

Managing Projects in Primavera P6 Professional Rel 8.0

Volume I • Student Guide

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Course Objectives

Managing Projects in Primavera P6 Professional R8 will cover the following topics:

Section I: Overview and Creating a Project

Lesson 1 - Project Management Life Cycle

- Identify the five process groups in the Project Management Life Cycle.
- Describe the steps included in each process group.

Lesson 2 - Understanding Data in P6

- Describe functionality and technical environment of P6 (EPPM).
- Describe the Enterprise Project Structure.
- Describe the Organizational Breakdown Structure.
- Distinguish between enterprise data and project-specific data.

Lesson 3 - Overview and Navigation

- Log in to P6 Professional.
- Open an existing project.
- Open and navigate among different windows.
- Open an existing layout.
- Customize a layout.
- Save a layout.

Lesson 4 - Creating a Project

- Create a project.
- Navigate in the Projects window.
- View and modify information in Project Details.

Lesson 5 - Creating a Work Breakdown Structure

- Define a Work Breakdown Structure (WBS).
- Create multiple levels of a WBS hierarchy.

Lesson 6 - Adding Activities

- Describe an activity and its components.
- Describe activity types.
- Add activities.
- Add a Notebook topic to an activity.
- Add steps to an activity.
- Assign activity code values to activities.

*Case Study 1 - Creating a Project***Section II: Scheduling the Project and Managing Data***Lesson 7 - Assigning Calendars*

- Define work time and non-work time.
- Explain the differences between global, project, and resource calendars.
- Create a new project calendar.

Lesson 8 - Creating Relationships

- View a network logic diagram.
- Describe the four relationship types.
- Create relationships in the Activity Network.
- Create relationships in Activity Details.

Lesson 9 – Scheduling

- Describe Critical Path Method (CPM) Scheduling.
- Perform a forward and a backward pass.
- Describe float and its impact on a schedule.
- Identify loops and open ends.
- Calculate a schedule.

Lesson 10 - Assigning Constraints

- Describe available constraint types.
- Apply Must Finish By constraint to a project.
- Apply a Start On or After constraint to an activity.
- Add a Notebook topic to a constrained activity.

Lesson 11 - Creating Layouts

- Group activities according to specific criteria.
- Sort activities.
- Apply a filter.
- Create a filter.

Lesson 12 - Managing Work Products and Documents

- Describe the difference between a work product and a reference document.
- Create a document record.
- Link the document record to a project document or work product.
- Assign the project document to an activity or WBS.

*Case Study 2 - Scheduling the Project***Section III: Assigning Resources and Baselining***Lesson 13 - Understanding Roles and Resources*

- Describe roles.
- View the roles dictionary.
- Describe resources.
- Identify the differences between labor, nonlabor, and material resources.
- View the resource dictionary.

Lesson 14 - Assigning Roles and Resources

- Assign roles to an activity.
- Assign rates on roles.
- Assign resources to an activity by role and directly from the resource dictionary.
- Adjust Budgeted Units/Time for a resource.
- Assign expenses to activities.

Lesson 15 - Optimizing the Project Plan

- Analyze schedule dates.
- Shorten a project schedule.
- Analyze resource availability.
- Resolve resource overallocation.
- Analyze project costs.

Lesson 16 - Baselining the Project Plan

- Create a baseline plan.
- Display baseline bars on the Gantt chart.
- Modify the bars on the Gantt chart.

Lesson 17 - Importing and Exporting Data

- Describe the process of importing and exporting data.
- Export a project.
- Import a project.

Case Study 3 - Optimizing and Baselining

Section IV: Project Execution and Control

Lesson 18 - Methods of Applying Progress

- Describe methods for applying progress to a project.

Lesson 19 - Executing the Project Plan

- Use Progress Spotlight.
- Update the status of completed activities and activities in progress.
- Reschedule the project.

Lesson 20 - Reflection Projects

- Create a reflection project.
- Merge changes from reflection project into source project.

Lesson 21 - Analyzing the Updated Project

- Analyze schedule dates, resource availability/allocation, and project costs.
- Identify areas where the project is falling behind schedule or exceeding planned costs.
- Make changes necessary to address variances.
- Understand the importance of analyzing a project after every status update.

Lesson 22 - Reporting Performance

- Describe reporting methods.
- Run a schedule report.
- Create a resource report with the Report wizard.
- Create a time distributed report.
- Create a report using the current layout.

Case Study 4 - Project Execution and Control

Section V: Advanced Project Analysis

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Lesson 23 - Duration Types

- Determine which duration type works best in a given situation.
- Assign a duration type to an activity.

Lesson 24 - Calculating Percent Complete

- Describe the three Percent Complete types.
- Determine which Percent Complete type to use based on how your organization reports progress.
- Explain how activity percentages are calculated based on the Percent Complete type chosen.
- Use weighted steps to calculate Percent Complete.

Lesson 25 - Earned Value

- Define earned value.
- Define Performance Percent Complete.
- Review the results of different earned value techniques.
- Recognize the benefits of using earned value analysis.

Lesson 26 - Managing Multiple Projects

- Filter and apply progress to multiple projects.
- Set the default project for multiple projects.
- Explain how project elements are handled in multi-project mode.

Lesson 27 - Advanced Scheduling

- Calculate multiple float paths when scheduling.
- Explain the difference between scheduling logic options.
- Describe a calendar's effect on lag.

Section VI: Appendices

Appendix A - Using P6 Professional with Spreadsheets

- Export activity data to a spreadsheet application.
- Modify project information in the spreadsheet application.
- Import project information from the spreadsheet application.
- Importing a new project from the spreadsheet application.

Appendix B - Claim Digger

- Describe how Claim Digger compares project plans.
- Create a comparison report in Claim Digger.

Appendix C - Creating Output

- Customize the appearance of headers and footers.
- Insert and format the curtain and text attachment tools.
- Format the appearance of the data date.

Appendix D - Timescaled Logic Diagrams

- Describe what a timescaled logic diagram is.
- Explain the value of timescaled logic diagrams.
- Create a timescaled logic diagram.

Appendix E - Case Study Solutions

SECTION I

Overview and Creating a Project

Project Management Life Cycle

Understanding Data in P6

Overview and Navigation

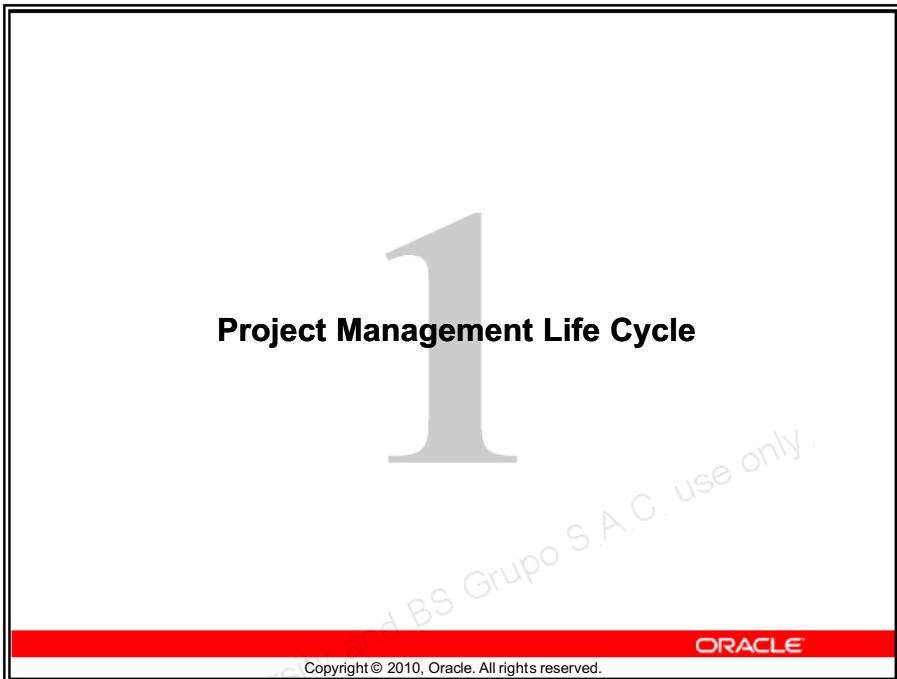
Creating a Project

Creating a Work Breakdown Structure

Adding Activities

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Lesson 1 – Project Management Life Cycle

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
15	-	-	5	20

Objectives

After completing this lesson, you should be able to:

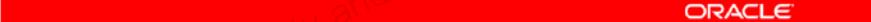
- Identify the five process groups in the Project Management Life Cycle.
- Describe the steps included in each process group.

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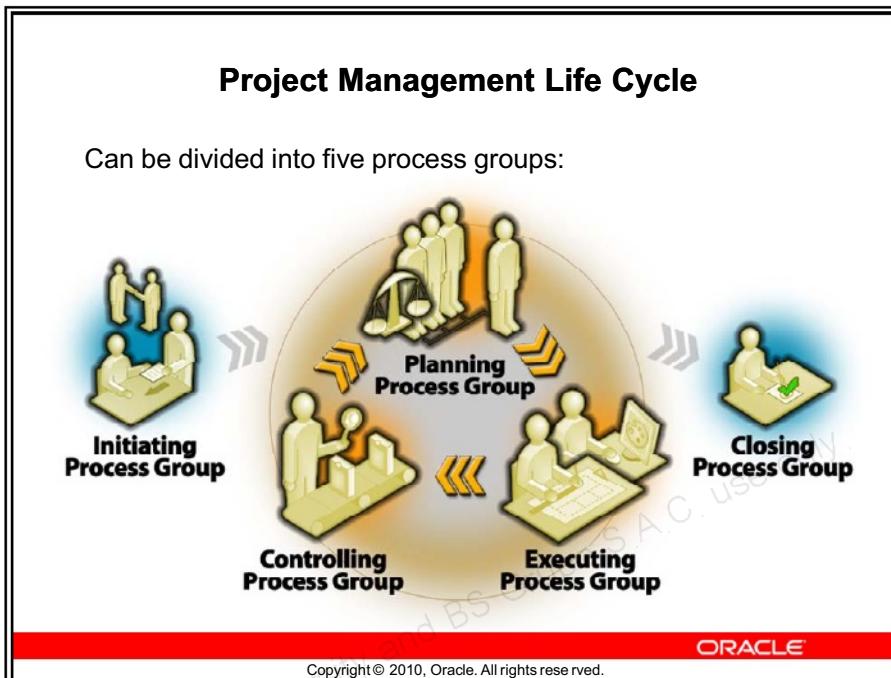
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Project Management Definitions

- **Project** – A temporary effort undertaken for the purpose of creating a unique product, service, or result.
- **Project Management** – The process of achieving project objectives within the constraints of schedule, cost, and resource restrictions.
- **Project Management Life Cycle** – A sequence of phases that defines the overall process from the beginning to the end of a project.

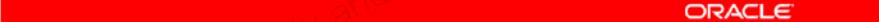
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Initiating Process Group

- Collect project information.
- Obtain organizational commitment.
- Develop the team.



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Planning Process Group

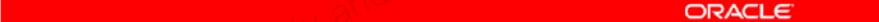
- Establish project objectives and scope of work.
- Define the work.
- Determine the timing.
- Establish resource requirements/availability.
- Establish a cost budget.
- Evaluate, optimize, and create a baseline plan.

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Executing Process Group

- Track work in progress and actual costs.
- Distribute information.



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Controlling Process Group

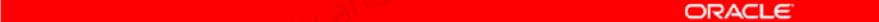
- Analyze and evaluate the project.
- Recommend necessary action.
- Modify the current project with realistic data.
- Reforecast the schedule.
- Communicate project performance to the project team.

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Closing Process Group

- Deliver product to client or stakeholders.
- Document lessons learned.
- Back-up or archive project files.



