MS PROJECT 2010

TUTORIAL GUIDE

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Introduction

The objective of this tutorial guide is to develop your skills in using Microsoft Project.

The following assumptions have been made when producing and writing this tutorial:

1. That you are using Microsoft Project 2010.
2. That you are familiar with Gantt charts and network diagram. These should have been covered before starting this tutorial.
3. That you are computer literate and have general understanding about using Microsoft Work and Excel.
4. That you are able to use help facility within a software package and are able to search for information using the Internet if require.

In the time available this tutorial will give you a good grounding in the basic aspects of using Microsoft Project. It is expected that when you have completed this tutorial that you will explore and learn some of the other many features of this software.

Also, it important to remember that this is not a project management text book and therefore there will only be limited or no explanation of various project management concepts. It you do not understand a term or a concept mentioned in the MS Project tutorial then I suggest that you go and read about it in a good project management text book.

Getting Started

The first thing I suggest you do is open MS Project and get a feel for where things are within the software. MS Project 2010 uses tabs along the top bar that open as graphical ribbon menus, rather than the drop down menus that Microsoft used to use. You may also want to read the "Getting Started" section of Project Help.

While MS Project has a built in help function, I suggest that the online help be explored. This can be found at:
http://office2010.microsoft.com/en-us/project-help

The English version can be found here, but there appears to be more information available on the US Microsoft site.
http://office.microsoft.com/en-gb/project-help/?CTT=97

Now that you are familiar with the look of MS Project let us started by creating a very simple Gantt chart, this will be developed using the precedence chart in table 1.

Task	Duration	Precedence
Start	0	-
A	5	-
B	4	-
C	6	A
D	2	B
E	5	B
F	6	C, D
end	0	E, F

Standard Precedence Chart
Table 1

Task Name	Duration	Predecessors
start	0 days	
a	5 days	1
b	4 days	1
c	6 days	2
d	2 days	3
e	5 days	3
f	6 days	4,5
end	0 days	6,7

MS Project Predecessors
Table 2

As you will have notice there are two tables above. Table 1 is a standard precedence chart as would be found in a text book, with the precedence listed by naming the tasks that are the predecessors.

Table 2 shows how predecessors are listed in MS project. The numbers in the predecessor column refer to the line that is the predecessor for a particular task. That is if you look at the extreme left of the MS Project columns you will notice that there are black line numbers against a grey background. These line numbers are similar to the line number that can be found at the extreme left of an Excel spreadsheet.

To create the Gantt chart follow these steps.

1. Open MS project. Project will open with a new project sheet waiting for your data.
2. In the "Task Name" column type the task names from the chart above
3. In the "Duration" column type the duration from the chart above

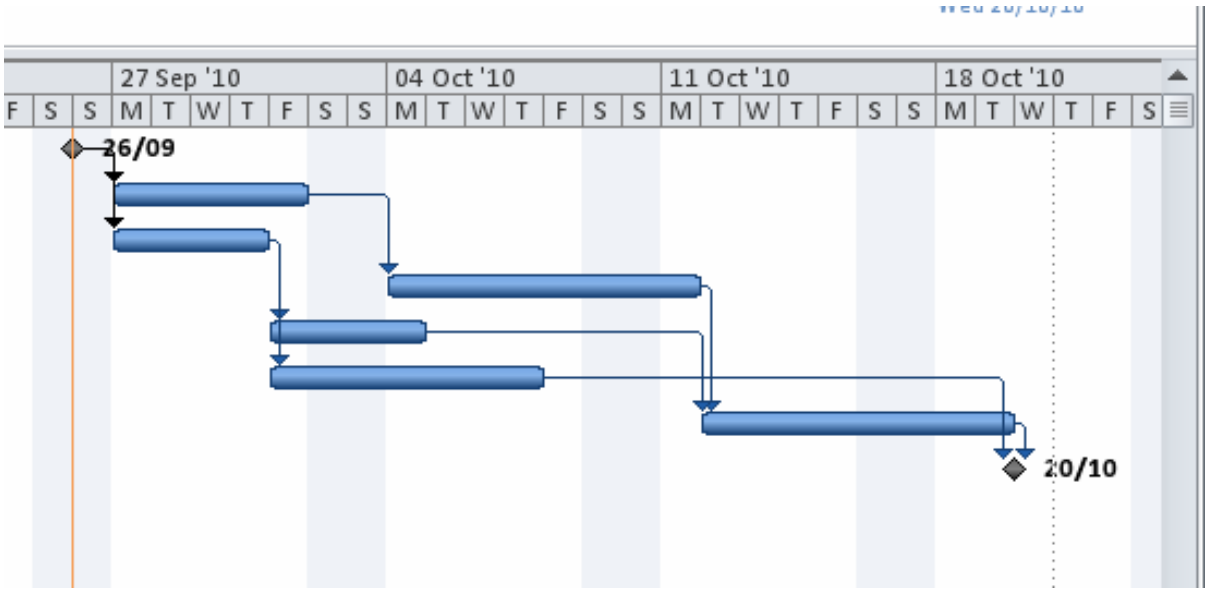
Notice that where there is a number there is a pale blue task bar, but where there is a zero there is a grey lozenge shape milestone.

A task bar uses time and can also use resources and have a cost attached to it.
A milestone never uses any time or resources and never has a cost. A milestone is purely an event indicating a particular stage of a project.

4. At the moment the predecessor column is probably not in view. To bring it into view on the vertical grey line that runs down to the left of the project graphical window, hover the mouse until the white arrow changes to two vertical line. Then hold down the left button and drag the mouse to the right until the “Predecessors” column is fully in view. Release the left button.
5. Now type in the predecessors numbers from table 2 above.

Notice that as you type each predecessor a link is put between the appropriate tasks in the graphical project window.

6. When all the predecessors have been entered the Gantt chart should look like the one in figure 1. Note depending on the setting of your version of MS Project the task bars and milestones may be a different colour



Simple Gantt Chart
Figure 1

Now that you have made your first Gantt chart with MS Project I will show you another way of connecting the tasks.

But first tasks in your Gantt chart must have there predecessors removed.

7. Hover the mouse over “1” in the grey column at the extreme left of all the other columns.
8. Hold down the left button and drag the mouse downward until all the columns are highlighted black. Release the left button.
9. Now left click on the “Task” at the top so that the task items come in view.
10. Left click on the “Auto Schedule” icon.
11. In the “Schedule” section there is a broken chain link icon and when you hover the mouse over it says “Unlink Tasks”.

12. Left click on “Unlink Task” icon

All the task should now be unlink and where they where before you added the predecessors.

Now the task need to be reconnected using the precedence chart above, but this time the mouse will be used to connect the tasks.

13. Hover the mouse over the start milestone, a black crosshairs will appear.
14. Hold down the left button and drag the crosshairs towards the middle of task “a”, as the crosshairs is dragged away from the milestone it will change into the image of a chain.
15. When the chain image is over the middle of task “a” release the mouse left button.
16. Repeat steps 13 to 15 but this time take the chain image to task “b” so it is connected to the milestone.
17. Next hover the mouse over the middle of task “a” until the crosshairs image appears, then hold down the left button and drag a link to task “c”, releasing the left button when the change image is in the middle of task “c”
18. Now connect the rest of the task using the precedence chart as a guide..

Note as you add links to the task using the mouse the predecessor number automatically appear in the predecessor column.

You should now have the Gantt chart reconnected and it should look like the one figure 1. This means that you now have the basic skills to make a simple Gantt chart using MS project.

The exercise above has demonstrated that there is more than one way to link tasks together. Tasks were linked in two different way, but there are several ways to link tasks you may, with the use of help, want to discover some more ways of linking tasks outside of class.

It is not just linking tasks that can be done in more than one way. As you use and discover more things about MS Project you find various ways of doing the same things. These are to numerous for this tutorial list but by discovering them for yourself you are more likely to remember them. The only way to become proficient and confident using a software package like MS Project is to use it and so discover its inner power. It would be hard for any tutorial to do this. The role of a tutorial is to develop your basic skills so that you can then go on to discover more about MS Project and how it can be used.

The rest of this tutorial will now build on the exercise above so that you can develop a MS Project plan that has a Gantt chart with resources and cost attached to it.

Garden Project Part 1

To develop a more substantial plan than the Gantt chart in Getting Started a plan for creating a garden will be developed. A garden was chosen as it is a very British thing and the plan has sufficient task to be of interest without getting complicated. The plan that will be created uses less than thirty task while a real-life project may have hundreds or thousands of individual tasks in the plan.

The garden that will be created will have several features:

- A lawn
- Two flower beds
- A pond
- A path
- A fence

There will be various tasks associated with each of these features. In, addition the design of the garden needs to be finalised.

To save you the time of typing the tasks and duration, there is a task and a duration list in appendix 1 and these can both be copied and then pasted in MS Project.

The first thing that needs to be done is set the proposed project start date. This must be done using the project information box so that MS Project processes the start date correctly.

The project start date must not be set by changing the date in the Start column. If you do this then project at times will not calculate project information correctly. This means that you will be making decision based of false data!

To do this, follow these instructions:

1. Open MS Project
2. Click on the Project tab at the top of the MS project window, the Project ribbon tab will be displayed
3. In the properties section of the ribbon tab click on “Project Information”. The project information box will open
4. At the top left of the project information box will be seen the start date box. The date shown will generally be the current date.
5. Change the start date to the date to the first Monday in May next year.
6. Click OK which is in the bottom right of the box.

The project start date is now set.

Note: the date use must be the first Monday in May next year. If you do not use this as your start date you may have problems later in the tutorial.

The way MS Project schedules the project must now be set. This project will be scheduled using the auto schedule mode rather than manual schedule mode.

7. Click on the Task tab at the top of the MS project window, the Task ribbon tab will be displayed.

8. In the task section of the ribbon tab click on “Mode” then click on “Auto Schedule”.

Auto Schedule mode should now be set and the auto schedule symbol should appear in the Task Mode column when a task is added to a line.

9. Copy the garden task in appendix 1 and then past the tasks into the Task Name column of MS Project.

This will cause all the other columns to be populated.
Notice how the duration column displays “1day?”. The question mark symbol indicates that MS Project has estimated the duration and that the user has yet to enter a duration for this task.

10. Copy the garden duration in appendix 1 and then past the durations into the Duration column of MS Project

The duration should now no longer display a question mark symbol.
The Auto Schedule symbol should also be displayed in the Task Mode column.

11. Now save the project as Garden 1

Note it is very important that you save files with the file name stated and that you save them when told to do so. If you are in a tutor led class the tutor should verify that what you have done is correct before you save it. Therefore if you ever make a mistake or have a problem then the last saved Garden file should be correct and can be used to redo the next section.

Garden Project Part 2

In this section the various task will be linked to form a basic plan in the form of a Gantt chart.

Before the tasks are connected let us learn how to add another task to a plan. A milestone will be added after planting is complete.

1. Open Garden 1
2. Right click on the “14” of line 14. This is the “erect fencing” task line.
3. On the drop down menu that appears click “insert task”. A new task line will appear on line 14, pushing the “erect fencing” task down to line 15
4. In the task name column of line 14 type “Planting complete”.
5. As this is a milestone add a duration of zero to the duration column of line 14. A milestone lozenge should appear in the graphical window to the right.
6. Save as Garden 2

The next task is to connect the tasks so that you create a linked Gantt. I suggest that you do this using the mouse using the method you learnt in the getting started section. The precedence chart to be used for linking the various tasks for the garden project is shown below.

