CHAPTER 12

CONSTRAINTS AND DEADLINES

INFOCUS

WPL_J411

Life is made up of *constraints* and *deadlines* – so too are projects.

All tasks which are created in Microsoft Project are automatically assigned the constraint *As Soon As Possible*. This particular constraint requires each task to begin as early as possible, depending on the project start date and any relationships which have been set.

Constraints allow you to place restrictions on the way Microsoft Project calculates task start and finish dates. This may be necessary when you need to take into account external factors such as resource availability.

Microsoft Project also gives you the option to set a *deadline* on tasks. This simply indicates when you want a task to be completed, without limiting the schedule calculations by setting a constraint.

In this session you will:

✓ gain an understanding of constraints and deadlines
✓ learn how to review project status
✓ learn how to add a constraint to a task
✓ learn how to resolve conflicts caused by constraints
✓ learn how to reschedule tasks to overcome constraint issues
✓ learn how to create a deadline.

UNDERSTANDING CONSTRAINTS AND DEADLINES

Every new task that you create in a project has a *constraint* imposed upon it. It is the type of constraint that dictates to Microsoft Project which calculation methodology to use for scheduling.

When you add a new task to a project the task is constrained by *As Soon As Possible* for a project based on a *start date*, and by *As Late As Possible* for a project based on a *finish date*.
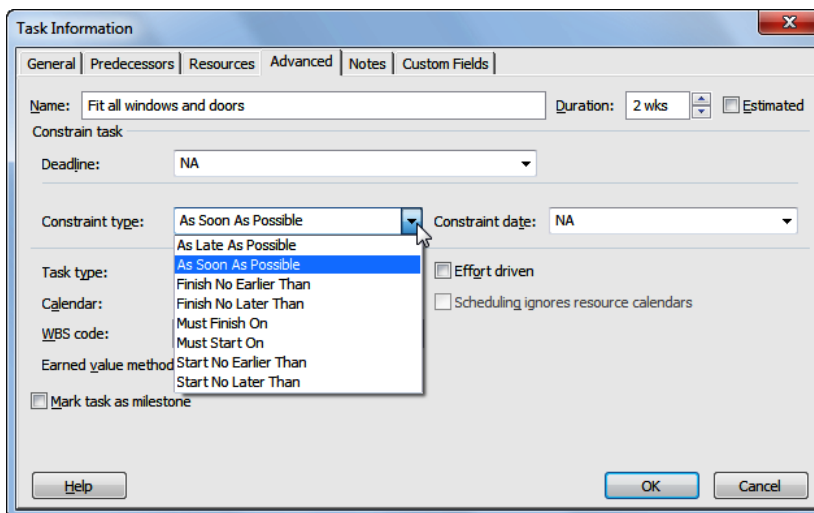
Constraints

Microsoft Project considers the sequencing requirements based on the task's predecessors and then schedules the task after these requirements are completed – in the literal sense of the word, there are no real constraints placed on the task.

Constraints are rules or directives that will affect the outcome of a task. For example, a specific task might have to start on a particular day, or it may have to be finished by a certain date. These are constraints.

However, the default constraint can be changed to one of the following.

- As Late As Possible
- As Soon As Possible
- Finish No Earlier Than
- Finish No Later Than
- Must Finish On
- Must Start On
- Start No Earlier Than
- Start No Later Than

They can easily be changed in the *Task Information* dialog box.

Constraints in Microsoft Project can be either *hard* or *soft.*

A *hard constraint* is one where the constraint must be honoured even if the predecessor links must be violated. This is the default setting in Microsoft Project.

A *soft constraint* is one where the predecessor relationship is honoured rather than the constraint.

Changing constraints to either hard or soft is done using the *Tasks will always honour their constraint dates* option in the *Schedule* tab of the *Options* dialog box.

Deadlines

Microsoft Project also allows you to assign a *deadline* to a task.

A deadline is like a constraint on sedatives. Unlike a constraint, which can determine the outcome of the project, a schedule deadline is simply a marker placed against a task and a time. If the task fails to be completed within the deadline an indicator appears in the project but the schedule remains unaffected.

REVIEWING OUR PROJECT

In this session you are going to enter some constraints and deadlines in the project for *The Rostadium* construction. Before setting up constraints or deadlines it's a good idea to review where the project is at in terms of start and end dates and matters financial. Even though you might be intimately aware of these factors it doesn't hurt to have another look.