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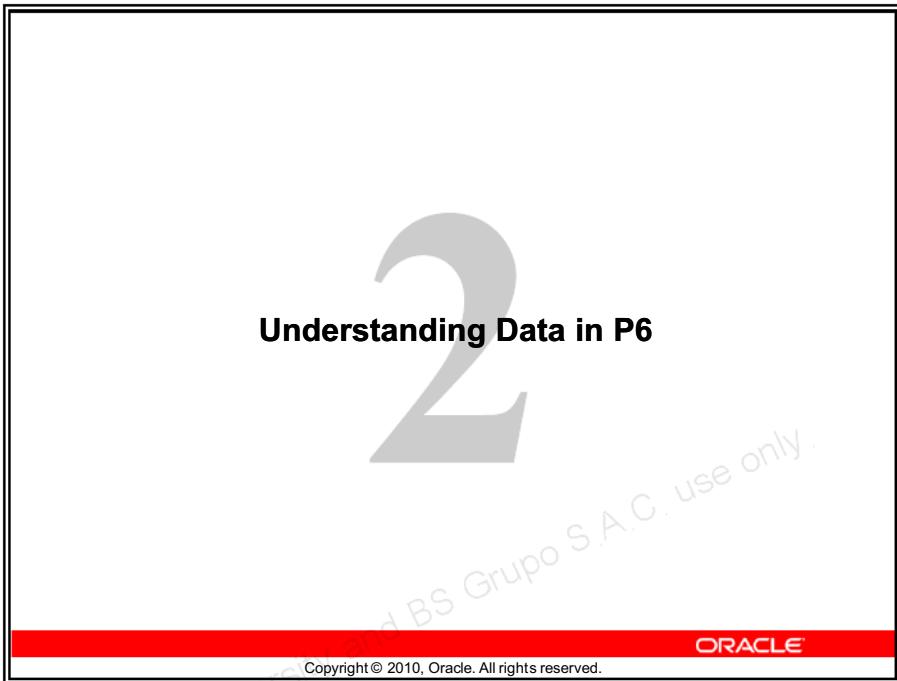
Lesson Review

Key Concepts

- Project management is the process of achieving project objectives within the constraints of schedule, cost, and resource limitations.
- The project management life cycle is a sequence of process groups that defines the overall process from the beginning to the end of a project.
- The project management life cycle can be divided into five process groups:
 - ◆ Initiating
 - ◆ Planning
 - ◆ Executing
 - ◆ Controlling
 - ◆ Closing

Review Questions

1. Which of the following characteristics is essential to a project?
 - a. Produces a unique result
 - b. Temporary in nature
 - c. Complex or consisting of myriad tasks
 - d. a and b
 - e. a, b, and c
2. Which of the following constraints must project management address?
 - a. Schedule
 - b. Cost
 - c. Resources
 - d. a and b
 - e. a, b, and c



Lesson 2 – Understanding Data in P6

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
15	-	-	5	20

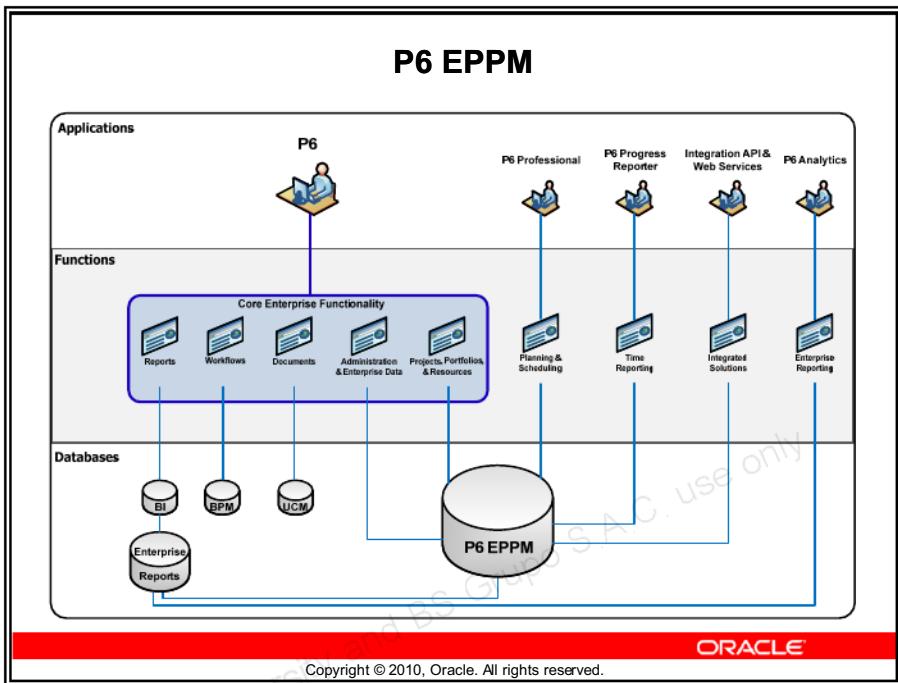
Objectives

After completing this lesson, you should be able to:

- Describe P6 Enterprise Project Portfolio Management (EPPM).
- Describe the Enterprise Project Structure.
- Describe the Organizational Breakdown Structure.
- Distinguish between enterprise data and project-specific data.

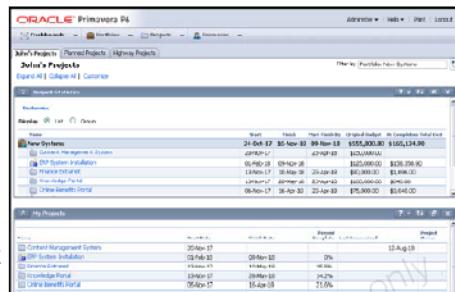


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P6

- Web-based
- Enterprise-wide project and resource management
- Portfolio management and analysis
- Customizable dashboards
- Document management
- Workflows
- Application administration

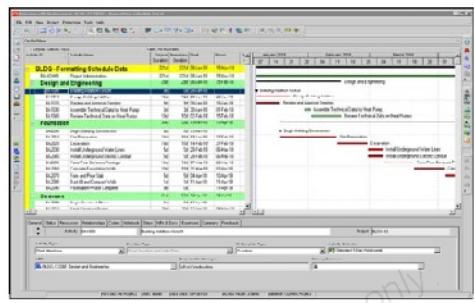


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P6 Professional

- Windows-based
- Enterprise-wide project and resource management
- Optimized for very large projects
- Optional module when installing P6



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Other Applications

- Progress Reporter
 - Timekeeping and resource communication
- P6 Analytics
 - Built on combination of P6 Reporting Database and Oracle Business Intelligence (OBI)
 - Interactive dashboards
 - Reporting
- P6 Integration API and Web Services
 - Enables developers to create programs to integrate P6 with other products and generate reports.

The red bar contains the word "ORACLE" in white capital letters.

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Enterprise Project Structure (EPS)

A hierarchy used to organize projects.

- Provides:
 - Foundation for enterprise-wide project management.
 - Access to project priorities, scope, budget, and resource information across the enterprise.
- Enables:
 - Individuals to manage projects separately.
 - Organizations to summarize data and view resource allocation across multiple projects.
 - Control access to project data at any level.

The red bar spans the width of the slide content area.

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EPS

Comprised of roots, nodes, and projects.

- **Root** – There is usually only one root, which represents the top level of an organization. A root can be subdivided into many nodes.
- **Nodes** – Represent different levels within the structure. Nodes can contain an unlimited number of projects.
- **Projects** – Represent the lowest level of a hierarchical branch. All projects must be included in a node.

Placement of a project in the hierarchy determines the summary level in which it is included.

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Sample EPS

- Any node in the EPS can contain projects.
- Some nodes in the EPS do not contain projects. These nodes are used to contain and organize projects.

```
graph TD; EPS_root[EPS root] --- EPS_node1[EPS node]; EPS_root --- EPS_node2[EPS node]; EPS_root --- EPS_node3[EPS node]; EPS_node1 --- EPS_node4[EPS node]; EPS_node1 --- EPS_node5[EPS node]; EPS_node4 --- EPS_node6[EPS node]; EPS_node4 --- EPS_node7[EPS node]; EPS_node5 --- EPS_node8[EPS node]; EPS_node5 --- EPS_node9[EPS node]; EPS_node6 --- PROJ1[PROJECTS]; EPS_node6 --- PROJ2[PROJECTS]; EPS_node7 --- PROJ3[PROJECTS]; EPS_node7 --- PROJ4[PROJECTS]; EPS_node8 --- PROJ5[PROJECTS]; EPS_node8 --- PROJ6[PROJECTS]; EPS_node9 --- PROJ7[PROJECTS]; EPS_node9 --- PROJ8[PROJECTS]
```

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Benefits of the EPS

- View project priorities, scope, budgets, and resources across entire project structure or within specific node.
- Manage projects separately while retaining ability to roll up and summarize data across multiple projects.
 - Each node acts as a master project, rolling up all "child" nodes and projects.
 - Node can be opened to view all detailed activity information from "child" projects.
- View resource allocation across projects.

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EPS and Security

- Assign security at any level of EPS to provide users with appropriate access to project information.
- For this course, you can access only the *Construction* and *Renovation* EPS nodes.
- Most of the projects you will open are in the *Office Building East* node.

```
graph TD; P6Training[P6 Training] --- IT[Info Technology]; P6Training --- Construction[Construction]; P6Training --- Renovation[Renovation]; Construction --- EasternDivision[Eastern Division]; Construction --- WesternDivision[Western Division]; EasternDivision --- OfficeBuildingEast[Office Building East]; EasternDivision --- MaintenanceEast[Maintenance East]; WesternDivision --- OfficeBuildingWest[Office Building West]; WesternDivision --- MaintenanceWest[Maintenance West]; OfficeBuildingEast --- Project1[PROJECTS]; OfficeBuildingEast --- Project2[PROJECTS]; OfficeBuildingEast --- Project3[PROJECTS]; OfficeBuildingEast --- Project4[PROJECTS]; MaintenanceEast --- Project5[PROJECTS]; MaintenanceEast --- Project6[PROJECTS]; MaintenanceWest --- Project7[PROJECTS]; MaintenanceWest --- Project8[PROJECTS];
```

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Organizational Breakdown Structure (OBS)

- Hierarchical arrangement of organization's project management structure.
- Controls user access to project data
 - All users are assigned to an OBS element to establish their access to project data.
- Designation of Responsible Manager
 - OBS element is assigned as Responsible Manager for work within an EPS node, a project, a Work Breakdown Structure, or an issue or risk within a project.
- Can be configured:
 - Detailed: Employee names
 - General: Departments and divisions
- Defined by the administrator.

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Enterprise Data and Project-Specific Data

- Enterprise data
 - Available to all projects across an organization.
 - Provides global standards and structure necessary for centralized project and resource management.
 - Defined and maintained by administrator.
- Project-specific data
 - Available only to the project in which it is defined.
 - Usually defined by project managers.
- Some data can be both enterprise and project-specific.



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Enterprise Data

Examples of enterprise data are listed below:

- EPS
- OBS
- Resources
- Roles
- Resource codes
- Project codes
- User-defined fields
- Cost accounts
- Currencies
- Financial periods
- Notebook topics
- Issue codes
- Risk categories
- Step templates



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Project-Specific Data

Examples of project-specific data are listed below:

- Work Breakdown Structure
- Activities Baselines
- Risks
- Issues
- Documents

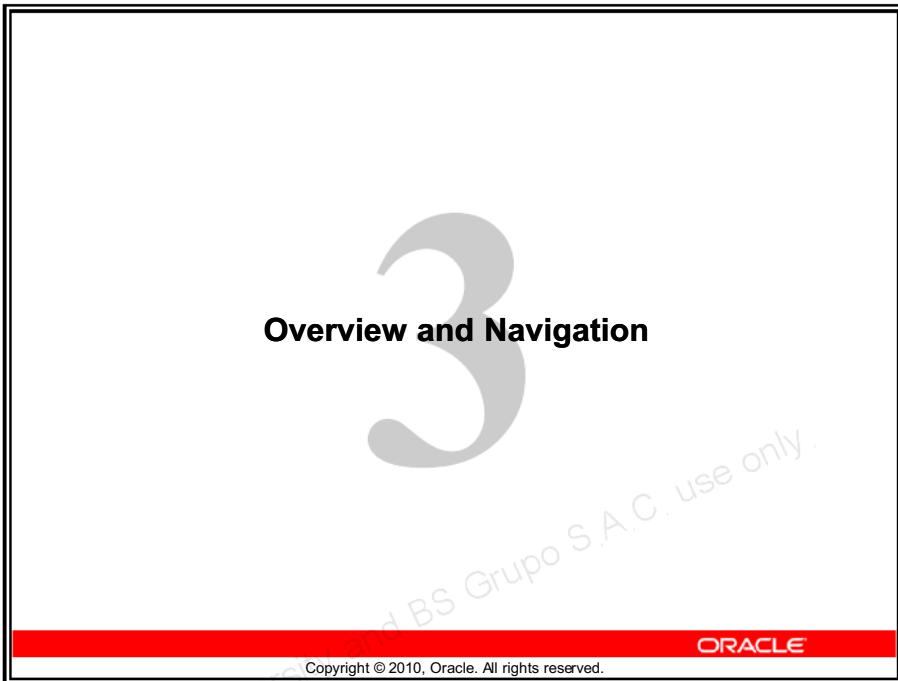
Lesson Review

Key Concepts

- The Enterprise Project Structure (EPS) is a hierarchy used to organize projects. It enables access to comprehensive scope, budget, and resource information and provides a foundation for enterprise-wide project management.
- The Organizational Breakdown Structure (OBS) is the hierarchical arrangement of an organization's project management structure. It controls user access to project data and designation of the responsible manager.
- Enterprise data provides the global structure needed to manage multiple projects. Examples include the EPS and OBS, resources, and roles.
- Project-specific data is available only to the project in which it is defined. Examples include activities and expenses.

Review Questions

1. Which of the following is enterprise data?
 - a. Expenses
 - b. Resources
 - c. Risks
 - d. Activities
2. Which statement about the EPS is false?
 - a. It includes all projects in the enterprise.
 - b. It enables project data to be analyzed at multiple levels.
 - c. It enables control of security at any level.
 - d. It is restricted to two levels.



Lesson 3 – Overview and Navigation

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
10	20	40	5	75

Objectives

After completing this lesson, you should be able to:

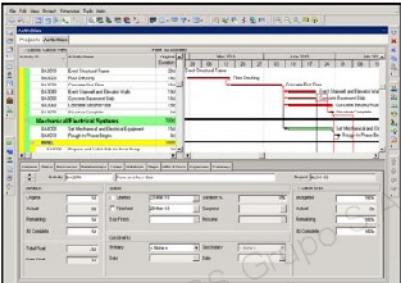
- Log in to P6 Professional.
- Open an existing project.
- Open and navigate among different windows.
- Open an existing layout.
- Customize a layout.
- Save a layout.



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Windows and Menus

- P6 Professional is organized into 11 windows, each focusing on an aspect of project management.
 - Examples: Projects, Resources, WBS, Activities, Expenses
- Launched from menus or toolbars.