Task Name	Duration	Precedence
START PROJECT	0 days	-
Finalise the design	2 days	START PROJECT
Customer acceptance	0 days	Finalise the design
Preparation of lawn area	2 days	Customer acceptance
Preparation of flower bed 1	1 day	Customer acceptance
Preparation of flower bed 2	1 day	Customer acceptance
Preparation of pond	2.5 days	Customer acceptance
Lay top soil for lawn	1 day	Preparation of lawn area
Lay top soil for flower bed 1	1 day	Preparation of flower bed 1
Lay top soil for flower bed 2	1 day	Preparation of flower bed 2
Put down turf for lawn	1.5 days	Lay top soil for lawn
Plant flower bed 1	2 days	Lay top soil for flower bed 1
Plant flower bed 2	2 days	Lay top soil for flower bed 2
Planting Complete	0 days	Put down turf for lawn, Plant flower bed 1, Plant flower bed 2
Erect Fencing	1 wk	Planting Complete
Paint Fencing	3 days	Erect Fencing
Install pond liner	1 day	Preparation of pond
Install pond pump and piping	2.5 days	Install pond liner

Task Name	Duration	Precedence
Install pump electrical supply	0.5 days	Install pond pump and piping
Lay pond surround	3 days	Install pump electrical supply
Fill pond	0.5 days	Lay pond surround
Test pond	0.5 days	Fill pond
Stock pond with plants	0.25 days	Test pond
Stock pond with fish	0.25 days	Stock pond with plants
Prepare path foundations	3 days	Customer acceptance
Lay path	2 days	Prepare path foundations
END PROJECT	0 days	Paint Fencing, Stock pond with fish, Lay path

7. Link the garden project tasks as per the precedence chart
8. Save as garden 3.

The basic Gantt chart for the garden project can now be seen.

At the moment all the tasks start straight after its predecessor has completed. In most cases this is what is required, but sometimes for a particular reason it is necessary to delay the start of a task because of the nature of the task itself or the preceding task. The type of delay being referred to here is a delay that needs to be inserted within the plan before the start of a project *e.g. waiting for paint to dry*, rather than a delay to a task cause by an issue that arises after the project begins *e.g. material is delivered late*.

The delays put into the project before the start of the project are referred to as a lag within MS Project.

Two lags will be added to the project. The first lag is to allow the pond liner to settle before the pond pump is installed. The second lag is to allow the plants to settle before the fish are added. Now add the lags.

9. Double click on the task “Install pond pump and piping”. The task information will open.
10. On task information window click on the predecessors tab.
11. At the moment the Lag is shown as 0d. Add a ½ day delay by changing the 0d to 0.5d
12. Click OK
13. Double click on the task “Stock pond with fish”
14. On task information window click on the predecessors tab.
15. At the moment the Lag is shown as 0d. Add a 1 week delay by changing the 0d to 1w
16. Click OK
17. Save as garden 4

The 1 week delayed added to the “Stock pond with fish” will be very obvious in the Gantt chart.

As well as delaying the start of an activity with relation to its predecessor, it is also sometime desirable to advance the start time of an activity relative to the finish time of it predecessor. Therefore, the link is still a “finish to start” link but the task starts ahead of its predecessor finishing. An easy way to do this is by using a negative lag.

To demonstrate this, a negative lag will be added to the painting of the fence of two days. This will allow the painting of to start two days before the end of the erection of the fence.

18. Double click on the task “Paint Fence”. The task information will open.
19. On task information window click on the predecessors tab.
20. At the moment the Lag is shown as 0d. Change the lag to -2 days (minus two days) by changing the 0d to -2d the use of the minus will create a minus lag that is an advance rather than a delay.
21. Click OK
22. Save as the current garden 4 this mean over-writing the current garden 4.

As with the week delay that was added the two day advance will be very obivious to see visually in the Gantt chart/

The next stage is to outline the project using summary tasks below which are various subtasks. Summary task will now be added to the project this will result in all the current project tasks becoming subtasks.

The summary tasks are Design, Preparation, Lay Soil, Planting, Fencing, Pond and Path.

Now let us add the summary tasks

23. Right click on line 2
24. On the menus that opens click on insert task
25. In the task name column at line 2 where it says <New Task> type Design
26. Highlight both lines 3 and 4 so that they are both selected
27. In the task tab ribbon menu in the schedule section click on the indent icon.

The two task highlighted should now have been justified to the right under Design and they should be embraced by a black bar on the Gantt chart.

28. At line 5 repeat 24 to 25 above, but this time type in the word Preparation. Preparation is automatically made a subtask of design, which is not what is wanted.
29. Now click on the task tab ribbon menu in the schedule section click on the outdent icon. The word preparation should now be fully left justified and no longer a subtask of Design.
30. Highlight lines 6 and 9 so that they are all selected
31. In the task tab ribbon menu in the schedule section click on the indent icon.

32. At line 10 repeat the above for Lay Soil indenting lines 11 to 13

33. At line 14 repeat the above for Planting indenting lines 15 to 18

34. At line 19 repeat the above for Fencing indenting lines 20 to 21

35. At line 22 repeat the above for Pond indenting lines 23 to 30

36. At line 31 repeat the above for Path indenting lines 32 to 33.

37. Now save as garden 5

The garden project now has a set of summary task, with each summary task having under it subtasks. These vary in number from two to eight.

The basic garden Gantt chart is now complete, but it lacks resources and costs. These will be added in the next section.

Garden Project Part 3

Once a basic Gantt chart plan has been develop this then has to be developed this can be developed into something more useful for the project management by adding the various resources that will be utilised be the project.

The project uses the following human resources:

Human Resource	Work group	How many	Hourly Rate
Designer	Management	one	£20
Labourer	Unskilled	three	£6.10
Gardener	Skilled	two	£8.60
Pool Specialist	Skilled	one	£9.50
Pavior	Semi-skilled	one	£7.50

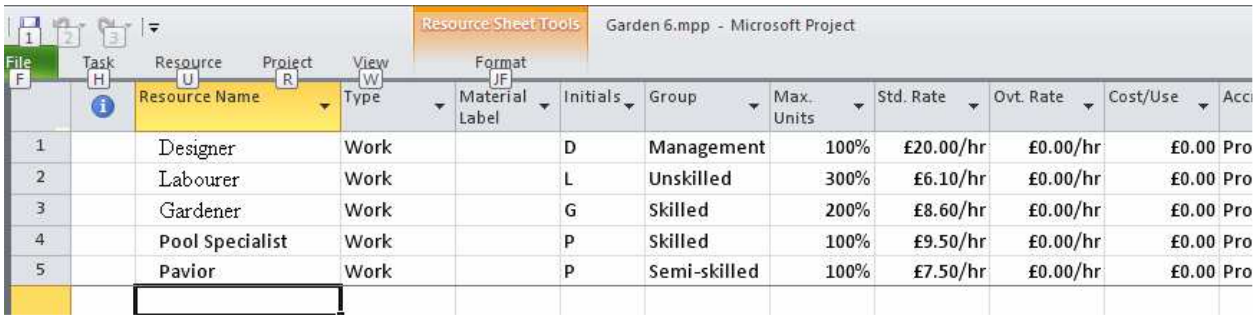
Garden Project Human Resources
Table N

A point to note is that while in the above table the number of each resource is stated as a number, for example there are three labourers. In MS Project a resource is stated a percentage, with each full unit of a resource equal to 100%. In MS Project terms this means that each of the labourers is a full resource of 100%. Therefore, because there are three of them, each equal to 100%, this means they are entered in MS Project as 300% maximum units.

Now let us add the project human resources

1. Open garden 5
2. Click on Task in the top left hand corner to open the task ribbon menu
3. Click on Gantt chart at the extreme left of the ribbon menu. A drop down menu will open.
4. Click on Resource Sheet. The Gantt chart view will change the resource sheet view.
5. Now add the resources as per the table above.
6. Save as garden 6

When the resources have been added the resource sheet should look like below.



	Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Acc
1	Designer	Work		D	Management	100%	£20.00/hr	£0.00/hr	£0.00	Pro
2	Labourer	Work		L	Unskilled	300%	£6.10/hr	£0.00/hr	£0.00	Pro
3	Gardener	Work		G	Skilled	200%	£8.60/hr	£0.00/hr	£0.00	Pro
4	Pool Specialist	Work		P	Skilled	100%	£9.50/hr	£0.00/hr	£0.00	Pro
5	Pavior	Work		P	Semi-skilled	100%	£7.50/hr	£0.00/hr	£0.00	Pro

Now that the plan has a set of human resources, they can now be assigned to the various project tasks.

Before this is done the following need to be checked

7. Click on the Resource tab at the top of the screen open the resource ribbon menu
8. Click on levelling options, the resource levelling box will open.
9. Ensure that the manual is selected for the levelling calculation
10. Click Ok
11. Go to Gantt Chart view then click on the Format tab at the top of the screen open the format ribbon menu
12. In the show/hide section tick the outline number box.
13. The outline numbers will now appear next to each task.
14. Now resave as garden 6 overwriting the current version of garden 6

The human resources can now be assigned as follows

Task Name	Resource
START PROJECT	
Design	
Finalise the design	Designer
Customer acceptance	
Preparation	
Preparation of lawn area	Labourer
Preparation of flower bed 1	Labourer
Preparation of flower bed 2	Labourer
Preparation of pond	Labourer
Lay Soil	
Lay top soil for lawn	Labourer
Lay top soil for flower bed 1	Labourer
Lay top soil for flower bed 2	Labourer
Planting	
Put down turf for lawn	Gardener
Plant flower bed 1	Gardener
Plant flower bed 2	Gardener
Planting Complete	
Fencing	
Erect Fencing	Labourer
Paint Fencing	Designer
Pond	
Install pond liner	Pool Specialist, Labourer
Install pond pump and piping	Pool Specialist
Install pump electrical supply	Pool Specialist
Lay pond surround	Pool Specialist
Fill pond	Labourer
Test pond	Pool Specialist
Stock pond with plants	Pool Specialist
Stock pond with fish	Pool Specialist
Path	
Prepare path foundations	Labourer
Lay path	Pavior

END PROJECT	

Resource Allocation Table

Summary tasks and milestones never have resources assigned to them. Only tasks can use resources.

MS Project allows resources to be assigned to a task using several different ways to do the same thing. It is suggested that by using help and searching on line you explore these various ways. Two methods of assigning resources will now be detailed.

15. You should still be using garden 6
16. Double click on task 2.1 Finalise design. The task information box should open.
17. Click on the resource tab so that it appears.
18. Click on the top box of the resource name box.
19. Click on the down arrow that appears in the right hand side of the box. A drop down menu of the various resources that you have entered will appear.
20. Click on Designer. This will assign the designer to this task. You will note that the designer has been added as a complete single unit of 100%
21. Click Ok at the bottom left of the task information box. The box will close and the designer will be assigned to the task. The designer name will appear next to the task in the Gantt chart.

Another way to assign a resource is as follows

22. Right click on task 3.1 preparation of the lawn area. A vertical bar menu box will open.
23. Click on Assign Resources which is about half way down the menu box. The assign resources box will open.
24. Click on Labourer. Labourer will appear in the white box just above Resource Name.
25. Click assign. Labourer will be assigned to task 3.1, but the assign resources box will not close.
26. Click task 3.2. Task 3.2 will become the active task but the Assign Resources box will stay on the top.
27. As before click on Labourer and then click assign.
28. Continue as above adding the human resources to each task using the information given in the table above till you get to task 7.1

At task 7.1 it will be noted that both the pool specialist and a labourer are assigned to this task.

29. Click on task 7.1
30. In the assign resources box click on pool specialist then click on assign.
31. Next click on labourer then click assign. Both the pool specialist and a labourer have now been assigned to task 7.1 as can be seen by from the resource names next to the task in the Gantt chart.
32. Continue to add the rest of the resources
33. When the resource has been added to task 8.2, click the close button on the assign resources box

34. Now resave as garden 6 overwriting the current version of garden 6

Hopefully you will have noticed little red figures have appeared next to certain task, if you hover the mouse over one of the red figures you will see that a box opens that say the resource is over allocated. The next section will look at how over allocation can be dealt with.

Garden Project Part 4

In this section the scheduling of tasks will be investigated to explore how task over allocation can be eliminated from a plan. This will be done in three different ways, manually, using the task inspector function, and finally automatically.

I do hope you have been saving the files with names I have told you to use so far in this tutorial. Because, in this section we will modify garden 6 in several different ways to demonstrate some of the ways a project can be balanced within MS Project and how each levelling solution will be different while still allowing the project to finish at the same time in each case.

