CASCAD-e

INTERACTIVE GRAPHICAL PROJECT SCHEDULING
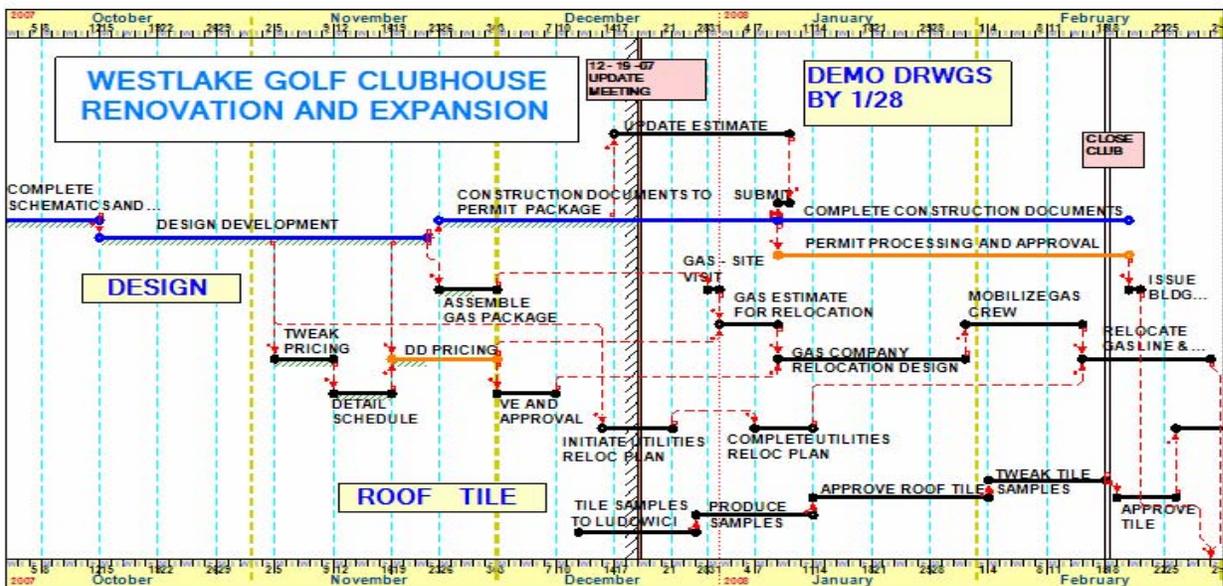
BASIC CASCAD-e USER GUIDE

WITH QUICK-START HIGHLIGHTS

FEBRUARY 1, 2010

TABLE OF CONTENTS

CASCAD-e BASIC USER GUIDE

INTRODUCTION

CASCAD-e is a revolutionary new way to carry out project planning and scheduling. It combines the graphical elegance and understandability of Time-Scaled Precedence Diagramming (TSPD), the real-time ability to manipulate the TSPD, and the rigor of the Critical Path Method (CPM). It is vastly superior to conventional project scheduling systems and their one-activity-per-row limitations, while maintaining the ability to interface with conventional systems. Using large-scale projection, CASCAD-e makes possible team strategizing, planning, and scheduling, with the attendant synergy and buy-in which promotes team building and improved project outcomes. Scheduling errors are minimized and schedule understanding is maximized. Persons who would never try to learn how to use a conventional system find it easy and inviting to use CASCAD-e. Typical user statements include "This is very intuitive!" and "I can read this schedule!"

This BASIC USER GUIDE is designed to introduce you to the essential features of CASCAD-e and give you the basic capabilities to create meaningful schedules. It will equip you to explore all the additional features which are covered in the full CASCAD-e ADVANCED USER GUIDE. For those wanting a true Quick Start look at CASCAD-e, the bare essentials have been highlighted.

This BASIC USER GUIDE assumes that you have downloaded a Trial Version of CASCAD-e or have a licensed Full Version of CASCAD-e on your computer. If you are uncertain as to whether or not you ought to invest the time to download the trial version and try your hand at it, scanning this BASIC USER GUIDE will let you see how easy and straightforward it is to use CASCAD-e. Then go to www.CASCAD-e.net and run the six-minute Video Demonstration to get a feel for CASCAD-e in action. If this proves interesting, download the Trial Version, which will let you build multiple projects of up to 100 activities each. This Basic User Guide will lead you through your testing of the Trial Version of CASCAD-e. The Trial Version has all the features of the Full Version but has a limited life of 2 – 3 months. When you are ready to purchase a Full Version, which can handle a virtually unlimited number of activities, call 1 (800) 330 8135 to complete your purchase.

GETTING STARTED

Entering the CASCAD-e Playing Field

Double left click (**DLC**) on the CASCAD-e icon on your desk-top.

On the graphic which appears, select (**LC**) the symbol on the left ("Create New Project").
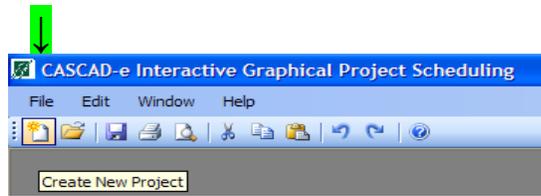
The following graphic appears:
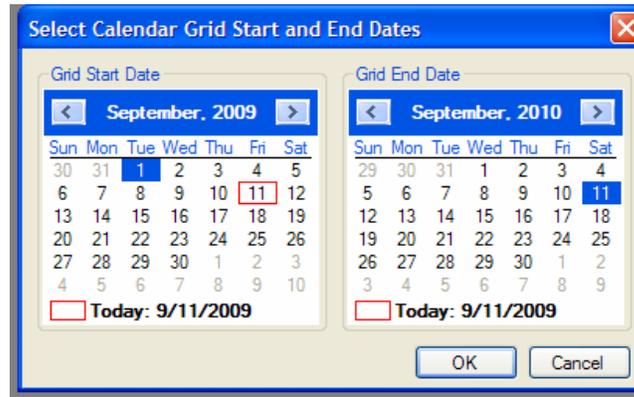
Setting Up a Calendar Grid

Select the start and end dates for your calendar grid. A good rule of thumb is to pick a grid start date about two months before your expected project start and a grid end date about six months later than your expected project end date. If later you need more space, the grid can easily be expanded. Select "OK". The following calendar grid will appear:
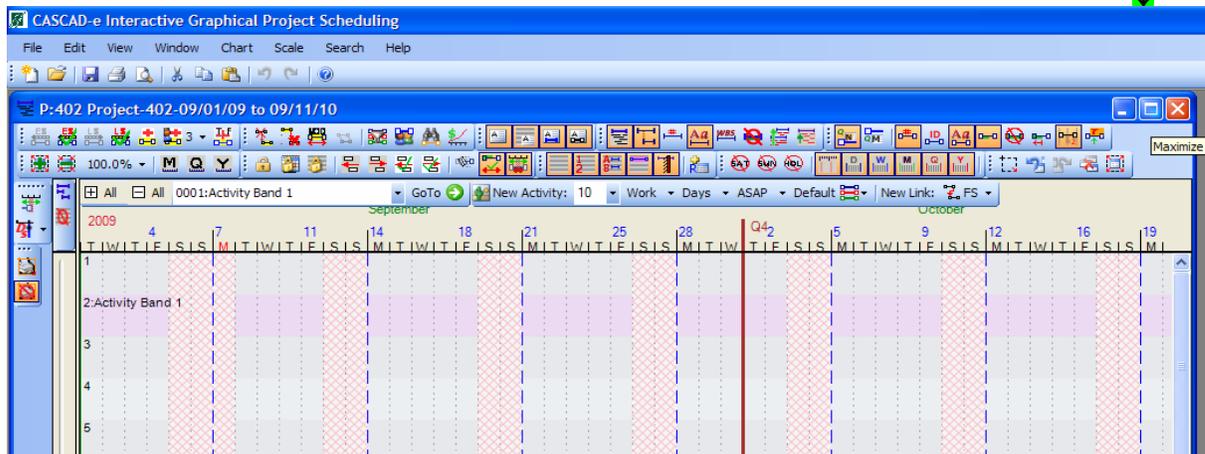
LC on "Maximize" (above upper right), then (on tool buttons below) "Display (in this case, Hide) Chart Row Background Stripes", "Do Not Display Non-Working Saturdays – Sundays – Holidays", and "Display (in this case, Hide) Vertical Month (and Quarter) Lines".
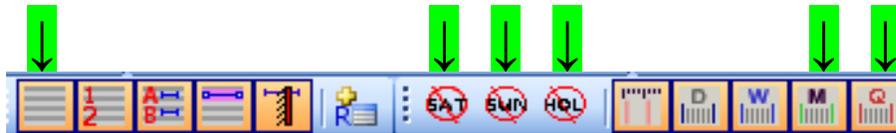
This will clean up the grid to better display the illustrations that follow. You can add back these features at any time.

The grid is initially created with 25 rows. Note that row numbers are shown along the left edge, but can be hidden by **LC** on "Display (or Hide) Row Numbers" (the first arrow below). When needed, **LC** on "Add 5 Rows To Bottom Of Chart" (the second arrow below) to do just that.
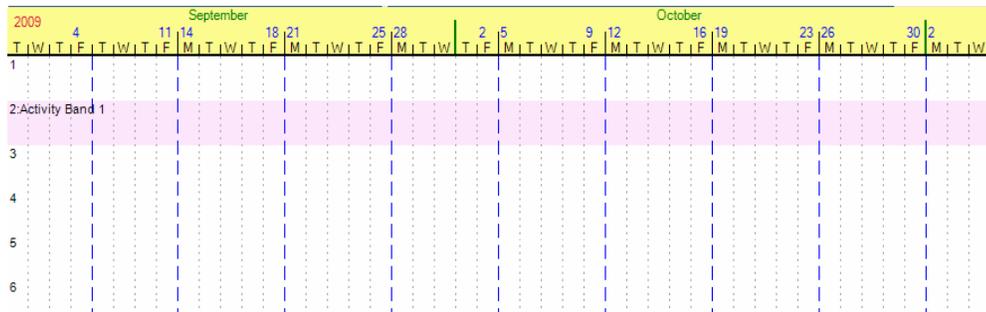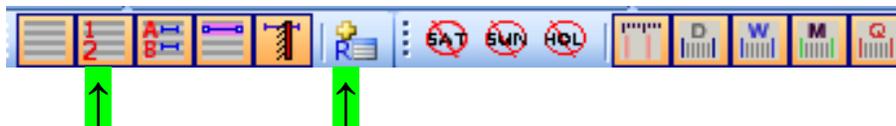
Note that the calendar appearance has been changed. By **RC** in the calendar area, then **LC** on "Properties" you can display a menu which lets you experiment with calendar font sizes and colors, offsets (vertical positioning), background color, and background transparency. *More about that in the ADVANCED CASCAD-e USER GUIDE.*

Creating Activities

The shaded row labeled "Activity Band 1" is the location for the automatically generated and absolutely necessary first Band. The Band Bar will appear when the first Activity is created and will be as long as necessary to cover all the Activities that are assigned to this Band. Multiple Bands and Sub-Bands are discussed later in this publication.

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You are now ready to create an Activity. Position the cursor anywhere and **RC.** In the menu which appears, select "Create Activity".

An Activity Bar will be created with a duration of 10, the "New Activity" (default) duration, which can be changed at any time. The Text Box will be lightly shown. The Activity Bar will be highlighted, probably in a different color than the one shown below. (Alternate forms of the Activity Bar are shown later in this BASIC USER GUIDE).
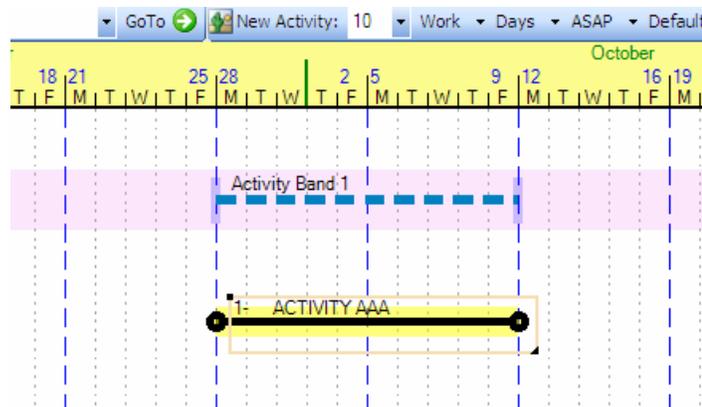
Type anywhere and the Activity Description will go into the Text (Activity Description) Box. The Text Box can be repositioned anywhere (such as under the Activity Bar) by grabbing the upper left corner of the Text Box (4-way arrow symbol with an "**A**" will appear) and moving it.

The Text Box will stay in that relative position as the Activity is moved around. The shape and size of the Text Box can be altered by grabbing the lower right corner and moving it vertically and/or horizontally to enclose (and therefore show) all of your description.

The Activity Duration can be adjusted by selecting the symbol on either end of the Activity, holding the mouse button down (L-R arrow symbol will appear on the end of the activity), and stretching or compressing the Activity Bar.

Making sure that the symbol which appears truly represents the action you want to carry out will save you much heartburn. The most frequent confusions are between "Move Activity" and "Move Text Box" and between "Move Activity" and "Adjust Duration". The following is a further compilation of the actions you will be using with varying frequency, and their associated symbols:
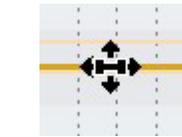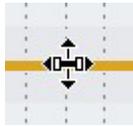
Move band	**Move Activity**	**Move Text box**	**Adjust size of text box**
Adjust duration	**Day Lock On**	**Row Lock On**	**Activity Locked**
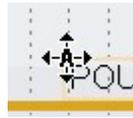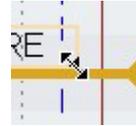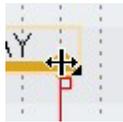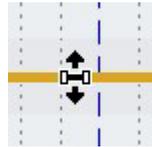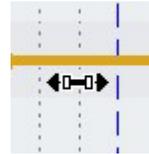
(You may be less than thrilled with the highlight colors that are the initial default colors. Your choice of "Selected Activity" (and other Activity) highlight colors will be explained in the ADVANCED USER GUIDE, but for the adventurous, go to "EDIT" and click on "PROJECT PROPERTIES".
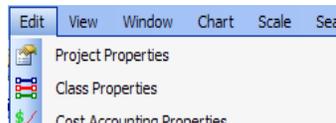
On the ensuing menu, click on "ACTIVITY" (on the top row), "SELECTED ACTIVITY" (under "Activity Global Display Colors"), the preferred color, "OK", and "SAVE EXIT".
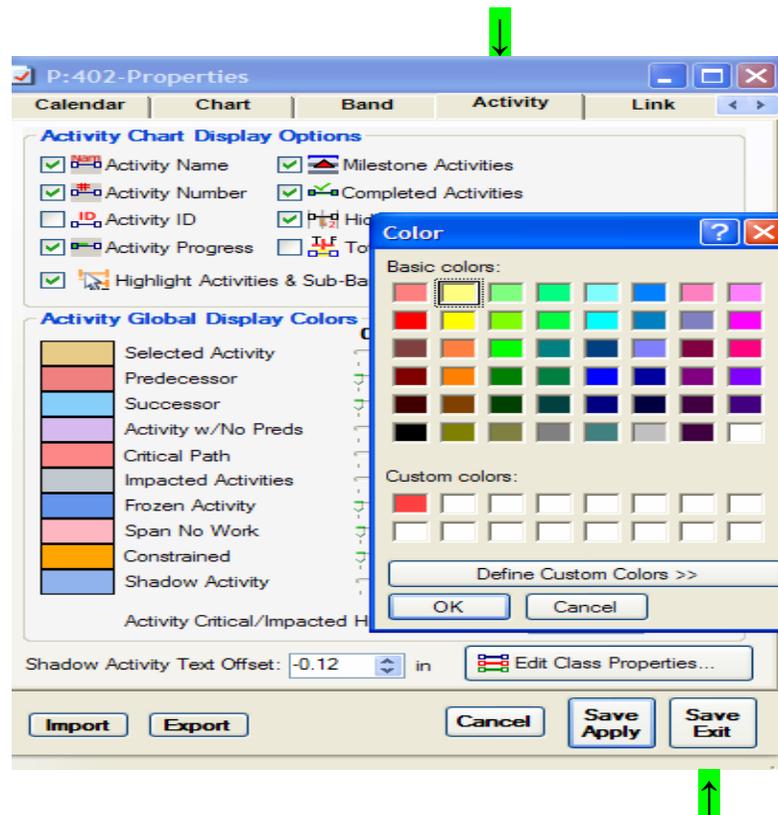
A "Selected Activity" will now be highlighted in your chosen color. In a similar fashion, you can change any highlight color under "Activity Global Display Colors", such as for "Impacted Activities" – now back to the main course..)

CREATING LOGIC TIES (PRECEDENCE RELATIONSHIPS)

Types of Relationships Among Activities

As soon as two or more activities are created, you have the option of linking them in sequence. (Creating Precedence Relationships). These Links may be Finish-to-Start (**FS**) (the most frequently used Link), **SS**, **FF**, or **SF** (the least frequently used Link). Using only **FS** initially, create four activities and pick two of them to link. Select either of them (DELTA, in this case) and **RC** on it. The following menu appears:
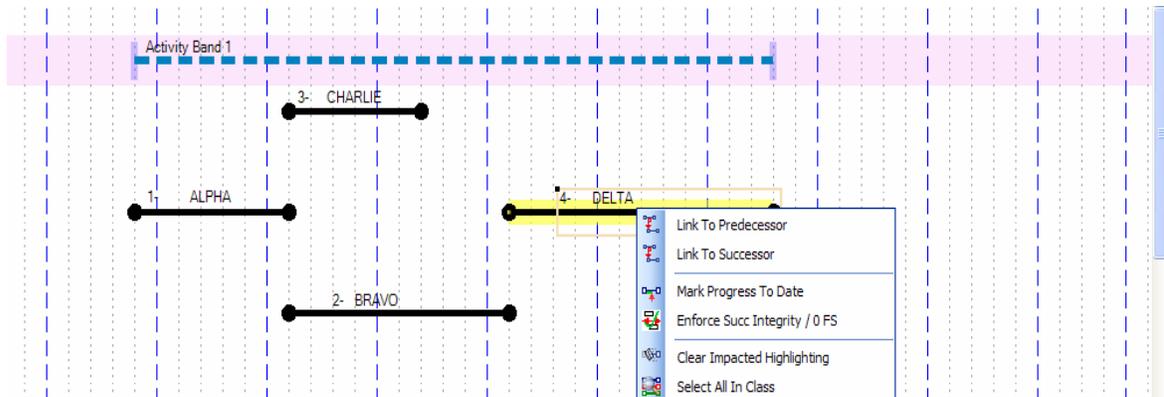
Choose "Link To Predecessesor" and **LC** on it. Then **LC** on the chosen Predecessor Activity (BRAVO in this instance).   A **FS** link will appear:
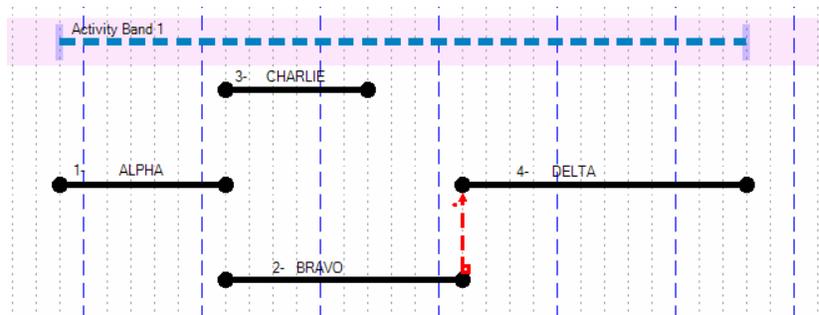
Linking the other activities might lead to this:
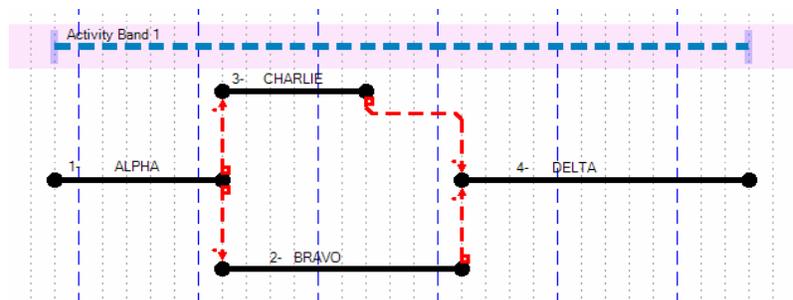
Using Lag Factors

Using other precedence types and lag factors gives great flexibility to describe how activities relate to each other. Note the example below:
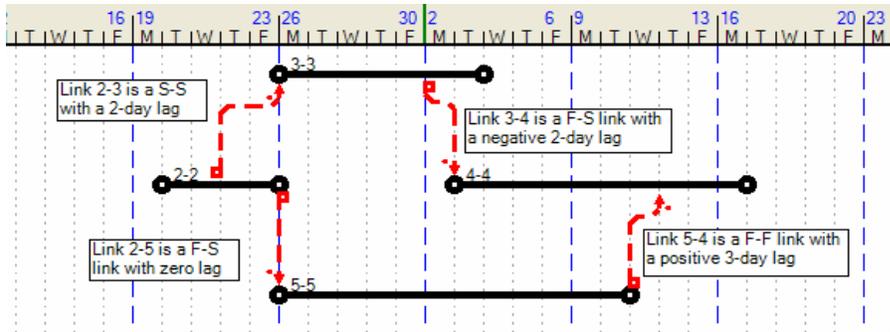
A quick look at how the activities could be positioned at their earliest time if Activity 2-2 must start no earlier that its current scheduled start of the 20th:
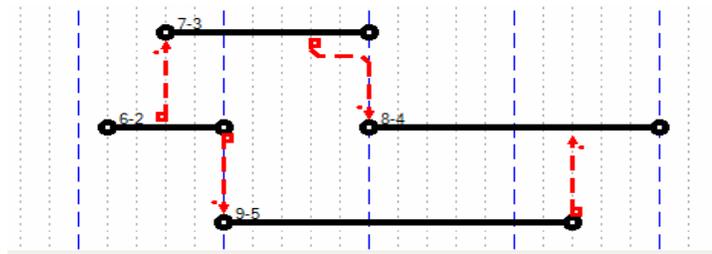
The lag factors are created by **RC** on the Link Line, turning it to a blue (or your selected) color. Then the little box at either the head or the tail of the selected link can be selected, held, and moved to the point reflecting the lag factor that has been described.
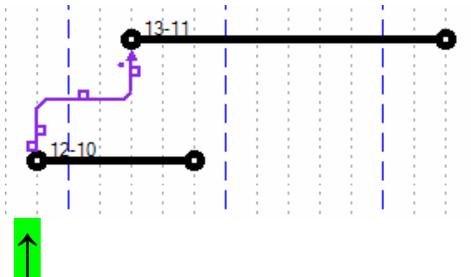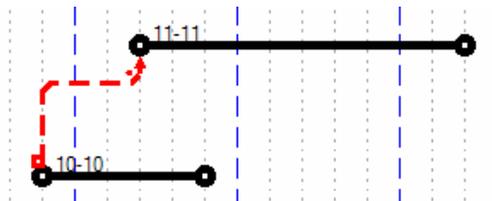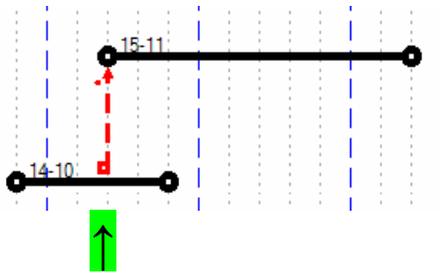
Precedence Links can be hidden by **LC** on the tool button "All" (Display All Activity Relationships)

Another **LC** will restore the Links.

MOVING ACTIVITIES

Moving Individual Activities

So far, we have operated with the logic turned **OFF**. This means that we can place an activity anywhere, even if the location is not consistent with the logic links we have created. You are also free at any time to relocate activities vertically and/or horizontally. To do so, select an activity (**LC**) and release. A 4-way arrow symbol will appear on the activity. **LC** on the symbol and hold the mouse button down.

Move the cursor (and the activity) in any direction. Logic links will move with the activity move to maintain the original logic. Release the mouse button. The activity is relocated. Two moves could give the following, which violates the logic which has been defined earlier:
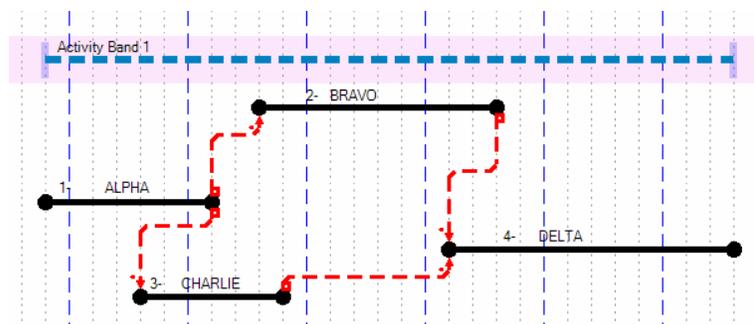
This freedom to be illogical is actually an advantage when designing your project plan and schedule. Moving an activity does not cause any other activity to move. However, at some point you will want to operate with the logic turned on, to honor the precedence restrictions you have assigned. **LC** on the tool button indicated below,
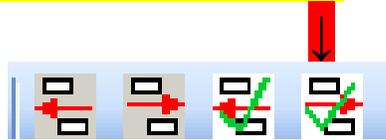
and a forward scan (Left to Right) will be done. This will cause all identified links to be taken into account and activities to be moved to the right as much as necessary to reach logical positions. Note that no activity is moved to the left. Each activity's location is treated as fixed (imposed) unless one of its predecessors pushes it to a later time.

The result of so doing when applied to the preceding schedule would be:
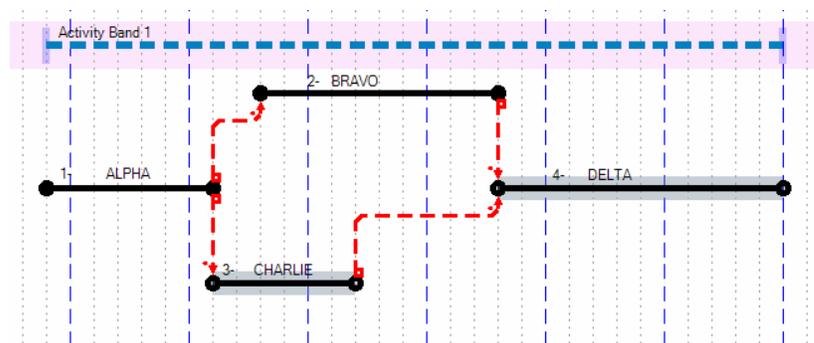
Note that the "Impacted Activities" have been highlighted. To turn off the highlights, **LC** on this tool button:

If the companion logic tool button to the left were **LC**'d,
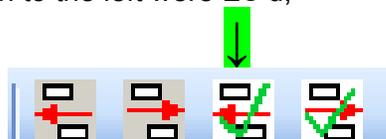
the same starting schedule would be adjusted to look like this:
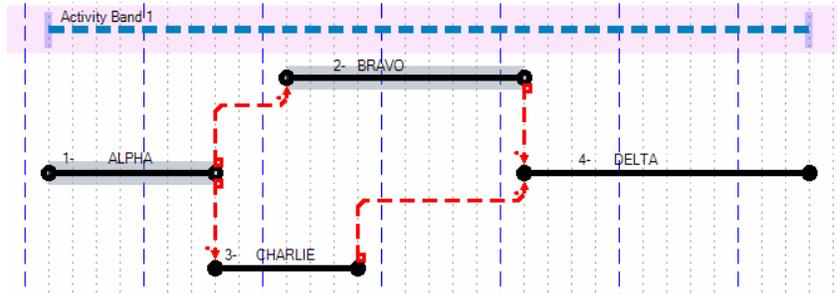
In effect, a backward scan (Right to Left) has been done, moving activities to the left as necessary to meet logic requirements.

These two buttons have immediate, but one-time, impact. They cannot be kept ON. Note that UNDO will restore any previous activity location, so that the effect of using one of the above buttons can be cancelled.

Turning on the next two indicated logic tool buttons will cause any Activity move after the buttons are turned on to impact any predecessor or successor Activity as the logic indicates. These buttons stay OFF or ON until clicked again. These buttons can both be ON at the same time, or either can be ON while the other is OFF, or both can be OFF.
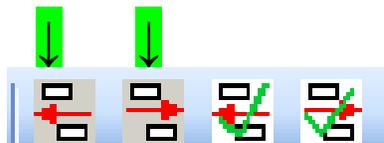
A series of moves with the rightmost of these last two logic buttons ("Maintain Successor Integrity On Activity Move") turned ON might look like this:
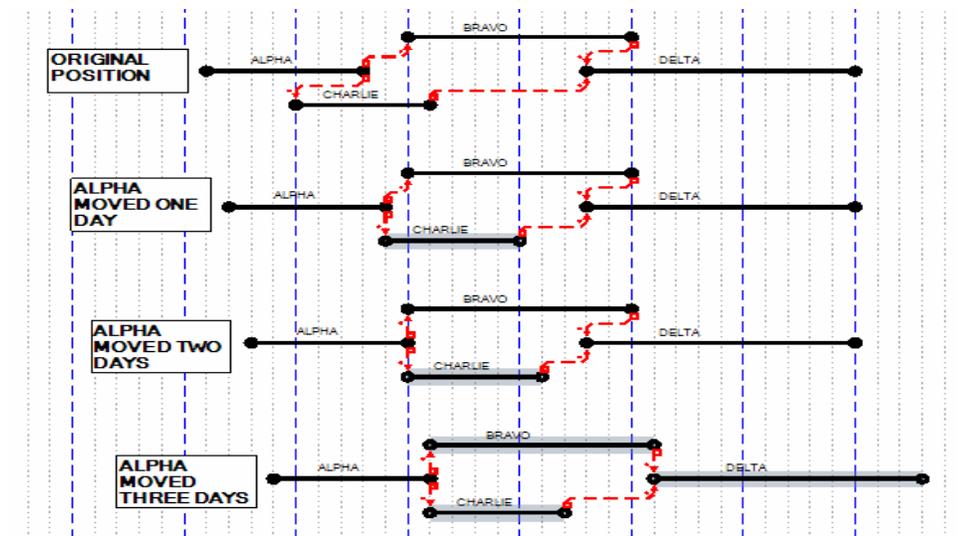
 Note that the BRAVO/DELTA illogic was not cured until Bravo moved.

13

Experimentation with the four logic buttons will quickly give you a feel for when and how they can be most productively employed.

Moving Groups of Activities

A special case of group movement involves moving all activities within a band while maintaining the positions of the activities relative to each other. This can be done by selecting the Band Bar just as you selected a single activity to move. The move symbol is a **bold** 4-way arrow symbol. Holding the mouse button down on the symbol allows you to move the entire Band to a different location, horizontally and/or vertically.

Band selected:
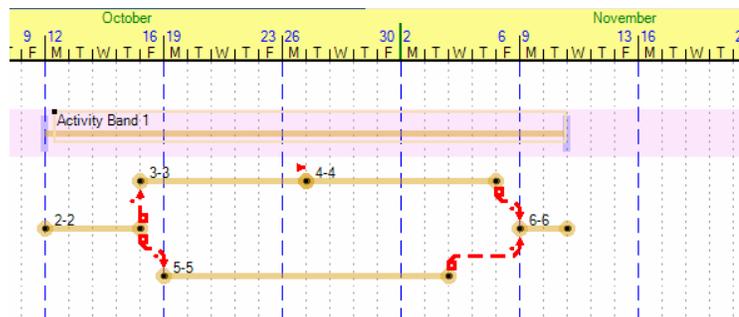
Band moved 4 days:
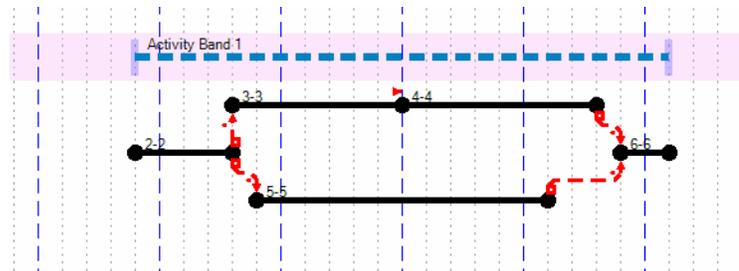
Another group move option is to use a Fence to select a set of activities. **LC** and hold on the point where you want the upper left corner of the Fence to be. Drag to the point where you want the lower right corner to be. **RC** inside the Fence and a menu will appear.
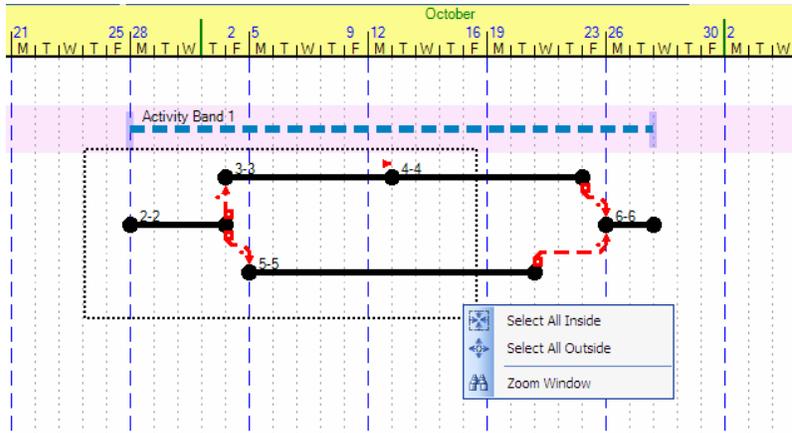
LC on "Select All Inside".
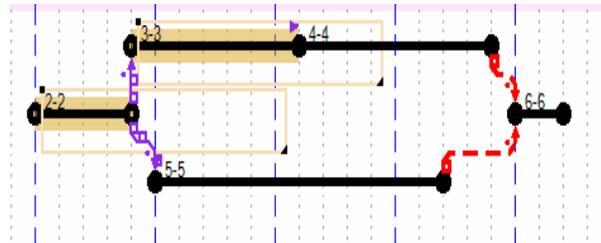
Note that the activities highlighted (selected) thereby are only those whose start <u>and</u> completion fell within the fence. Selecting (**LC**) any one of the highlighted activities and holding the mouse button down allows you to drag the selected group to any other location.
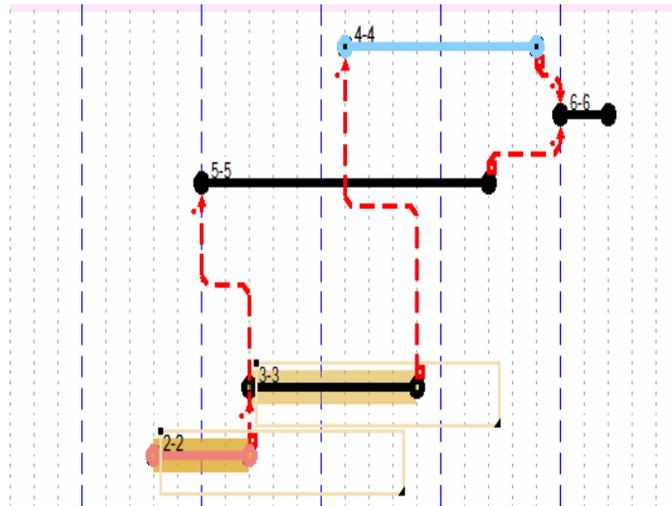
Note that logic links are preserved.

COPYING AND PASTING ACTIVITIES

A single Activity can be copied and pasted into any location by **RC** on the Activity to create the dropdown menu, and **LC** on "Copy".
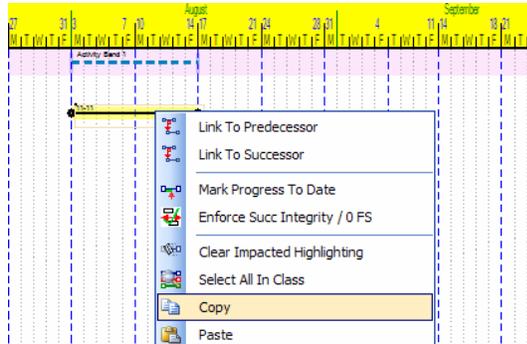
Then move the cursor to the desired location, **RC** to create the menu, position the cursor on "Paste", then **LC** on "Activities" to duplicate the Activity.
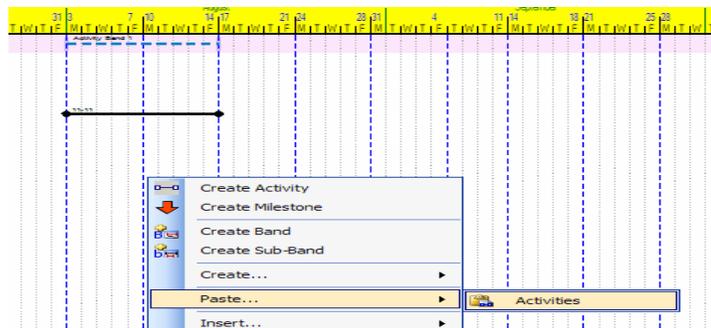
Activity Pasted Into Place
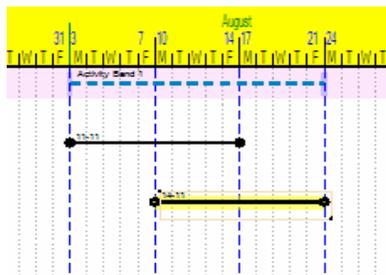
A group of activities can be copied by Fencing them (as was done above to move them), selecting "All Inside", then, using any Activity in the group to represent the group, copy and paste as you did with a single Activity to recreate the group elsewhere. Link lines going outside the fence will not be copied. Copying a group does not alter the original group.