Try This Yourself:

Open File

Before starting this exercise you MUST open the file J411 Constraints_1.mpp...

1   Spend a few moments studying the project

Let's examine some of the key information…

2   Click on the *Project* tab on the *Ribbon* and click on *Project Information* to display the *Project Information* dialog box
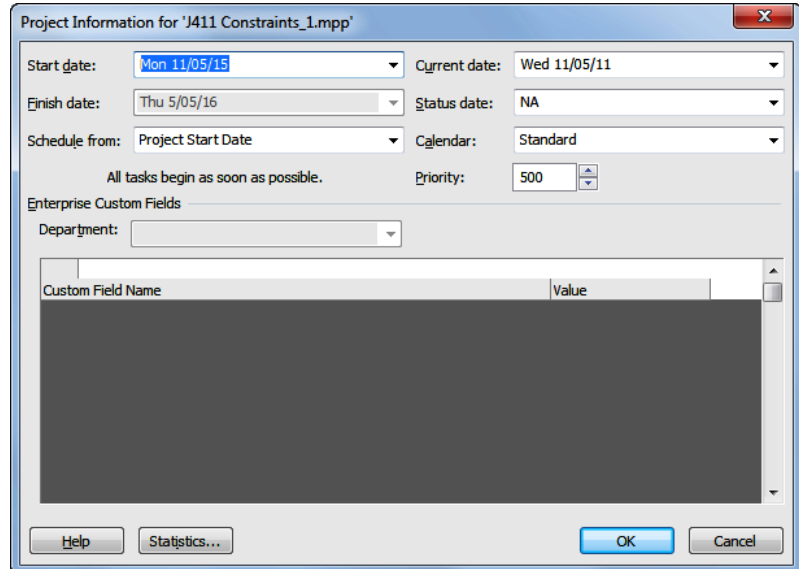
Notice that the project is scheduled to finish on Thursday, May 5. Ah, everything in our project is so calm and carefree – for the moment…
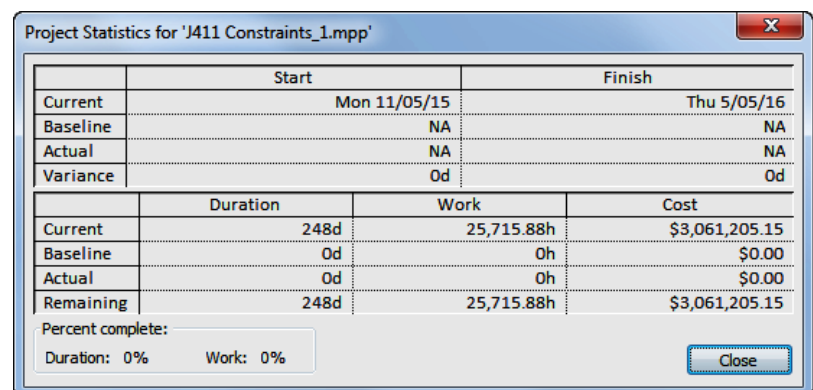
3   Click on **[Statistics]** to have a bit of a look here

4   Click on **[Close]** to close the statistics dialog box

2

Project Information for 'J411 Constraints_1.mpp'

Start date:	Mon 11/05/15	Current date:	Wed 11/05/11
Finish date:	Thu 5/05/16	Status date:	NA
Schedule from:	Project Start Date	Calendar:	Standard
	All tasks begin as soon as possible.	Priority:	500

Enterprise Custom Fields
Department:

Custom Field Name	Value

Help   Statistics…   OK   Cancel

3

Project Statistics for 'J411 Constraints_1.mpp'

	Start	Finish
Current	Mon 11/05/15	Thu 5/05/16
Baseline	NA	NA
Actual	NA	NA
Variance	0d	0d

	Duration	Work	Cost
Current	248d	25,715.88h	$3,061,205.15
Baseline	0d	0h	$0.00
Actual	0d	0h	$0.00
Remaining	248d	25,715.88h	$3,061,205.15

Percent complete:
Duration: 0%   Work: 0%

Close

For Your Reference…

To *review* project information and statistics:

1. Click on the *Project* tab on the *Ribbon* and click on *Project Information* to display the *Project Information* dialog box
2. Click on **[Statistics]**

Handy to Know…

- Reviewing the project information and statistics should be done regularly. Even the smallest change to a task can throw a project schedule out. By regularly checking the schedule and statistics you will pick up changes before they become too entrenched – hopefully!

