aligned} \text{Dead} &= 12 \times 15 \times 1.3333 + 8 \times 10 \times 1.3333 \\ &= 346.6666 \text{ pounds} \end{aligned}$$

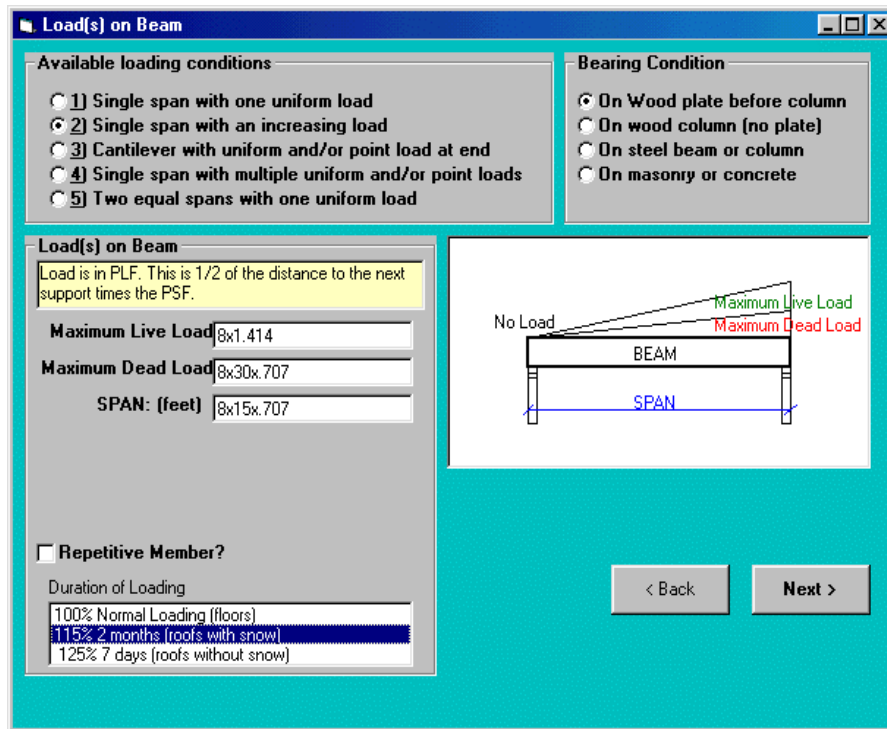
3) Single span with an increasing load

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:

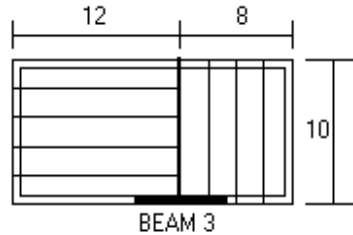
Live = $8 \times 30 \times .707 = 169.68$ plf

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

Span = 11.312 feet

4) 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

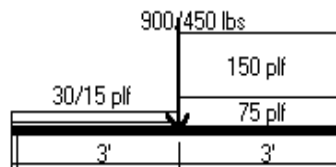
$$LL = 2/2 \times 30 \text{ or } 30 \text{ plf}$$

$$DL = 2/2 \times 15 \text{ or } 15 \text{ plf}$$

PLF on the last three feet

$$LL = 10/2 \times 30 \text{ or } 150 \text{ plf}$$

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



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

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

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

The following form shows the input for this beam

Load(s) on Beam

Available loading conditions

- 1) Single span with one uniform load
- 2) Single span with an increasing load
- 3) Cantilever with uniform and/or point load at end
- 4) Single span with multiple uniform and/or point loads
- 5) Two equal spans with one uniform load

Bearing Condition

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

Loads on Beam

Enter distances in feet from the left end of the beam

Uniform load(s) in plf

Live load:	Dead load:	Starts at:	Ends at:
30	15	0	3
150	75	3	6

Point load(s) in pounds

Live load:	Dead load:	Location:
900	450	3

Span: Repetitive Member?