Menus →  ← **Window**

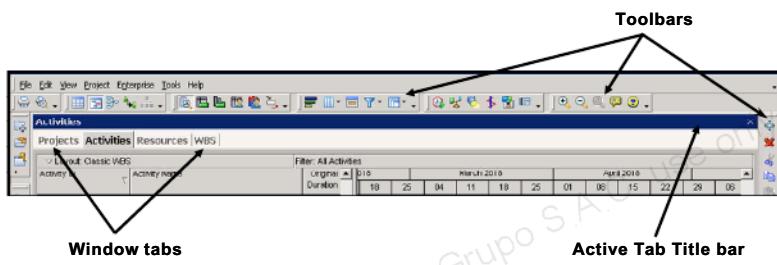
Toolbars →  ← **Window**

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Tabs and Toolbars

- Multiple windows can be open at one time.
 - Windows displayed on tabs.
 - Active Tab Title bar indicates the active window.



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Layouts

- Customized view of information.
 - Available in Projects, WBS, Activities, and Tracking views.
- Consists of top layout and bottom layout.
- Key layout functions on Layout Options bar.

The screenshot shows the Oracle Project Management interface with the following annotations:

- Layout Options bar:** Located at the top left, this bar contains various icons and buttons for layout management.
- Top Layout:** The upper section of the screen, which includes a Gantt chart and a detailed activity list.
- Bottom Layout:** The lower section of the screen, which includes a summary table for tasks and resources.
- Copyright notice:** "Copyright © 2010, Oracle. All rights reserved."
- ORACLE logo:** Located at the bottom right of the application window.

Details

- Displays detailed information about selected item.
- Available in all windows, except Tracking.
- Always in bottom layout.
- Organized into tabs.
- Tabs can be customized in some windows.

General Status Resources Relationships Codes Notebook Steps WPs & Docs Expenses Summary

Activity 3A2070 Form and Pour Slab

Project ELDG-03

Duration

Original	5d
Actual	0d
Remaining	5d
At Complete	5d

Status

Start	20-Mar-18	Duration %	0%
Finish	20-Mar-18	Suspend	
End Finish		Resume	

Labor Units

Budgeted	160h
Actual	0h
Remaining	160h
At Complete	160h

Constraints

Primary	<NONE>	Secondary	<NONE>
Date		Date	

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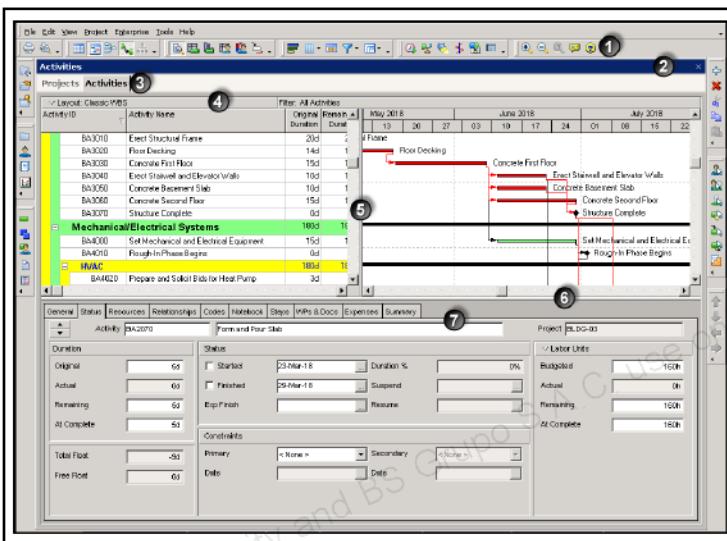
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Notes



Overview: Overview and Navigation

The table below lists key navigation items in Primavera P6 Professional.



- 1** **Toolbars** – Display icons that replicate menu options. Toolbars are displayed across the top and along both sides of the screen.
- 2** **Active Tab Title bar** – Indicates which window is currently displayed.
- 3** **View Tabs** – Indicate open windows and enable users to navigate between them by clicking the appropriate tab.
- 4** **Layout Options bar** – Displays a menu of options for changing the way the open view looks.
- 5** **Vertical Split bar** – Drag bar to hide/show more information in the Activity Table/Gantt chart.
- 6** **Horizontal Split bar** – Drag bar to hide/show more information in top/bottom layouts.
- 7** **Activity Details** – Displays detailed information about the activity selected in the Activity Table.

Practice: Overview and Navigation

In this practice you will:

- Log in to P6 Professional.
- Open an existing project.
- Navigate in the Activities window.
- Open an existing layout.
- Customize and save a layout.

Logging In

Type a valid Login Name and Password to log in to P6 Professional. Passwords are case-sensitive.

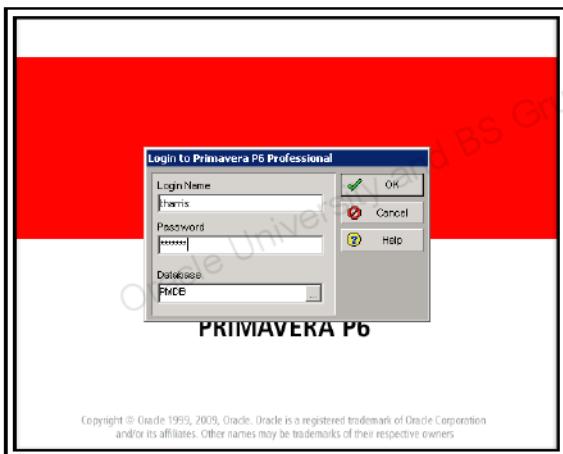


Figure 3-1: Type a Login Name and Password.

❖ Log in to P6 Professional.

1. Click *Start, Programs, Oracle – Primavera P6 Professional, P6 Professional*.
2. In the Login to Primavera P6 Professional dialog box, type a Login Name, <tharris> and Password <tharris>.
3. Click *OK*.

After logging in, the Projects window and the Project Table are displayed.

Opening a Project

Open projects from the Project Table in the Projects window or the Open Project dialog box. The Open Project dialog box shows all projects you are authorized to open.

- Open a single project, indicated by  (An open project is indicated by 

 - ◆ All projects under the node are opened.

- Open multiple projects under different nodes.

 - ◆ Use Ctrl+Click to select more than one project.

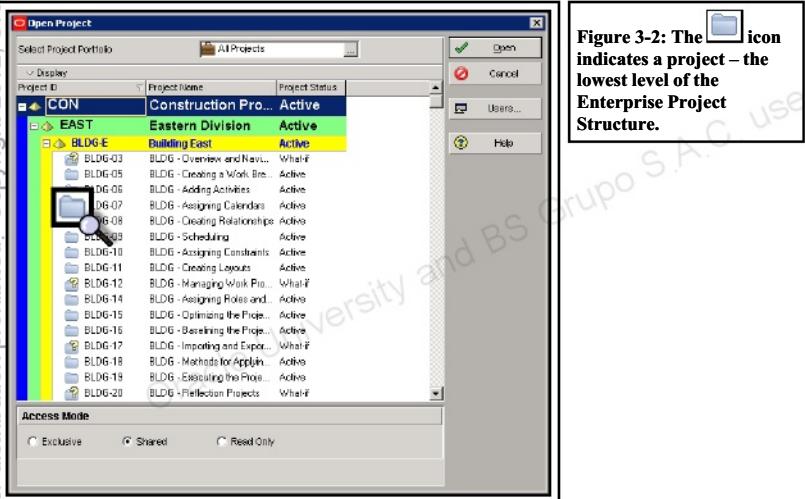


Figure 3-2: The  icon indicates a project – the lowest level of the Enterprise Project Structure.

Display the Open Project dialog box.

1. On the File menu, click *Open*.

Access Modes

You have the option to select an access mode prior to opening a project:

- **Shared** – Multiple users can view, input, and change data. This is the default setting.
- **Read Only** – User can view data but cannot input or change data.
- **Exclusive** – The current user is the only user who can edit data on these projects. Other users can access these projects in Read Only mode.

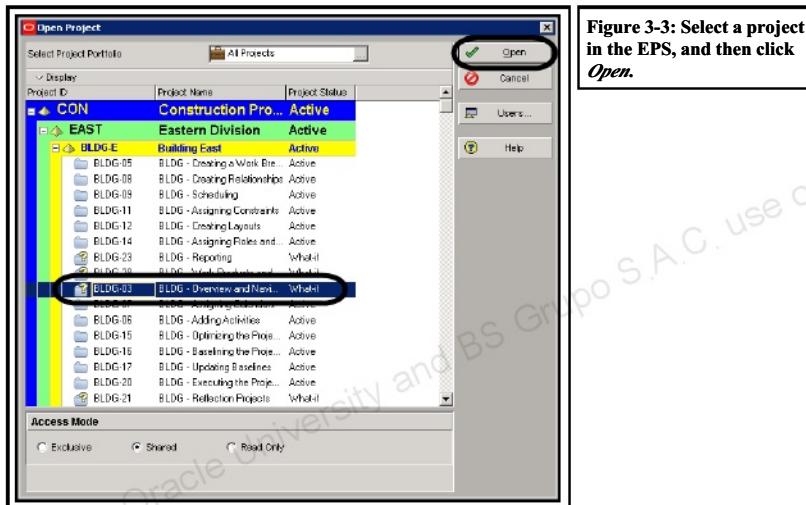


Figure 3-3: Select a project in the EPS, and then click **Open**.

Open a project.

1. In the Open Project dialog box, select a project, *BLDG-03 BLDG – Overview and Navigation*.
2. Click *Open*.

Tabbed Windows

The project opens in the Activities window. Open windows are indicated by tabs near the top of the screen, with the active tab indicated by bold black text and by an Active Tab Title bar directly above the tabs. A tab is displayed only when a window is opened.

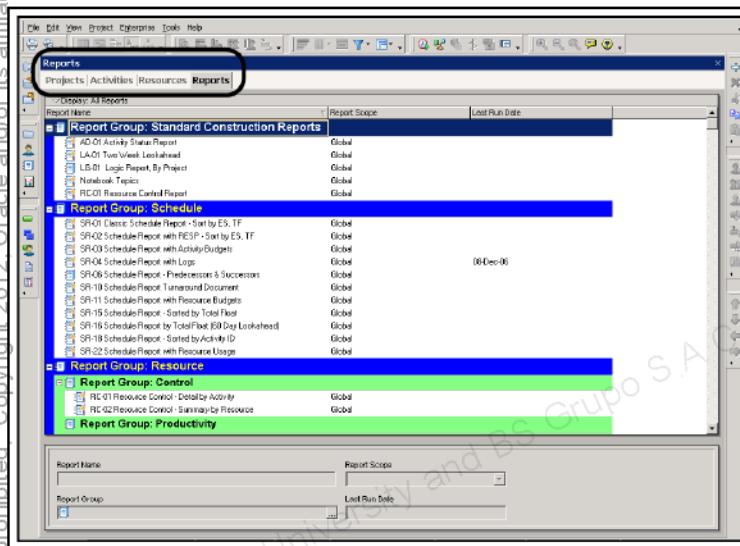


Figure 3-4: The tab area near the top of the screen shows which windows are open. The tab with the bold black text – in this case, Reports – indicates the active tab.

Open additional windows.

1. On the Enterprise menu, click *Resources*.

Note that the Resources tab is displayed at the top of the screen. It is the new active tab, indicated by bold tab text and by the blue Active Tab Title bar.

2. On the Tools menu, click *Reports*, *Reports*.

Note that the Reports tab is displayed as the active tab.

Click on the appropriate tab to navigate between windows. You also can drag-and-drop the tabs to arrange the windows as you choose. The X at the right end of the Active Tab Title bar is the close button for the active tab. When only one window is open, no tab is displayed.

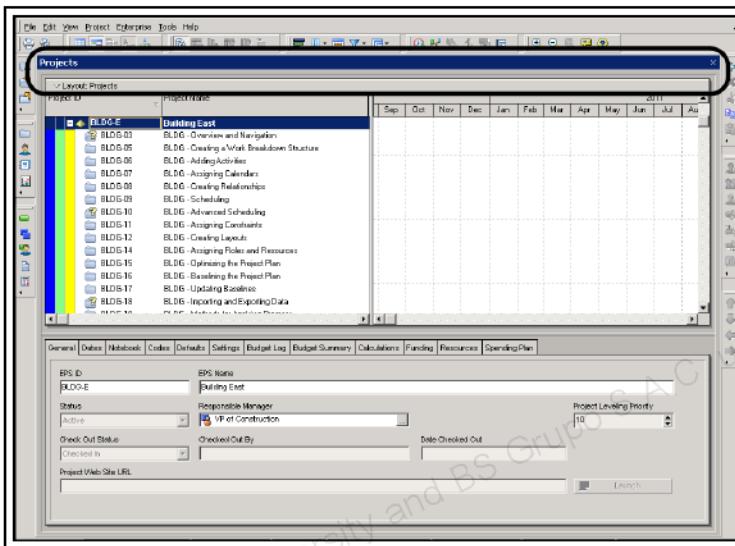


Figure 3-5: When only one window is open, no tab is displayed. Nevertheless, the Active Tab Title bar still indicates the active window.

Navigate among the open windows and then close them.

1. Click on each tab to navigate from one window to another.
2. Click the Projects tab and, holding the mouse button down, drag the tab to the right end of the row of tabs.
3. Click the Activities tab and drag it to the right end of the tabs.
4. Click the Resources tab, and then click the X on the end of the Active Tab Title bar to close the Resources window.
5. Click the X on the Active Tab Title bar to close the Reports and Activities windows.

Note that although only the Projects window is open and no tabs are displayed, the Active Tab Title bar still indicates the active window.

Tab Groups

Window tabs can be separated into tab groups, with each tab group in its own window. Use this feature to compare related information in different windows without having to switch between tabs. For example, you might want to check rates and availability in the Resources window while making resource assignments in the Activity window.