ADDING A CONSTRAINT

The project manager has been told that the official opening of the new ***Rostadium*** complex must take place on Saturday, April 30 at 7:30 pm. Our stadium will need to be completed by this date – this is a ***constraint*** imposed on our project. The opening's start time is a *hard* constraint so it's going to have to be set up as a ***Must Start On*** constraint.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file J411 Constraints_1.mpp...

1   Scroll down the list of tasks and double click on ***Official opening*** to display the ***Task Information*** dialog box and click on the ***Advanced*** tab

2   Click on the drop arrow for ***Constraint type*** and click on ***Must Start On***

3   Click on ***NA*** in ***Constraint date*** and type **30/4/16 07:30PM**

4   Click on **[OK]**

The Planning Wizard will appear because the constraint can't be met given the current state of the project – the critical path makes it impossible to have the ceremony on April 30…

5   Click on ***Continue. A Must Start On*** constraint will be set and click on **[OK]**

This time the Planning Wizard will advise of a scheduling conflict…

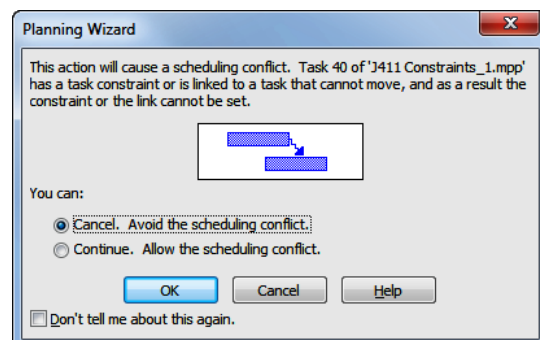6   Click on ***Continue. Allow scheduling conflict*** and click on **[OK]**
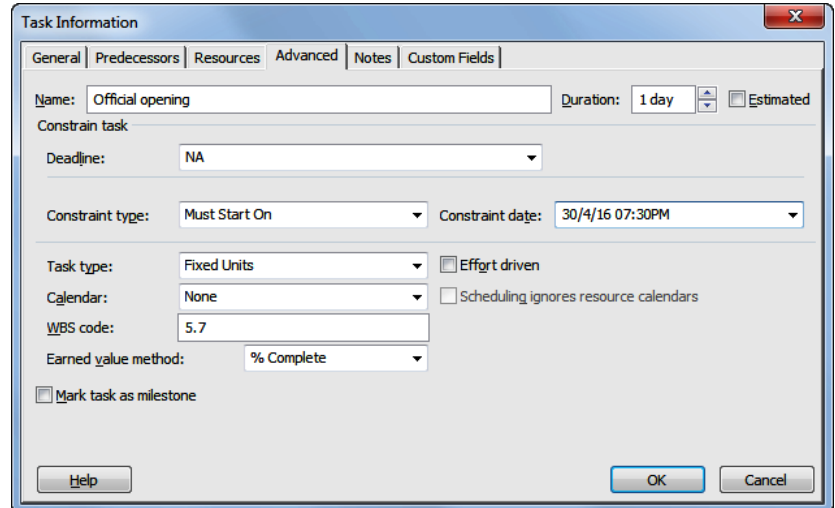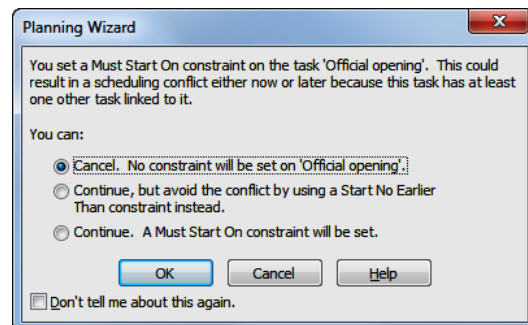
For Your Reference…

To apply a constraint to a task:

1. Double click on the task and click on the ***Advanced*** tab on the dialog box
2. Click on the ***Constraint*** type drop arrow and choose the appropriate constraint
3. Type a constraint date

Handy to Know…

- When a task is constrained a scheduling icon will appear next to the task. In our case study the Gantt Chart has become quite convoluted – notice that some tasks prior to the official opening are now scheduled to be done after the opening!

USING ELAPSED TIME

It is pretty clear that we need to resolve the scheduling conflict in the project. The conflict has occurred because the tasks on the critical path cannot be completed in time to honour the constraint on the *Official Opening* task. One problem we have is that the opening celebrations take place outside of normal working hours – but no one has told Microsoft Project of this!