Where it is found that tasks conflict and there is a resource issue there are various ways of dealing with this.

a. Increase the number of resources that are available at the time of the over allocation. In reality, this can be difficult to do as rarely will there be resources, particularly human resources, waiting around for something to do. Though human resources can often be found at short notice if contract staff are used, but it must remember that contract staff often cost a lot more to employ than company staff members and therefore may have a detrimental effect on the project budget.

b. Another way is too utilised under allocated resources to undertake the task assuming they have the required skills. Now while this may sound a good idea in many organisations for example a skilled person would not do an unskilled workers job certainly not for any significant period. This situation becomes more acute if the staff are unionised.

c. Often the easiest and most cost effective way is to delay a task or tasks so that the over allocation is avoided.

d. Overtime payments can be used to pay staff to work longer but as this has a cost implication over and above the standard hourly rate it is best used only as a temporary measure.

e. If the over allocation are noticed before the project is started a solution to extend the normal working hours paid at the standard rate.

Note: remember that the little red man  in the information column means that task is has a resource allocation clash

In this next part of the tutorial we will investigate various ways of levelling the project. The first way we will do this is by levelling the project manually.

As we are going to use garden 6 several times we need to ensure that the garden 6 file is not modified. Therefore, in this section as soon as we open garden 6 we will save it with another file name as given in the instruction below.

To start with the project will be levelled manually this will be done by:

a. Adding an extra labourer.
b. Allocating a gardener to do one of the tasks done by a labourer.
c. Delaying a task.
d. Using overtime for a task.

So now let us level the garden project manually.

1. Open garden 6
2. Save it as garden 7a

You now need to ensure that that resource levelling is set to manual. This should have been done in part 3. But to check that resource levelling is set to manual follow steps 7 to 10 in part 3.

We are now ready to start actually levelling the garden 7a file manually.

The first task is to add an extra labourer

3. Click on Task in the top left hand corner to open the task ribbon menu
4. Click on Gantt chart at the extreme left of the ribbon menu. A drop down menu will open.
5. Click on Resource Sheet. The Gantt chart view will change the resource sheet view.
6. Now increase the labourer Max Units from 300% to 400%, so adding an extra labourer.
7. Resave the Garden 7a file.

You will note that none of the resources clashes have disappeared yet.

Next a gardener will be used to prepare flower bed 1 in place of a labourer. This will be done by utilising the Resource Allocation view and the “go to next over allocation” function.

8. Click on Resource in the top left hand corner to open the resources ribbon menu
9. Click on words Team Planner at the extreme left of the ribbon menu. A drop down menu will open.
10. Click on More Views which will be found right at the bottom of the drop down menu. This will open the More Views box.
11. Scroll down the list of views and left click on Resource Allocation then click apply. The resource allocation view will open.

It can be seen that the resource allocation view is split and shows two different views. The top view is Resource Usage while the bottom view is the Levelling Gantt.

12. The resource ribbon should still be open therefore left click on Next Over Allocation icon. This can be found at the far right of the ribbon menu in the level section. This will cause a move to the first over allocated resource, in this case the labourer. It should also be note that the various tasks undertaken by the labourer have now appeared in the Levelling Gantt section.
13. Scroll the Resource Usage view so that all the tasks associated with the labourer can be seen.

You should now be able to see that for the first day that the labourers are used, the labourers are allocated to 40 hours of work. But, as there is only four labourers the maximum about of work they can do together on a standard eight hour day is 32 hours.

That is PxWD=M/Hr

where P is the number of people available in this case 4 labourers,
WD in the number of hours in the working day in this case 8 hours,
and M/Hr in the resulting number of man hours available in the working day for them

14. In the Levelling Gantt view double click “preparation of flower bed 1”. The task window for “preparation of flower bed 1” will open.
15. Click on resources tab.
16. Then using the method that you learnt in 18 to 21 of part 3 change labourer to gardener. The labourers on the first day should now be level, indicated by the total work time for the day changing colour from red to black and the hours changing from 40 hours to 32 hours.
17. Resave the Garden 7a file

The next over allocated day for the labourers will now be levelled by delaying the laying of the topsoil for flower bed 1 by 1 day. This will result in this task happening on the third day that the labourers work where currently they are only being used for 24 man hours and so have 8 slack hours available.

18. In the Levelling Gantt view the column after Name should be Levelling Delay.
19. Change the levelling delay for “lay top soil for flower bed 1” from zero days to one day.
20. The labourers should now be level and the all figures involved with the labourer will now be black. Also, the red over allocation icon should have gone for all labourer related tasks.
21. Resave the Garden 7a file

The over allocated gardeners will now be levelled.

VERY IMPORTANT NOTE
At this point it should be possible to click on the next over allocation icon and move to the over allocated gardener.
But MS Project gives a message stating that there is no allocation. This appears to be a bug in MS Project.

I had hoped to demonstrate a work around that would work on large projects, unfortunately I cannot find one where I can come back to the correct place on the resource usage view.

With a small project like this the easiest work around is to just scroll down to the Gardeners in the Resource Usage window and click on the.

Therefore, until Microsoft fixes the bug this is the workaround that will be used.

22. In Resource Usage view scroll down to the Gardener.
23. In the Resource Name column click on Gardener. The various task associated with the gardener should appear in the Levelling Gantt window.
24. In the Resource Usage window click on the Add New Column header. A drop down menu of column choices will open.
25. Select Overtime Work
26. As the Gardener is over allocated by 12 hours add 12 hours overtime to the "put down turf task" in the Overtime Work column.

    Now what appears to be another bug means that once you add the overtime the work assigned to the task disappears. This will be corrected once the fix is known.

27. Resave the Garden 7a file

We will now look some of the automatic ways of levelling the project. This will be done in three different ways. The reason for this is to demonstrate that automatic levelling will level the project in different depending on how levelling is done.

1. Open garden 6
2. Save it as garden 7b
3. Ensure that you are in Gantt view
4. Right click on the first little red man in the Information column, this should be at line 6, "preparation of the lawn area".
5. Left click of "Reschedule to Available Date". The "preparation of the lawn area" task will now be rescheduled to a later date and this will be visible when looking at the Gantt chart. The little red man on line 6 will also disappear.
6. Next, right click on the next little red man in the Information column, this should be at line 7, "preparation of flower bed 1".
7. This time left click on "Fix in Task Inspector". The task inspector will open at the left of the screen and will give some repair options. In this case two choices are given. The Team Planner will not be used but it is suggest that you explore this option and how it can be used before continuing.
8. Left click on the first option "Reschedule Task". The "preparation of flower bed 1" task will now be rescheduled to a later date and this will be visible

when looking at the Gantt chart. The little red man on line 7 will also disappear along with all the other little red men. As there are now little red men it means that the project is now level.

9. Click on the cross at the top right of Task Inspector to close the Task Inspector.
10. Resave file as garden 7b

We will use the above techniques to automatically level the project again but will achieve a different result this will be done by starting with the last over allocated task and then moving up the list rather than down the list as was done above.

1. Open garden 6
2. Save it as garden 7c
3. Ensure that you are in Gantt view
4. Right click on the last little red man in the Information column, this should be at line 32, “prepare path foundation”.
5. Left click of “Reschedule to Available Date”. The task will now be rescheduled to a later date and this will be visible when looking at the Gantt chart. The little red man on line 32 will also disappear.
6. Now move up to the next red man this should be at line 17 and right click on the little red man.
7. Left click of “Reschedule to Available Date”. The task will now be rescheduled to a later date and this will be visible when looking at the Gantt chart. The little red man on line 17 will also disappear along with those at lines 15 and 16.
8. Now move up to the next red man this should be at line 13 and right click on the little red man.
9. Left click of “Reschedule to Available Date”. The task will now be rescheduled to a later date and this will be visible when looking at the Gantt chart. The little red man on line 13 will also disappear along with the one at line 12.
10. Now move up to the next red man this should be at line 9 and right click on the little red man.
11. Left click of “Reschedule to Available Date”. The task will now be rescheduled to a later date and this will be visible when looking at the Gantt chart. The little red man on line 9 will also disappear along with remaining little red men.
12. Resave file as garden 7c.

The next method of automatic levelling will level the whole project in one go rather than doing the automatic levelling task by task.

1. Open garden 6
2. Save it as garden 7d
3. Ensure that you are in Gantt view
4. Left click on the Resource tab. This will open the resource ribbon menu.
5. In the level section of the resource ribbon menu click on “Level All”. The whole project should now be level and all the little red men should have disappeared.
6. Resave as garden 7d.

You now have four version of the project all of which of level. You should now compare all four and note down the different ways the projects have been levelled.

The project plan is now complete and levelled. As the various resource costs will now have been calculated by project let us now review these.

1. Open garden 7d
2. Save as garden 8
3. Click on Task in the top left hand corner to open the task ribbon menu
4. Click on Gantt chart at the extreme left of the ribbon menu. A drop down menu will open.
5. Click on Task Sheet. The Gantt chart view will change the task sheet view.
6. After the Resource Name column add a new column called Cost chosen from the “add new column” drop down menu choice of column names. The cost of the resource for each task can now be seen.

If you look down the list of costs two costs appear excessive, the cost of digging the hole for the pond and the cost of painting the fence. The pond cost is excessive because it is been dug manually and the fence painting cost is excessive because the designer is doing the painting. This must be changed.

A person with a mechanical digger will do the job for a fixed cost of £60 and will take no more than half a day.

Also a painter will do paint the fence for a fixed cost of £200 and a will take 2 days.

As both of the above is a fixed cost for doing each task this is referred to in MS Project as a cost per use.

7. Using the skills and methods you learnt earlier in this tutorial guide add the digger and the painter to the resource sheet. Remember to put the costing the “cost/use” column.
8. Now go to back to the Gantt chart view.
9. For the “Preparation of Pond” Task exchange the labourer for the digger and reduce the duration to 0.5 of a day.
10. Now on the paint fence task swap the designer for the painter, reduce the duration to 2 days, and reduce the lag to -1 day.
11. Resave as Garden 8

Note1: consider what has now happened having exchanged a labourer for the digger. If this swap had been made earlier, what would the effect have been on the project?

Note2: What other major effect has using the digger had on the project?

Something that will often happen with projects is a resource human or otherwise will not be available when they are required by the actual project plan. This will require that the plan is modified to accommodate this fact.

The way this can be done is by using the various task constraint choices provided within MS Project. The default task constraint type is “start as soon as possible”.

The other choices available are:

a) Finish as late as possible
b) Finish no earlier than
c) Must finish on
d) Must start on
e) Start no earlier than
f) Start no later than

When one of the constraint listed above are used they can cause scheduling errors and conflicts if they are not used correctly. Therefore, when they are used you need to understand the consequences of the constraints that you are setting.

Let us look at an example of this but first

1. Open garden 8
2. Save it as garden 9temp. This file will be used to explore the scenario below.

We will assume that the pavior has informed us that he is only available to start laying the path either 7 days or 14 days after the start of the project.

Using the “garden 9temp” explore the various things that can happen if the pavior’s start date is set to 7 days after the start of the project using the “must start on” constraint. What are the different ways this can affect the project and the pavior?

Hopefully you will have realised that a start date 7 days after the start of the project cannot be used for the pavior.

Therefore, the option of the pavior starting work 14 days after the start of the project will be used. Let us add this to the main project plan.

1. Open Garden 8
2. Save as garden 9
3. Add the “must start on” day 14 after the start of project constraint to the lay path task
4. Resave garden 9

The project plan is now complete.

In the next section setting a base line and tracking the progress of the project will be explored.

Garden Project Part 5

In this section using MS Project as a tracking, monitoring and control tool will be explored.

The first thing that needs to be done is the addition of a baseline to the project. The baseline provided a reference starting point for the various project tracking function. In most cases this will be the start date of the project. The garden project is no exception to this and the baseline will be set at the project start date.

1. Open garden 9
2. Save as garden 10

Before the baseline is set we confirm that the project does not have a baseline set.

3. Click on the Project tab, this will open the Project ribbon menu.
4. In the properties section click on Project Information. The project information box will open.
5. At the bottom left of the project information box click on Statistics. The project information box will close and the project statistics box will open. The baseline start and finish date should be "NA". This indicates no baseline is set.
6. Now click on close on the project statistics box so that it closes.

Now to set the base line

7. Click on the Project tab, this will open the Project ribbon menu.
8. In the schedule section click on Set Baseline. Two options appear Set Baseline and Clear Baseline.
9. Then click on the Set Baseline option. The set Baseline box will open.
10. Ensure that the Set Baseline button is click and has a black dot inside it.
11. Click OK. The set baseline box will close.