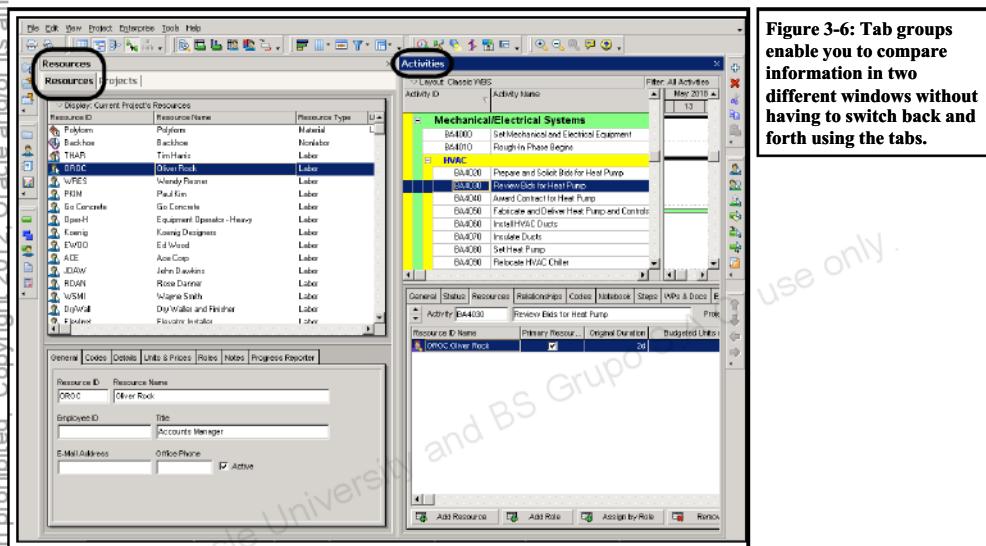


Figure 3-6: Tab groups
enable you to compare
information in two
different windows without
having to switch back and
forth using the tabs.

Create tab groups.

1. On the Enterprise menu, click *Resources*.
2. On the Project menu, click *Activities*.
3. On the View menu, click *Tab Groups, New Vertical Tab Group*.

Note that the screen is divided into two vertical tab groups: The left group contains the Resources and Projects tabbed windows and the right group contains the Activities window.

4. In the left tab group, click the Resources tab to display the Resources window.
5. In the right tab group, click the Resources tab in Activity Details to view resource assignments.
6. On the View menu, click *Tab Groups, Merge all Tab Groups*.

Toolbars and Menus

P6 Professional uses menus and toolbars to navigate between windows and to execute functions within the application.

- **Menus** – File, Edit, View, Project, Enterprise, Tools, and Help – are located at the top of the screen.
- **Toolbars** – Located at the top and both sides of the screen. Toolbar commands are represented by icons.

Application functions can be executed either by menu or toolbar – it is a matter of personal preference which you use. You can display or hide toolbars, change their location, and choose which icons each toolbar contains, enabling you to configure P6 Professional to your own job requirements and working preferences.

This training course will generally reference the applicable menu command, not the toolbar icon.

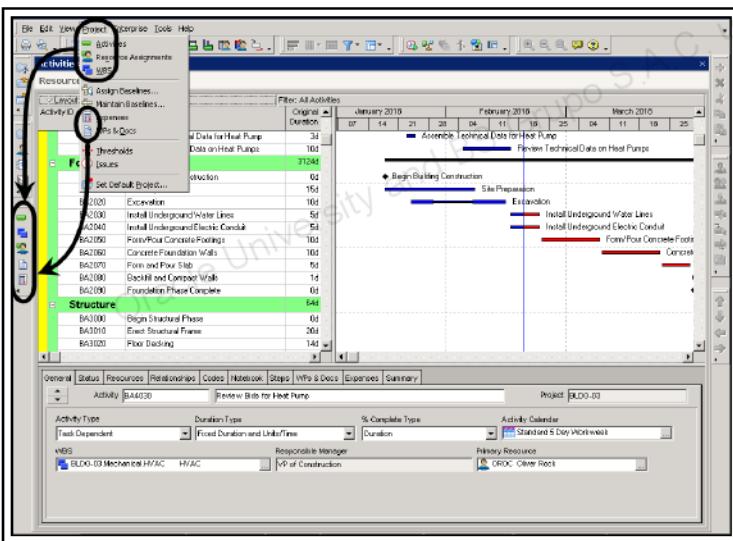


Figure 3-7: Commands on the Project menu are also available on the Project toolbar.

View menu commands and toolbar icons.

1. Confirm that you are in the Activities window. (Check the Active Tab Title bar near the top of the screen. To display the Activities window, click the Activities tab or on the Project menu, click *Activities*.)

2. Click the Project menu and view its commands.

Note that a number of its icons are reproduced on the Project toolbar on the left side of the screen.

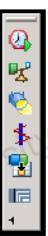
3. Click the Enterprise menu and view its commands.

Note that a number of its icons are reproduced on the Enterprise toolbar just above the Project toolbar.

4. Click several other menus, view their commands, and try to locate their respective icons on one of the toolbars.

Commonly Used Toolbars

There are 17 toolbars available in P6 Professional. Several of the most commonly used toolbars are pictured in the table below.

	Enterprise	Tools	Edit
	Enterprise Projects Resources Reports Tracking Project Portfolios Roles	Tools  Schedule Level Resources Progress Spotlight Progress Line Update Progress Disable Auto-Reorganization	Edit  Add/Insert Delete Cut Copy Paste
	Project Activities WBS Resource Assignments WPs & Docs Expenses Maintain Baselines	Assign  Resources Resources by Role Roles Activity Codes Predecessors Successors Steps	Layout  Bars Columns Time Scale Filter By Group and Sort by

Viewing Toolbars

To see a full list of the available toolbars, as well which toolbars are currently displayed, click *Toolbars* on the View menu or right-click on a blank space in the toolbar area along the top or sides of the screen. A check mark indicates that a toolbar is displayed.

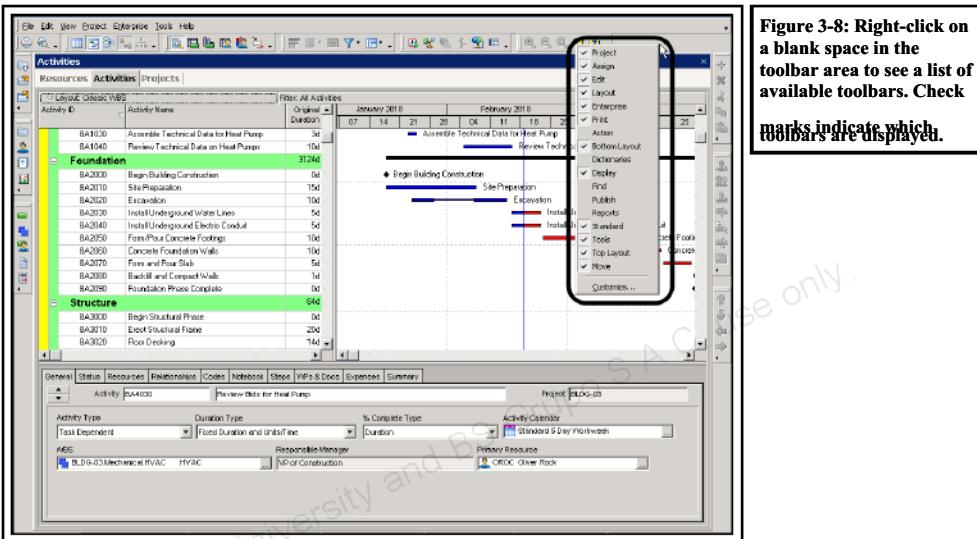


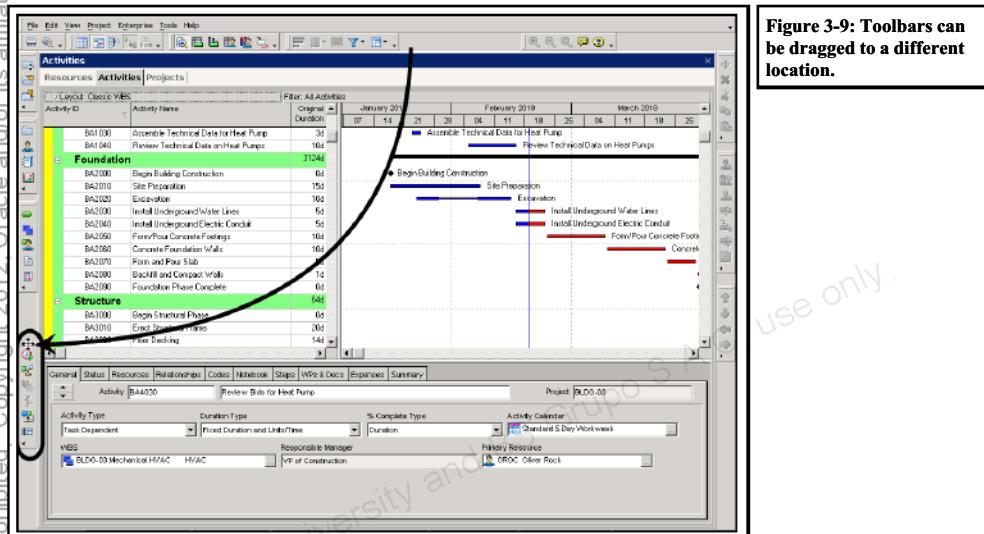
Figure 3-8: Right-click on a blank space in the toolbar area to see a list of available toolbars. Checkmarks indicate which toolbars are displayed.

View available toolbars.

1. Right-click on a blank space in the toolbar area along the top or sides of the screen (or on the View menu, click *Toolbars*).

Customizing Toolbar Location

The toolbars on your screen are the default toolbars following P6 Professional installation. As you become more familiar with the application and the procedures required to do your work, you can customize toolbars for your own personal use.



Display/hide and reposition a toolbar.

1. On the toolbar list, select *Project* to remove the check mark and hide the Project toolbar.
 2. Right-click a blank space in the border area and select *Project* to display the Project toolbar again.
 3. Click the gray bar on the left end of one of the toolbars along the top of the screen and.
- A four-directional arrow is displayed.
4. While pressing the mouse button, drag the toolbar to an empty area of the border on the left of the screen.
 5. Drag the toolbar you just moved back to its original position at the top of the screen.

Customizing Toolbar Icons

You can further customize the toolbars by choosing which icons each displays. Hide icons you seldom use and make the ones you use most often easier to find.

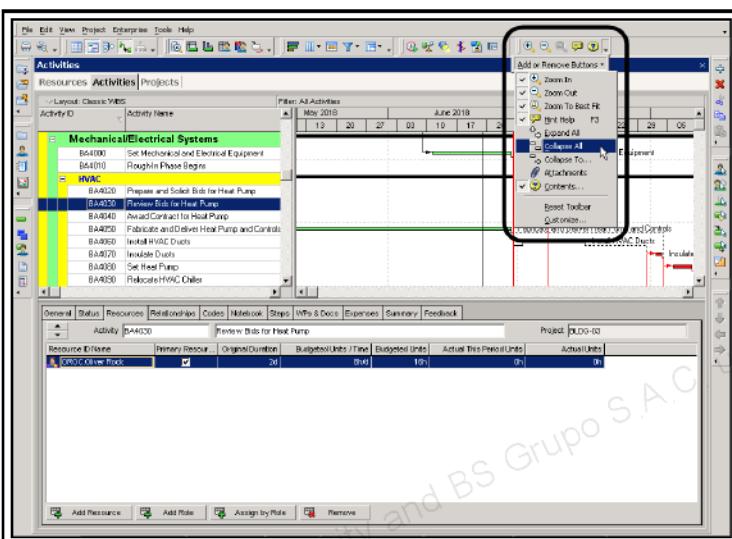


Figure 3-10: Click to select or de-select the icons on the toolbar.

Customize toolbar icons.

1. On the Display toolbar (rightmost of the toolbars across the top of the screen), click and then click *Add or Remove Buttons* to view all the icons available for that toolbar.
Compare the icons in the list and the icons on the toolbar.
2. Watch the toolbar as you select and de-select different icons.
3. After making several changes to the toolbar icons, click *Reset Toolbar*, and then click *OK*.

Customizing Menu Commands

Just as you can customize toolbar icons, you also can customize menu commands. Menu commands can be moved from one menu to another, rearranged on the same menu, or deleted. Open the Customize dialog box to put menus into edit mode, allowing you to make changes. Click *Reset* in the dialog box to return to the default commands.

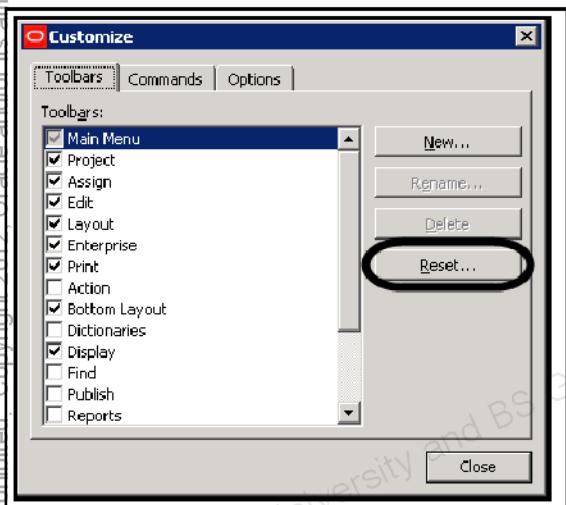


Figure 3-11: When the Customize dialog box is open, the menus are in edit mode, allowing you to rearrange menu options as you choose. To restore the menus to their default settings, click *Reset*.