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file J411 Constraints_2.mpp...

1   Click on the *Official opening* task, click on the *View* tab on the *Ribbon* and click on *Details* in *Split View* to see a *Task Form* in the lower pane

Notice that even though we said this started on Saturday at 7.30 PM it still occupies all of Monday. Actually the task should be 3 hours, not 1 day. Let's change the duration…

2   Click in *Duration* (in the top pane), type **3h** and press [Enter]

3   If the *Planning Wizard* has appeared click on *Continue*, and *Don't tell me about this again*, then on [OK]

4   Click in *Duration* (in the top pane), type **3eh** and press [Enter]

5   Click on *Details* in *Split View* to return to a single pane view

1
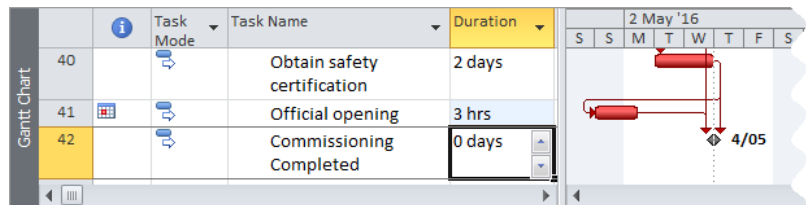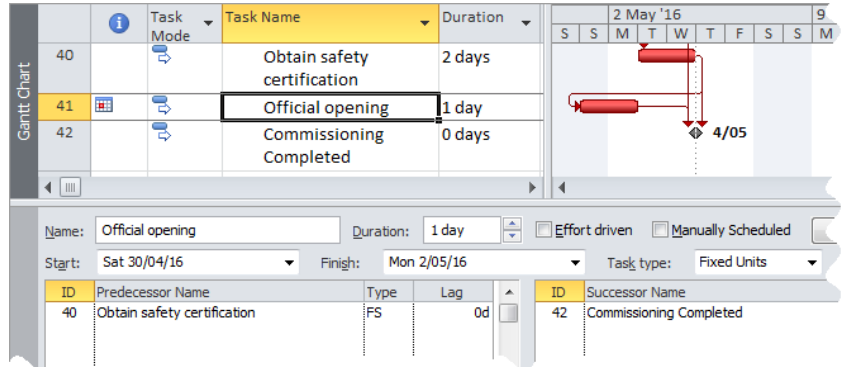
2   *This has reduced the duration but it still spills into Monday because we scheduled the start outside of normal working time. Microsoft Project has to assign the 3 hours in work time. The next available work period starts at 7:30 am on Monday morning.*
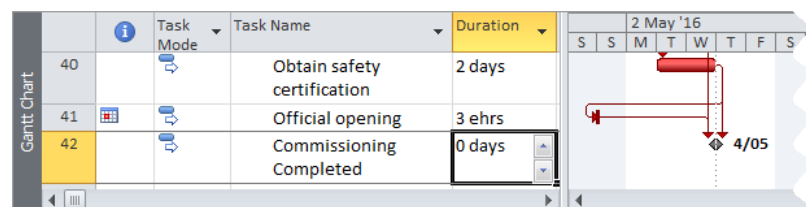
4   *By changing the duration to elapsed time we have adjusted the timeline. The duration is now applicable only to the Saturday.*

For Your Reference…

To specify *elapsed time*:

1. Click in the duration cell of the desired task
2. Insert the letter **e** (for elapsed) between the amount and type of duration (e.g. *3d* becomes *3ed*)
3. Press [Enter]

Handy to Know…

- We are not advocating that you resolve all scheduling problems as we have done above. The method you choose should be determined by the circumstances and situations within your project and each project is different.

RESCHEDULING TASKS

We've now reached crisis point in the case study. The official opening must be held on April 30 but, given the current schedule, there is no way this can happen. Something has to give and we need to go back and make some changes to the schedule. The problem lies towards the end of the project in the *Commissioning* phase and it is here that we'll look for solutions.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file J411 Constraints_3.mpp...