Let us confirm that the baseline has been set

12. Click on the Project tab, this will open the Project ribbon menu.
13. In the properties section click on Project Information. The project information box will open.
14. At the bottom left of the project information box click on Statistics. The project information box will close and the project statistics box will open. The baseline start and finish date should now be the same as the date in the "current" row. This indicates that the baseline is now set.
15. Now click on close on the project statistics box so that it closes.
16. Resave as garden 10

Now that we have a baseline set let us explore what can happen as we start to track the project.

1. Open garden 10
2. Save as garden 11
3. Set the current date to 5 days after the start of the project. The current date can be set in the Project Information box.

You should now update project manually. To do this you will need to use help to find out how to do this.

4. Referring the Task Outline Numbers, Tasks 1, 2.1. and 2.2 were completed on time as per the current plan.

5. Task 3.1 is complete but started on day 5 of the project and ended on the same day.

6. Tasks 3.2, 3.4 were completed as per the current plan.

7. Task 3.3 started on time but is only 50% complete (estimate is accurate)

8. Tasks 4.2 started on time and has used 1 day, but still requires a further 0.5 day (original estimate was incorrect).

9. Task 4.3 cannot start as 3.3 is not complete

10. Task 5.2 cannot start as 4.2 is not complete.

11. Tasks 7.1, 7.2 were completed as per the current plan.

12. Save as garden 11.

13. Investigate the plan to see any effects, for example changes to end date, the critical path etc. by comparing garden 11 with garden 10.

14. Select all the tasks and reschedule work

15. Save as garden 12 and investigate the plan again.

16. Investigate any overloads of resources. Level any overloaded resources.

17. Save as garden 13

This brings to an end this basic introduction to MS Project.

Further Exploration of MS Project

So far only the basics of using MS Project have been covered in this tutorial guide. There is so much more to project and it would now be worth spending some time exploring of these option.

Areas that it is suggest that you explore include defining the work breakdown structure for your project, use of filter, report generation and use of the timeline facility.

But if you cannot be bothered to explore any of the above I urge you to at least explore the printing option available in MS Project and how you can printout project that will appear meaningful to the reader of the printout.

Appendix 1

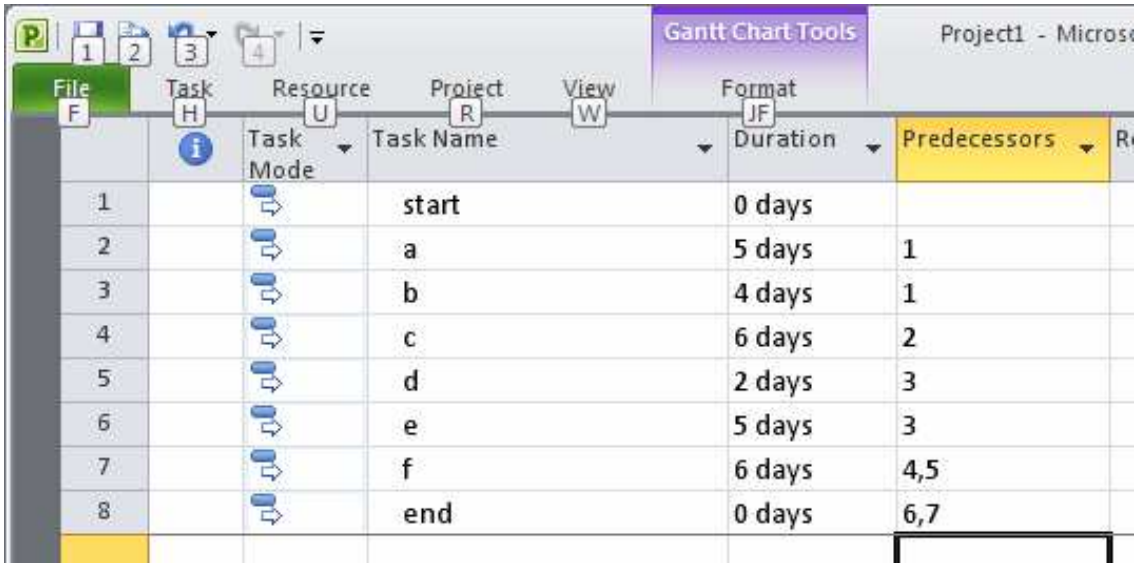
The Garden Task

START PROJECT
Finalise the design
Customer acceptance
Preparation of lawn area
Preparation of flower bed 1
Preparation of flower bed 2
Preparation of pond
Lay top soil for lawn
Lay top soil for flower bed 1
Lay top soil for flower bed 2
Put down turf for lawn
Plant flower bed 1
Plant flower bed 2
Erect Fencing
Paint Fencing
Install pond liner
Install pond pump and piping
Install pump electrical supply
Lay pond surround
Fill pond
Test pond
Stock pond with plants
Stock pond with fish
Prepare path foundations
Lay path
END PROJECT

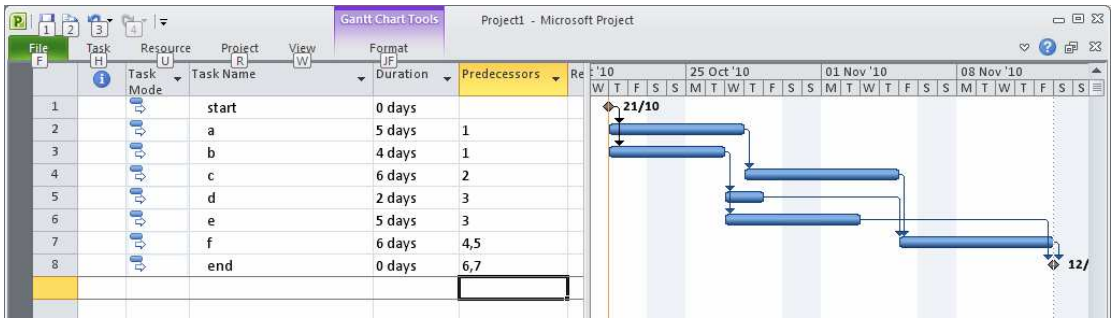
The Garden Durations

0 days
2 days
0 days
2 days
1 day
1 day
2.5 days
1 day
1 day
1 day
1.5 days
2 days
2 days
1 wk
3 days
1 day
2.5 days
0.5 days
3 days
0.5 days
0.5 days
0.25 days
0.25 days
3 days
2 days
0 days

Appendix 2
Getting started

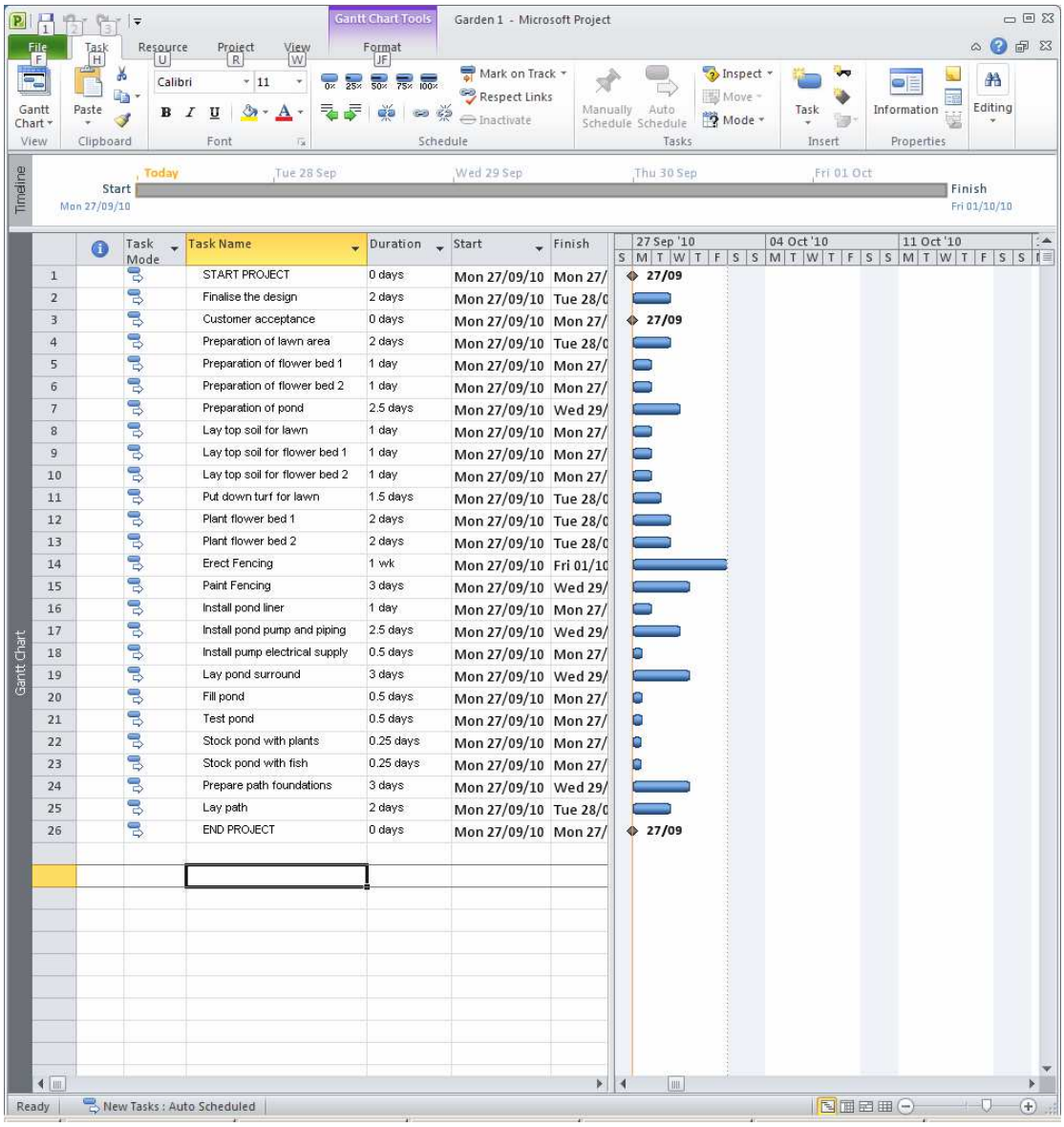


	Task Mode	Task Name	Duration	Predecessors
1		start	0 days	
2		a	5 days	1
3		b	4 days	1
4		c	6 days	2
5		d	2 days	3
6		e	5 days	3
7		f	6 days	4,5
8		end	0 days	6,7