View options for customizing menus.

1. On the View menu, click *Toolbars, Customize*.

The menus on the toolbar are now in edit mode.

2. In the Customize dialog box, click the Commands tab to view commands for each menu.
3. On the File menu, at the top of the screen, click *Page Setup* and, holding down the mouse button, drag the command to the bottom of the menu.
4. On the Edit menu, at the top of the screen, click *Spell Check*, and drag the command to the Tools menu heading (which expands the Tools menu) and then drag it to just below *Job Status* on the Tools menu.
5. In the Customize dialog box, click the Toolbars tab, and then click *Reset*.
6. At the prompt, click *OK*, and then click *Close*.

Layouts

A layout is a customizable view of information, combining all the visual elements that appear on the screen. The Activities window provides options for viewing data in top/bottom layouts. You do not have to show a bottom layout.

- Choose one of the following to show on top:
 - ◆ Activity Table
 - ◆ Gantt Chart
 - ◆ Activity Usage Spreadsheet
 - ◆ Activity Network
- Choose one of the following to show on bottom:
 - ◆ Activity Details
 - ◆ Activity Table
 - ◆ Gantt Chart
 - ◆ Activity Usage Spreadsheet
 - ◆ Resource Usage Spreadsheet
 - ◆ Activity Usage Profile
 - ◆ Resource Usage Profile
 - ◆ Trace Logic

Opening an Existing Activity Layout

A variety of layouts are available that provide different views of activity data. You can create user-specific layouts and project-specific layouts or use global layouts provided by your company.

After selecting a layout, you can click either *Apply* or *Open*.

- **Apply** – Displays the selected layout but keeps the Open Layout dialog box open.
- **Open** – Displays the selected layout and closes the Open Layout dialog box.

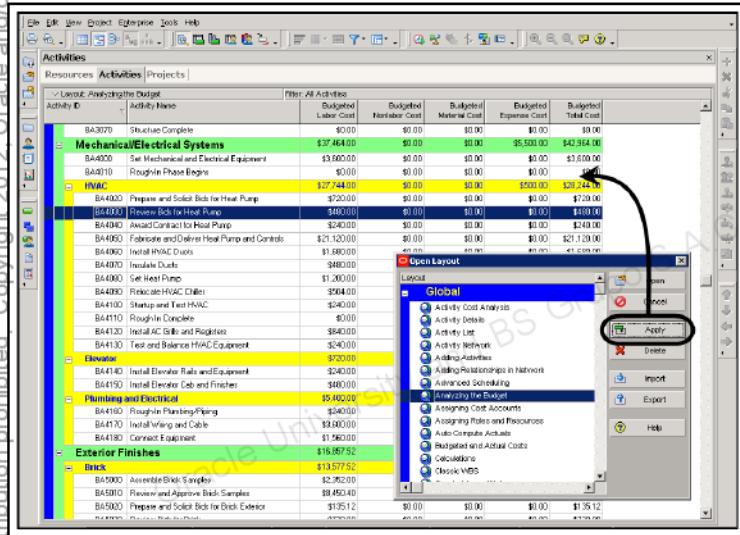


Figure 3-12: Click *Apply* to view the layout without closing the Open Layout dialog box.

Apply a layout to the Activities window.

1. On the Layout Options bar, click *Layout*, *Open*.
2. When prompted to save changes to the layout, click *No*.
3. In the Open Layout dialog box, select a layout, *Analyzing the Budget*.
4. Click *Apply*.

After viewing the new layout that displays when you click *Apply*, you will select a different layout and then click *Open*, which displays the layout and closes the Open Layout dialog box.

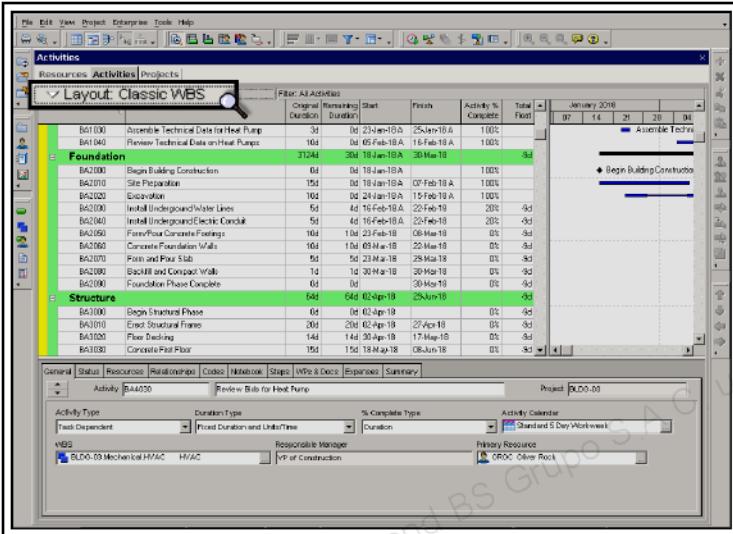
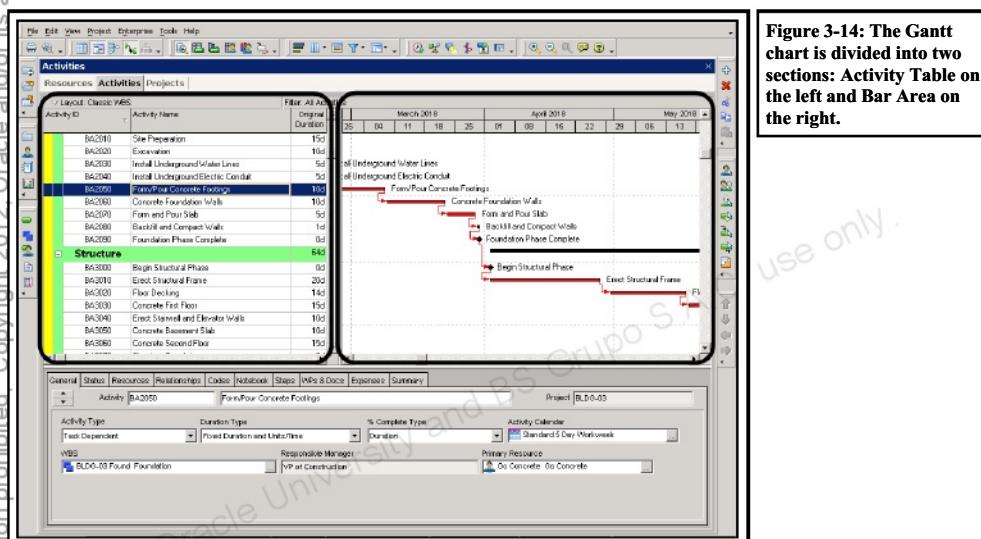


Figure 3-13: The layout name is displayed on the Layout Options bar.

Gantt Chart

The *Classic WBS* layout displays a Gantt chart in the top layout and Activity Details in the bottom layout. The Gantt chart is divided into two sections, Activity Table and Bar Area:

- **Activity Table** – Displays activity data in columns.
- **Bar Area** – Provides a graphical display of activity progress over the duration of the project.



Activity Usage Spreadsheet

The Activity Usage Spreadsheet displays unit, cost, or earned value data by activity over time. Use this type of layout to review per period and rolled up activity resource/cost data.

You can customize the timescale of the Activity Usage Spreadsheet:

- Move the timescale to focus on a specific time period**—Place the cursor in the major date interval until the cursor displays as and then click and drag the timescale left or right.
- Compress/expand the timescale to widen/narrow width of columns**—Place the cursor in the minor date interval until the cursor displays as and then click and drag the cursor left or right to compress or expand the columns.

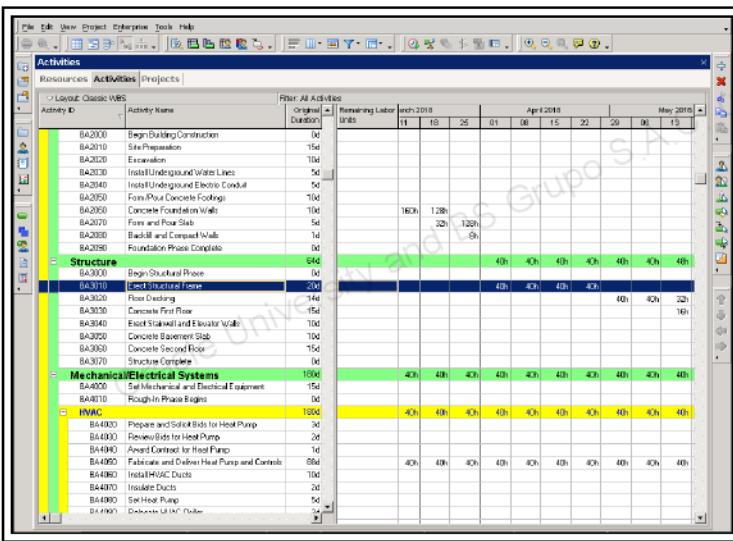


Figure 3-15: The Activity Usage Spreadsheet covers the top and bottom layouts.

Display the Activity Usage Spreadsheet.

- On the Layout Options bar, click *Show on Top, Activity Usage Spreadsheet*.
- On the Layout Options bar, click *Show on Bottom, No Bottom Layout*.
- Hover your mouse in the minor date interval, and then click and drag to expand the timescale.
- Hover your mouse in the major date interval, and then click and drag to move the timescale.

Activity Network

Use the Activity Network to view the relationships between activities and to better understand the logical flow of the activities in the project:

- **Left window** – Displays the WBS hierarchy.
 - **Right window** – Shows a graphical display of activities and their relationships.

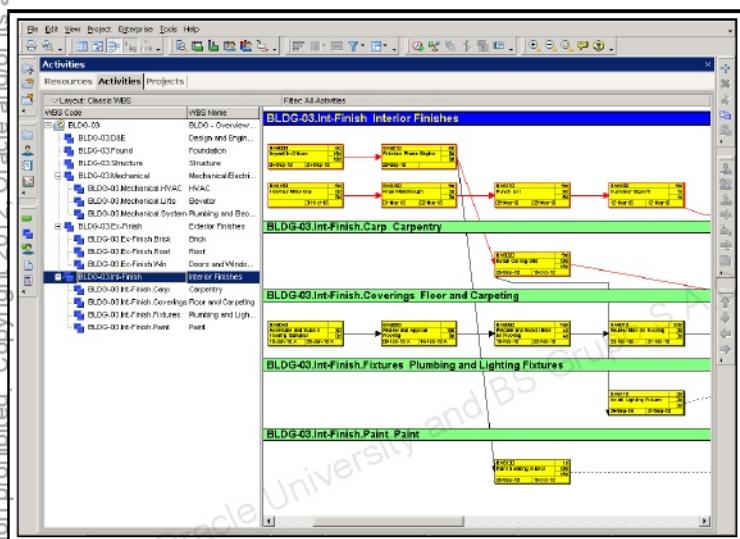


Figure 3-16: The Activity Network provides a graphical display of project activities and their relationships.

Display the Activity Network.

1. On the Layout Options bar, click *Show on Top, Activity Network*.
 2. On the Display toolbar, click  several times to zoom in on the activities.
(Press and hold the *Alt* button on your keyboard, click and hold the mouse button, and move the mouse up/down to zoom in/out manually.)
 3. Click an item in the left pane, *BLDG-03.Int-Finish*, to see it displayed in the Activity Network in the right pane.

Activity Table

The Activity Table enables you to display project data in a tabular format. You can modify the columns in the Activity Table to meet your needs.

Activity ID	Activity Name	Original Duration	Start Date	End Date	Activity % Complete	Total Effort
B41100	Concrete Foundation Walls	10d	01-Mar-18	22-Mar-18	0%	25d
B41200	Form and Pour Slab	5d	04-Mar-18	29-Mar-18	0%	9d
B41300	Backfill and Compact Walls	14	1d 30-Mar-18	30-Mar-18	0%	4d
B41400	Foundation Phase Complete	0d	0d	30-Mar-18	0%	0d
Structure						
B41500	Begin Structural Phase	0d	0d 02-Apr-18	27-Apr-18	0%	9d
B41600	Errect Structural Frame	20d	0d 02-Apr-18	27-Apr-18	0%	9d
B41700	Floor Decking	14d	1d 30-Apr-18	17-May-18	0%	9d
B41800	Concrete First Floor	15d	1d 18-May-18	08-Jun-18	0%	9d
B41900	Errect Stairwell and Elevator Walls	10d	1d 11-Jun-18	22-Jun-18	0%	4d
B42000	Concrete Basement Slab	10d	1d 11-Jun-18	22-Jun-18	0%	4d
B42100	Concrete Basement Walls	15d	1d 11-Jun-18	29-Jun-18	0%	9d
B42200	Concrete Basement Floor	6d	1d 11-Jun-18	25-Jun-18	0%	4d
B42300	Concrete Basement Complete	0d	0d	25-Jun-18	0%	0d
Mechanical/Electrical Systems						
B44000	Get Mechanical and Electrical Equipment	15d	1d 11-Jun-18	29-Jun-18	0%	11d
B44100	Rough-in Phase Begins	0d	0d 02-Jul-18	03-Jul-18	0%	1d
HVAC						
B44200	Prepares and Scales Bids for Heat Pump	3d	3d 19-Feb-18	21-Feb-18	0%	17d
B44300	Review Bids for Heat Pump	2d	2d 22-Feb-18	23-Feb-18	0%	1d
B44400	Award Contract for Heat Pump	1d	1d 26-Feb-18	26-Feb-18	0%	1d
B44500	Fabricate and Deliver Heat Pump and Controls	9d	6d 27-Feb-18	29-Mar-18	0%	23d
B44600	Install HVAC Ducts	10d	1d 02-Mar-18	15-Mar-18	0%	11d
B44700	Insulate Ducts	2d	2d 02-Mar-18	05-Mar-18	0%	4d
B44800	Set HVAC Filter	5d	4d 04-Mar-18	15-Mar-18	0%	2d
B44900	Install HVAC Filter	3d	3d 11-Mar-18	15-Mar-18	0%	2d
B45000	Startup and Test HVAC	1d	1d 31-Aug-18	31-Aug-18	0%	0d
B45100	Rough-in Complete	0d	0d	31-Aug-18	0%	0d
B45200	Install AC Units and Registers	5d	5d 25-Sep-18	01-Oct-18	0%	1d
B45300	Test and Balance HVAC Equipment	1d	1d 31-Oct-18	31-Oct-18	0%	0d
Vendor						
B44140	Install Elevator Rails and Equipment	1d	1d 25-Jun-18	25-Jun-18	0%	23d

Figure 3-17: Columns in the Activity Table can be customized.

Display the Activity Table.

- On the Layout Options bar, click *Show on Top, Activity Table*.

Customizing a Layout

The Activities window can be customized and saved as a layout. Saving layouts for future use allows you to retrieve information quickly. Use the Layout Options bar as your centralized menu for layout customizing. Customizable elements include:

- Bars
- Columns
- Timescale
- Table font and colors
- Row height
- Filters
- Activity grouping and sorting
- Top/bottom layouts

Selecting Columns

The Columns dialog box enables you to select columns to display in the Activity Table and specify the order in which they appear:

- **Available Options section** – Lists data items in groups or in a list.
- **Selected Options section** – Lists items you have chosen to display.
- **Single arrows** – Move highlighted data items to the other window.
- **Double arrows** – Move all data items to the other window.
- **Up/down arrows** – Specify the order of the selected data items.

Click *Edit Column* to change the selected item's title and choose the title's alignment in the display.



Add a column to the Activity Table and reorder the items displayed.

1. On the Layout Options bar, click *Columns*.

2. On the Columns dialog box Available Options bar, click *Group and Sort By, List*.
3. In the Available Options section, select a data item, *Budgeted Labor Cost*.
4. Click to move the selected data item to the Selected Options section.
5. Use the navigation arrows to order the data items as follows: Activity ID, Activity Name, Budgeted Labor Cost, Original Duration, Remaining Duration, Start, Finish, Activity % Complete, Total Float.
6. Click *Apply*.

Using Hint Help in the Columns Dialog Box

You can use Hint Help to view a definition for any data item.

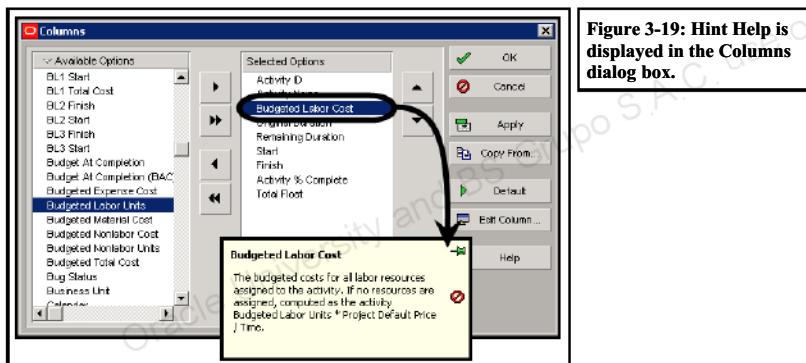


Figure 3-19: Hint Help is displayed in the Columns dialog box.

Display Hint Help in the Columns dialog box.

1. On the Available Options bar, click *Hint Help*.
2. In the Selected Options window, click a data item, *Budgeted Labor Cost*.
Note the definition displayed for the selected data item.
3. On the Available Options bar, click *Hint Help* to disable the onscreen help box.
4. Click *OK*.

Displaying Activity Details

Activity Details displays detailed information for an activity highlighted in the Activity Table or Activity Network.

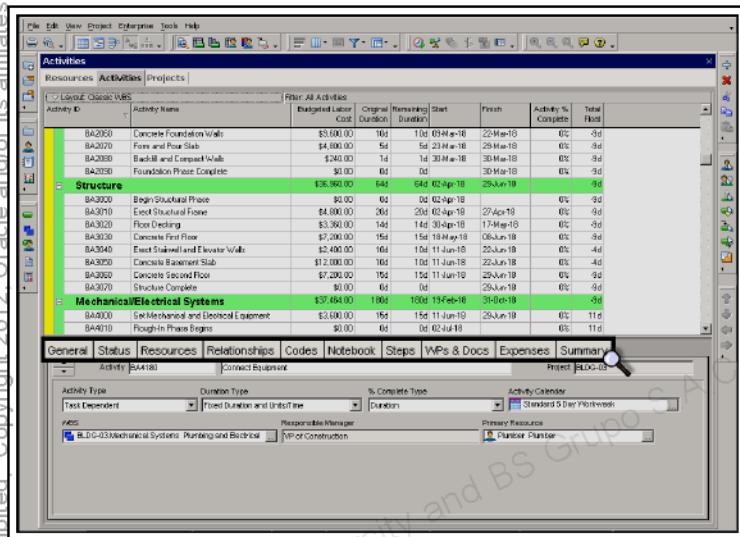


Figure 3-20: Activity Details is arranged in tabs.

Display Activity Details.

1. On the Layout Options bar, click *Show on Bottom, Activity Details*.

Selecting Details Tabs

The tabs displayed in Activity Details can be customized.

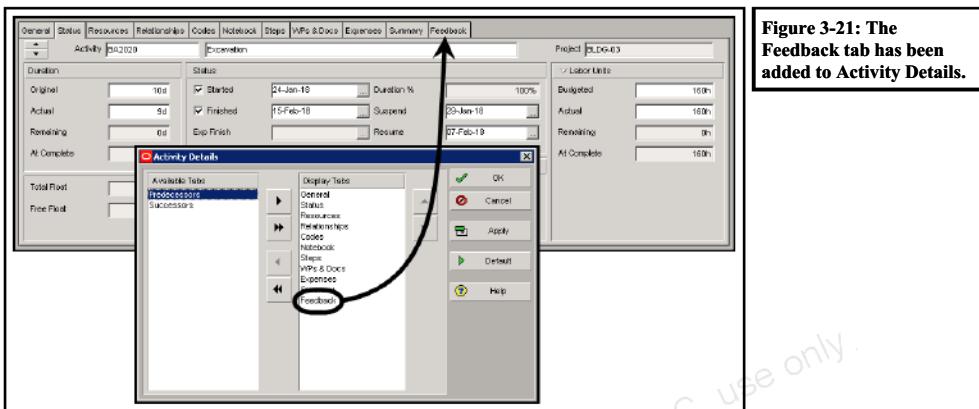


Figure 3-21: The Feedback tab has been added to Activity Details.

✓ Add a tab to Activity Details.

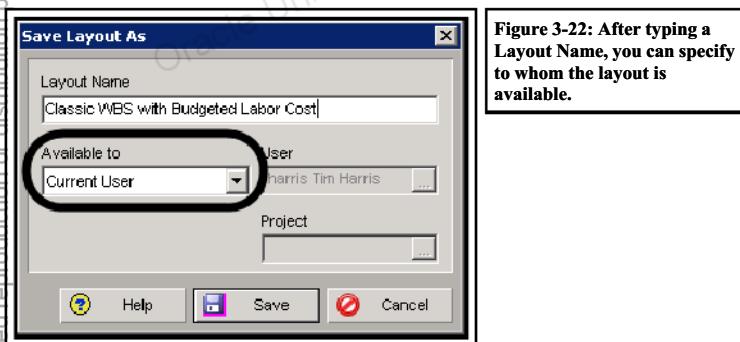
1. On the Layout Options bar, click *Bottom Layout Options*.
2. In the Activity Details dialog box Available Tabs window, select *Feedback*.
3. Click to move the selected data item into the Display Tabs window.
4. Click *OK*.

Saving Layouts

Layouts can be saved and shared with other users to facilitate project communication. Use the Save Layout dialog box to save a layout in the Activities, WBS, Projects, Assignments, or Tracking window:

- **Layout, Save** – Saves changes to the existing layout.
- **Layout, Save As** – Prompts you to save the layout with a new name.
 - ◆ Current User – Only the user creating the layout will have access to it in the future.
 - ◆ All Users – All licensed users will have access to the layout (Global).
 - ◆ Another User – A specified user will have access to the layout. Note, however, that the current user will not have access to the layout.
- Project – Apply the layout to any project that is currently open in P6 Professional. Though project-specific layouts can be applied to multiple projects, you can only select one project at a time in the Layout Save As dialog box. After a project-specific layout is saved, it can be viewed in the Project band in the Open Layout dialog box. Project-specific layout offers two advantages:
 - Exported with the project when it is exported.
 - Enhanced organization of multi-user layouts.

Layouts can be global, project-specific, or user-specific. The Save Layout dialog box allows you to specify to whom a saved layout is available.



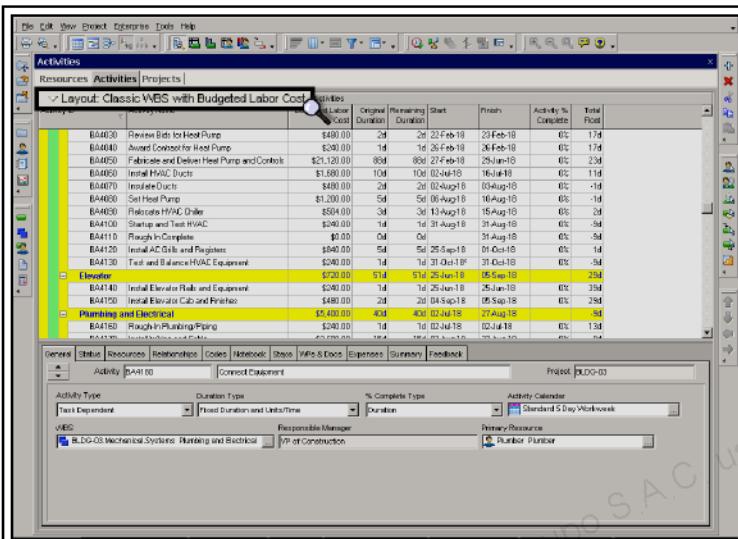


Figure 3-23: The new layout is displayed.

Save a layout.

1. On the Layout Options bar, click *Layout, Save As*.
2. In the Save Layout As dialog box *Layout Name* field, type <**Classic WBS with Budgeted Labor Cost**>.
3. Confirm that *Current User* is selected in the *Available to* list.
4. Click *Save*.

? *Why might you want to customize or create your own layouts rather than just using one of the available default layouts?*

Closing a Project

Close the project when you are finished working with it. You are prompted to verify that you want to close the project.

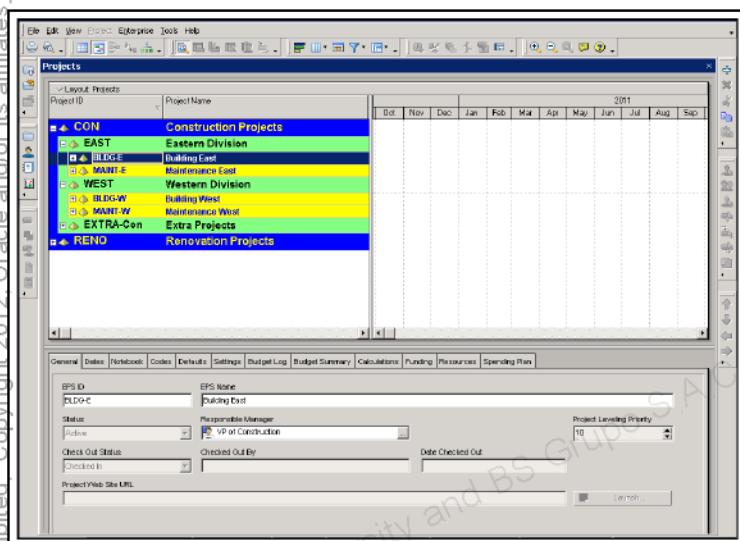


Figure 3-24: After closing all projects, the application displays the Projects window.