1 Set up the Gantt Chart so that you can see all of the *Commissioning* tasks together with their timelines

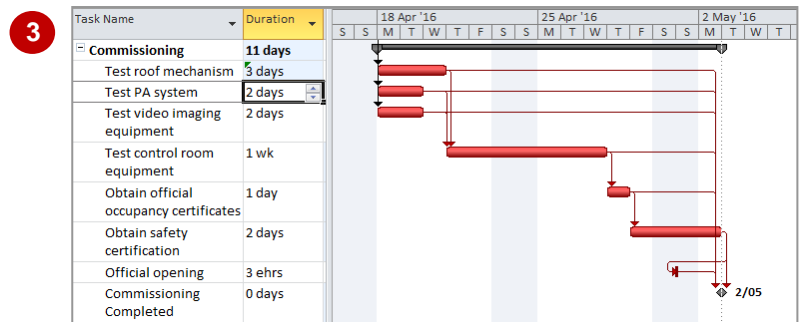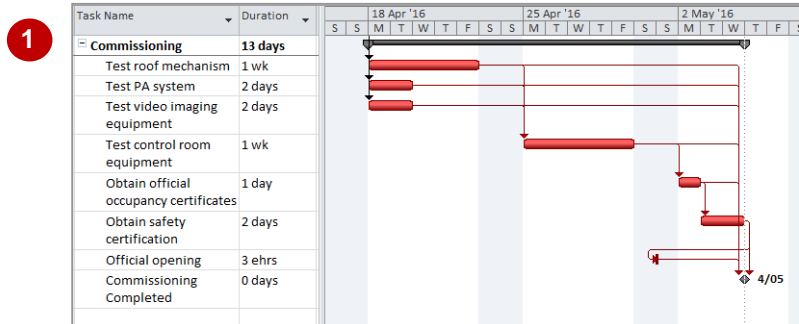2 Click on *1 wk* in *Duration* for *Test roof mechanism*, type **3d** and press `Enter`

A scheduling message appears because our schedule still doesn't fit within the constraint…

3 Click on **[OK]**

4 Click on *1 wk* for *Test control room equipment*, type **3d** and press `Enter`

Ah, success. But we'll dabble a little more…

5 Click on *2 days* for *Obtain safety certificatio*n, type **1d** and press `Enter`
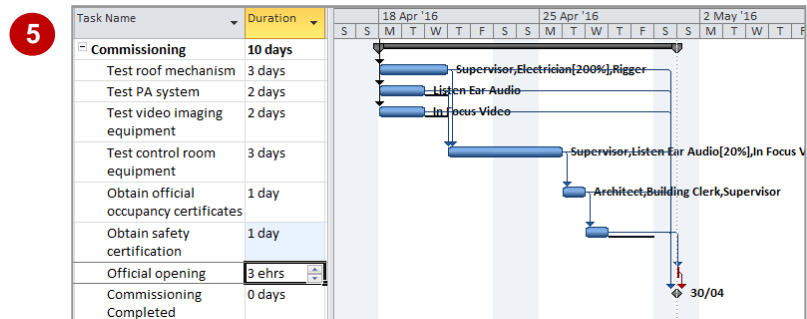
For Your Reference…

To reschedule tasks:

1. Review the problem area using a *Gantt Chart* view
2. Determine a strategy for overcoming the problem – e.g. change durations, task dependencies, or resources

Handy to Know…

- We could have changed the dependencies in some of the above so that the tasks started at the same time. However, this would have caused a resource conflict as the supervisor is used in most of these tasks.

CREATING A DEADLINE

Microsoft Project also allows you to assign *deadlines* to tasks. Unlike constraints, deadlines do not impact in any way on the outcome of a schedule and are not used by Microsoft Project to calculate schedule dates. Deadlines are simply *visual cues* that can be placed on a Gantt chart to show that a task was completed after a finish date.

Try This Yourself:

Same File

Continue using the previous file with this exercise, or open the file J411 Constraints_4.mpp...

1. Press `Ctrl` + `Home` ,then `Alt` + `Home` to move to the top and the start of the project

2. Double click on **Submit plans for approval** to display the **Task Information** dialog box and click on the **Advanced** tab

3. Click on **NA** in **Deadline** and type **26/06/15**

4. Click on **[OK]**

   A deadline icon will appear at the end of the task. Our task will be placed on the critical path

For Your Reference…

To add a **deadline** to a task:

1. Double click on the desired task, then click on the **Advanced** tab
2. Click on the **Deadline** date
3. Click on **[OK]**

Handy to Know…

- Deadlines appear visually only after the due date has elapsed and if the task is not completed by that date. They also appear in a **Deadline** field and can be used as part of the filtering system. E.g. you can create a filter that shows only tasks that have deadlines, or that are due on a specific date.

NOTES: