CPM'S MADE EASY

Developing a proposed construction schedule in Microsoft Project

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1.0   GETTING STARTED

Microsoft Project should be setup on all the designers'
machines to run from the icon. To start Project simply
double click the icon. If you do not have an icon, call
the IT Help Desk to set up your machine for Project.

2.0   SETTING UP THE BASICS

2.1   PROJECT INFORMATION - START DATE

The Project Information dialog box controls the
starting date for the project. Define the starting
date by choosing Project Information from the
Project Menu. Enter the start date in the Start
Date box and choose OK.
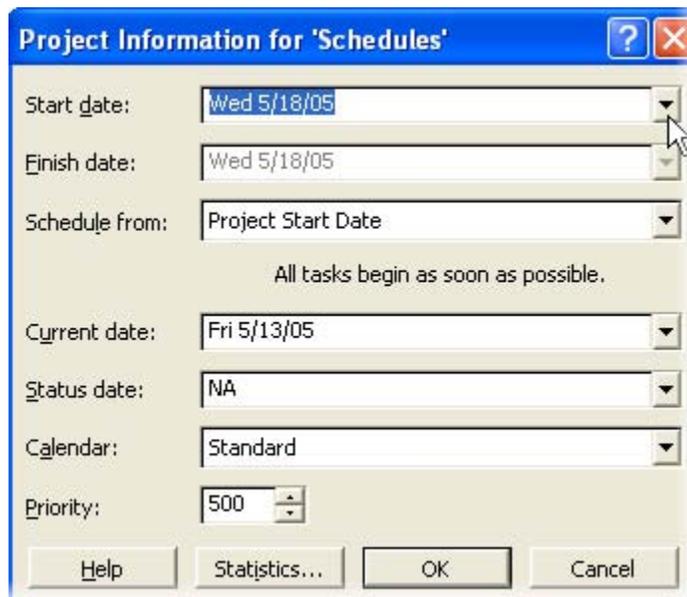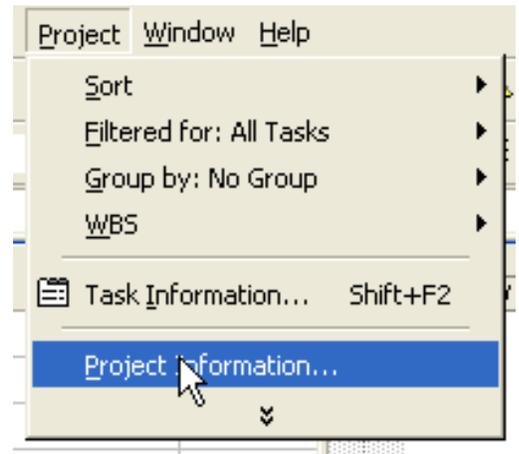
2.2 TABLE COLUMNS

Project enters and works with information a lot like a spreadsheet program. The columns that you see on the left hand side of the screen are the table. Table formats can either be a standard format or customized.

For this project let's create a custom table that will have just the columns we need for entering and editing the schedule.

From the View menu, choose Table: Entry, then More Tables…which will bring up a list of existing standard tables, along with any custom tables that have already been created.
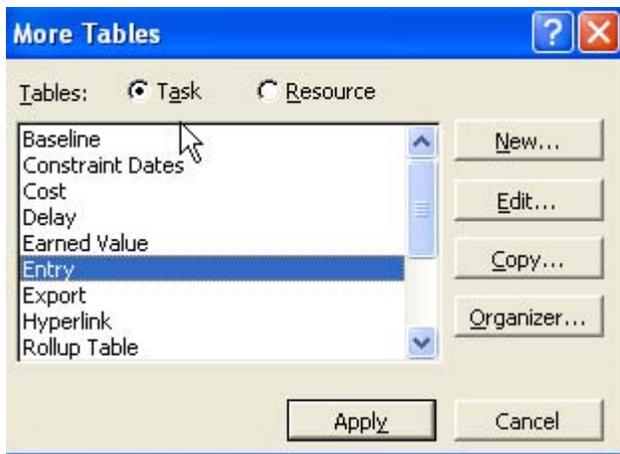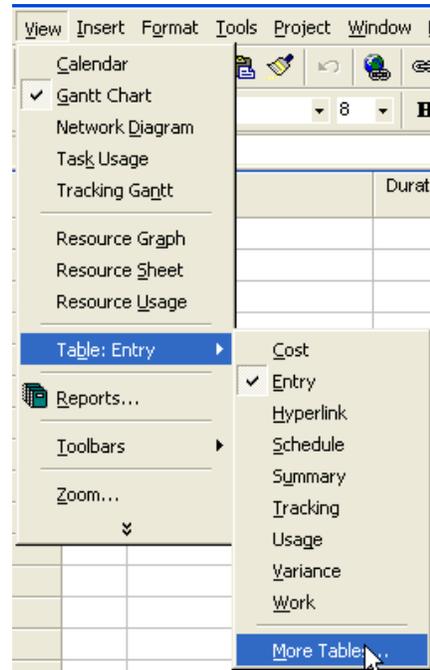
Choose the Entry table and then click the Copy button. This will copy the existing Columns of the table entry to a new table that we can edit.

In the dialog box change the name to *Design Schedule* and edit the list of columns to look like the following. You can cut and paste columns to move them around within the list. Also you can add a text description, such as Task Name for the Name column.

After completing the columns, press OK, then press APPLY from the More Tables dialog box. This will assign the new list of columns to the left side of the screen in Project.
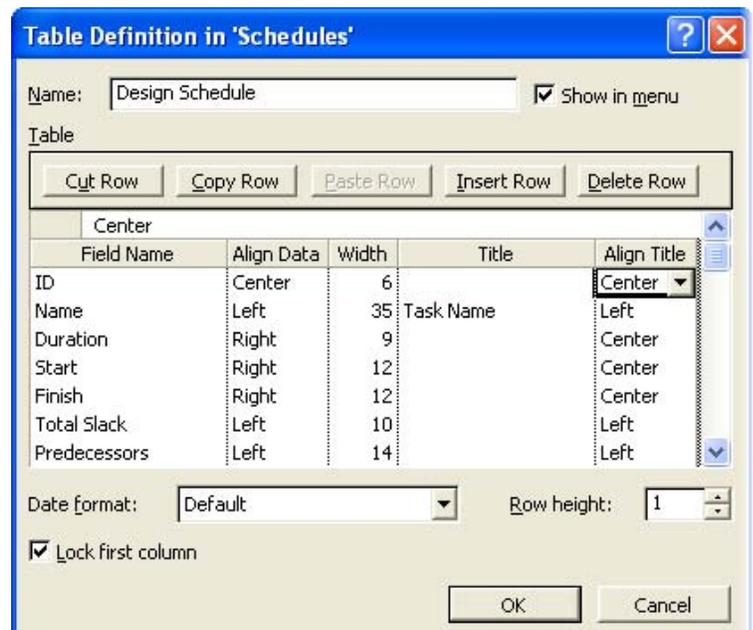
2.3   BASE CALENDARS - WORKING TIME

Project has a standard calendar that will apply to all activities initially. The choice of the base calendar used was assigned back in Project information.   We assigned the standard calendar, so now we are going to edit that calendar to fix the base schedule for our job.

From the Tools menu choose, change Working Time, which brings up the following dialog box.
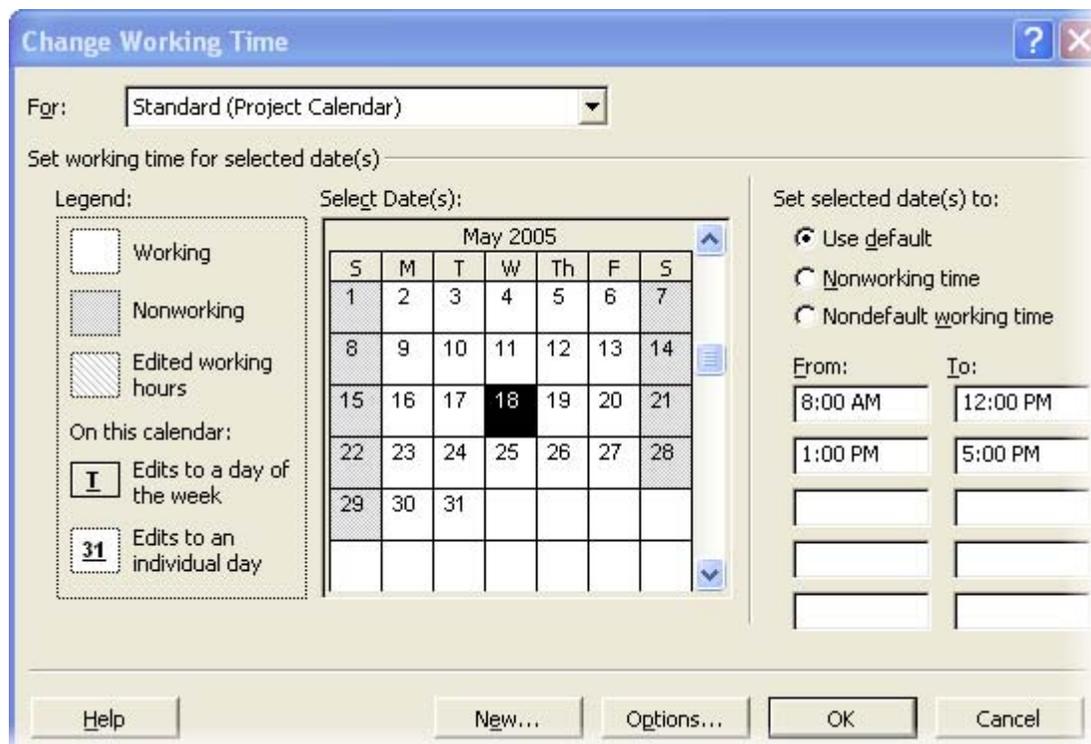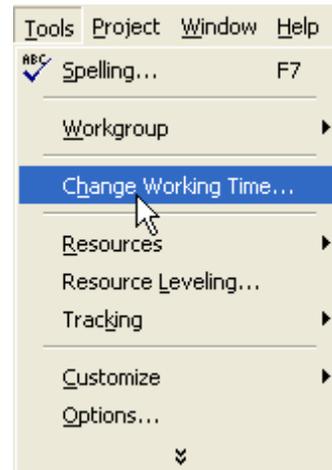
Move to the month that work will not be performed. Once on the month, click and hold on the first day which work cannot be performed, then drag to the last day of the month. This will highlight all the days in the month and then click the Nonworking check box on the right. Now click once on any day in the month and you will see that all the days are gray and have no hours assigned to them. Continue the same process for the remaining months work will not be performed. Once you are done, press OK.

3.0 ENTERING ACTIVITIES (ENTRY, LINKING, SUMMARY TASKS)

3.1 ENTERING TASKS

Enter the information highlighted below in the first 6 rows, first 3 columns. Notice that once you enter a task name, the start date defaults to whatever you have setup and the duration defaults to 1 day.
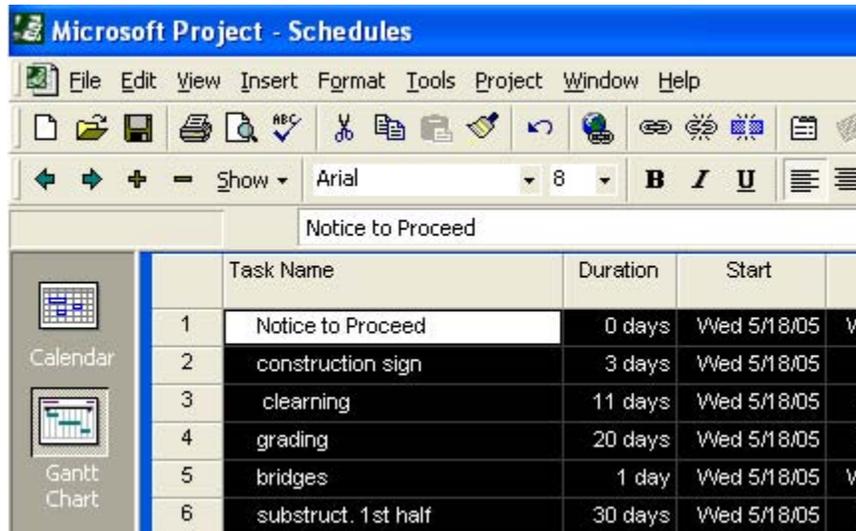
For milestone activities, such as Notice to Proceed, interim completion dates, and the Fixed Completion Date, enter the duration as 0 (zero) days.

One major pitfall in entering data is that the delete key actually deletes the entire task, as opposed to simply clearing that cell. To clear the contents of a cell choose Edit, Clear All from the menus.

3.2 LINKING TASKS

Tasks are linked simply by highlighting the tasks and pressing the link button as shown below. To link tasks 2 through 4 together, highlight 2-4 and press the link button (or choose from the menus, Edit, Link Tasks).

This will make tasks 3 through 4's dates change to reflect the activities being completed sequentially, based on the working days available on the standard calendar. Project assigns the number of the activity as a predecessor to the activity shown, i.e. Clearing has activity 2 as its

predecessor. To see the predecessors, if they are not already shown on your screen, widen the left side of the screen by clicking and holding on the vertical bar between the table and the Gantt chart. The linked tasks with predecessor numbers are shown below.

3.3   SUMMARY TASKS

Summary tasks are groupings of tasks that relate to one item. For instance, a bridge might have substructure and superstructure activities. Summary tasks are created in Project a lot like an outline, simply by indenting or outdenting the activities. We entered activities 5 and 6, so let's make task 5 a summary activity. Click once on activity 6, the one we want to indent, and press the indent button as shown below. This will move the activity name for 6 in, bold activity 5 and create a summary bar for activity 5.

Now you could double click on activity 5 and roll up the summary tasks so that sub structure does not show. This is helpful when you have a complicated schedule, tasks can be rolled that do not need to be shown all the time.

3.4 LINKING TASKS – again

If you would like to link tasks that are not immediately adjacent to each other, you can simply click on one of the tasks (say task 2) and then while holding the control key click on the other tasks (say task 6). When both tasks are highlighted, press the link button.

3.5 MORE DATA ENTRY

Enter tasks 7 through 12 as shown below. Note that when you enter task 12, at first it is indented like task 11. Press the Outdent key as shown to move task 12 back to the left. You do not have to enter the dates, we will link the activities to create the start and finish dates.

3.6 LINKING TASKS – and again

Highlight tasks 6 through 11 and press the link button to link those together.

4.0 TIME RESTRICTIONS (IN-STEAM WORK, ROAD CLOSURES ETC.)

Most of the time there are some restrictions on when a certain activity can take place. Common restrictions are working below the high water mark in certain types of streams or when a road closure can take place. In our example project we have two restrictions currently, an in-stream work restriction and a road closure restriction.

We specifically broke the substructure and superstructure into 3 activities each because of the in-stream work restriction. This way we could assign a time restriction to the activities involving rip rap. When you are developing your schedule, consider what activities might include a restriction. The proposed schedules do not have to be detailed to the nth degree, but some minor level of detail might be required to deal with time restrictions.

4.1 CREATING A TIME RESTRICTION (one suggested method)

- From the Tools menu, choose
- Change working time
- Click New
- Enter "In-Stream Work" (or another restriction name) in the Name box
- Click OK
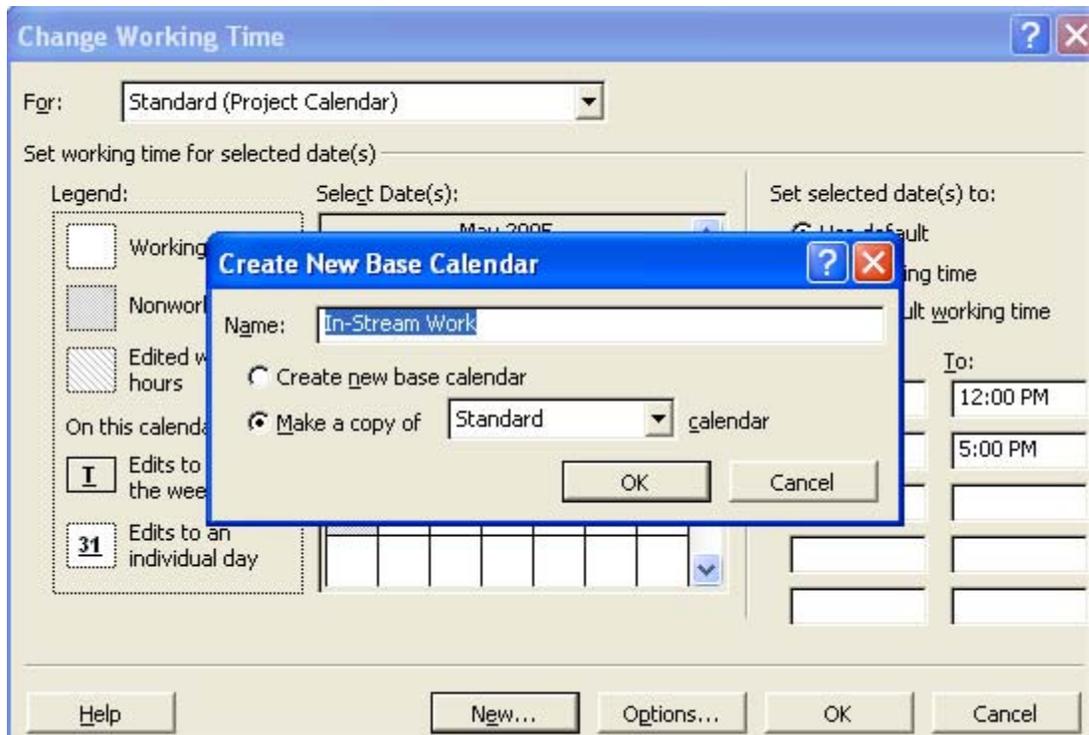
- Highlight the days on which in-stream work cannot be performed
- Click on non-working time

- Do this for the entire project duration
- Click OK

Now, you'll want to have certain activities use that restricted calendar.

- For the activities that can only occur during the in-stream window, such as the riprap activities, double click on those tasks, and in the Task Information window,
- Click on ADVANCED
- Click on the Calendar down arrow and select In-Stream Work
- With this, the riprap activities can only occur during the period you have allowed on the In-Stream Work calendar.

5.0   FINISHING THE EXAMPLE SCHEDULE

5.1   ADDING A FEW MORE TASKS

Enter the following (this is the last time of entering data) information for tasks 13 through 15:

12	large culvert	10 days	Mon 7/4/05	Fri 7/15/05
13	crushing	49 days	Thu 5/19/05	Tue 7/26/05
14	placing base	38 days	Tue 8/16/05	Thu 10/6/05
15	pavement	25 days	Wed 5/18/05	Tue 6/21/05

5.2   LINKING TASKS – AGAIN

Links tasks 12 and 2, 13 and 1, and 14 and 4. Now link tasks 14, 12, 13, and 5 all to task 15 pavement.
To do this you can click on sets of two and press the link button or type the task numbers separated by
commas in the predecessor box for pavement.

6.0   SPECIAL RELATIONSHIPS

All the links we have created so far have been Finish-Start relationships, the link is from the finish of one activity to the start of another. This is normally the case with most activities, however sometimes a different relationship is more appropriate. Notice that currently there is not a link between crushing and placing base. If we linked these activities with a finish-start relationship, that would overstate the time to complete the project because all crushing would have to be finished before placing base could begin, which is not true. Click on activities 13 and 14 and press the link button to create a finish-start link.

Now double click anywhere on activity 14 and the following dialog box will appear. Press the Predecessors tab to view which activities number 14 is linked to. Click once on the crushing activity and then change the relationship to Start-Start as shown below.
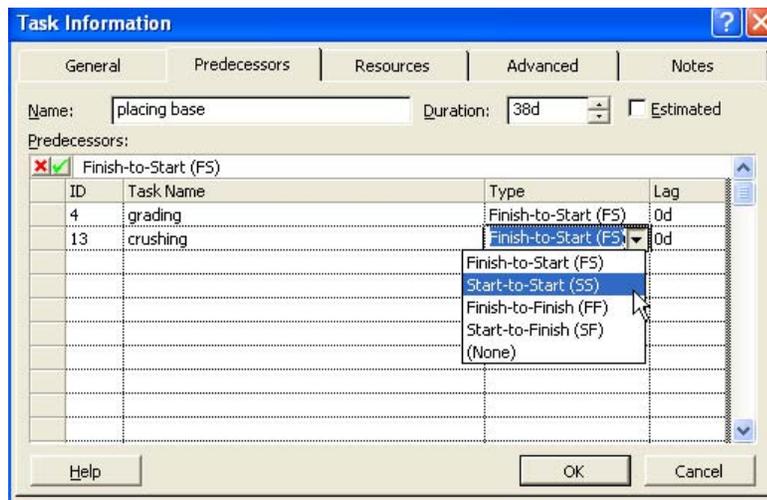
Now we can assign a lag time for the start-start relationship. This would be the time it takes to crush enough base to make hauling and placing the material reasonable. Lets assume 15 days would be enough. Enter 15 in the lag column as shown below.
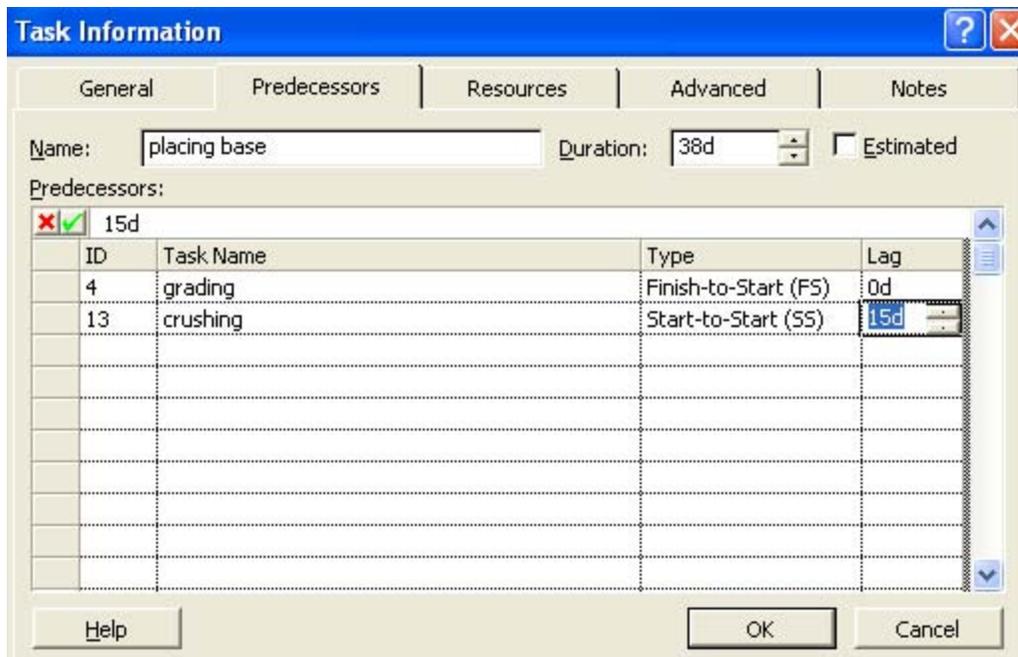
This changes the predecessor column to read 4,13SS+15d.

7.0   FORMATTING THE GANTT CHART BARS

Project will let us control the formatting of individual task bars or control the task bars for types of activities (e.g., for critical activities). In general "bar styles" controls all of the bars, and "bar" affects only the selected bar.

7.1   FORMAT BAR STYLES

To format the style of certain types of activities (normal, summary, critical, etc.) choose from the Format menu the Bar Style choice and the following dialog box appears. Typically most of these will be already set for you, however if you know that black and white printing is needed you could can some of the types to look better with black and white.
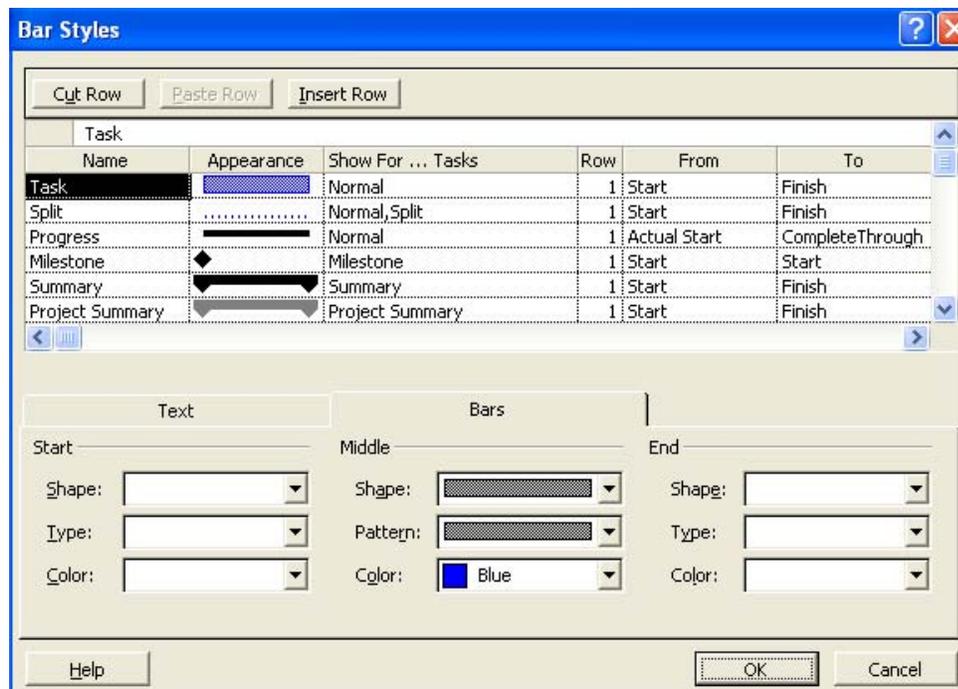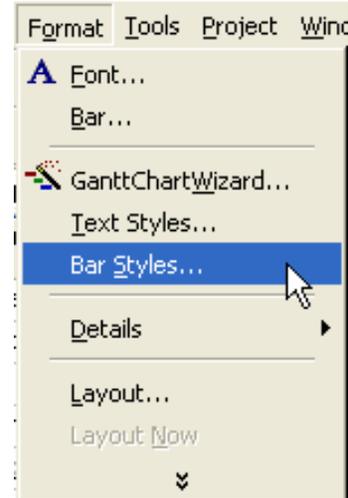
7.2   FORMAT BARS – INDIVIDUALLY

To format the individual bars for a task, and the text that is displayed with each task, just double click on the time bar, on the Gantt chart, for the specific activity. Double click on activity 12 and the following dialog box will appear. Press on the Bar Text table to see what text is currently being displayed.   You can customize the text to whatever you need.
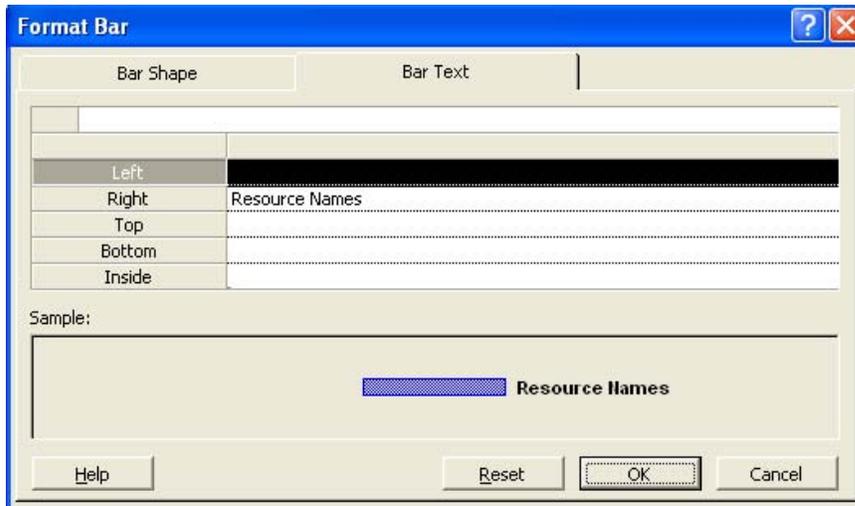
8.0 PRINTING THE GANTT CHART

Printing with Projects "what you see is what you get" versus what fits on a page. It becomes an iterative process. The columns that are visible to the left of the vertical bar between the table and Gantt chart will determine columns that will print. The time scale of the Gantt chart (days, weeks, quarters, months) will determine the width of the printout. Usually the goal is to have a printout that is one page wide with a time scale that is still readable. Let's use the zoom in/zoom out function to make our schedule appear in quarters as shown below.

Now from the File menu choose print preview. If the triangular arrows are black that means there are more sheets to the right or down. Preview and adjust the settings as necessary to get the desired printout.