Lesson Review

Key Concepts

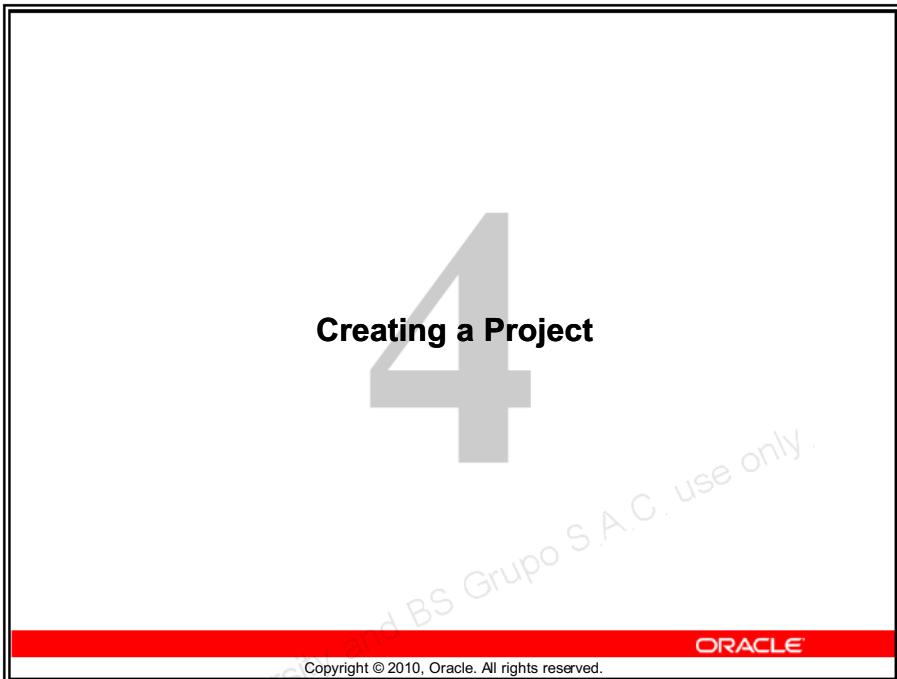
- You can choose to open a project in *Read Only*, *Shared*, or *Exclusive* mode.
- Tabbed windows enable you to have multiple windows open simultaneously and to navigate between windows by clicking the appropriate tab.
- Tab groups, which enable you to display two or more windows simultaneously, can be useful for comparing related information in different windows.
- View activity data in the Activities window using customized top and bottom layouts.
- Use layouts to easily view data specific to your needs. You can customize layouts by selecting columns and by specifying top/bottom layouts.
- Activity Details, arranged in tabs, displays detailed information for the activity highlighted in the Activity Table or Activity Network.

Review Questions

1. When you open a project in _____ mode, you are the only user who can change data in that project.
 - a. Read Only
 - b. Shared
 - c. Exclusive
 - d. User
 2. **True or False:** A layout can be saved so that it can be accessed by only one user.
 3. Which function displays onscreen definitions of project data items?
 - a. Home
 - b. Hint Help
 - c. Help
 - d. None of the above
 4. **True or False:** In P6 Professional, toolbar icons and menu options can both be customized.
-

Notes





Lesson 4 – Creating a Project

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
15	20	30	5	70

Objectives

After completing this lesson, you should be able to:

- Create a project.
- Navigate in the Projects window.
- View and modify information in Project Details.



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Project

- Creates product or service.
- Finite start and end date.
- Managed within confines of:
 - Schedule
 - Resources
 - Cost

ORACLE

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Creating a Project

There are three ways to create a project:

- **Create new** – Best suited for new endeavors or for implementation of new processes / policies.
- **Import** – Add data from P6, spreadsheet applications or Microsoft Project.
- **Copy/paste** – Duplicate existing project or elements of existing project.



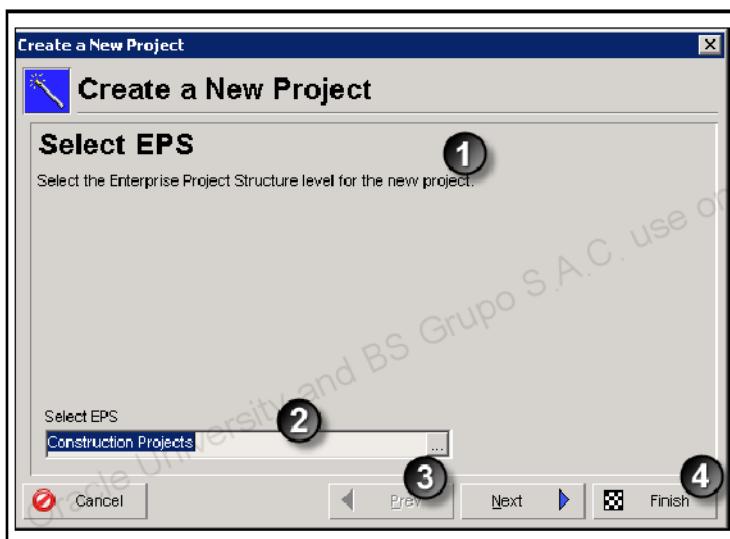
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Notes



Overview: Creating a Project via Create New Project Wizard

In this lesson, you will use the Create a New Project wizard to create a project. The wizard provides students who may be new to project management and/or to P6 Professional with the most reliable way of ensuring that all necessary project information is properly entered. As you become more experienced with project management and P6 Professional, you may wish to use other methods to create projects. On the File menu, click *New* to launch the Create a New Project wizard.



- ① Each screen in the wizard contains information on the data that you need to provide.
- ② Type or select data in the designated field.
- ③ Click *Prev* to return to the previous screen; click *Next* to advance to the next screen in the wizard.
- ④ Click *Finish* when you have completed entering data. You can click *Finish* at any time. Note, however, that some project information may be populated with default data or no data if you click *Finish* before completing all screens in the wizard.

Practice: Creating a Project via Create New Project Wizard

In this practice, you will:

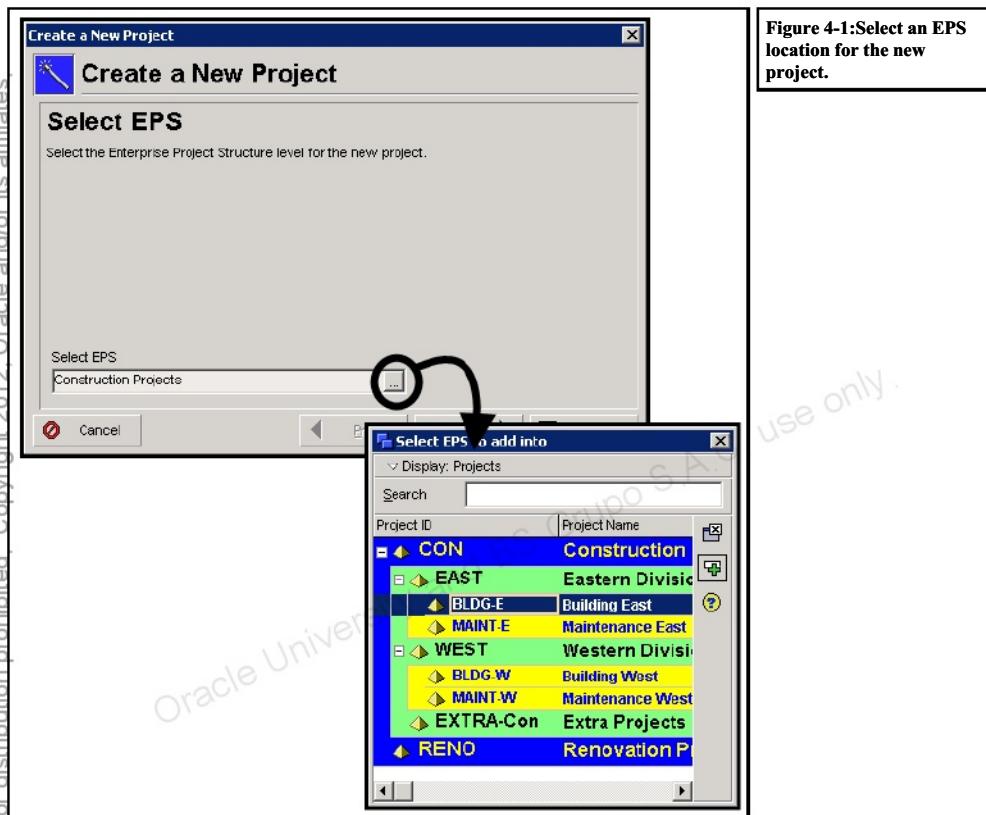
- Launch the Create a New Project wizard.
- Select Start and Finish dates.
- Select a Responsible Manager.
- Select an Assignment Rate type.

Creating a Project with the Create a New Project Wizard

To create a project, launch the Create a New Project wizard. The following fields should be completed before exiting the wizard:

- Project ID (must be unique)
- Project Name (recommended, but not necessary, that it be unique)
- EPS location
- Responsible Manager
- Planned Start date

The first step in creating a new project is to select an appropriate EPS location where it will reside.



① Launch the Create a New Project wizard and select an EPS location.

1. On the File menu, click *New* to launch the Create a New Project wizard.
 2. In the *Select EPS* field, click .
 3. Select an EPS node, *BLDG-E – Building East*, and then click  to assign the selection.
- ?** *What is the purpose of assigning the new project to an EPS node?*
4. Click *Next*.

Entering a Project Name

The name of the project is *Office Building Addition*. You can shorten the name to create the Project ID, *BLDG*.

- **Project ID**—Type a unique ID in this field.
- **Project Name**—Type a new name in this field. (The *Project Name* field does *not* require a unique name.)

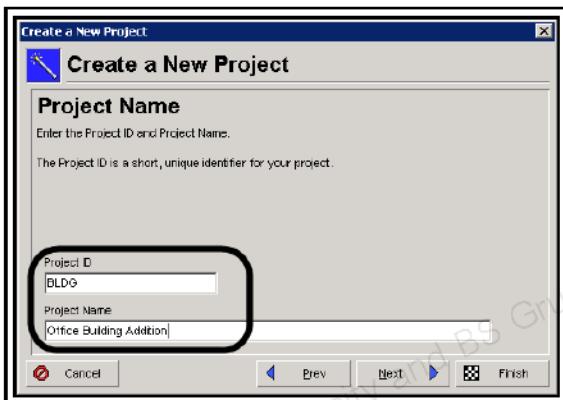


Figure 4-2: Type a Project ID and Project Name.

☛ Type a Project ID and Project Name for the new project.

1. In the *Project ID* field, type <BLDG>.
2. In the *Project Name* field, type <**Office Building Addition**>
3. Click *Next*.

Entering Project Start and End Dates

Use the calendar to select Planned Start and a Must Finish By date for the project. The *Must Finish By* field is not mandatory. Assign a project Must Finish By date at any time during the project life cycle in the Dates tab in Project Details.

To navigate in the calendar:

- When you launch the calendar, the current month/year is displayed. To navigate to a different year, click the Month/Year section in the calendar, and then use the arrows to scroll to the desired year.
- Click the desired month and date, and then click *Select*.

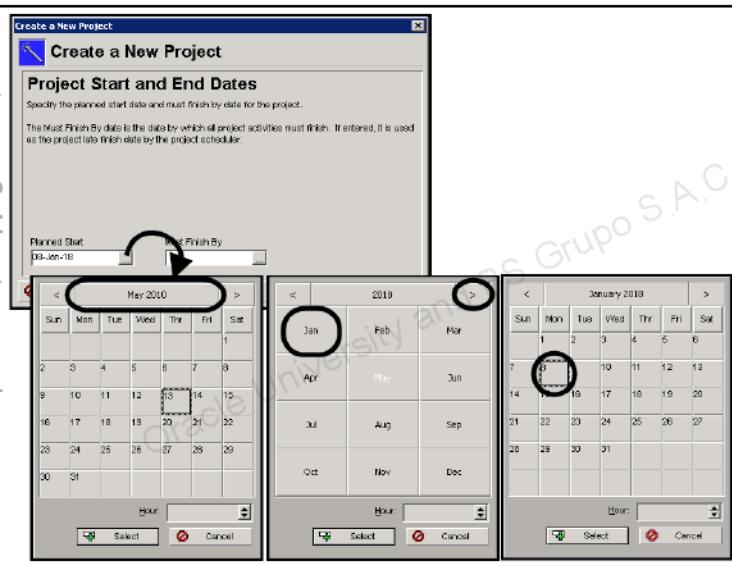


Figure 4-3: Navigate in the calendar to select a Planned Start date, 08-Jan-18.

Assign a Planned Start date for the project.

- In the *Planned Start* field, click .
- Use the calendar to specify a Planned Start date, *8-Jan-18*.
- Click *Select* to select the date.
- Click *Next*.

Entering a Responsible Manager

The Responsible Manager, selected from the Organization Breakdown Structure, is the individual responsible for the project.

The OBS is a hierarchical arrangement of an organization's project management structure, either as roles or individuals. The OBS can be configured to represent a detailed organizational breakdown with employee names or a more general framework where departments, teams, or types of responsibility are modeled in the structure.



Figure 4-4:Select a Responsible Manager.

>Select a Responsible Manager.

1. In the *Responsible Manager* field, click .
2. Select a Responsible Manager, *Tim Harris*, and then click to assign the selection.
3. Click *Next*.

Selecting the Assignment Rate Type

Specify the Assignment Rate Type for new resource assignments. The default rate type determines which price/unit is set on a resource assignment.

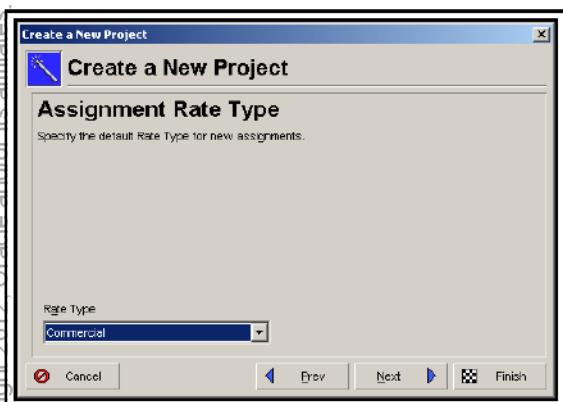


Figure 4-5: Use the list to select a Rate Type.

Select an Assignment Rate Type.

1. In the *Rate Type* list, confirm *Commercial*.
2. Click *Next*.

Completing the Wizard

After completing the wizard, P6 Professional creates the *Office Building Addition* project.