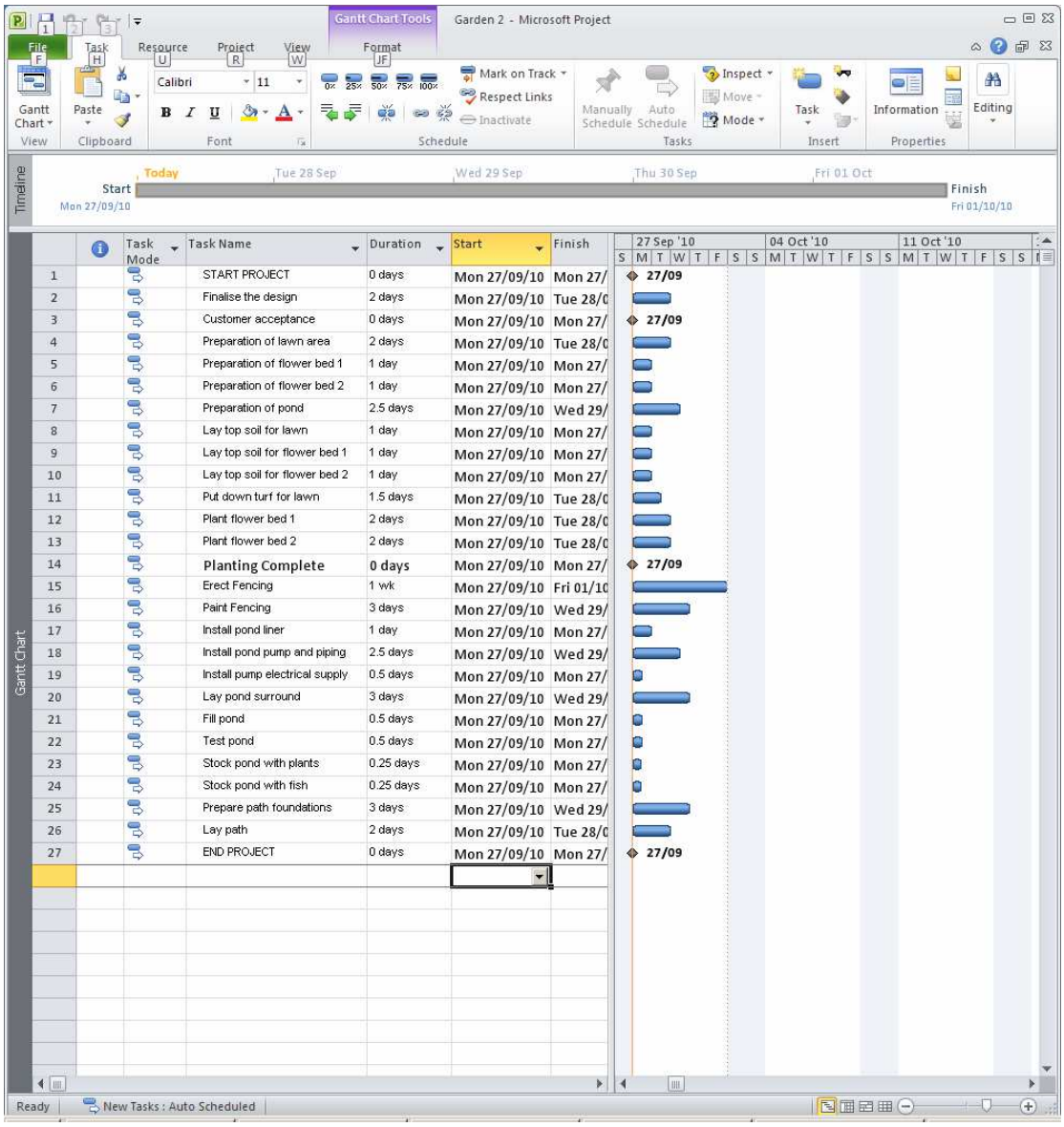


	Task Mode	Task Name	Duration	Predecessors
1		start	0 days	
2		a	5 days	1
3		b	4 days	1
4		c	6 days	2
5		d	2 days	3
6		e	5 days	3
7		f	6 days	4,5
8		end	0 days	6,7

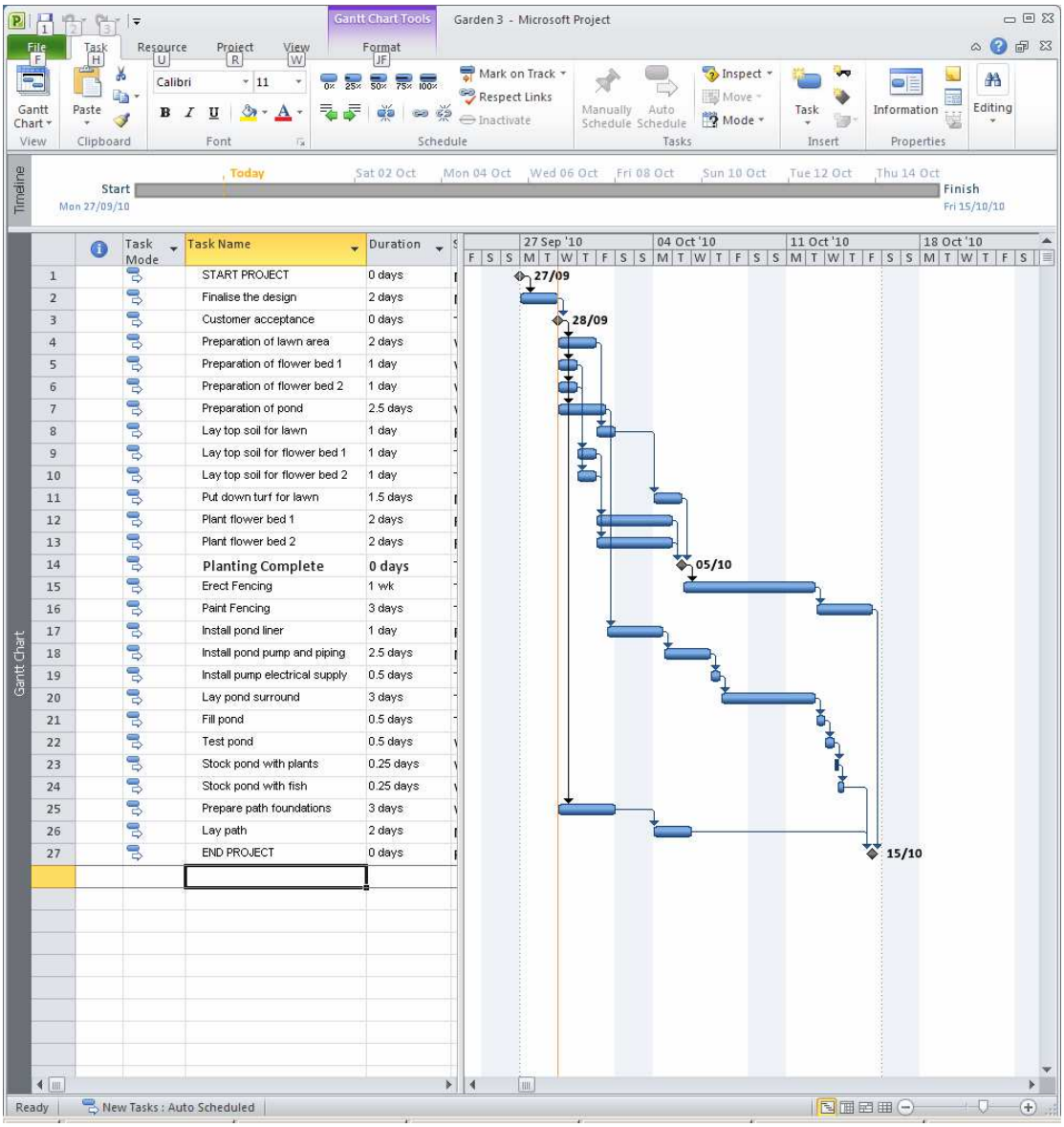
Garden 1


Garden 1 - Microsoft Project
Gantt Chart Tools
File
Task
Resource
Project
View
Format
Gantt Chart
Paste
Calibri
11
Mark on Track
Respect Links
Inactivate
Manually Schedule
Auto Schedule
Inspect
Move
Mode
Task
Information
Editing
View
Clipboard
Font
Schedule
Tasks
Insert
Properties
Timeline
Today
Tue 28 Sep
Wed 29 Sep
Thu 30 Sep
Fri 01 Oct
Start
Mon 27/09/10
Finish
Fri 01/10/10
Gantt Chart
Task Mode
Task Name
Duration
Start
Finish
27 Sep '10
04 Oct '10
11 Oct '10
1 START PROJECT 0 days Mon 27/09/10 Mon 27/
2 Finalise the design 2 days Mon 27/09/10 Tue 28/0
3 Customer acceptance 0 days Mon 27/09/10 Mon 27/
4 Preparation of lawn area 2 days Mon 27/09/10 Tue 28/0
5 Preparation of flower bed 1 1 day Mon 27/09/10 Mon 27/
6 Preparation of flower bed 2 1 day Mon 27/09/10 Mon 27/
7 Preparation of pond 2.5 days Mon 27/09/10 Wed 29/
8 Lay top soil for lawn 1 day Mon 27/09/10 Mon 27/
9 Lay top soil for flower bed 1 1 day Mon 27/09/10 Mon 27/
10 Lay top soil for flower bed 2 1 day Mon 27/09/10 Mon 27/
11 Put down turf for lawn 1.5 days Mon 27/09/10 Tue 28/0
12 Plant flower bed 1 2 days Mon 27/09/10 Tue 28/0
13 Plant flower bed 2 2 days Mon 27/09/10 Tue 28/0
14 Erect Fencing 1 wk Mon 27/09/10 Fri 01/10
15 Paint Fencing 3 days Mon 27/09/10 Wed 29/
16 Install pond liner 1 day Mon 27/09/10 Mon 27/
17 Install pond pump and piping 2.5 days Mon 27/09/10 Wed 29/
18 Install pump electrical supply 0.5 days Mon 27/09/10 Mon 27/
19 Lay pond surround 3 days Mon 27/09/10 Wed 29/
20 Fill pond 0.5 days Mon 27/09/10 Mon 27/
21 Test pond 0.5 days Mon 27/09/10 Mon 27/
22 Stock pond with plants 0.25 days Mon 27/09/10 Mon 27/
23 Stock pond with fish 0.25 days Mon 27/09/10 Mon 27/
24 Prepare path foundations 3 days Mon 27/09/10 Wed 29/
25 Lay path 2 days Mon 27/09/10 Tue 28/0
26 END PROJECT 0 days Mon 27/09/10 Mon 27/
27/09
Ready
New Tasks : Auto Scheduled