16

by treating the Band Bar as you did a single Activity. The copy becomes a new Band with the original Band's name. The new Band can then be renamed just as you might change an Activity description.

MOVING AROUND THE SCHEDULE DISPLAY

When the schedule display becomes larger that the screen can display in a readable single screen view, you can move to any hidden part of the display using the vertical and/or horizontal scroll bars on the right and bottom of the screen. You can also zoom out (or in) using the tool buttons below:

A faster pan and zoom process involves using a wheeled mouse and the "Shift" key on your keyboard. With the shift key depressed, you can pick a point on the display and drag the display horizontally and/or vertically in one move. Longer moves may require repetitions of this process to get the desired area displayed. You will often find it helpful to zoom out, find the desired area, panning if necessary, and zoom back in. Zooming can be done by depressing the shift key and moving the wheel forward to zoom in, backward to zoom out. The following example illustrates the process:

FIRST FLOOR NOT VISIBLE

17
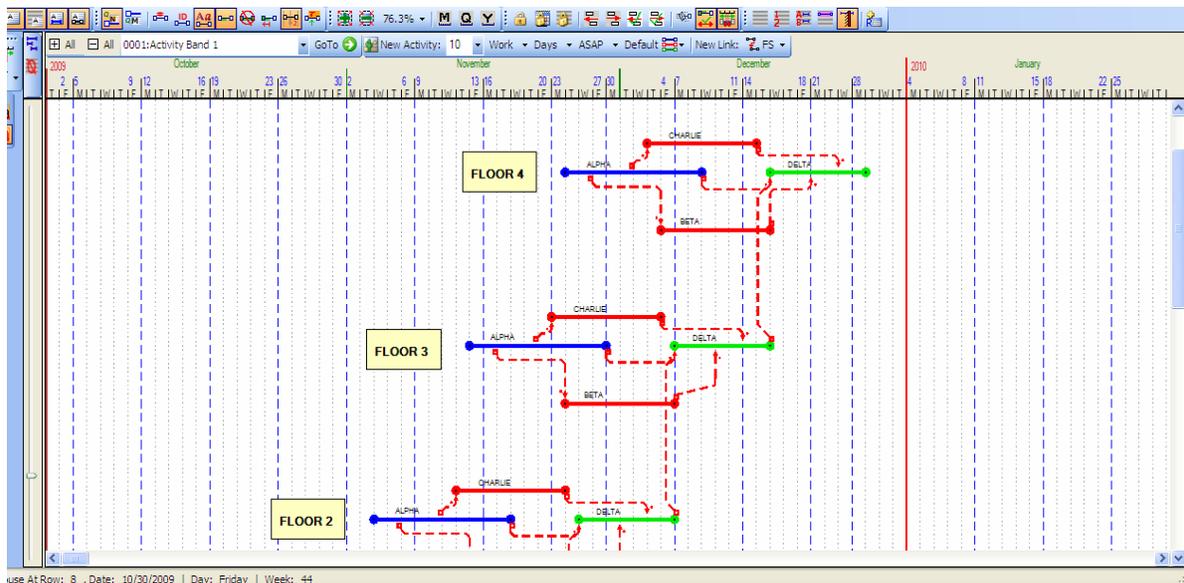
ZOOM OUT (AND/OR PAN) LOCATES FIRST FLOOR
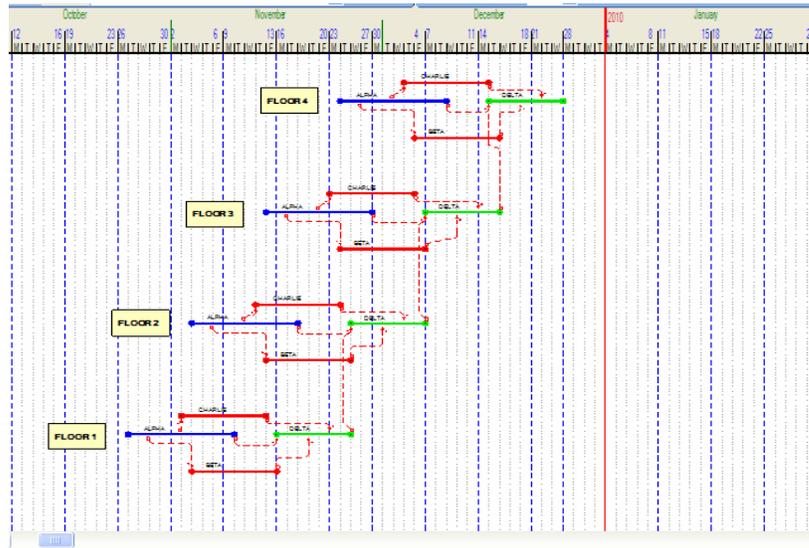
ZOOMING BACK IN GIVES DESIRED AREA

18
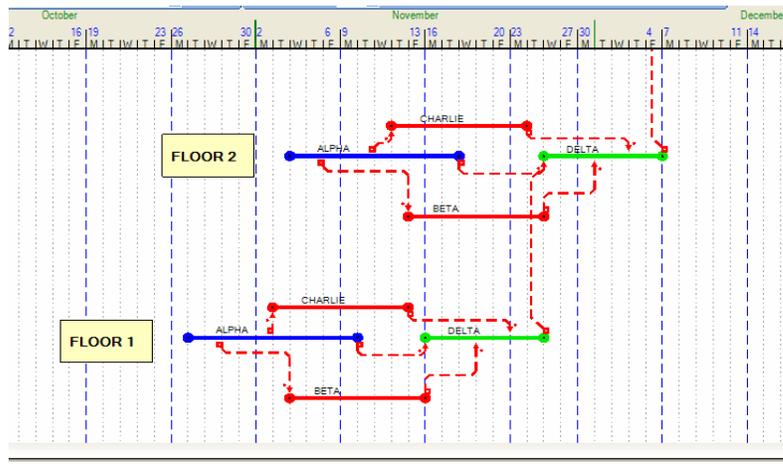
IDENTIFYING THE CRITICAL (OR CRITICAL + NEAR-CRITICAL) PATH(S)

With the logic turned **ON** or **OFF**, and without correcting any illogical activity locations, the true CPM-calculated Critical Path may be highlighted by **LC** on the <u>Critical Path</u> tool button below.

The result will be this type of highlighting identification:
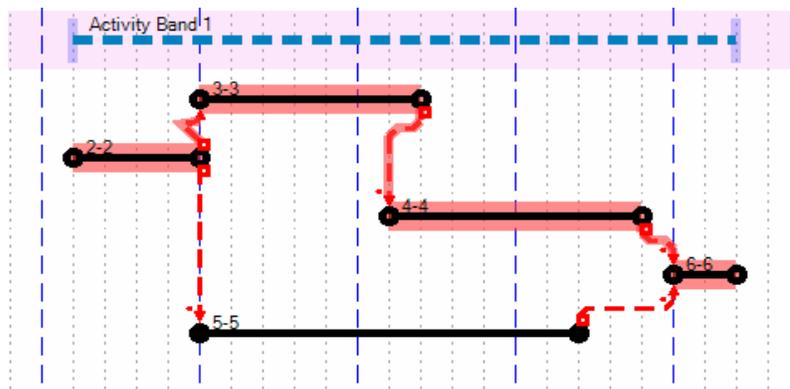
Note that both Critical Activities and Critical Link Lines are highlighted.

To also identify the paths that are within **X** days of being critical, the **X** can be selected by choosing from the menu appearing when you **LC** on the indicated point (the triangle):
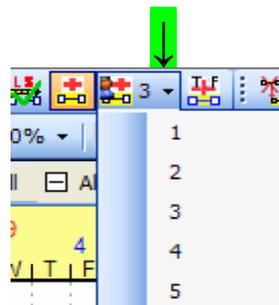
LC on a number for **X** (say, 5) and all activities within 5 days of being critical will now be highlighted
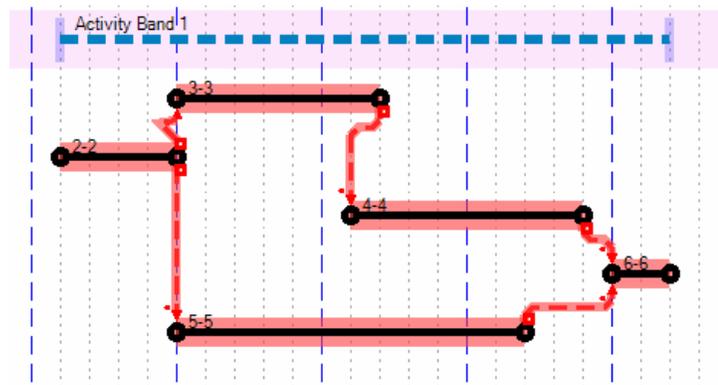
DISPLAYING ALL-EARLY-START AND ALL-LATEST-START SCHEDULES

Show the chosen project Early Start date by **RC** on that dayline, highlighting "Create", and **LC** on "Marker Line"
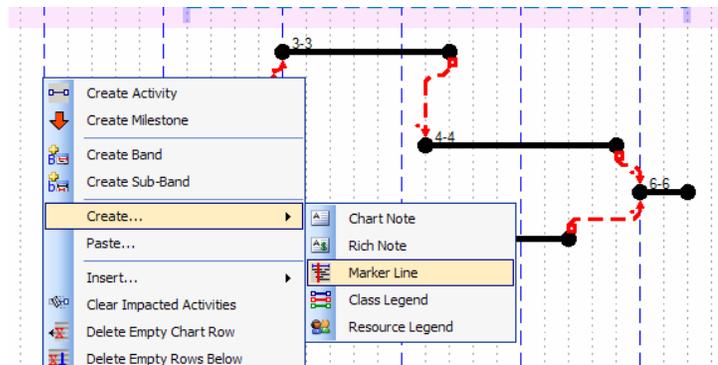
RC on the resulting Marker Line and **LC** on "Set as Project Start".
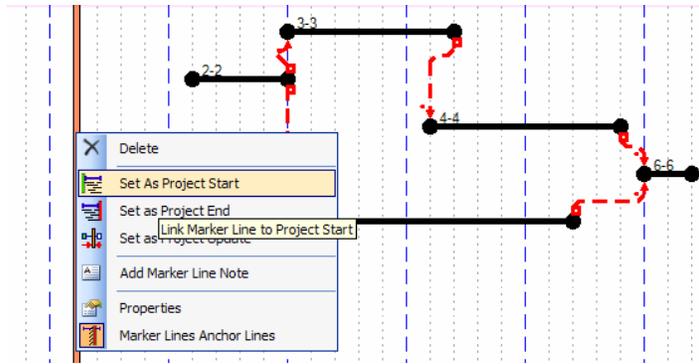
The resulting Project Start (Early Start) Line will take this form:
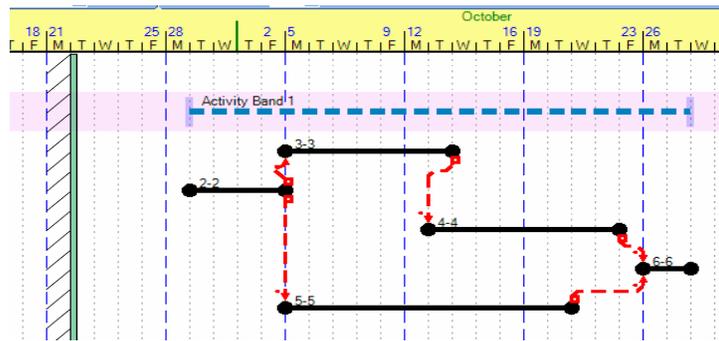
By a similar approach, the project End (Late Completion) line can be established.
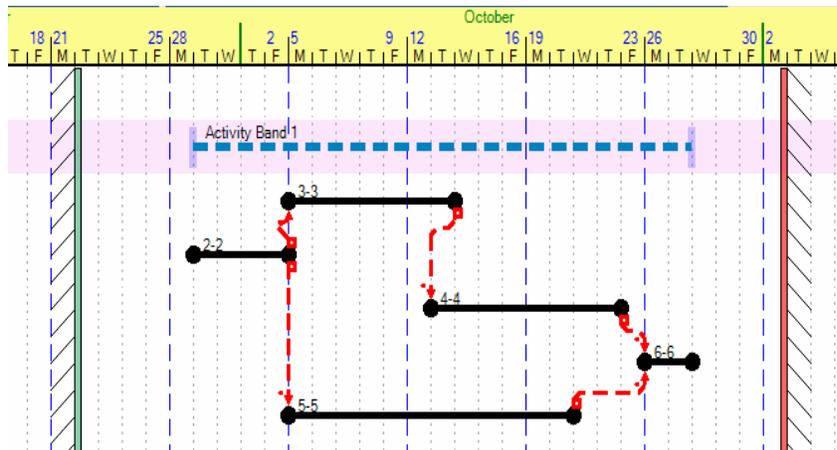
If "Critical Path" was previously turned **ON**, turn it **OFF** and back **ON**. Then **LC** on the "ES" symbol and then the "LS" symbol and the two extreme schedules will in turn be shown.

ALL- ES

ALL-LS
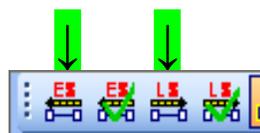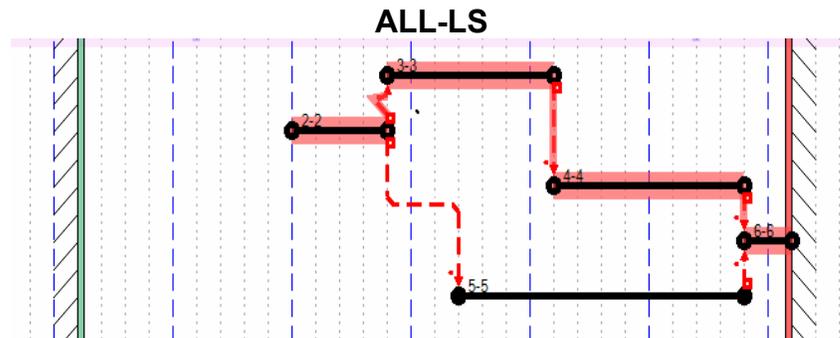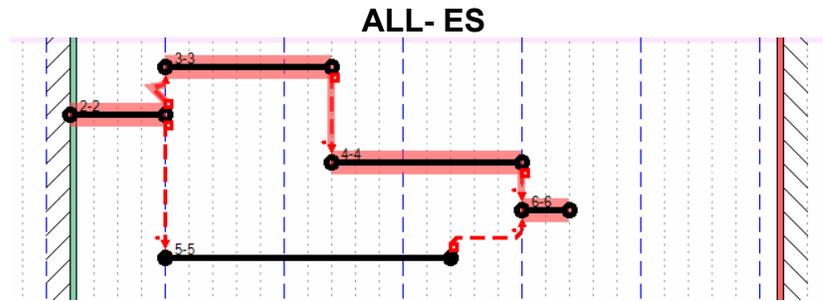
A **LC** anywhere after either of these schedules is shown will restore the original schedule.

You cannot modify the **ES** or **LS** schedules in this display. If you wish to use one of these schedules as a point of departure for further scheduling, **LC** on the adjacent tool button.
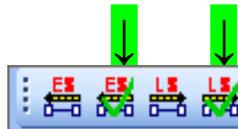
Now you can modify the schedule and it will not necessarily be the **ES** or **LS** schedule.

PLACING ACTIVITIES IN CLASSIFICATIONS (CATEGORIES)

Introduction

Activities may be grouped into different classifications (Such as "Governmental Approvals" or "Electrical Contractor Activities") to make it easier to visually differentiate among them (or sort them in a tabular listing of activities, if desired). These classes may each be (but are not necessarily) assigned unique graphical properties for color, line size, and line pattern. This makes possible visual sorting of the classes. It is also possible to print only a selected class (or classes) while hiding, or printing in a default color, all other classes. Using color only, the schedule on the

left below could become the schedule on the right, with each activity assigned to one of three classes, representing perhaps three different groups on the project team.
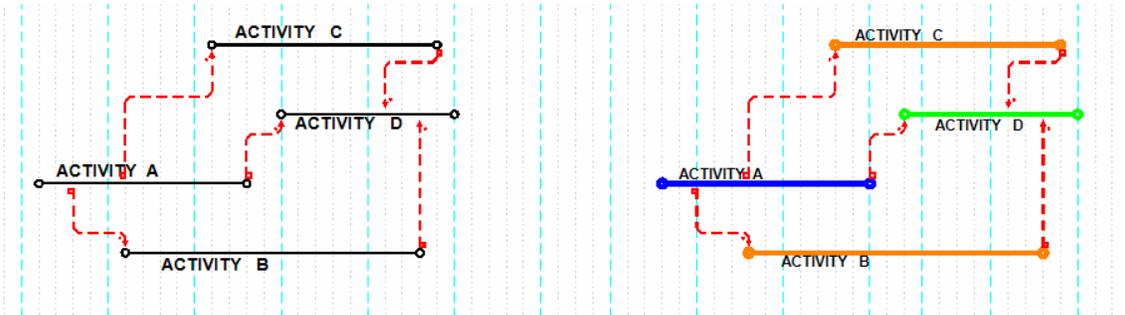
Class Properties

Until other classifications are set up, all activities fall into a "Default" classification. To create other classifications or to modify the Default class, **LC** on "Edit", then "Class Properties".
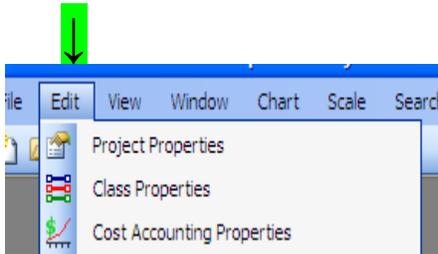
The following menu will be displayed:
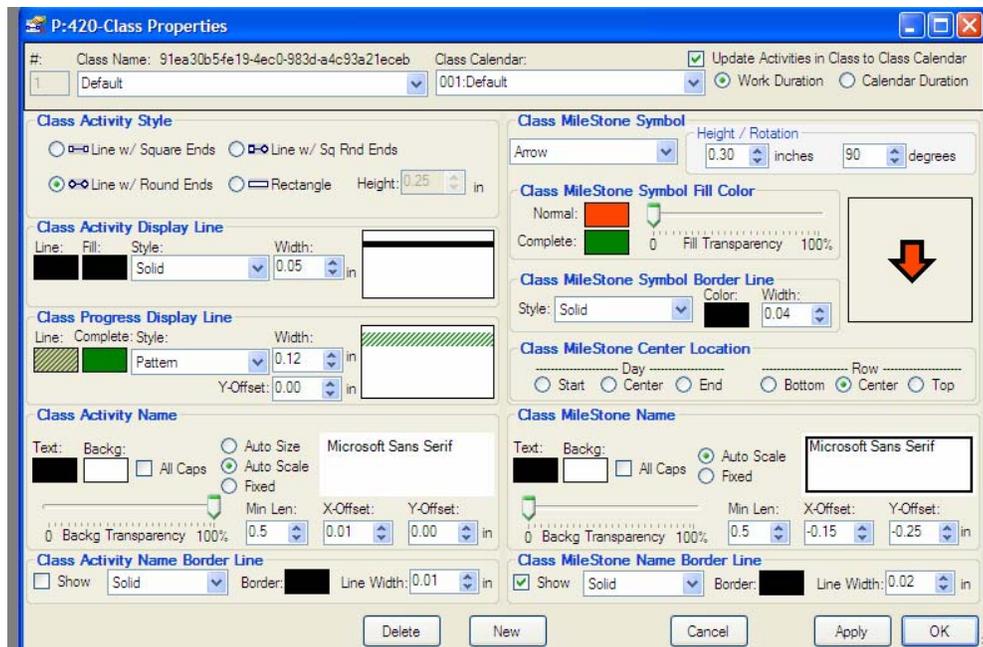
This menu describes the characteristics of the "Default" class (identified in the top left-hand corner). The left side describes how Activities in this classification will be displayed.

The right side similarly describes how Milestones in this classification will be displayed. The top center allows for the choice of the Calendar against which Activity durations in this class will be measured. This is primarily used for assigning activities to a work week other than the default 5-day week. Milestones will be address later in this Basic User Guide and alternative calendars will be addressed in the Advanced User Guide.

On the left side, under "Class Activity Style", you may choose from three types of activity bars. The three choices are:
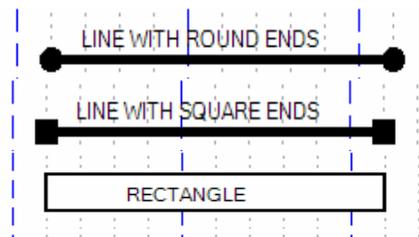
(The fourth bar type shown, "Line with Sq Rnd Ends" is a special purpose bar which will not be covered here)

Under "Class Activity Display Line", you may establish the color of the Activity Line, its Style (pattern) and its Width (thickness). For the Rectangle form of the Activity, you may set Fill (the infill color within the rectangle) and size (height) of the rectangle.

Indicating the state of completion of the Activity (Progress Display) is a matter of **RC** on an activity in the day through which you want to show progress. On the menu which appears, **LC** on "Mark Progress to Date".
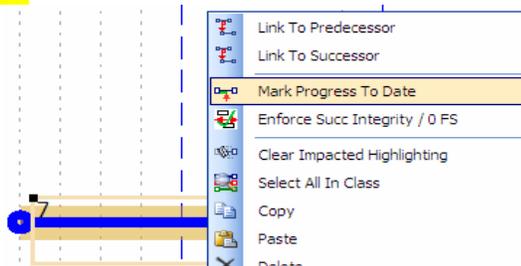
The following is an Activity statused to show a remaining duration of four days:
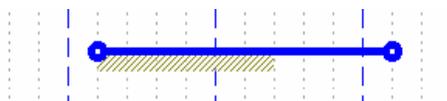
The "Class Progress Display Line" section allows you to select the color for the partial progress markup (shown above) on the Activity Bar and for the totally completed indicator. The Style (pattern) of the progress indicator, its Width, and its Offset from the activity bar are available for your selection.

For the selected classification, the "Class Activity Name" section allows you to choose font style, size, color, and "All Caps" if desired. "Min Len" refers to the minimum length of the Activity Text Box. "X - and Y- Offsets" allow you to establish the starting location of the Text Box relative to the Activity Bar. "Auto Size", "Auto Scale", and "Fixed" will be discussed in the Advanced User Guide, as will be "Class Activity Name Border Line".

The right side of the menu, dealing with Milestones, will be discussed later in this Basic User Guide.

To set up a new classification, select "New" (center bottom on the "Class Properties" menu above) and **LC.** "Default" will change to "Default Copy". LC on "Default Copy" to highlight the class name. The menu will look like this:
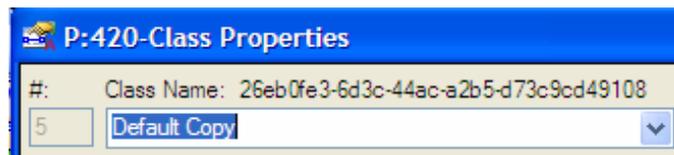
Type in the name of the new classification and assign to it any characteristics which you choose to use to differentiate it from the previous classification, such as Activity line size, pattern, and color. **LC** on "Apply" and your new classification is established.

If your activities were created in the "Default" class and look like this:
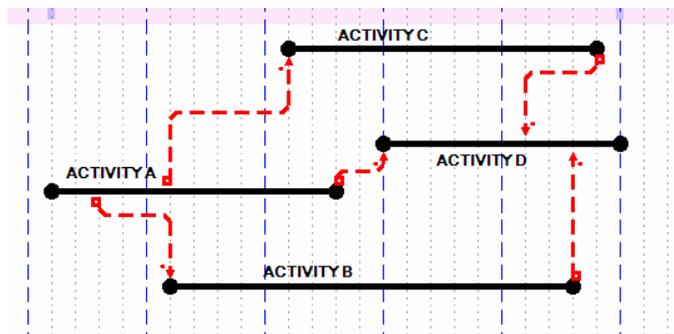
You could have then set up additional classifications – in this case, Blue, Red, and Green (or Mechanical, Electrical, and Plumbing, for example). To move Activity A from the Default class to the Blue class, select Activity A, then LC on the "Categories" tool button shown below.
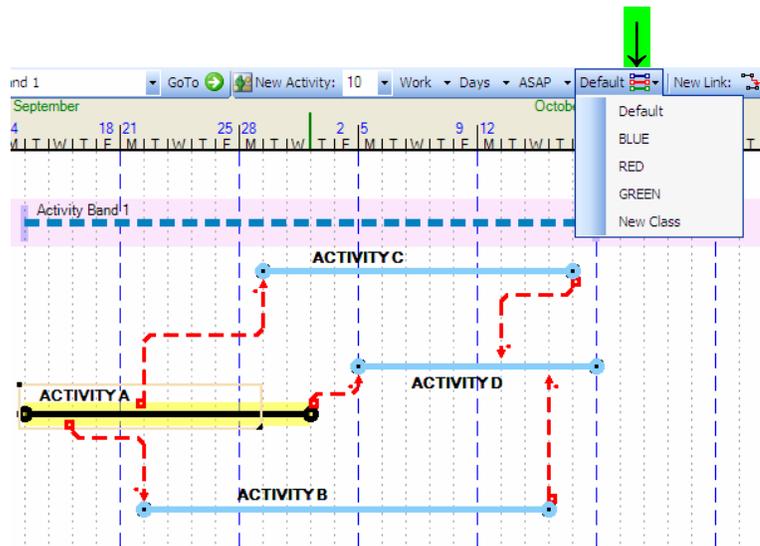
Note that when you selected Activity A, all the (immediate) successor activities temporarily changed color to mark them as successors. If predecessors were shown, they would similarly change to a different color to identify them as predecesors.

Select "Blue" and a menu will appear asking you to confirm that you wish to assign Activity A to the Blue Class.
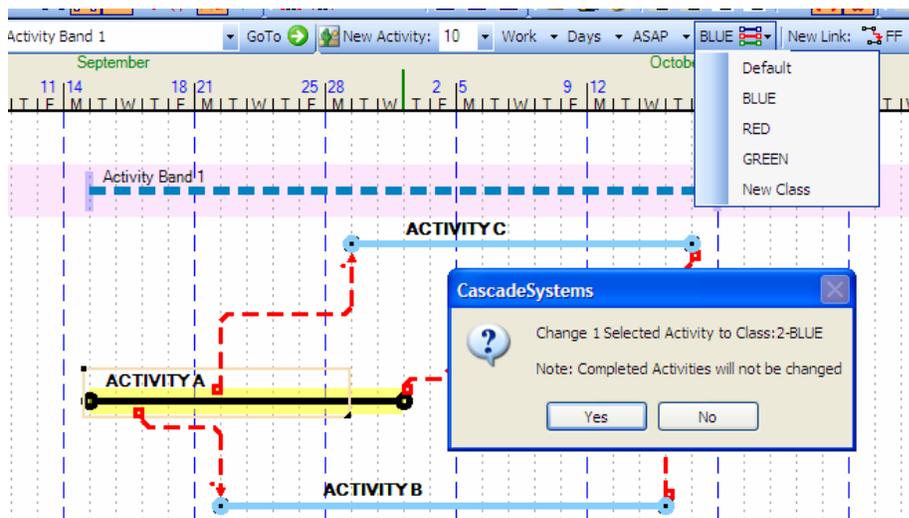
LC on "Yes" and Activity A takes on the color (and all other characteristics) assigned to the Blue Class.
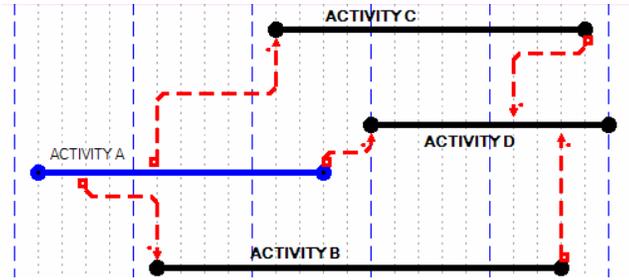
In a similar fashion, the remaining Activities could be assigned to Classes, giving:
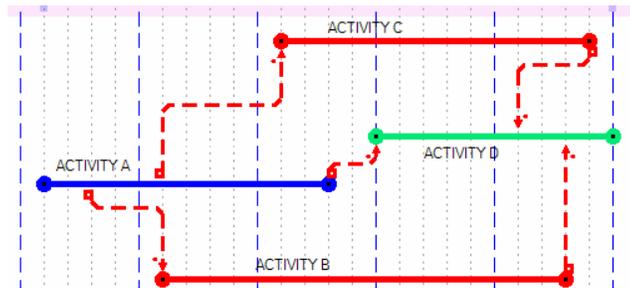
The different possible display features for different Classes (line color, name color, name font type, name font size, line pattern, line size, activity symbol) give you a very extensive graphical sorting potential with all Classes displayed.

Displaying the Classes

It is also possible to hide (not display) any Class or combination of Classes. LC on the "Display Activities for Selected Property Classes" tool button.
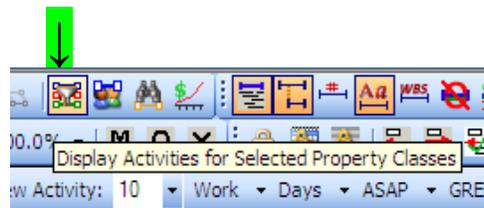
The following menu will appear:
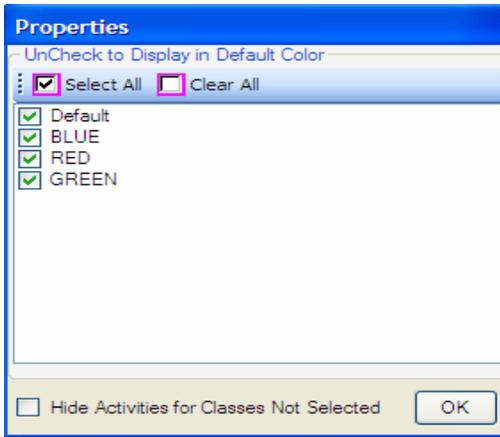
To display only one Class, say Red, for example, **LC** on "Clear All", **LC** on "Hide Activities for Classes Not Selected", then **LC** on "RED" and LC on "OK". The following display results.
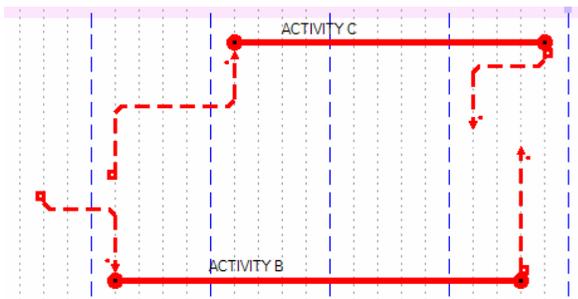
By hiding all Precedence Links and Hiding Empty Rows, a cleaned-up Red-only display appears.
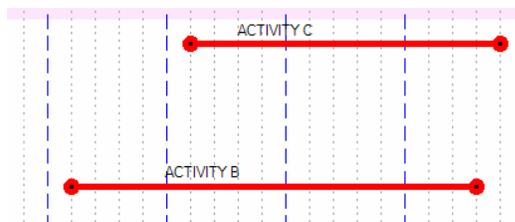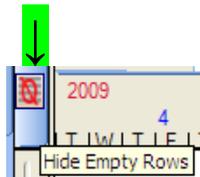
An alternative approach is to use the same "Properties" menu and uncheck the Classes you want to have appear in the Default color. Leave "Hide Activities for Classes Not Selected" unchecked. By temporarily setting the Default color to a muted shade, you could display the Red Activities boldly, and everything else in background:
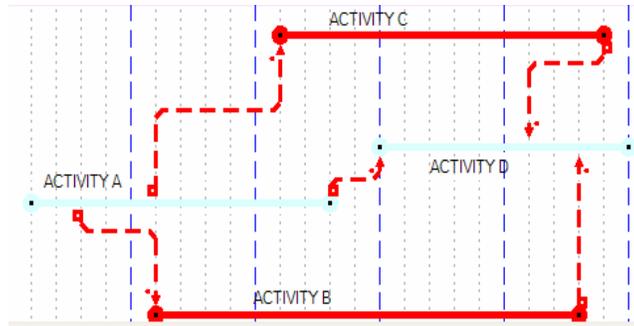
ADDING NOTES TO THE SCHEDULE DISPLAY

The schedule display will be more easily read and understood if notes are added to identify various sections of the schedule. Also, hideable notes can be attached to Activities to add more information than you want to include in the Activity description. To create a note, place the cursor approximately where you want the note to appear, **RC**, and select from the resulting menu as shown:
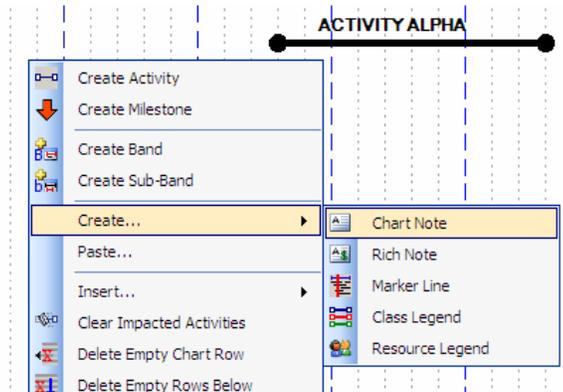
The preliminary Chart Note text box appears:
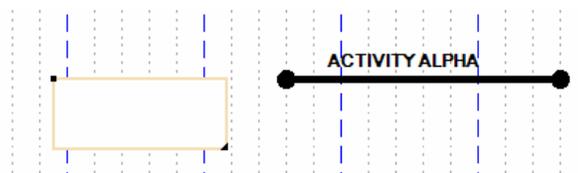
DLC inside the box and type the text:
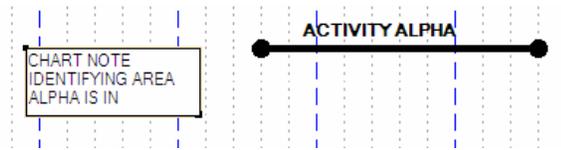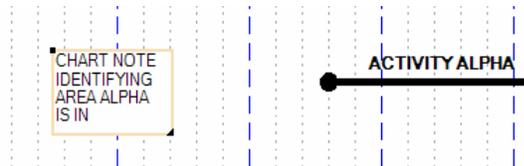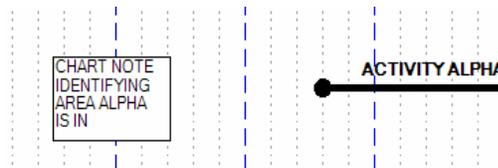
Technically, the <u>Chart</u> Note has thereby become an <u>Activity</u> Note:
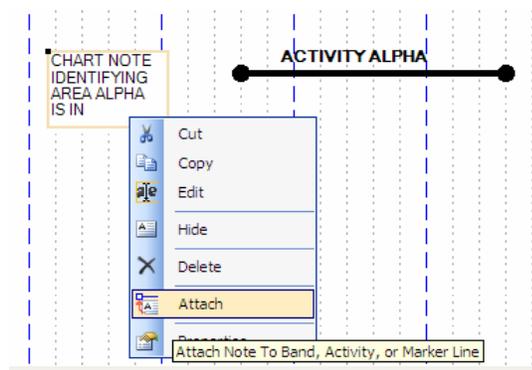
From this same menu, you may "Hide" the Chart Note, attached or not, or "Delete", "Edit", "Copy", or "Cut" it. LC on "Properties" from this same menu and you may alter the appearance of the note:
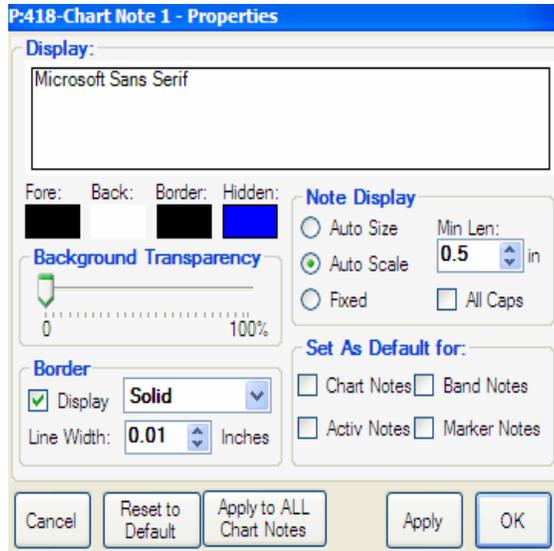
This "Properties" menu allows you to change font style, size, and color; and, of particularly interest, change the background color. Assigning the background a light shading color does much to improve the readability of the schedule. Background transparency near zero will normally work best with a shaded background.
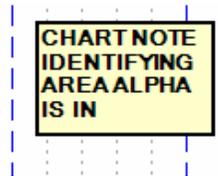
You may choose note borders of different patterns, colors, and line widths, or choose to not display the border at all. You have the option of changing the appearance of only the note you have selected, or applying the change to all notes of the same type. When you have made your selections, LC on "Apply", then "OK".

If, on the earlier menu, you chose to "Hide" the selected note, the Hidden note will be replaced with a small *i* symbol to alert you to its existence and location.