Duration of Loading

- 100% Normal Loading (floors)
- 115% 2 months (roofs with snow)**
- 125% 7 days (roofs without snow)

Diagram:

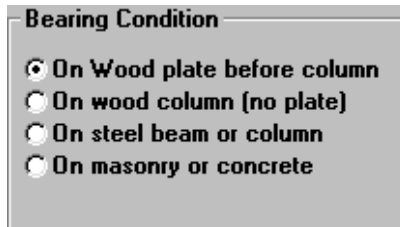
The diagram shows a horizontal beam supported by two vertical columns. A downward arrow labeled 'Point Load' is positioned at the center of the beam. Above the beam, there are two green boxes labeled 'Live Load' and two red boxes labeled 'Dead Load', arranged symmetrically around the point load. Below the beam, a blue double-headed arrow labeled 'SPAN' indicates the distance between the two columns.

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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



The image shows a software dialog box titled "Bearing Condition". It contains four radio button options:

- 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.

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failed to remedy such breach within thirty (30) days following written notice thereof. Upon termination of this service, Subscriber shall comply with Section 8, Returns and Retention's. Upon such termination, the rights and obligations of the parties shall cease, except for the obligation to make any payment that was due at the date of termination and Subscriber's obligations with respect to proprietary rights in the data and the Software.

If within the first thirty (30) days after installation, Subscriber is not completely satisfied with the Software, the Software may be returned with a 15% restocking fee charged to the Subscriber.

Contact your account representative for further information.

17. **SOFTWARE AND EQUIPMENT:** Subscriber has the option to lease the computer equipment from IHS Global as part of the service. If Subscriber exercises this option, IHS Global grants to Subscriber a license to use the equipment with the Software purchased from IHS Global and subject to all of the Terms and Conditions hereof. Computer equipment, unless purchased shall remain the property of IHS Global. If Subscriber furnishes its own computer equipment, Subscriber shall be responsible for providing a microcomputer with which the leased computer equipment will be used and electrical power and environmental conditions in compliance with the specifications stated in Global's user documentation. IHS Global shall not be obligated to provide any training in the use of the computer equipment and Software unless the Subscriber has ordered training for an additional fee. The Software will be delivered by IHS Global with the computer equipment in magnetic disc form. It is Subscriber's responsibility to install the Software on the microcomputer. If IHS Global delivers to the Subscriber a revised version of the Software, Subscriber shall be responsible for installing the revised version and shall immediately cease use of and return the prior version to IHS Global, FOB destination, Englewood, Colorado. Subscriber understands that proper functioning of the equipment and the Software requires a database in the form provided by IHS Global. The computer equipment and Software are not designed for use with any non-Global databases.

18. **GENERAL TERMS:**

- (a) These Terms and Conditions represent the complete and exclusive statement of the understanding between the parties and supersede all prior proposals and understandings, oral or written, relating to the subject matter of these Terms and Conditions and may be amended

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only by a written document executed by IHS Global and Subscriber. In the event Subscriber issues a purchase order or other instrument only by a written document executed by IHS Global and Subscriber. In the event Subscriber issues a purchase order or other instrument he event Subscriber issues a purchase order or other instrument concerning the Software, it is specifically agreed and understood that such purchase order or other instrument is for Subscriber's internal purposes only and any and all terms contained therein, whether printed or written, shall be subordinate to the Terms and Conditions contained herein.

- (b) Failure by either party to enforce any provision of these Terms and Conditions shall not be deemed a waiver of that provision or of any other provision of these Terms and Conditions.
- (c) IHS Global shall not be responsible for any delay or failure in performance resulting from acts beyond its reasonable control.
- (d) Neither party hereto may assign this Software, or its rights or duties hereunder, without the prior written consent of the other, except that IHS Global may assign this Software to any company which directly or indirectly controls or is controlled by or is under common control with IHS Global or to any successor to Global's assets and business, provided that the assignee assumes all of Global's obligations hereunder. Subject to the foregoing, this Software shall inure to the benefit of, and be binding upon, the parties hereto and their respective successors, personal representatives, and assigns.
- (e) These Terms and Conditions shall be governed by the laws of the State of Colorado.

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HELP:

See the online help within Adobe Acrobat Reader with Search for assistance.

CUSTOMER SERVICE:

If you need further assistance, contact IHS Global Customer Service Department:

Phone: 800-624-3974 (United States and Canada)

303-792-2181 (Outside the United States)

Fax: 303-792-2192

Email: globalcustomerservice@ihs.com

Internet: global.ihs.com