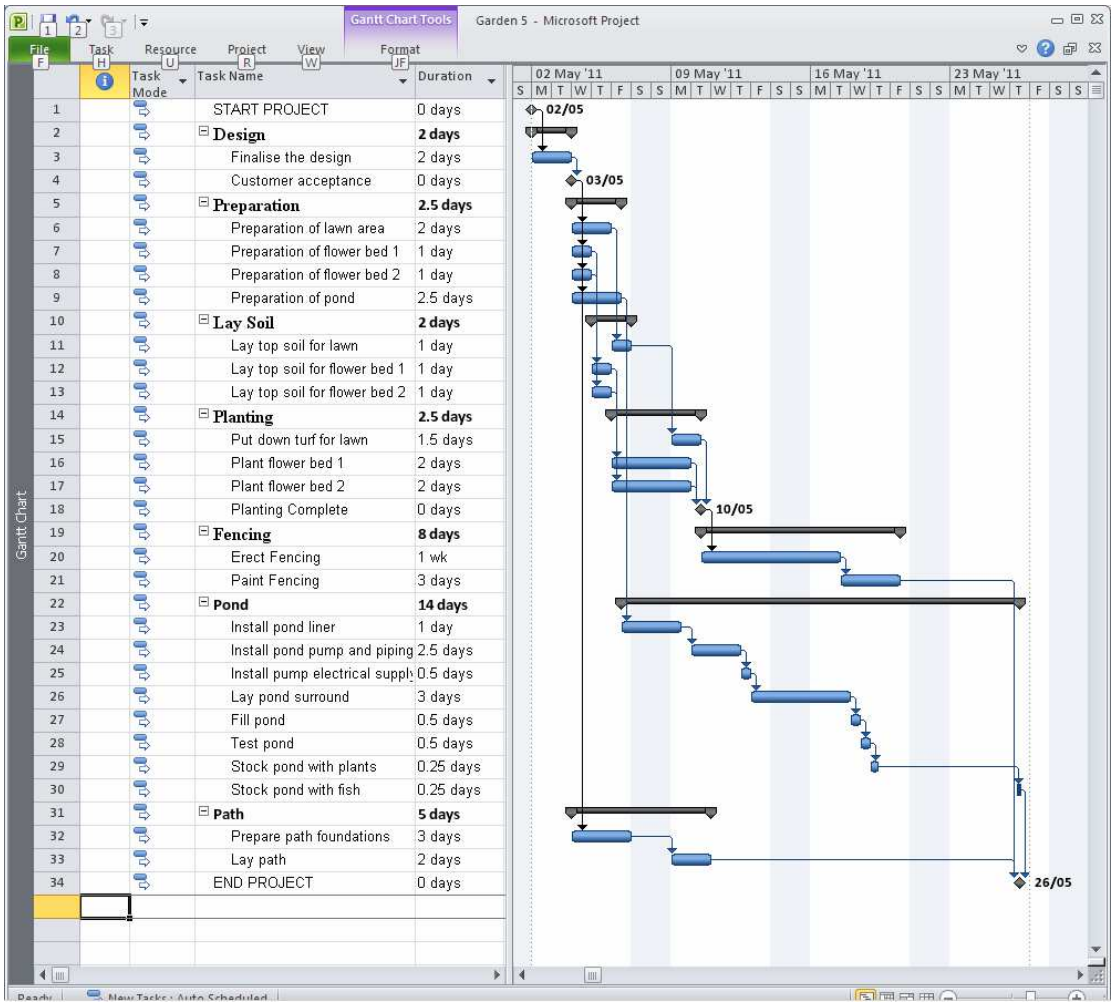
Garden 2


Garden 2 - Microsoft Project
Gantt Chart Tools
File
Task
Resource
Project
View
Format
Gantt Chart
Paste
Calibri
11
Mark on Track
Respect Links
Inactivate
Manually Schedule
Auto Schedule
Inspect
Move
Mode
Task
Information
Editing
View
Clipboard
Font
Schedule
Tasks
Insert
Properties
Timeline
Today
Tue 28 Sep
Wed 29 Sep
Thu 30 Sep
Fri 01 Oct
Start
Mon 27/09/10
Finish
Fri 01/10/10
Gantt Chart
Task Mode
Task Name
Duration
Start
Finish
27 Sep '10
04 Oct '10
11 Oct '10
1 START PROJECT 0 days Mon 27/09/10 Mon 27/
2 Finalise the design 2 days Mon 27/09/10 Tue 28/0
3 Customer acceptance 0 days Mon 27/09/10 Mon 27/
4 Preparation of lawn area 2 days Mon 27/09/10 Tue 28/0
5 Preparation of flower bed 1 1 day Mon 27/09/10 Mon 27/
6 Preparation of flower bed 2 1 day Mon 27/09/10 Mon 27/
7 Preparation of pond 2.5 days Mon 27/09/10 Wed 29/
8 Lay top soil for lawn 1 day Mon 27/09/10 Mon 27/
9 Lay top soil for flower bed 1 1 day Mon 27/09/10 Mon 27/
10 Lay top soil for flower bed 2 1 day Mon 27/09/10 Mon 27/
11 Put down turf for lawn 1.5 days Mon 27/09/10 Tue 28/0
12 Plant flower bed 1 2 days Mon 27/09/10 Tue 28/0
13 Plant flower bed 2 2 days Mon 27/09/10 Tue 28/0
14 Planting Complete 0 days Mon 27/09/10 Mon 27/
15 Erect Fencing 1 wk Mon 27/09/10 Fri 01/10
16 Paint Fencing 3 days Mon 27/09/10 Wed 29/
17 Install pond liner 1 day Mon 27/09/10 Mon 27/
18 Install pond pump and piping 2.5 days Mon 27/09/10 Wed 29/
19 Install pump electrical supply 0.5 days Mon 27/09/10 Mon 27/
20 Lay pond surround 3 days Mon 27/09/10 Wed 29/
21 Fill pond 0.5 days Mon 27/09/10 Mon 27/
22 Test pond 0.5 days Mon 27/09/10 Mon 27/
23 Stock pond with plants 0.25 days Mon 27/09/10 Mon 27/
24 Stock pond with fish 0.25 days Mon 27/09/10 Mon 27/
25 Prepare path foundations 3 days Mon 27/09/10 Wed 29/
26 Lay path 2 days Mon 27/09/10 Tue 28/0
27 END PROJECT 0 days Mon 27/09/10 Mon 27/
27/09
Ready
New Tasks : Auto Scheduled

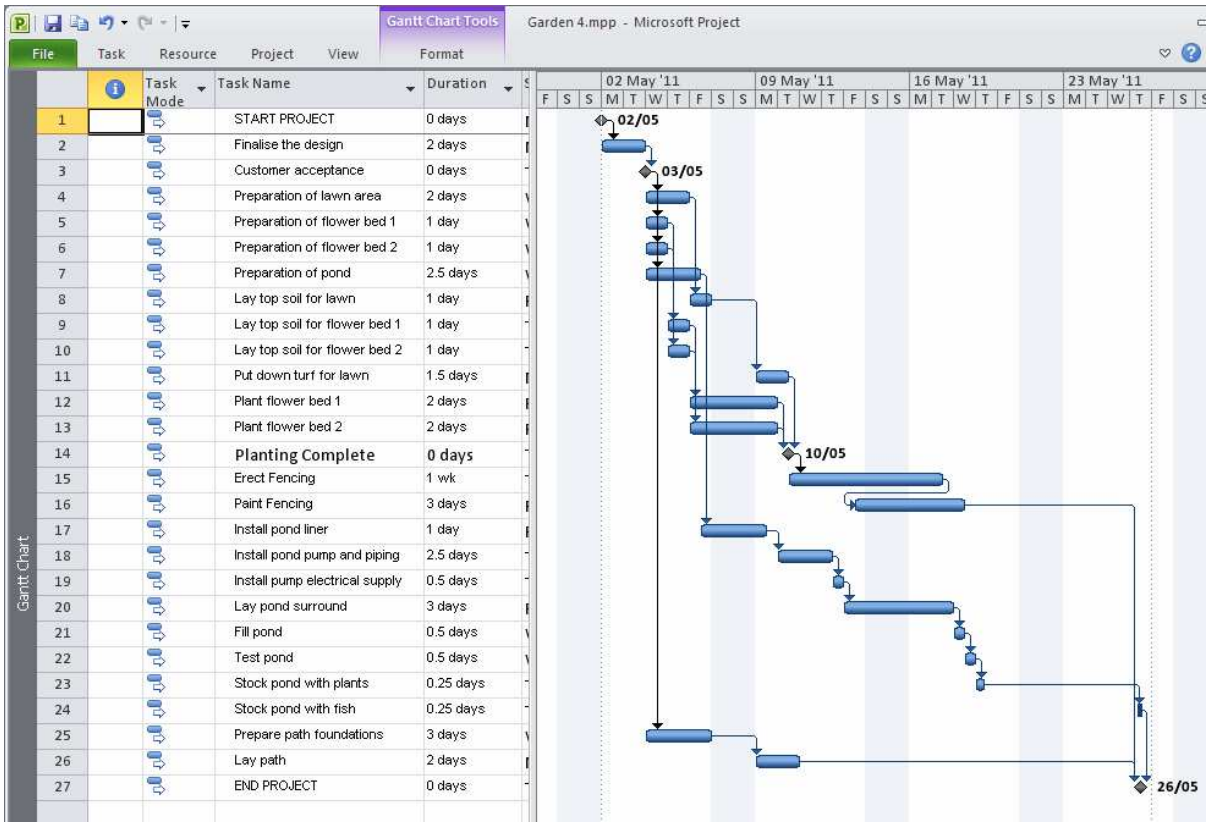
Garden 3 without lags



Garden 4 the pond lags added

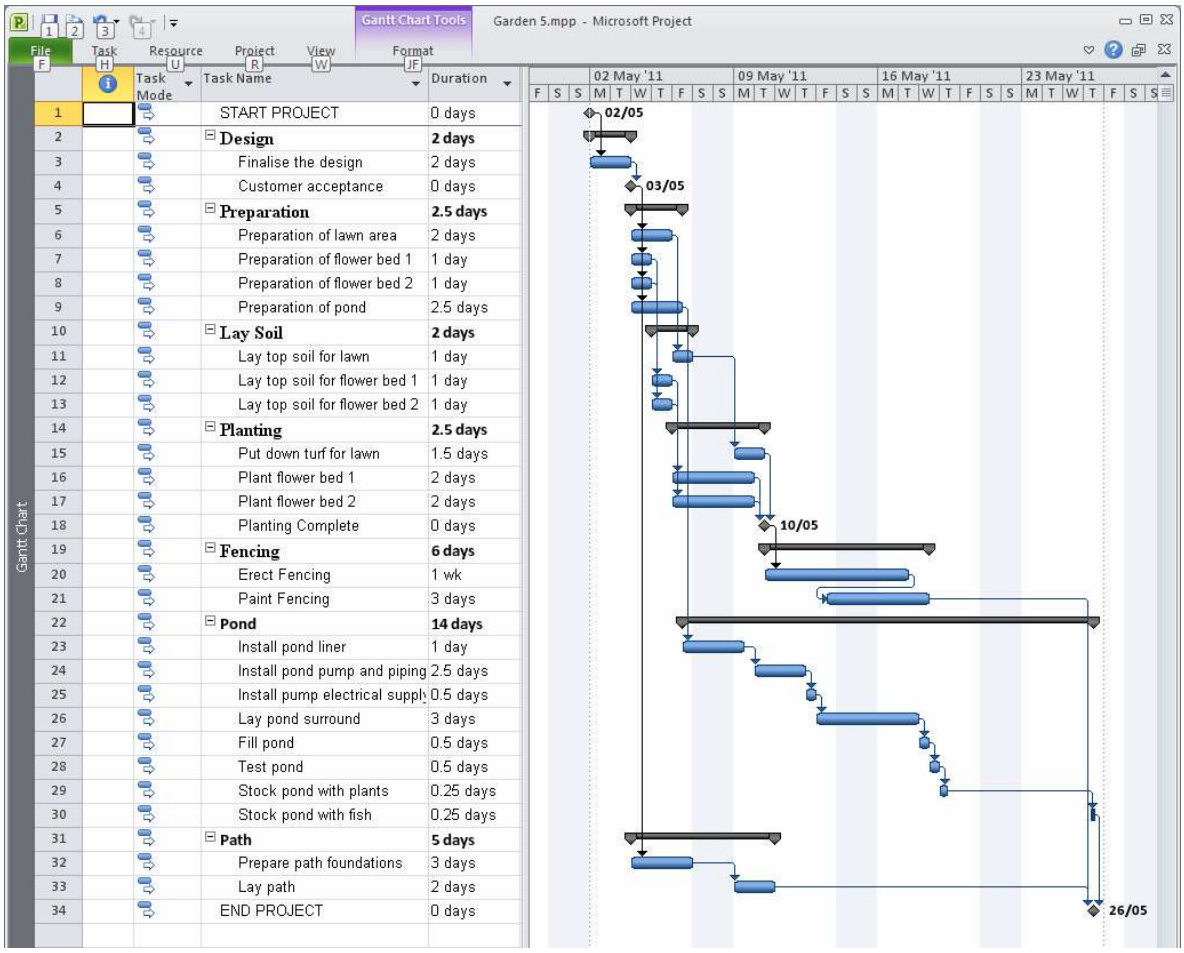


Garden 4 with negative and positive lags added



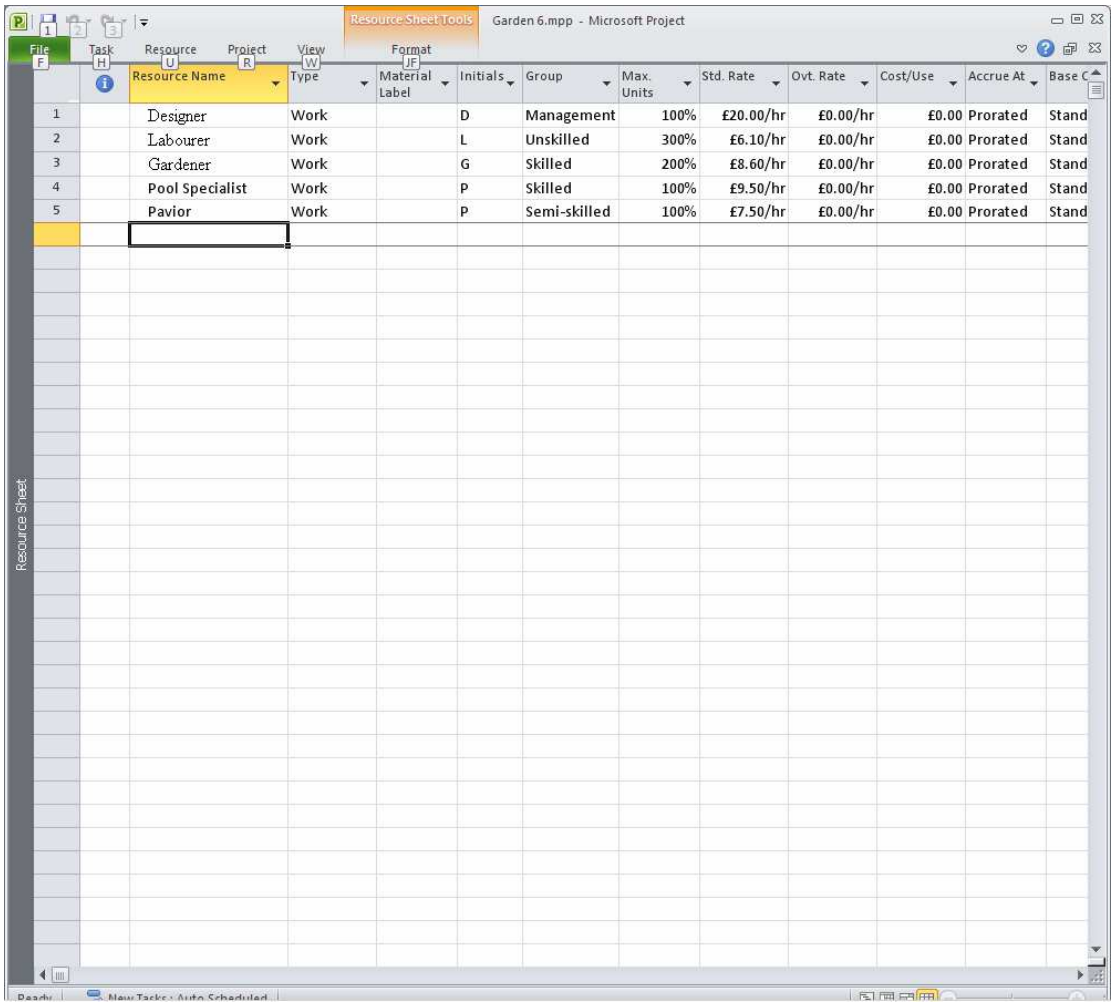
	Task Mode	Task Name	Duration
1		START PROJECT	0 days
2		Finalise the design	2 days
3		Customer acceptance	0 days
4		Preparation of lawn area	2 days
5		Preparation of flower bed 1	1 day
6		Preparation of flower bed 2	1 day
7		Preparation of pond	2.5 days
8		Lay top soil for lawn	1 day
9		Lay top soil for flower bed 1	1 day
10		Lay top soil for flower bed 2	1 day
11		Put down turf for lawn	1.5 days
12		Plant flower bed 1	2 days
13		Plant flower bed 2	2 days
14		**Planting Complete**	**0 days**
15		Erect Fencing	1 wk
16		Paint Fencing	3 days
17		Install pond liner	1 day
18		Install pond pump and piping	2.5 days
19		Install pump electrical supply	0.5 days
20		Lay pond surround	3 days
21		Fill pond	0.5 days
22		Test pond	0.5 days
23		Stock pond with plants	0.25 days
24		Stock pond with fish	0.25 days
25		Prepare path foundations	3 days
26		Lay path	2 days
27		END PROJECT	0 days

Garden 5

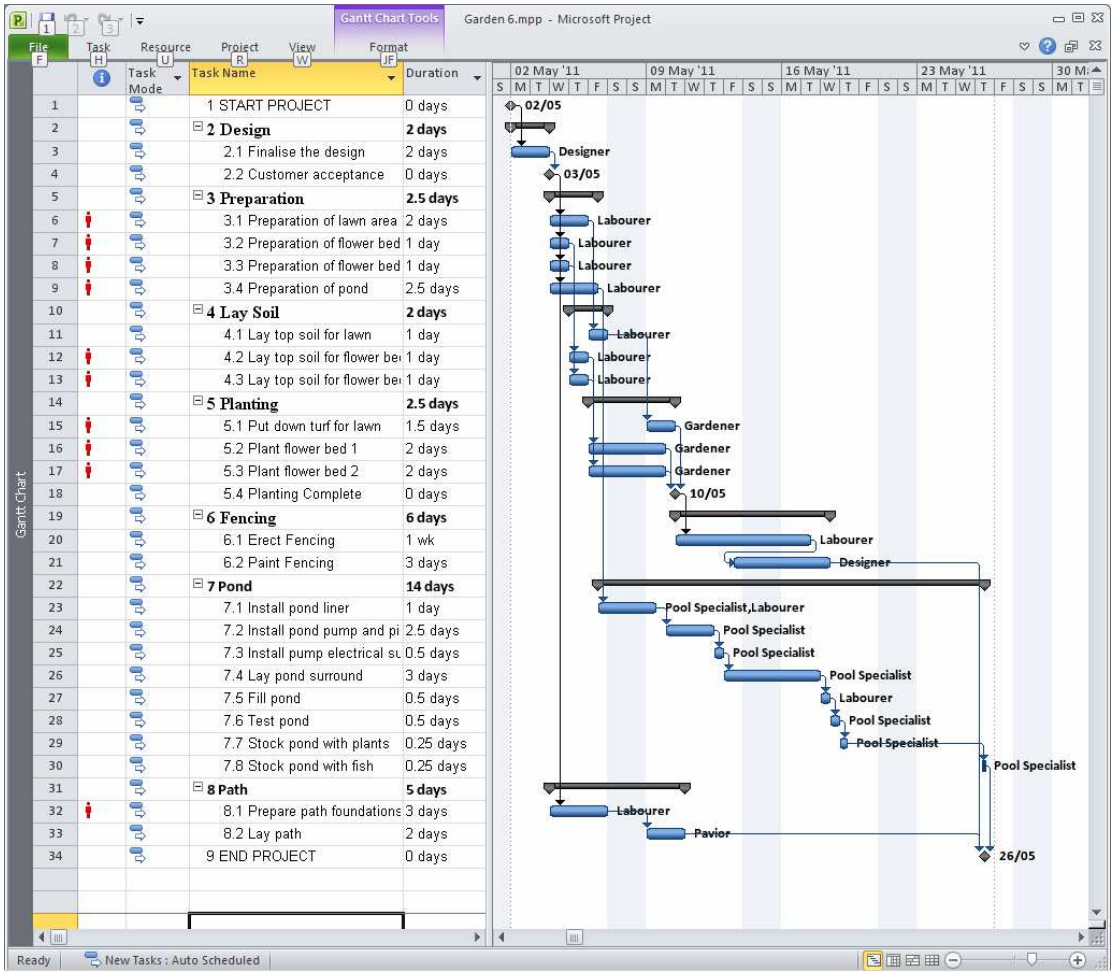


	Task Mode	Task Name	Duration
1		START PROJECT	0 days
2		**Design**	**2 days**
3		Finalise the design	2 days
4		Customer acceptance	0 days
5		**Preparation**	**2.5 days**
6		Preparation of lawn area	2 days
7		Preparation of flower bed 1	1 day
8		Preparation of flower bed 2	1 day
9		Preparation of pond	2.5 days
10		**Lay Soil**	**2 days**
11		Lay top soil for lawn	1 day
12		Lay top soil for flower bed 1	1 day
13		Lay top soil for flower bed 2	1 day
14		**Planting**	**2.5 days**
15		Put down turf for lawn	1.5 days
16		Plant flower bed 1	2 days
17		Plant flower bed 2	2 days
18		Planting Complete	0 days
19		**Fencing**	**6 days**
20		Erect Fencing	1 wk
21		Paint Fencing	3 days
22		**Pond**	**14 days**
23		Install pond liner	1 day
24		Install pond pump and piping	2.5 days
25		Install pump electrical supply	0.5 days
26		Lay pond surround	3 days
27		Fill pond	0.5 days
28		Test pond	0.5 days
29		Stock pond with plants	0.25 days
30		Stock pond with fish	0.25 days
31		**Path**	**5 days**
32		Prepare path foundations	3 days
33		Lay path	2 days
34		END PROJECT	0 days

Garden 6



	Resource Name	Type	Material Label	Initials	Group	Max. Units	Std. Rate	Ovt. Rate	Cost/Use	Accrue At	Base C
1	Designer	Work		D	Management	100%	£20.00/hr	£0.00/hr	£0.00	Prorated	Stand
2	Labourer	Work		L	Unskilled	300%	£6.10/hr	£0.00/hr	£0.00	Prorated	Stand
3	Gardener	Work		G	Skilled	200%	£8.60/hr	£0.00/hr	£0.00	Prorated	Stand
4	Pool Specialist	Work		P	Skilled	100%	£9.50/hr	£0.00/hr	£0.00	Prorated	Stand
5	Pavior	Work		P	Semi-skilled	100%	£7.50/hr	£0.00/hr	£0.00	Prorated	Stand

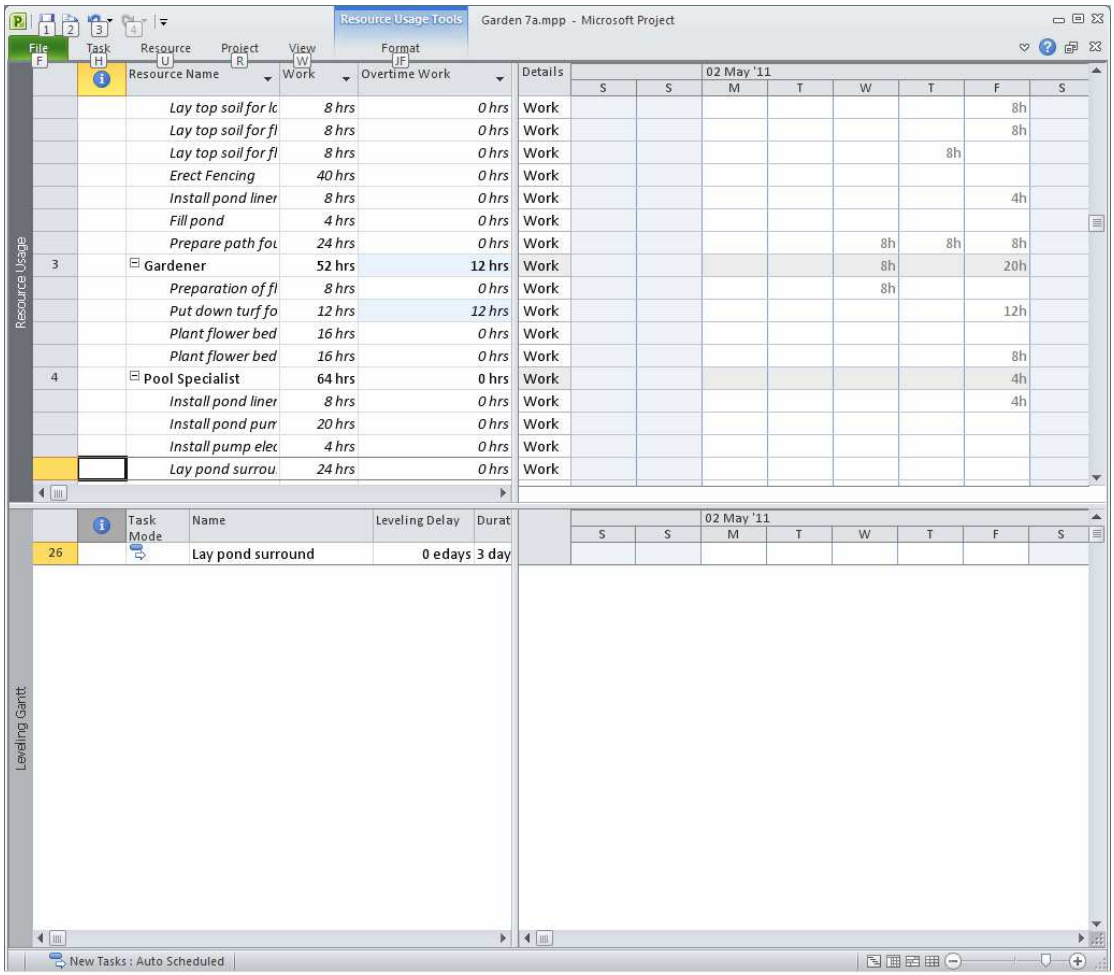

Gantt Chart Tools
Garden 6.mpp - Microsoft Project
File
Task
Resource
Project
View
Format
Gantt Chart
Task Mode
Task Name
Duration
1 START PROJECT 0 days
2 Design 2 days
2.1 Finalise the design 2 days
2.2 Customer acceptance 0 days
3 Preparation 2.5 days
3.1 Preparation of lawn area 2 days
3.2 Preparation of flower bed 1 day
3.3 Preparation of flower bed 1 day
3.4 Preparation of pond 2.5 days
4 Lay Soil 2 days
4.1 Lay top soil for lawn 1 day
4.2 Lay top soil for flower be 1 day
4.3 Lay top soil for flower be 1 day
5 Planting 2.5 days
5.1 Put down turf for lawn 1.5 days
5.2 Plant flower bed 1 2 days
5.3 Plant flower bed 2 2 days
5.4 Planting Complete 0 days
6 Fencing 6 days
6.1 Erect Fencing 1 wk
6.2 Paint Fencing 3 days
7 Pond 14 days
7.1 Install pond liner 1 day
7.2 Install pond pump and pi 2.5 days
7.3 Install pump electrical su 0.5 days
7.4 Lay pond surround 3 days
7.5 Fill pond 0.5 days
7.6 Test pond 0.5 days
7.7 Stock pond with plants 0.25 days
7.8 Stock pond with fish 0.25 days
8 Path 5 days
8.1 Prepare path foundations 3 days
8.2 Lay path 2 days
9 END PROJECT 0 days
02 May '11
09 May '11
16 May '11
23 May '11
02/05
Designer
03/05
Labourer
Labourer
Labourer
Labourer
Labourer
Labourer
Labourer
Gardener
Gardener
Gardener
10/05
Labourer
Designer
Pool Specialist,Labourer
Pool Specialist
Pool Specialist
Pool Specialist
Labourer
Pool Specialist
Pool Specialist
Pool Specialist
Labourer
Pavior
26/05
Ready
New Tasks : Auto Scheduled