 RC on this symbol and **LC** on the word "Show" and the note will reappear. ("Hide" in the accompanying explanatory menu should actually say "Display")
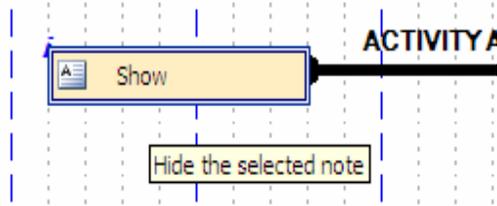
The following tool buttons allow you to Hide or Display "All Notes", "All Chart Notes", "All Band Notes", or "All Activity Notes", rather than doing so one note at a time:
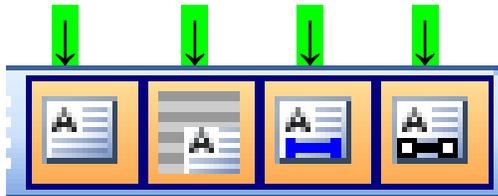
MILESTONES

Creating Milestones (Events)

Another way to improve the readability of the schedule is to incorporate Events into the display. An event typically describes a condition <u>in</u> time, not an action taking place <u>over</u> time. An Event normally represents the time at which an activity, or group of activities, is completed or is ready to start. As an example, an activity, "Dig Ditch" might have an Event shown at its completion which reads "Ditch Dug". At its start, it might have an Event that reads, "Ditch Ready to Dig", or a slightly different twist, "Ditch Digging Started". You can originate any Event which seems to aid in understanding the schedule. If later you find the Event superfluous, you can delete it. Key Events are often called "Milestones". Herein, we will use "Event" and "Milestone" interchangeably. Tracking Milestone dates over a series of project updates (Trend Charting – a feature currently being developed as an automatic CASCAD-e function, but easily done manually) gives quick insight into the schedule performance on a project.

To create an Event, point to any location, such as above the end of an Activity, and **RC.** The following menu will appear:

LC on "Create Milestone" and a Milestone symbol will appear:
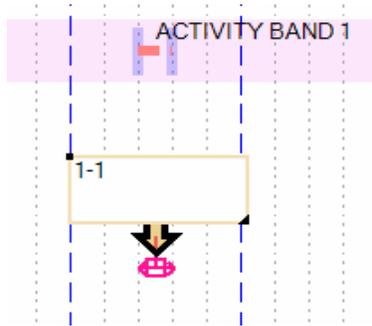
Note that a temporary one-day Activity symbol is displayed at the tip of the Milestone symbol. For reasons that are not important at the moment, the Milestone is treated as if it were a one-day Activity, but can be made to function as a zero-day Activity. Your Milestone symbol will possibly not be the same as above, but will be as dictated in the CASCAD-e Default menu (Described below). You can arrive at an approximation of the Milestone display above, or any other by going to the "Milestone Properties" as described below.

Milestones can be fashioned in a variety of ways, such as the following:
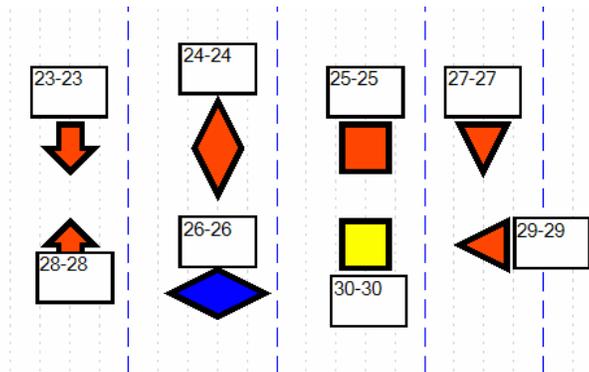
You may choose the type, size, orientation, and color of the symbol. You may locate and size the Text Box, and you can choose the placement of the Milestone symbol relative to the hidden one-day activity. These and other options are available by **RC** on the Milestone <u>Symbol</u> (not the text box) and **LC** on "Milestone Properties" from the resulting menu:
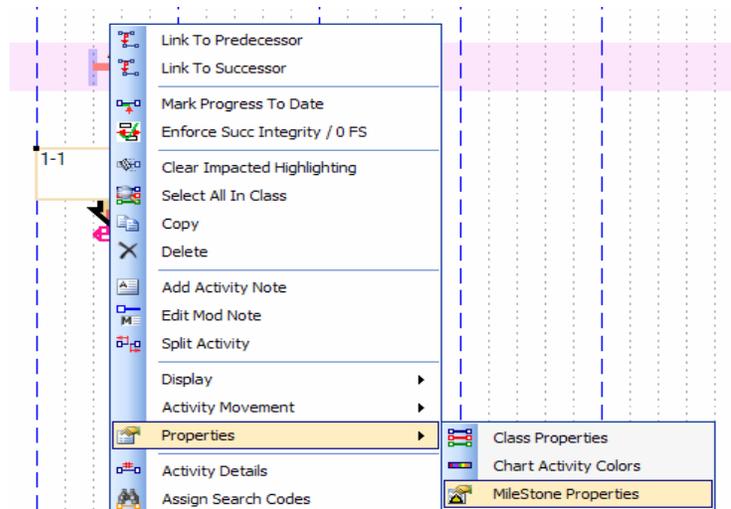
This will produce the following "Milestone Properties" menu from which you can make configuration choices. Note that Milestones, just like normal Activities, are created in a Class ("Default", in this example). Your Milestone configuration choices can differ from one Class to another. If you make a change to a Milestone, it applies only to that Milestone, unless you click on "Apply Changes to All Milestones in Same Class". You cannot currently apply a change to all Milestones across all Classes.
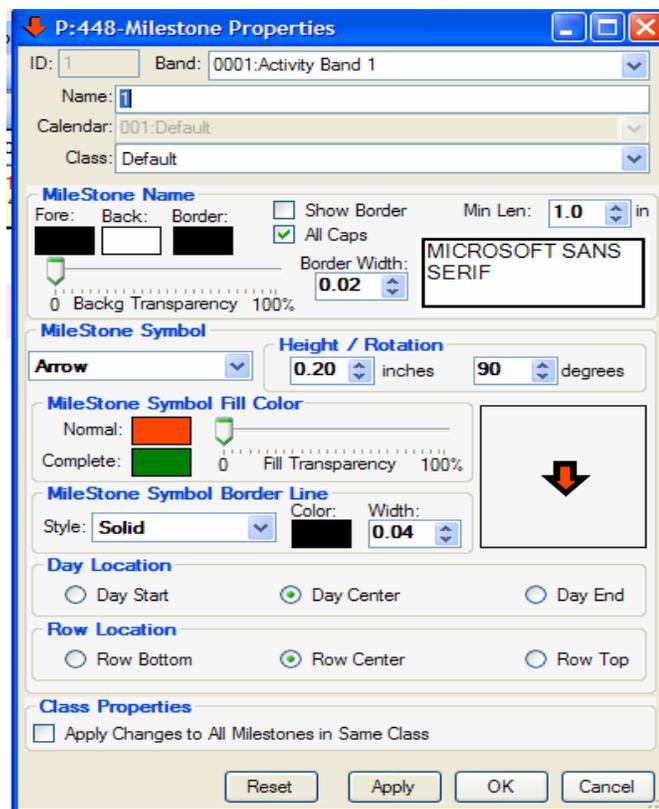
Text Box sizing (other than minimum length) and location cannot be accomplished on this menu, but can be altered by LC on the Milestone Symbol (not the Text Box) to display markers on the upper left and lower right corners of the Box. Adjustments are then done in the same way that Activity Text Boxes are sized and relocated.

The choices you make on this menu will remain fixed for the class and project in effect, reappearing when you close and then reopen the project file. When you create a new class for this same project, its Milestone Properties will be those from the Default Menu (See below) until you reset the Milestone Properties menu for that new class. If you go to the Default Menu and reset the desired Milestone Properties Defaults, all new Classes (but not those classes previously created) will have the new Milestone Properties. New projects opened up (but not those projects previously created) will have the Default Milestone settings.

*(Once you have experimented with Milestone options, you can go to the Default Menu and adjust the Milestone settings to give you the Milestone configuration you want as your default for all future projects.(Having your Milestone appear looking just like you prefer is both efficient and comforting.) You may access the Default menu by **LC** on "View" and selecting "Default Settings" and "User".*
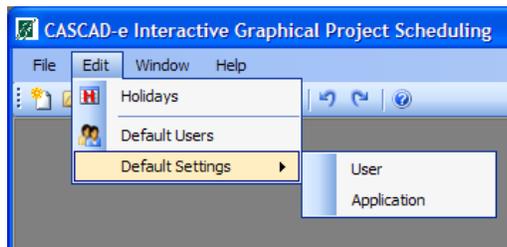
Depending upon the version of CASCAD-e which you have downloaded, the Milestone Default Settings will contain settings such as shown below. Some of the actual values will probably be different in your Default display, but the author has found the following to be preferred Default settings for Milestones:

35

Changes made to change the original Default Menu to the one above are:

> **Height Inches (Milestone Symbol size) = 0.2**
> **Symbol Type (Milestone Symbol type) = 3 (Arrow)**
> **Name Default All Caps = True**
> **Name Default Offset X Inches (Text Box horizontal positioning) = -0.27**
> **Name Default Offset Y Inches (Text Box vertical positioning) = -0.18**
> **Name Default Text Font = Arial, <u>10 pt.</u>, style=Bold**

This gives the Milestone configuration shown at the start of this Section..

The entire Default Menu offers similar advantages in other areas. This will be developed further in the Advanced Users Guide, but you will probably be tempted to open this Pandora's Box early. GOOD LUCK!)

<u>Using Milestones</u>

You may create an Activity and then create and position a Milestone relative to that Activity.
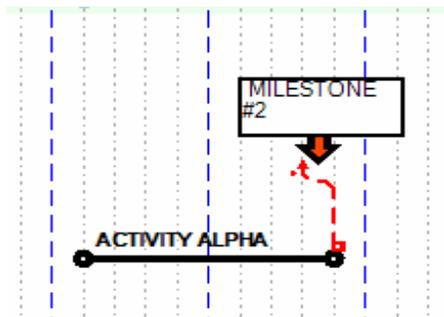
However, that positioning may not be quite what you wanted. What is shown could represent an event which occurs during the final day of the Activity, such as an inspection. But you may want to make the Milestone line up with the end of the Activity, and have the Link Line feed directly into the point of the arrow, representing the true completion of the Activity. To do that requires two actions. **RC** on the Milestone symbol (the arrow) and use the ensuing menu to select "Properties", then "Milestone Properties".
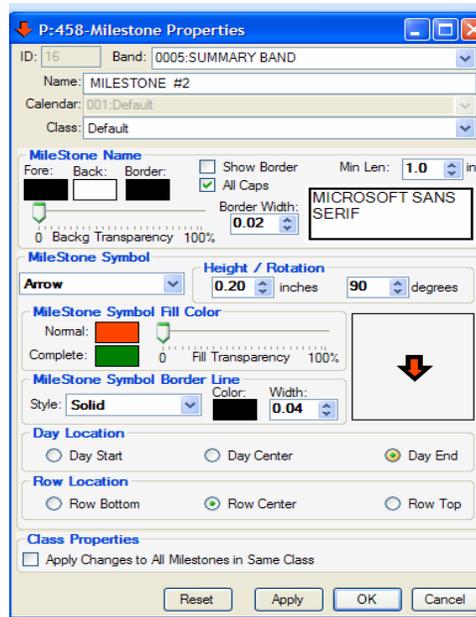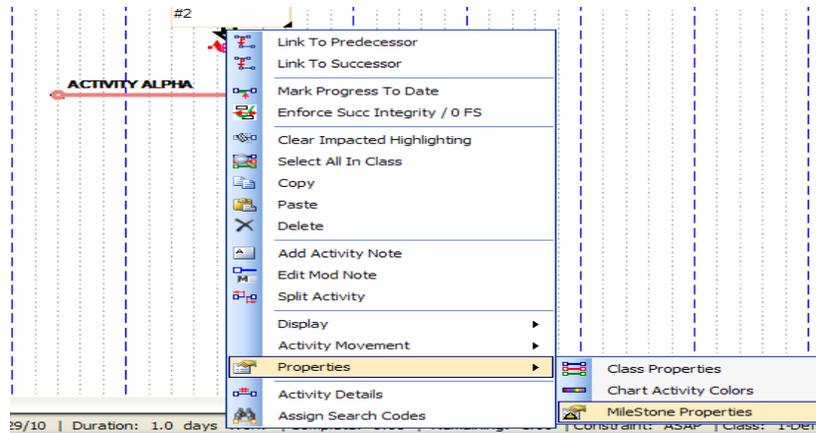
Under "Day Location", you would have found "Day Center" designated by the dot in the circle. LC on "Day End" and the dot moves there. You have now accomplished half of your goal, and the Milestone appears as:
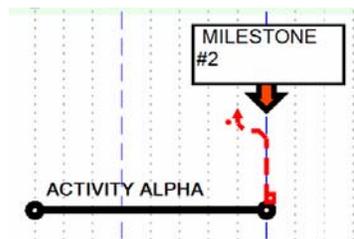
Now **LC** on the Link Line, which is in a Finish-to-Start (**FS**) relationship with the invisible one-day Activity which is the carrier for the Milestone. On the ensuing menu, select Finish-to Finish (**FF**) and the Link Line will move to reflect that change.
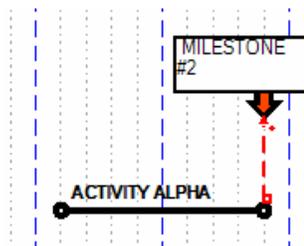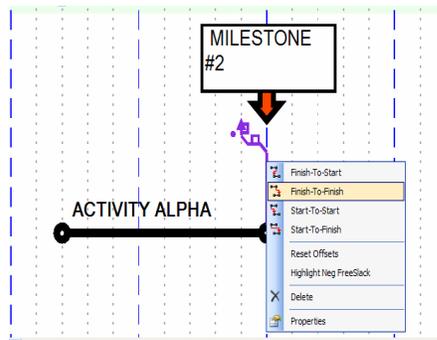
Now add **ACTIVITY BETA** and make it a **FS** successor of **MILESTONE #2**, rerouting Link Lines to avoid the visual confusion that would otherwise result.
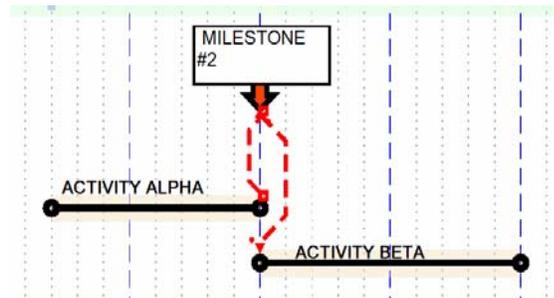
With the "Predecessor" and "Successor Integrity" **ON**, moving **ALPHA** to the right or **BETA** to the left will cause **MILESTONE #2** to move accordingly and push the other Activity as necessary to honor the assigned logic. Moving **ALPHA** left or **BETA** right will have no impact on **MILESTONE #2** because no logic is violated.

Using Milestones to Show Imposed Dates

Sometimes a project team member will impose a **LC** or an **ES** for an Activity. A milestone depicting that imposed date can be tied to the completion (for an imposed **LC**) of an activity or to the start (for an imposed **ES**). The Milestone will be placed on the day line of the imposed date and then locked in place by **LC** on the "Lock In Place" tool button.
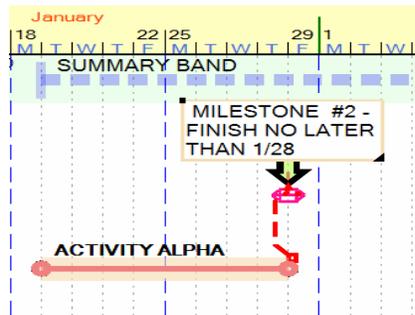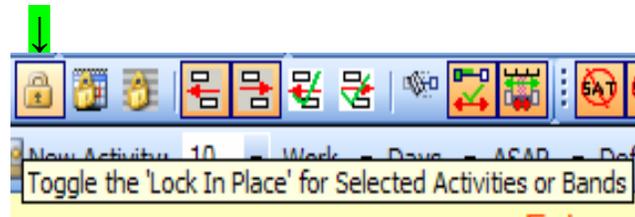
Then LC on the link from the Activity to the Milestone and check "Highlight Negative Free Slack".
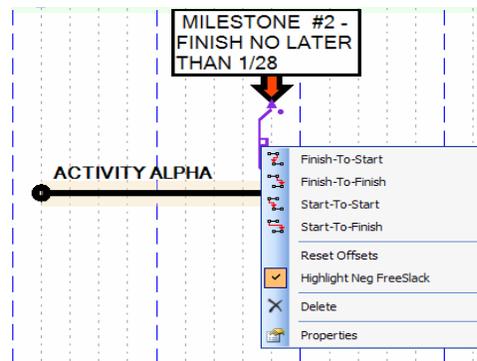
Now if the Activity completion is moved past 1/28, the Milestone remains locked in place and the logic link will be highlighted to call attention to a conflict between a scheduled date and the imposed date.
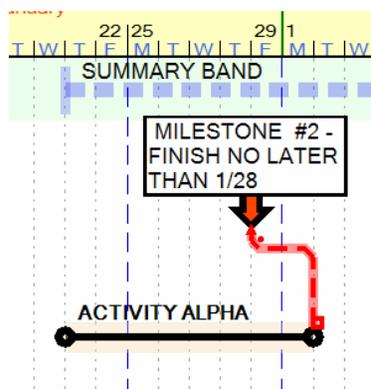
In a similar fashion, an imposed Start-No-Earlier-Than date could lead to the following:
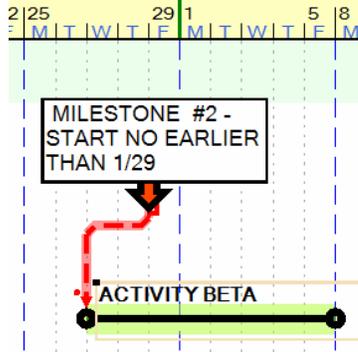
CASCAD-e logic does not allow imposed dates to override calculated or manually scheduled dates, but it identifies the conflicting logic so that a reconciliation can be addressed.

When "Highlight Negative Free Slack" is turned **ON**, it applies to all logic links, not just those involved in imposed dates.