Garden 7

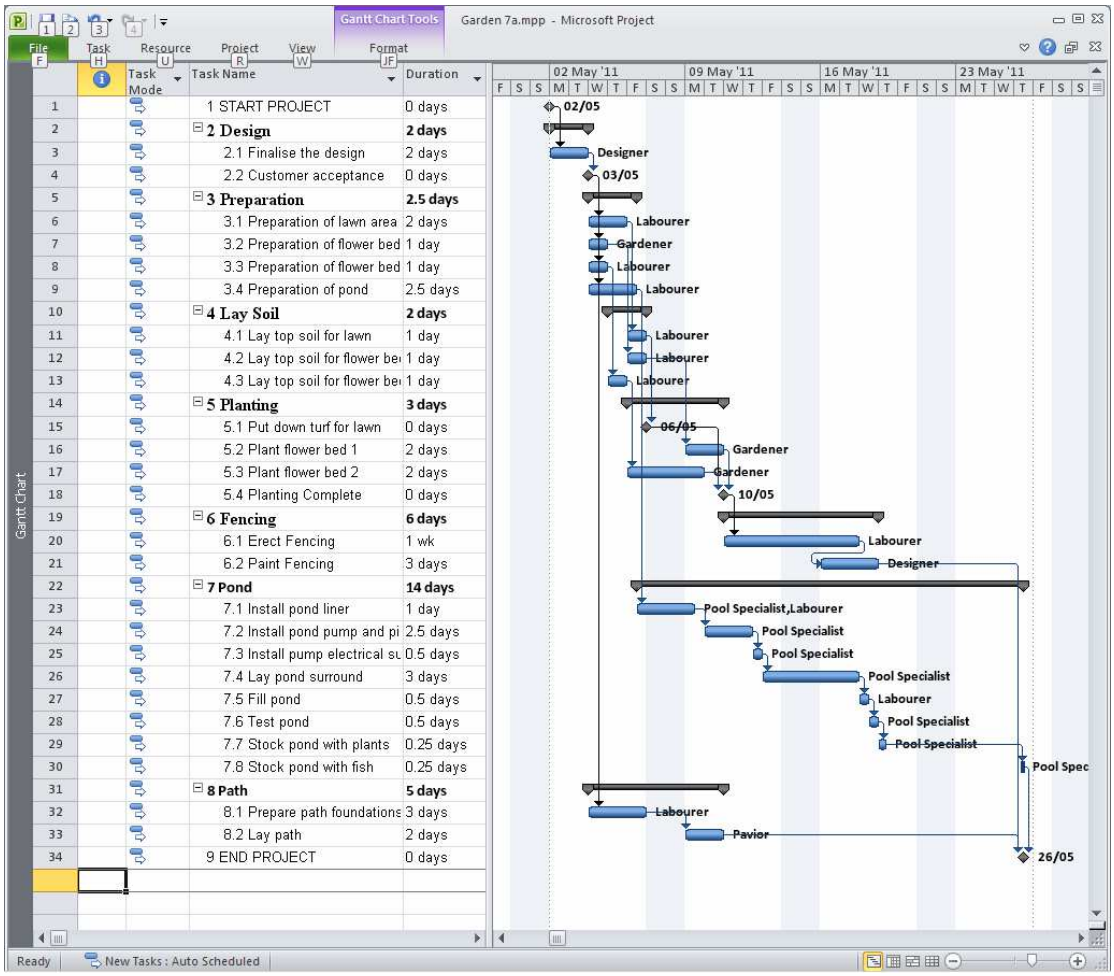
Project1

	Task Name	Duration	Predecessor	Re
1	start	0 days		
2	a	5 days	1	
3	b	4 days	1	
4	c	6 days	2	
5	d	2 days	3	
6	e	5 days	3	
7	f	6 days	4,5	
8	end	0 days	6,7	

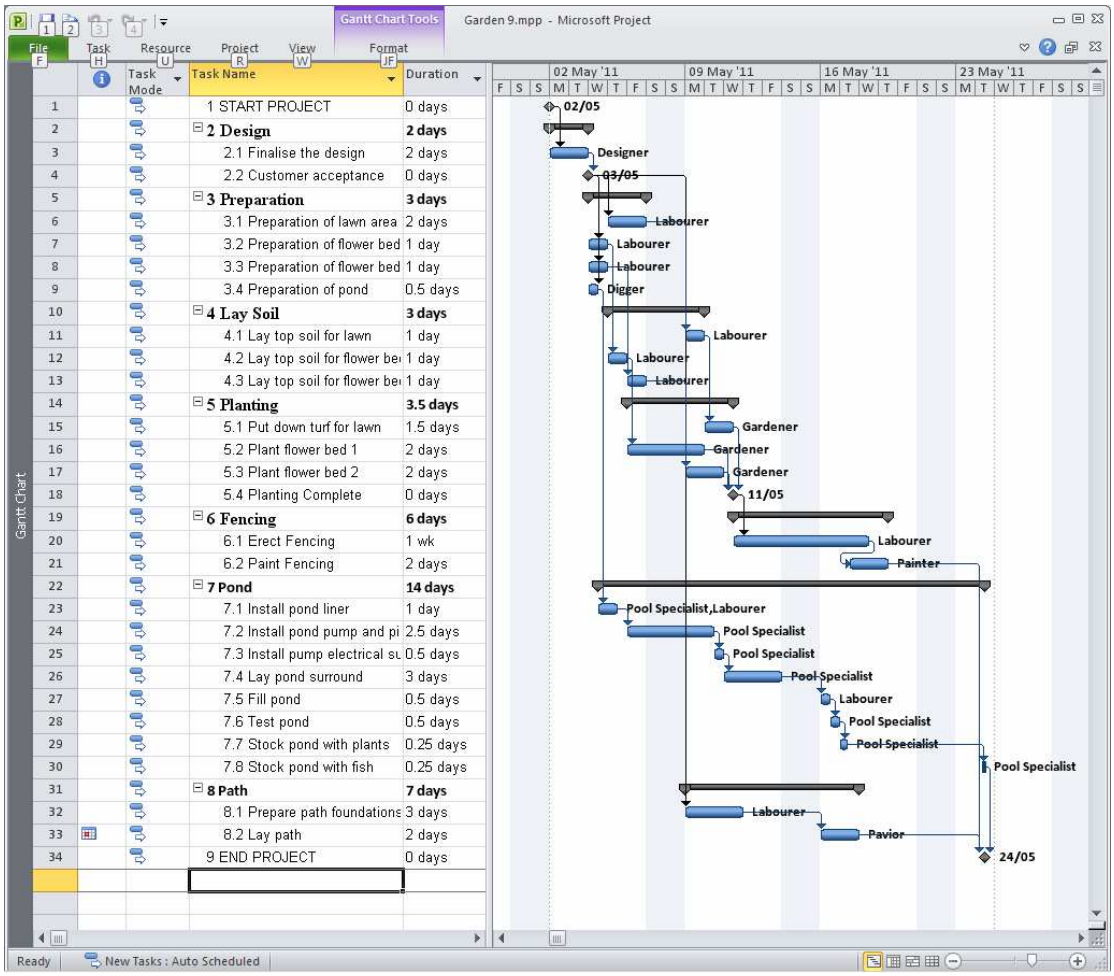
Garden 7a


Resource Usage Tools
Garden 7a.mpp - Microsoft Project
File
Task
Resource
Project
View
Format
Resource Usage
Resource Name
Work
Overtime Work
Details
02 May '11
S S M T W T F S
Lay top soil for lc 8 hrs 0 hrs Work 8h
Lay top soil for fl 8 hrs 0 hrs Work 8h
Lay top soil for fl 8 hrs 0 hrs Work 8h
Erect Fencing 40 hrs 0 hrs Work
Install pond liner 8 hrs 0 hrs Work 4h
Fill pond 4 hrs 0 hrs Work
Prepare path fou 24 hrs 0 hrs Work 8h 8h 8h
3 Gardener 52 hrs 12 hrs Work 8h 20h
Preparation of fl 8 hrs 0 hrs Work 8h
Put down turf fo 12 hrs 12 hrs Work 12h
Plant flower bed 16 hrs 0 hrs Work
Plant flower bed 16 hrs 0 hrs Work 8h
4 Pool Specialist 64 hrs 0 hrs Work 4h
Install pond liner 8 hrs 0 hrs Work 4h
Install pond purr 20 hrs 0 hrs Work
Install pump elec 4 hrs 0 hrs Work
Lay pond surrou 24 hrs 0 hrs Work
Leveling Gantt
Task Mode
Name
Leveling Delay
Durat
26 Lay pond surround 0 edays 3 day
02 May '11
S S M T W T F S
New Tasks : Auto Scheduled

Garden 7a Gantt after it has been manually levelled.



Garden 9


Gantt Chart Tools
Garden 9.mpp - Microsoft Project
File
Task
Resource
Project
View
Format
Gantt Chart
Ready
New Tasks : Auto Scheduled
02 May '11
09 May '11
16 May '11
23 May '11
1 START PROJECT 0 days
2 Design 2 days
2.1 Finalise the design 2 days
2.2 Customer acceptance 0 days
3 Preparation 3 days
3.1 Preparation of lawn area 2 days
3.2 Preparation of flower bed 1 day
3.3 Preparation of flower bed 1 day
3.4 Preparation of pond 0.5 days
4 Lay Soil 3 days
4.1 Lay top soil for lawn 1 day
4.2 Lay top soil for flower bed 1 day
4.3 Lay top soil for flower bed 1 day
5 Planting 3.5 days
5.1 Put down turf for lawn 1.5 days
5.2 Plant flower bed 1 2 days
5.3 Plant flower bed 2 2 days
5.4 Planting Complete 0 days
6 Fencing 6 days
6.1 Erect Fencing 1 wk
6.2 Paint Fencing 2 days
7 Pond 14 days
7.1 Install pond liner 1 day
7.2 Install pond pump and pi 2.5 days
7.3 Install pump electrical su 0.5 days
7.4 Lay pond surround 3 days
7.5 Fill pond 0.5 days
7.6 Test pond 0.5 days
7.7 Stock pond with plants 0.25 days
7.8 Stock pond with fish 0.25 days
8 Path 7 days
8.1 Prepare path foundations 3 days
8.2 Lay path 2 days
9 END PROJECT 0 days
02/05
Designer
03/05
Labourer
Labourer
Labourer
Digger
Labourer
Labourer
Labourer
Gardener
Gardener
Gardener
11/05
Labourer
Painter
Pool Specialist,Labourer
Pool Specialist
Pool Specialist
Pool Specialist
Labourer
Pool Specialist
Pool Specialist
Pool Specialist
Labourer
Pavior
24/05