USING BANDS AND SUBBANDS

Grouping Activities into Bands and SubBands

You have been operating so far with all activities assigned to one Band, which was created automatically by CASCAD-e. There is no requirement that you create any other Bands. However, additional Bands and Sub-Bands can serve the valuable function of helping you to organize your schedule into groups and sub-groups of activities. This type of organization of the schedule is often referred to as the Work Breakdown Structure (WBS). It can be invaluable in helping you use CASCAD-e effectively when the schedule contains a large number of activities and you want to concentrate in detail on only a selected group (or groups) of activities. A simple example of multiple Bands is:
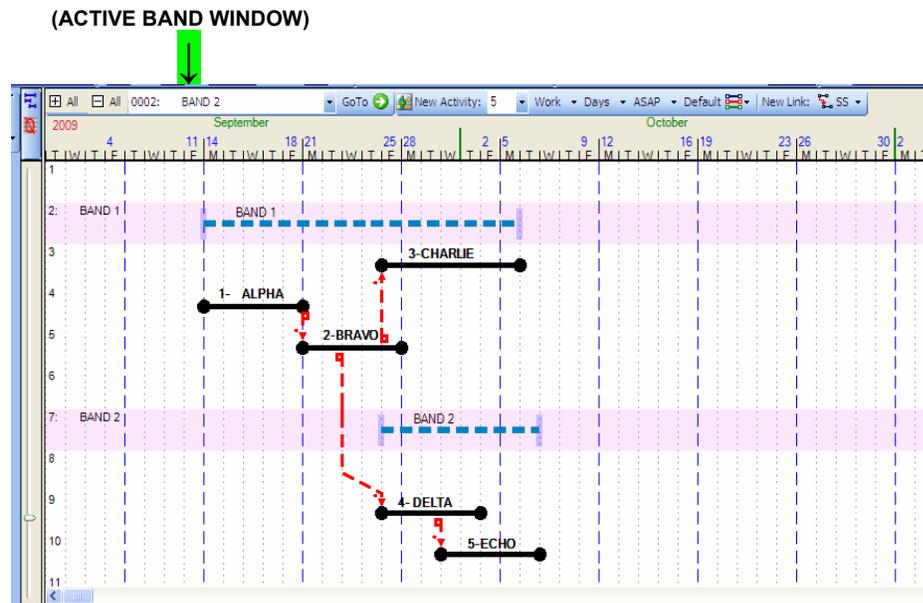
BAND 1 is the summary representation of Activities 1, 2, and 3. It was created by renaming the original automatically-created Band **BAND 1.** Renaming can be accomplished by **DLC** on the Band (the original Band name will be highlighted in blue) and typing in the new name. You can then create the Activities 1, 2, and 3 normally. **BAND 2** was created by **RC** on an arbitrarily-selected row, selecting "Create Band" from the resulting menu, and typing "**BAND 2**" when prompted to give the Band a name. Activities 4 and 5 were created with "**BAND 2**" displayed in the "Active Band Window" indicated above. Note that Link Lines can cross Band boundaries. If you now wanted to put a new Activity in Band 1, first **LC** on the Band Bar for Band 1 and "Band 1" will appear in the "Active Band Window".

Caution: An Activity being created will be assigned to the Band displayed in the "Active Band Window", regardless of where the Activity is located on the grid. If you want to change the Band assignment for an Activity, or group of Activities, select the Activity(s) (DELTA in this example), **RC**, and the following menu will appear:
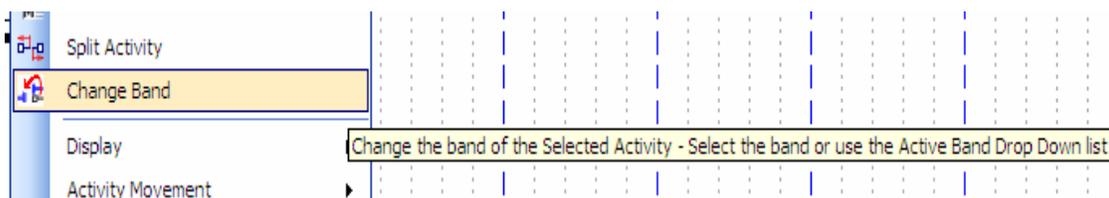
LC on "Change Band" and refer to the Band window to select the Band to which you want to assign the Activity. **LC** on the triangle on the right side of the window to display all existing Bands. **LC** on the Band name to which you want to re-assign the Activity.
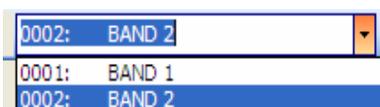
LC on "BAND 1" and the window will display "BAND 1". You will then be asked to confirm that you want to "Change Selected Activities to BAND 1". **LC** on "Yes" and DELTA is now assigned to BAND 1, but its physical location is unchanged.
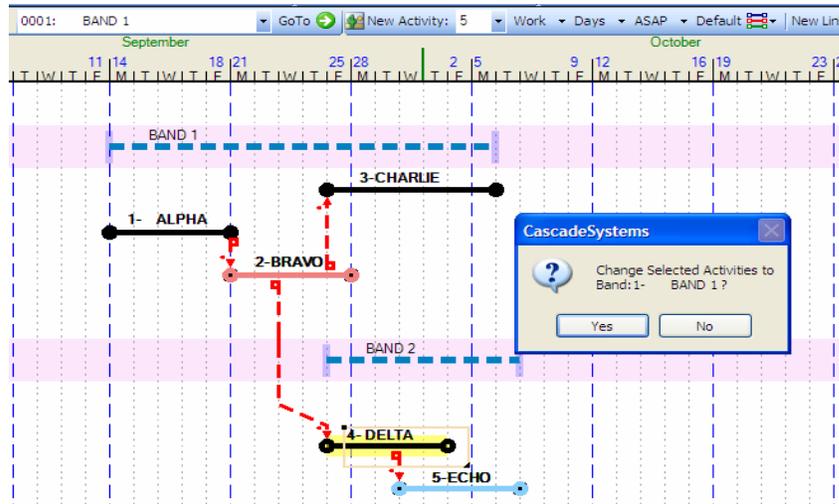
If you wished to create a Copy of Delta in Band 1, **RC** on Delta, and on the drop-down menu, **LC** on "Copy". The Band Window will display Band 2, the Band from which you are copying. **LC** on the triangle on the right side of the Band Window to display all existing Bands. **LC** on Band 1. Then **RC** on the location on to which you want to Paste Delta. On the resulting menu, **LC** on "Paste", and then on "Activities". Delta (the copy) will appear where you choose to place it and it will be assigned to Band 1.

Using Bands and SubBands to Create Summary Schedules

Now assume that we neither moved nor copied Delta. You now have the choice of viewing the original Bands and Activities schedule, or viewing Bands only, or viewing Activities only. **LC** on the "Toggle" tool button will alternately hide or display all Activities. (A little later you will be using the "Hide Empty Rows" tool button directly beneath "Toggle")
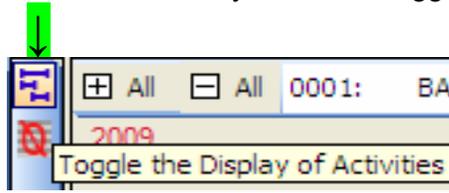
With activities toggled **OFF**, a summary schedule is left.
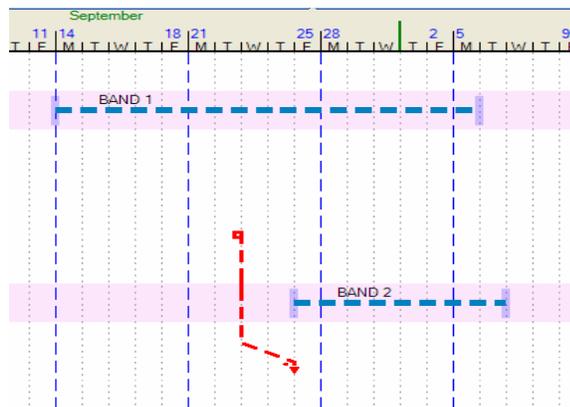
InterBand logic links will be shown unless you turn **OFF** the tool button "Display Relationships Exiting Selected Band"

To eliminate the Band Bars from the original schedule display, **RC** on the "Display Band Summary Bar" to turn it **OFF**.
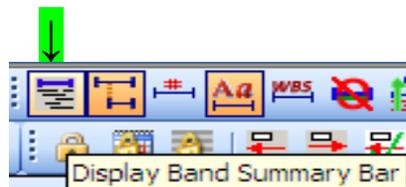
The resulting schedule display is:
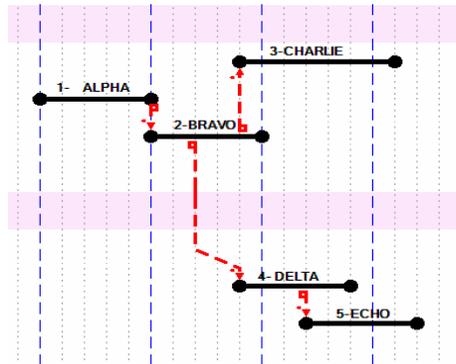
Considerable value can be realized from the use of Independent Bands (no SubBands) only. Breaking the project up into a number of elements (Bands) allows you to move or copy these elements independently of each other. Where one of these elements represents a repeatable portion of the project, such as a typical floor in a multi-story building, copying once and pasting repeatedly can speed up the scheduling process significantly.

However, in addition to (Parent) Bands, SubBands may be created under any Band or any other SubBand. The process is essentially the same as for creating a Band. When you **RC** on a row, you will select (**LC**) from the menu "Create SubBand". This new Sub-Band will have as its parent Band or parent Sub-Band the Band or SubBand displayed in the Band Window when the new SubBand is being created. Name the new SubBand and proceed to populate it with Activities as you did with a Band.
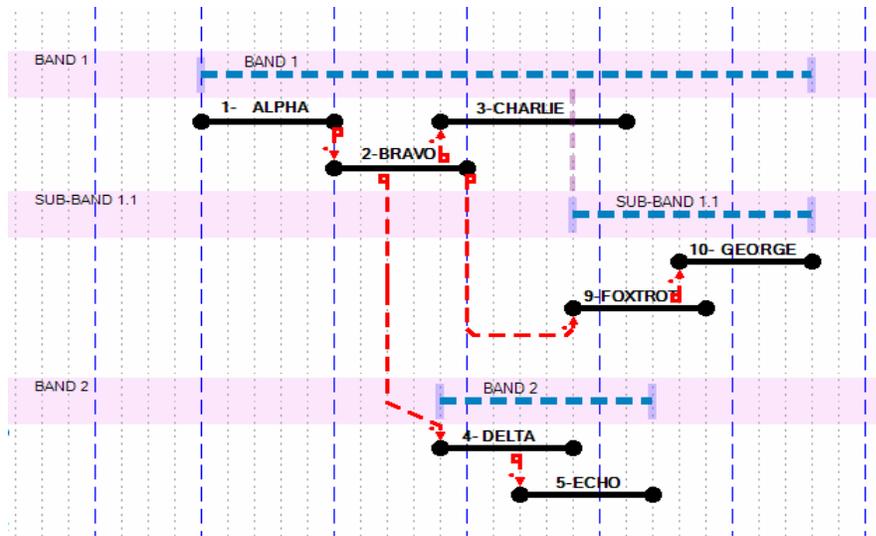
The connection between SubBand and Parent Band (or Parent SubBand) can be shown or hidden by **LC** on tool button "Display Line from SubBand to Parent Band".
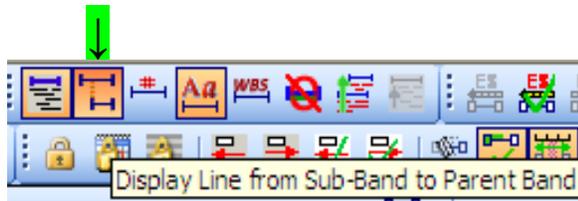
You have seen that Toggling the Activities **ON** and **OFF** is one way of looking at a summary view of the project. All of the Activities are shown or hidden, but when Toggling activities **OFF**, their rows (now vacant) are still shown. **LC** on "Hide Empty Rows" will completely compress the display to only the Rows occupied by Bands and SubBands.

Another approach to summarization is to "Collapse All" (and return to full detail by "Expand All"), which gives a similar summary view. Rows containing Activities will disappear, but empty Rows will be shown. The empty Rows can be made to disappear by LC on "Hide Empty Rows". However, the advantage of summarizing with "Collapse All" is that with all Activities collapsed, you can then expand selected Bands or SubBands to give a mixture of summarized and detailed Bands/SubBands. Consider the following schedule:
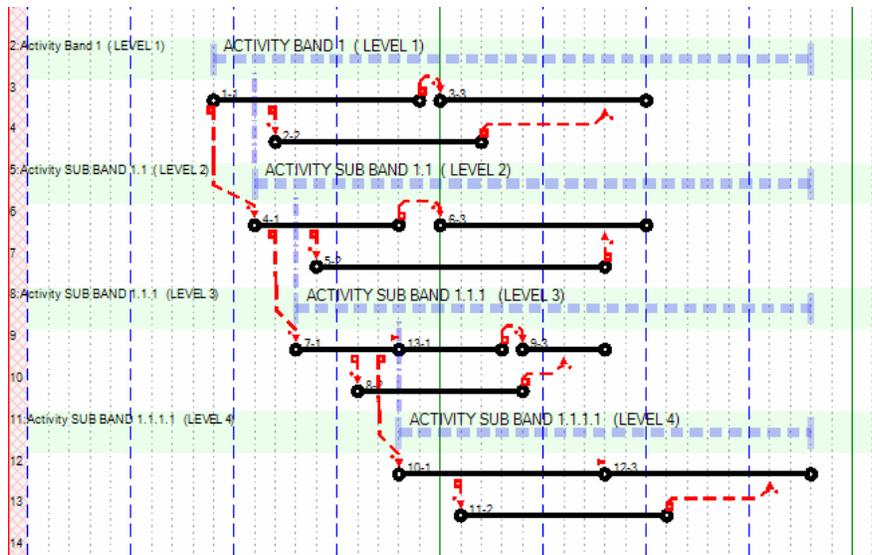
Activity Band 1 is parent to SubBand 1.1, and each SubBand is parent to the one below it, giving you four levels of WBS. If you "Collapse All",
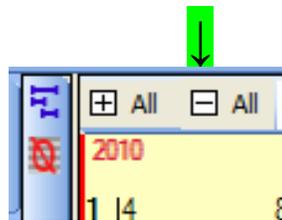
you will get the following display:
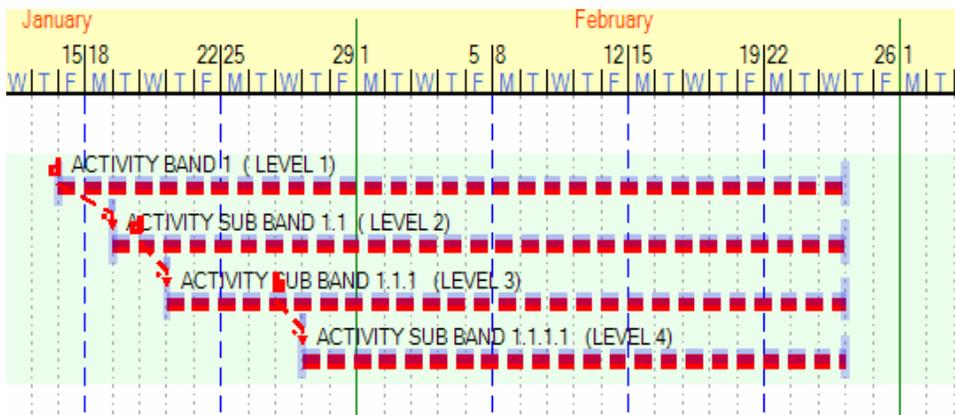
(The two-color Band Bars indicate that Activities within that Band have been collapsed into the Band) You can then **RC** on any Band/SubBand and "Expand" that Band only or "Expand All w/SubBands" to see all activities in that Band plus all Activities in all SubBands feeding into that Band.
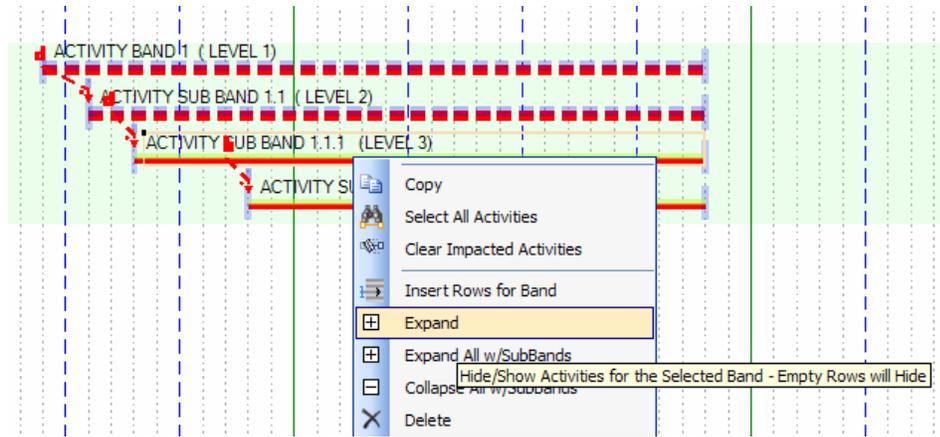
Expanding the Level 3 SubBand <u>only</u> gives:
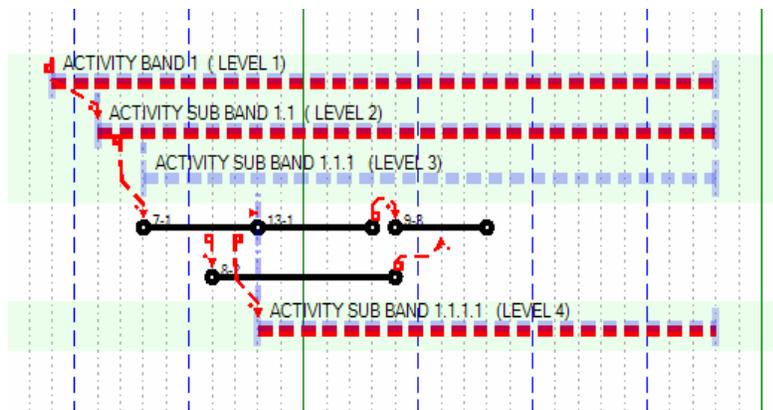
"Expanding All w/SubBands" would have displayed the Level 4 SubBand details as well.

An alternate summary schedule approach will collapse all SubBands up to a specified level in one step, rather than collapsing Bands on a one-at-a-time basis. **RC** anywhere on the open grid and the following menu will appear:
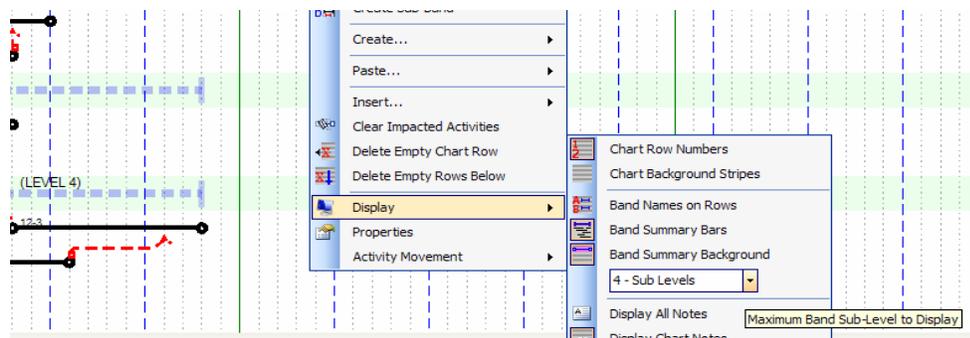
Scroll across on "Display", then **LC** on the triangle in the "Sub-Levels" and select " 2 - Sub-Levels".
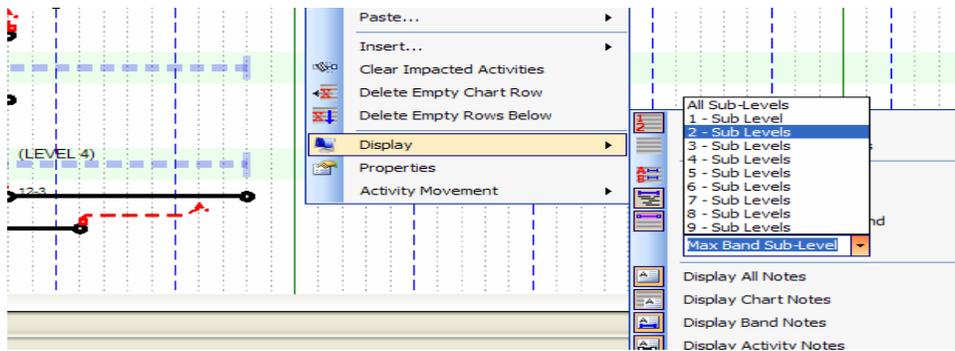
The schedule display will show only Bands/SubBands from Level 1 through Level 2.
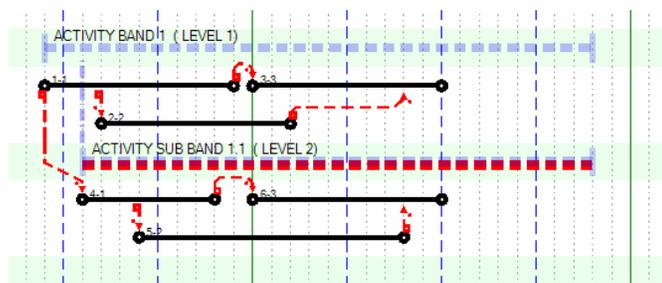
In this way, higher levels of management can restrict their review of the schedule to only as far into detail as they elect. The Activities in these two Levels can all be further toggled **OFF** or **ON**, or Bands at either of the two Levels can be independently collapsed or expanded.

With the display limited to Levels 1 and 2, no lower (higher-numbered) Band can be displayed in any fashion other than again **RC** on the open grid and using the resulting menu to change the Maximum Level to some level number higher than 2.

Fully summarized schedules may be so crowded as to cause readability to suffer. You may find it sufficient to "Insert Chart Rows" between selected Band Rows. **RC** between Bands (Caution – you may have to move left or right of the two Band Bars to avoid clicking on Band Bar Text Boxes). On the resulting menu, **LC** on "Insert", then "Chart Row", and then on the number of Chart Rows you wish to add (1 in this case).
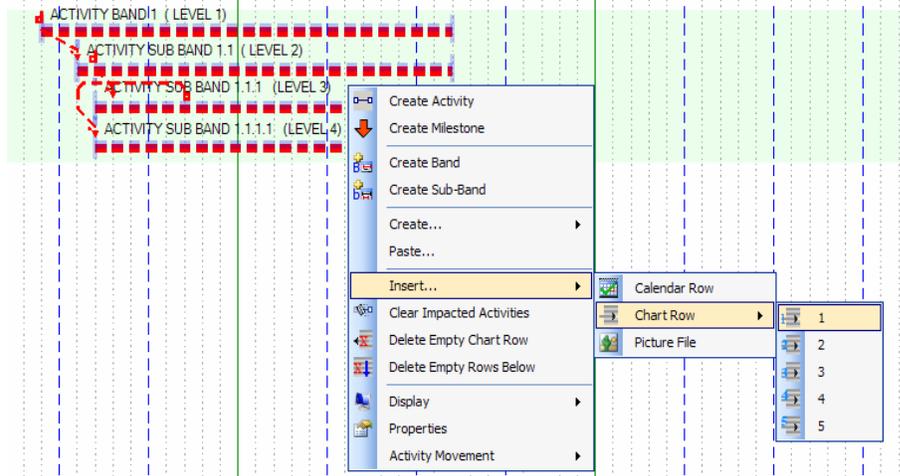
The resulting display would be:
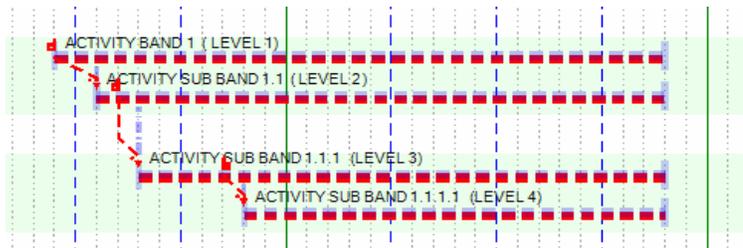
If you wish to uniformly open up the summary schedule display to something like this:
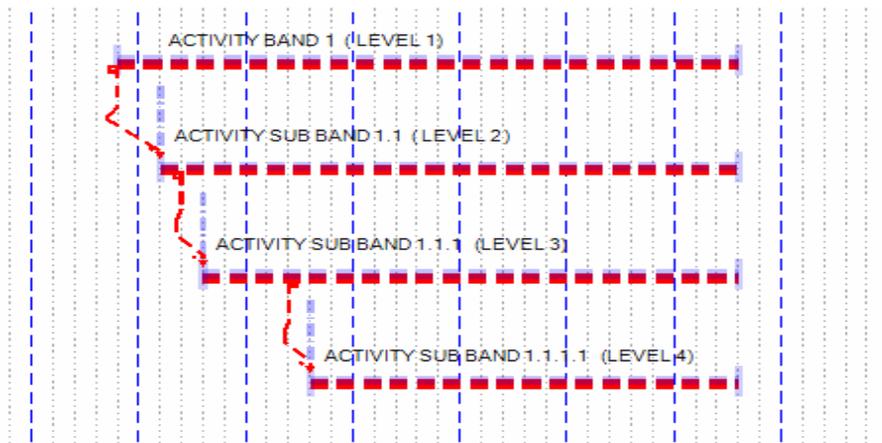
You may do so by **LC** on "Edit", then "Project Properties",

then **LC** on "Chart" and going to "Row Settings" (at the bottom) and increasing the row height from the nominal 0.40 inches to whatever gives you the desired Band separation (1.05 inches in this case).
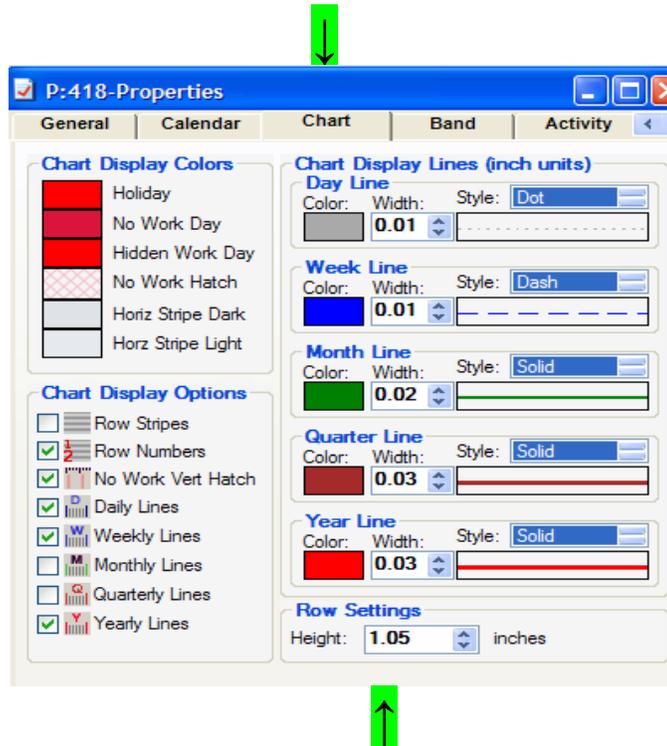
You can also change the row height very quickly by moving the slider on the left-hand side of the display. In this manner, you can quickly select the minimum row height increase needed.

You may also want to experiment with changing the day width by **LC** anywhere in the calendar area, holding, and moving the cursor left to compress the day width, right to increase. Combining that with turning OFF the Day Lines and the Band Row Shading

and going to "Edit", "Project Properties", and "Chart" to change the pattern and color of the week lines could give a more compact and more readable summary schedule:
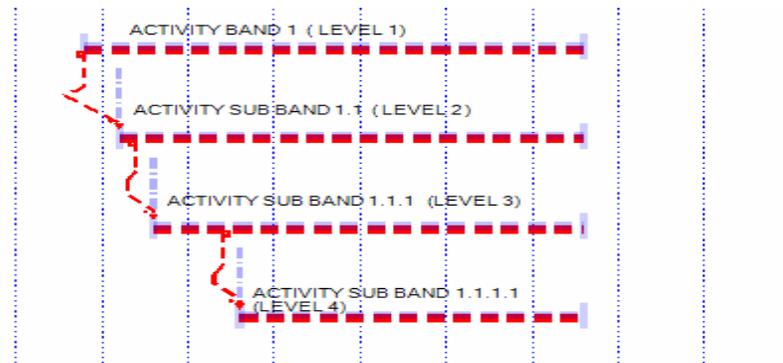
When compressing the calendar, you may need to resize Text Boxes to display all text and maintain good readability.

 CAUTION: You will normally want to restore the row height and day width to, or close to, their original value when again displaying the detailed activities.

The use of Bands/SubBands can be a challenge at first. Just remembering that any Activity created will be assigned to the Band appearing in the Active Band Window, not the Band in whose area you place the Activity, will keep you out of much of the potential frustration. However, with just a little experience, you will find Bands to be great assets in managing larger projects and in presenting to higher levels of management.

PRINTING AND PLOTTING YOUR SCHEDULE

Getting Your Schedule Ready to Print

After you have created a schedule that you wish to use in a graphic hard copy version, or if you are at an interim point in the scheduling process and wish to give the team a hard copy of the schedule to that point to use for review or reference, you will need to go through the **PRINTING** (Or **PLOTTING**) process (the steps are essentially the same).

Review your schedule display to clean up activity placements and description placements. What was a suitable display while working on the schedule may be subject to significant improvement for printed schedule readability. Often, rerouting Precedence Links or vertically swapping the positions of two activities will reduce precedence line confusion. When swapping out activities or groups of activities, it is helpful to turn on the "Day Lock" tool button, which allows activities to be moved vertically, but not horizontally. This assures that you will not accidentally modify the scheduled dates.
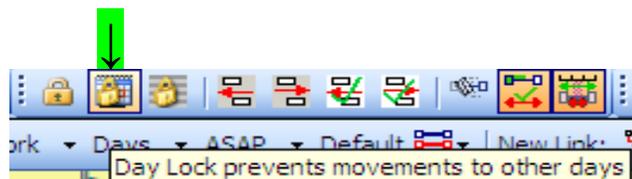
Additional Chart Notes, or modifying the content, size, background color and placement of existing notes will often enhance the schedule usefulness. Adding, deleting, or modifying day, week, month, quarter, or year lines needs to be considered. In particular, day lines consume considerable plotter memory and will slow up the plotting process or the transmission of a PDF copy of the schedule. Similarly, the Row Shading should most often be eliminated when plotting. Printing is much less affected by these two features.

The Row Shading can be turned **OFF** and **ON** by the use of the Chart Row Shading tool button :
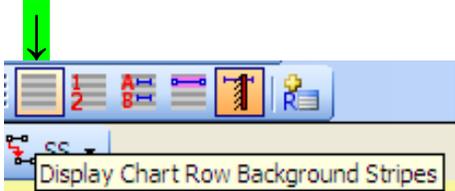
The alternative appearances are: **Chart Row Stripes** and **Day Lines ON**
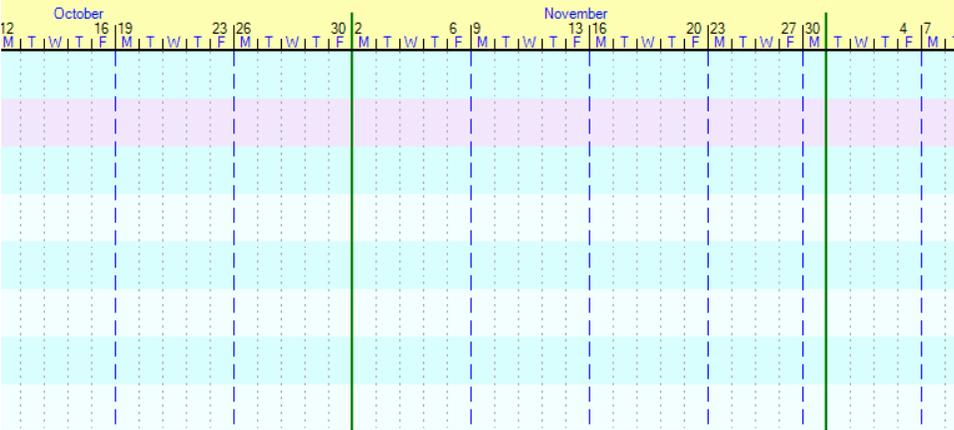
Or **Chart Row Shading** and **Day Lines OFF** (Band Row Shading still **ON**)
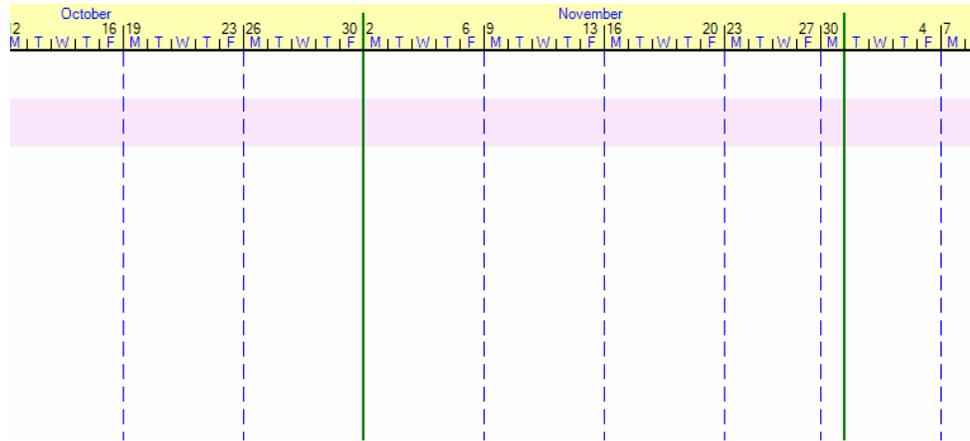
Another "clean-up" option is to turn Activity Numbers **OFF** with the use of the Activity Number Display button :

1:Activity Band 1
Display the Activity Number

Selecting the Print/Plot Size and Shape (Print Zones)

You are now ready to define the boundary (Print Zone) within which your schedule, or schedule section, will appear. Go to "New Print Zone" and **LC:**

Create a new Print Zone
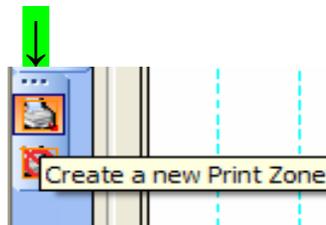
An hourglass "wait" symbol will appear for a few seconds. When it disappears, put the cursor where you want the upper left corner of the Print Zone to be located. **LC**, hold down, and drag to the point at which you want the lower right corner of the Print Zone to be located. Release.

At Row: 2 , Date: 3/23/2010 | Day: Tuesday | Week: 13
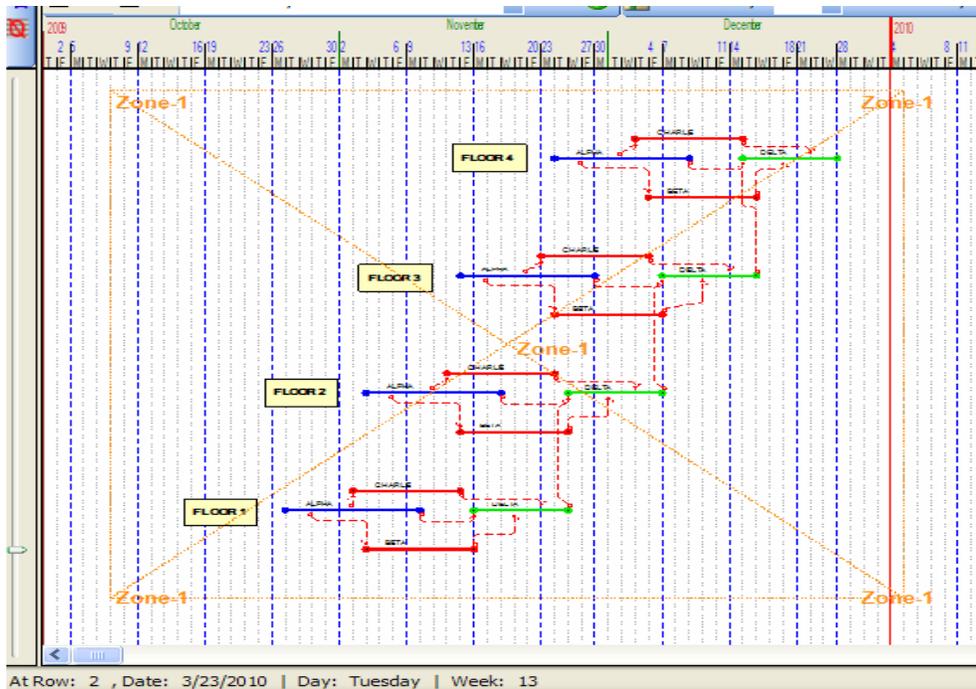
The print zone you have defined is shown in a fence with diagonals and is named "Print Zone 1". You can move the print zone, maintaining its dimensions, by **LC** anywhere in the print zone. A four-way arrow symbol appears. **LC** on that symbol and hold and you can move the print zone to any other area of the display. Or you can change the shape of the print zone by grabbing any boundary (a two-directional arrow will appear on the boundary line) and moving in either of the directions on the arrow.

LC anywhere inside the Print zone, then **RC**. The following menu appears:
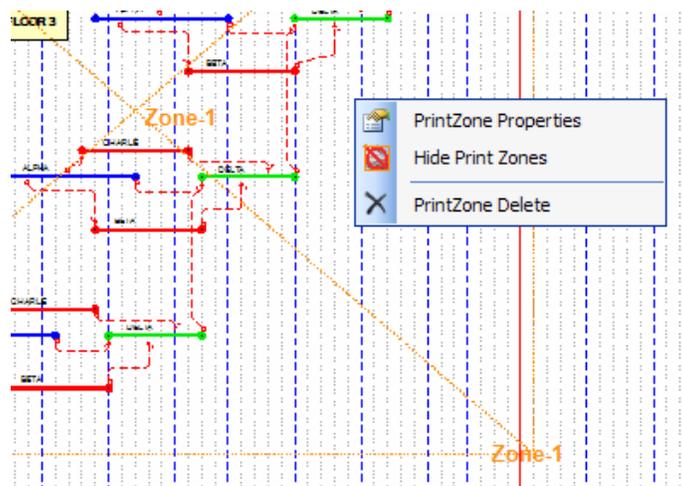
RC on "Print Zone Properties" and the associated menu will appear. **LC** in the top area of the menu, hold, and move it to the upper right, leaving both scroll bars exposed.
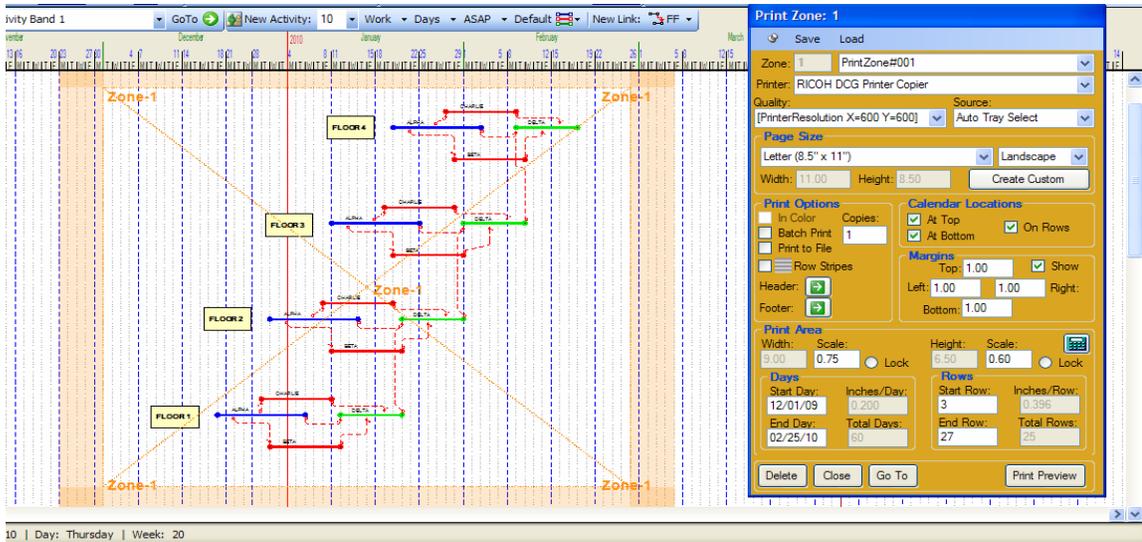
Creating the shaded borders will be explained shortly,but this is very helpful in maintaining visual control of the Print Zone area.

Other Print Properties

The Print Zone menu allows many print/plot options to be acted on and takes a little experience to get comfortable with.
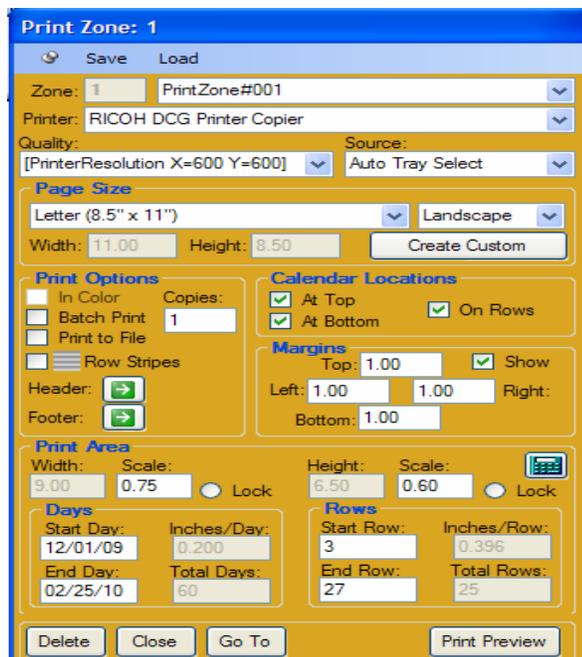
PRINT ZONE SELECTION – Because you may create multiple Print Zones which will exist simultaneously, it will frequently be easier to create the Print Zone menu from any Print Zone, then select the Print Zone you want to work with from the list of Print Zones available on the drop-down menu available on the "Zone" row.

PRINTER SELECTION – The drop-down menu on this row will show you all of your printers and plotters for which you have drivers, including "Adobe Acrobat" for creating a PDF file, which can be sent to others who do not have CASCAD-e installed.

QUALITY – Here you may choose from a variety of printer resolutions. Not all printers will handle the highest levels of resolution, but medium to low resolution will normally provide good quality prints, will print faster, and will conserve ink.

PAGE SIZE – This selection will require experimentation to assure that your selected PrintZone area will be fit into the selected page size with the legibility and effective use of space that you desire. If you do not find an appropriate page size, you may create your own custom page size by **LC** on "Create Custom" and setting the "Height" and "Width" you desire, then **LC** on "Accept". This normally will be an alternative course of action when plotting, not printing.   In this area, you may also select the "Portrait" or "Landscape" orientation of the print, which will impact your "Height" and "Width" selections.

PRINT OPTIONS – In general, what you saw on your screen display is what you will see on your print display. For the moment, ignore the "In Color" option, "Batch Print" and "Print to File". One option that exists, however, is to print or hide "Row Stripes", regardless of whether they were hidden or displayed in your screen display. Under "Copies", indicate the quantity of prints/plots desired. Good practice is to initially print/plot and review a single copy as a draft before electing to print multiple copies.

You may add information to your printed/plotted schedule using "Header" and "Footer" areas above and below the basic schedule display. These each offer three areas for text – Left, Center, and Right. These are frequently used for project title, organization name(s), data date, page number, etc.
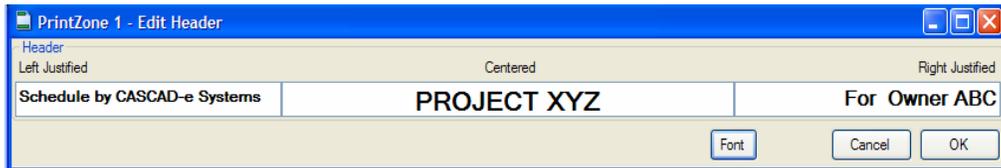
CALENDAR LOCATIONS – You will almost always want to select "At Top" and "At Bottom" as calendar placements on your printed schedule. In addition, you will often find it desirable to plot the calendar rows that you may have inserted at intervals between the top and bottom of your display.

MARGINS – "Show" (by shading between margins and edge of paper size) was selected earlier in this discussion of Printing/Plotting and will almost always be selected by you to aid you in reviewing the area to be printed.

The actual amount of space to be assigned as margins requires more experimentation than almost any other selection you have to make in CASCAD-e. Differences in printing devices require margin adjustments to avoid truncating the print or having excess space in the margins. Also, the shape of your Print Zone will not often match the paper shape closely. CASCAD-e will seek to fit the display in the Print Zone into the space on the selected paper size, less the selected margins. This may result in a print in which the ratio of row height to day width is significantly different from that on the screen display. Margin

size can be varied to bring this ratio closer to the on-screen ratio. Note the excessive horizontal margins required to accomplish this on the example Print Zone:
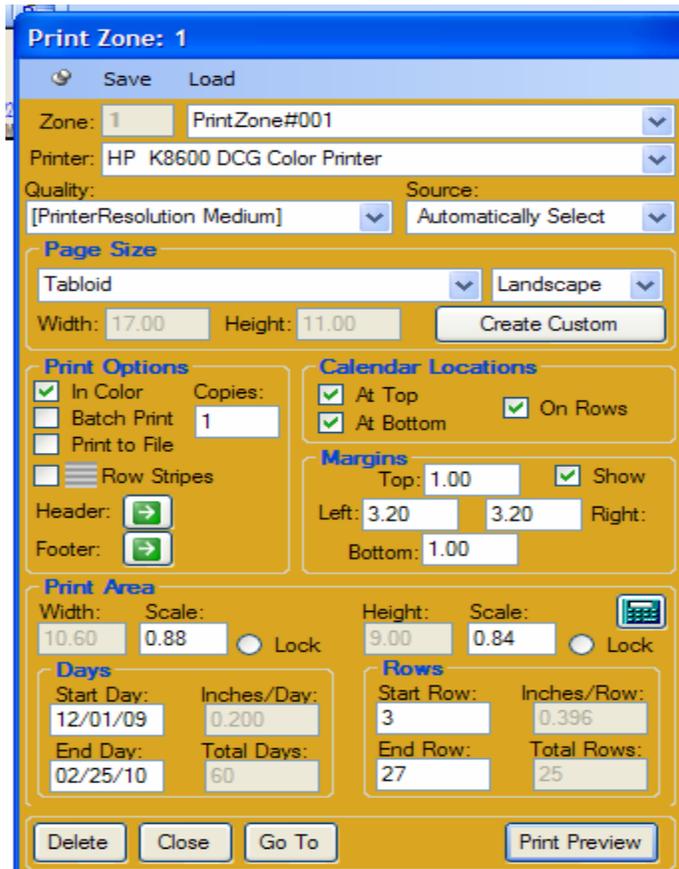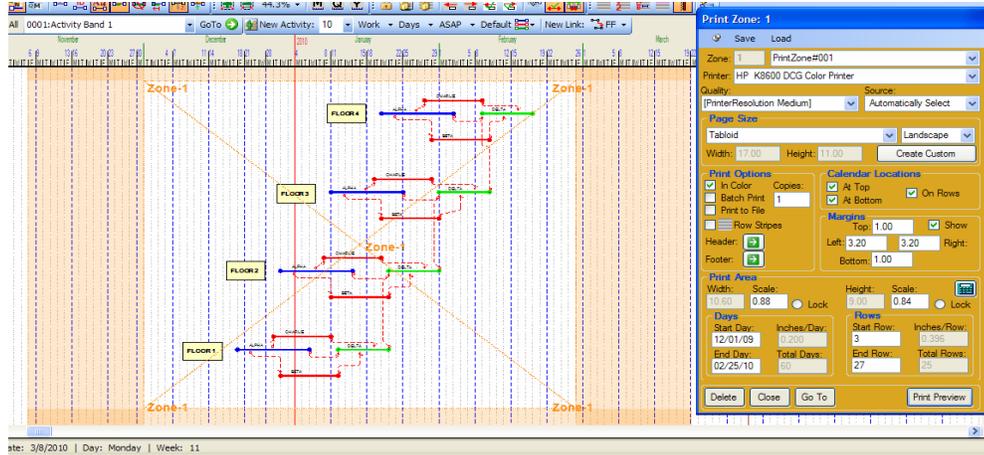
PRINT AREA – In this area, "Width" and Height" refer to printable area after the size of the margins have been subtracted from the paper size. "Scale" gives the resulting Row height and Day width as a decimal fraction of the default values (O.4 inches row height, 0.2 inches day width). If the difference in these scale numbers is small, it will be difficult to detect that they are not equal. At some degree of difference, however, the characters begin to become obviously distorted. Working with paper size and margins gives you an opportunity to keep the scale numbers fairly close, say, within 10% of each other. "Lock" will be dealt with in the Advanced User Guide.

Print Preview and Printing

PRINT PREVIEW - **LC** on "Print Preview" and (Surprise!) you will get a preview of what you are about to print.
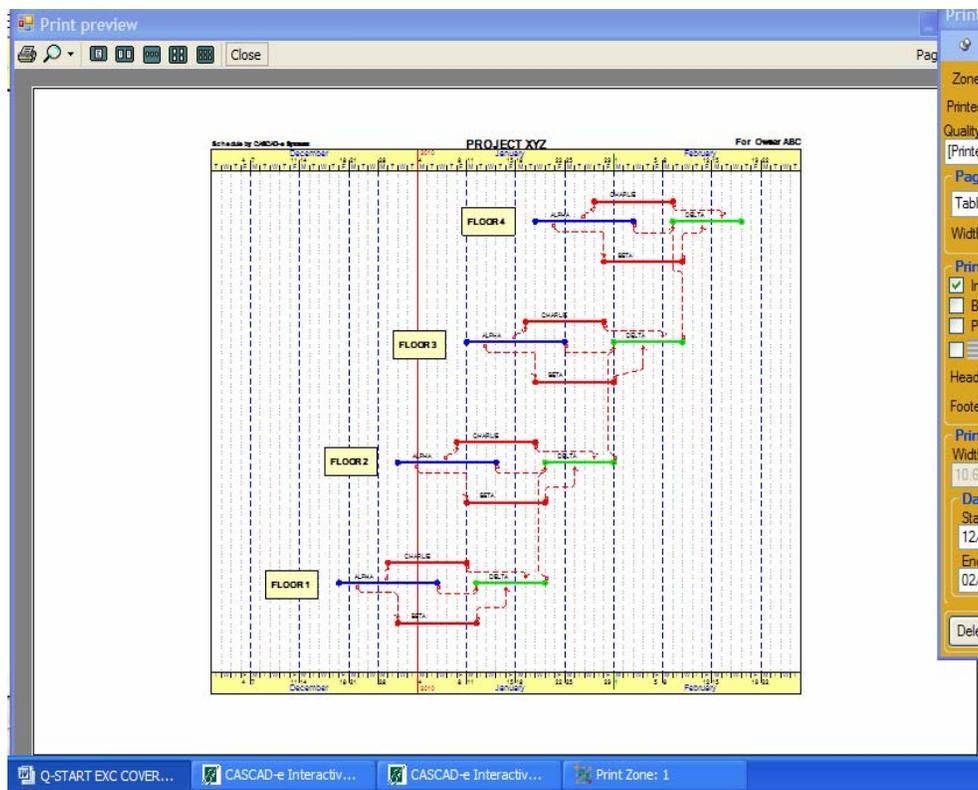
If you are satisfied with the Print Preview, **LC** on the Printer symbol in the upper left corner and printing will proceed. If, however, you see a change that is needed, you must close the Print Preview, then close the Print Zone menu, then Hide the Print Zones before making schedule display adjustments.

Hide / Show Print Zones
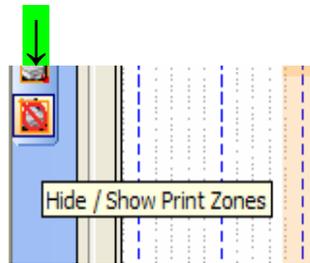
MULTIPLE PRINT ZONES - It is possible to print any portion of the schedule without printing all of it. Near-Term schedules on 8.5 X 11.0 paper are easy to create and print, as an example. The following is an example of a second Print Zone overlaying a previously-created Print Zone:
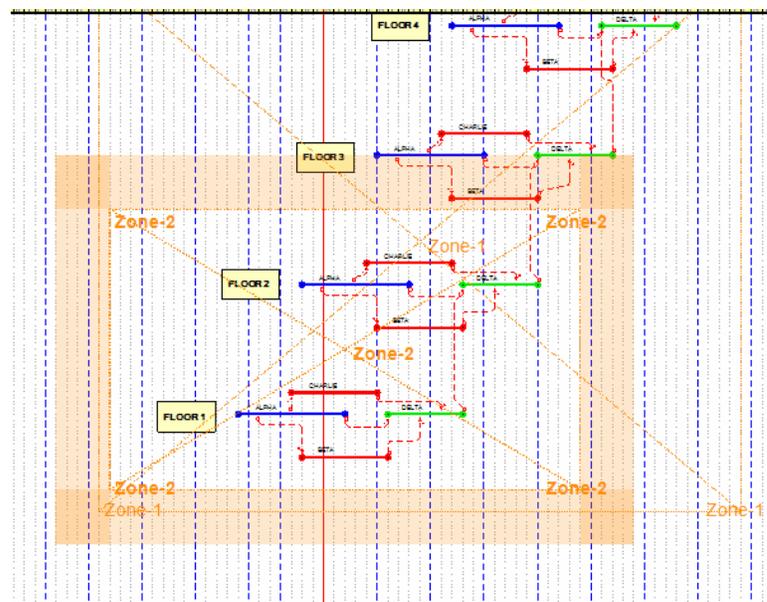
It is handled just as if it were the only Print Zone that had been created.

To create a PDF file of the schedule, select Adobe Acrobat as the printer. You will be asked into which file you want the PDF to be saved. This file can be e-mailed to an entity that does not have CASCAD-e installed.

Tabular Printouts

CASCAD-e is designed to take advantage of the almost universal superiority of its graphical representation of the project schedule. However, **CASCAD-e** has the capability of providing a tabular printout of the schedule. You can select three different tables to view and save to a file. To view (or print out) these tables, **LC** on **VIEW**, scroll over **TABLE,** and **LC** on activities, bands, or links. This will produce a tabular listing of your selection.

This Table, or Activity Report, has 28 columns of information available. You may configure the report to suit your needs by expanding, compressing, or hiding columns. You may sort on any useful column, such as Early Start, Total Slack, Band Number, Properties, or others by **LC** on that column heading. Similar Successor and Predecessor reports are also available in this format from the Activities Table. Any of these tables can be saved in a Comma Delimited File (csv) format and later opened by most spreadsheet programs.

CONCLUSION

You are now equipped to create and update both uncomplicated and involved schedules, using CASCAD-e. Using a computer projector and a conference setting, you can facilitate a project team's collaboration in the planning and scheduling of a project. Never before has there been the means to combine the values of graphic representation with the capability to drive the process with true CPM logic. Users of conventional scheduling systems are astounded to see what CASCAD-e allows them to do that they could not do before.

CASCAD-e enables you to bring a transparency, a new vision, and a new flexibility to the planning, scheduling, and updating components of project management. Without sound project scheduling, all other elements of project management are built on a shaky foundation. With CASCAD-e, you can build the solid foundation with which the probability of your project's success can be significantly improved.

We at CASCAD-e Systems want you to have a very positive experience with CASCAD-e. Whether it means answering a question on the phone, looking at a file containing a problem you have encountered, conducting a web conferencing training session, or working with you on-site to help you establish the best way to apply CASCAD-e to your particular project environment, we would be pleased to assist you in mastering this powerful new system.

For questions or further information, contact Dr. J.Gordon Davis at
 jgdavis@CASCAD-e.net or Joe Hanley or Mike Cenker at 1 (800) 330 8135.

GET READY TO DO SOME REVOLUTIONARY PLANNING/SCHEDULING !

<u>PREVIEW OF THE ADVANCED USER GUIDE</u>

<u>Beyond the Basics</u>

As you become comfortable with CASCAD-e Basics (and you will do so rapidly), the <u>Advanced User Guide</u> will help you develop added competence in such areas as:

- *- RESOURCE LOADING*
- *- COST LOADING*
- *- WORK BREAKDOWN STRUCTURE*
- *- TREND CHARTING*
- *- MULTIPLE CALENDARS IN THE SAME SCHEDULE*
- *- GRAPHICAL COMPARISONS TO BASELINE (Shadow Reports)*
- *- USE OF TEMPLATES and IMPORTS FROM OTHER PROJECT SCHEDULES*
- *- "STICKY-NOTE" SCHEDULING (Non-Time-Scaled Precedence Diagrams)*
- *- EXPORTING CASCAD-e TO/FROM OTHER SCHEDULING PROGRAMS*
- *- USING CASCAD-e IN THE MULTI-PROJECT ENVIRONMENT*
- *- FACILITATING THE CASCAD-e PLANNING/SCHEDULING CONFERENCE*
- *- FACILITATING PROJECT PROGRESS MEETINGS*
- *- ANALYZING AND PRESENTING DELAY IMPACTS*
- *- SCHEDULE TRAINING WITH CASCAD-e*

And a host of "Tricks of the Trade"

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