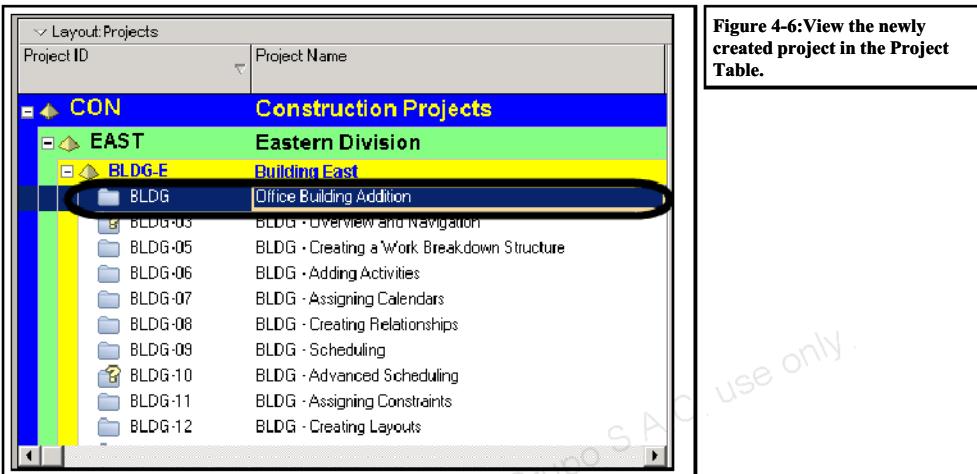


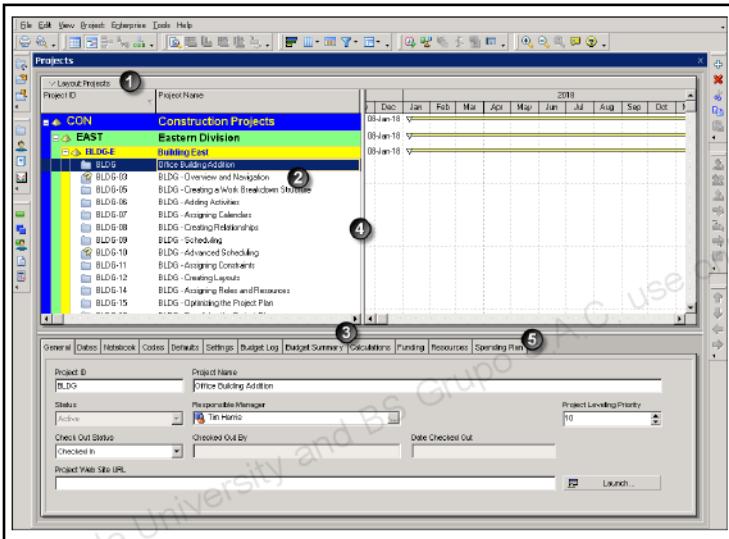
Figure 4-6: View the newly created project in the Project Table.

Complete the wizard.

1. Click *Finish*.
2. Confirm you are in the Projects window.
3. In the Project Table, click + to expand the WBS element, *BLDG-E – Building East* WBS level.
4. View the new project, *BLDG – Office Building Addition*.

Overview: Projects Window and Editing Project Details

The Projects window displays projects within the EPS elements to which you have access. On the Enterprise menu, click *Projects* to access the Projects window. Project Details, arranged in tabs in the bottom layout, enables you to view and edit project information.



- ➊ The Layout Options bar enables you to format data and open layouts.
- ➋ The Project Table displays project information in spreadsheet format.
- ➌ Use the horizontal split bar to hide/show more information – for example, to display more of Project Details and less of the Project Table.
- ➍ Use the vertical split bar to alter the balance between left and right panes of the Projects window.
- ➎ Tabs in Project Details display detailed information about a project selected in the Project Table.

Practice: Projects Window and Editing Project Details

In this practice, you will:

- View information in Project Details.
- Assign a Notebook topic on the Notebook tab.
- Assign a project code on the Codes tab.

Viewing Project Details

Project Details is located in the bottom layout of the Projects window. Use Project Details to define the project properties and defaults that are applied to the selected project.

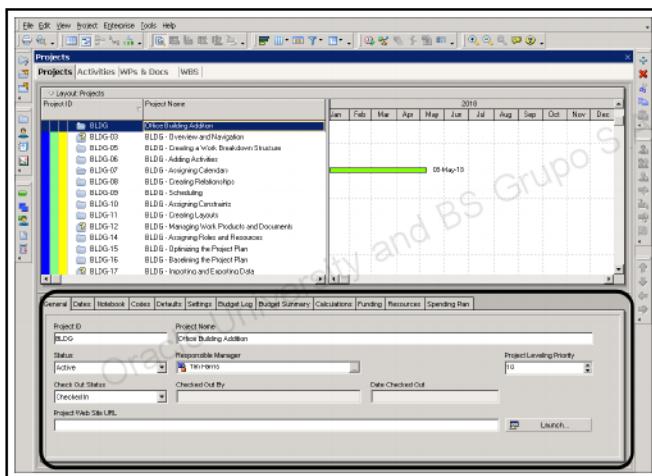


Figure 4-7:Project Details, in the bottom layout of the Projects window, displays detailed information about the project selected in the Project Table.

Open a layout.

1. Confirm that you are in the Projects window.
2. On the Layout Options bar, click *Layout, Open*.
3. Select a layout, *Projects*, and then click *Open*.
4. In the Project Table, select a project, *BLDG-Office Building Addition*.
5. Confirm that the General tab is selected.

General Tab

The General tab enables you to view or modify general information about the selected project. Specify Project ID, Project Name, and Responsible Manager when you create the project, or modify this information in the tab. The remaining fields are set by default.

Fields on the General tab:

- **Project ID** – Short, unique identifier for the project.
- **Project Name** – Name of the project.
- **Status** – Indicates project status based on the table below:

Project Status	Use Case
Active	Project is currently being worked on.
Inactive	Project is completed or on hold.
Planned	Project is being analyzed before moving to permanent plan.
What-if	Project is used as a test scenario.

- **Responsible Manager** – Individual, selected from the OBS, who is responsible for the project.
- **Leveling Priority** – Projects with a lower number in this field receive resources first when projects are leveled. Enter a value between 1 and 100. The highest rank is 1; the default is 10.
- **Check Out Status** – Indicates whether the project is checked in or checked out.
- **Checked Out By** – Displays the user who checked out the project.
- **Date Checked Out** – Indicates the date and time the user checked out the project.
- **Project Web Site URL** – Displays the project's Web site address.

Dates Tab

The Dates tab enables you to edit date information for the selected project. Specify the Planned Start and Must Finish By dates when you create the project, or modify this information in the tab.

Fields in the Dates tab:

- **Planned Start**—Planned start date of the project.
- **Data Date**—Used as the starting point for schedule calculations.
- **Must Finish By**—Date indicating the desired project end date.
- **Finish**—Non-editable field indicating the latest early finish date calculated when the project was last scheduled.
- **Actual Start and Actual Finish**—Non-editable field indicating the actual start and finish dates of the project.
- **Anticipated Start and Anticipated Finish**—Expected dates that you can select while planning the project at a high level.

Schedule Dates		Anticipated Dates	
Planned Start	Must Finish By	Anticipated Start	Anticipated Finish
08-Jan-18			
Data Date	Finish		
08-Jan-18			
Actual Start	Actual Finish		

Figure 4-8: When a project is created, the Planned Start date and the data date are the same.

View the data date.

1. Click the Dates tab.
2. In the *Data Date* field, confirm *08-Jan-18*.

? *Is it possible to change the data date in Project Details?*

Notebook Tab

The Notebook tab enables you to write, view, or edit project notes such as the project's purpose, core requirements, or other project-specific details.

The Notebook tab is divided into two sections:

- **Notebook Topic** – List of topics assigned to the selected node/project. You can also add Notebook topics to WBS elements and activities.
- **Detail** – User-defined description of the selected topic. HTML editing features are available to use, including formatting text, inserting pictures, copying, pasting, and adding hyperlinks.

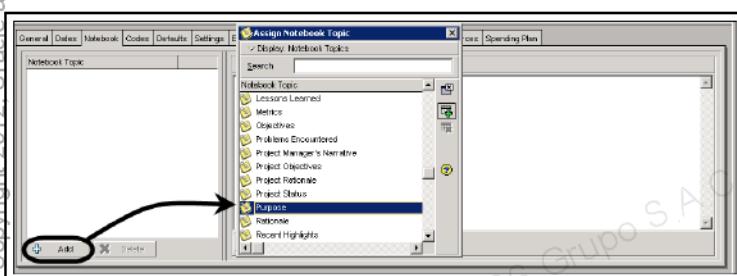
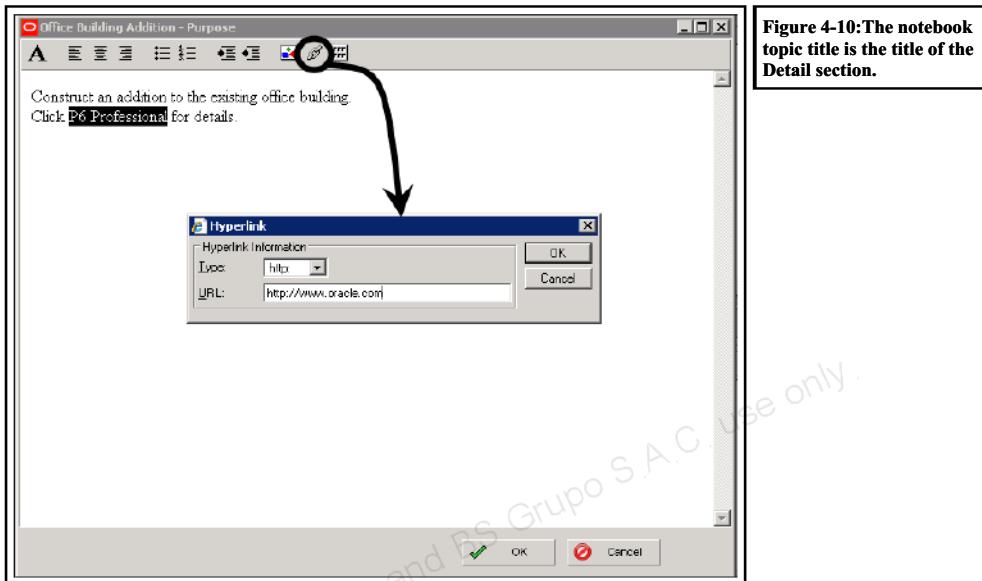


Figure 4-9: Click *Add* to assign a Notebook topic.

Use a Notebook topic to define the purpose of the project.

1. Click the Notebook tab.
2. In the Notebook Topic section, click *Add*.
3. Select *Purpose* and then click to assign the topic.
4. Click to close the Assign Notebook Topic dialog box.

Click *Modify* to type a description for the selected topic.



5. In the Detail section, click *Modify*.
6. Click in the dialog box and type <**Construct an addition to the existing office building**>
7. Press *Enter* on your keyboard.
For single spacing, press *Shift-Enter*.
8. Type <**Click P6 Professional for details.**>
9. Select the text, *P6 Professional*, and then click 
10. In the *Type* list in the Hyperlink dialog box, confirm *http* is selected.
11. In the *URL* field, type <**www.oracle.com**>.
12. Click *OK*.
13. Click *OK*.

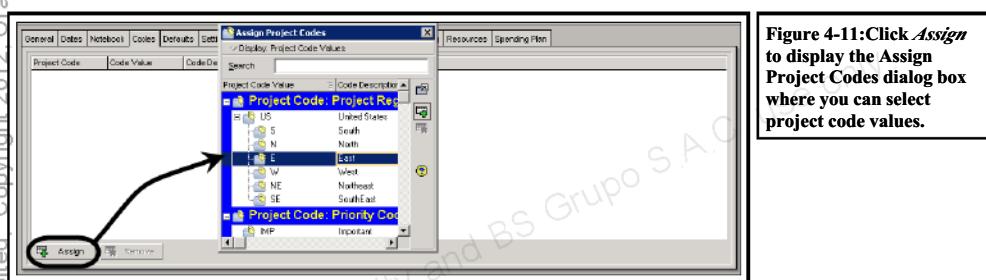
Codes Tab

The Codes tab enables you to assign project codes and values to the selected project.

Project codes allow you to group the projects in the EPS into specific categories, such as location or division. Project codes are also useful for organizing large amounts of information and for distinguishing one project from another. Unlimited hierarchical project codes are supported.

Note the distinction between project code and project code value. It is the project code value – not the project code – that is assigned.

! *Can you suggest ways that your company might use project codes?*



Assign a project code to the project.

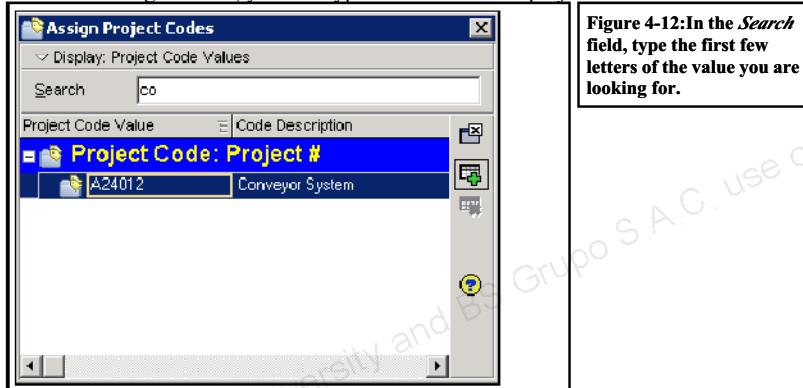
1. Click the Codes tab.
2. Click *Assign*.
3. In the *Project Code: Project Region* grouping, select a project code value, *E-East*.
4. Click to assign the selection.

Type Ahead and Search in Dialog Boxes

The *Search* field in dialog boxes throughout P6 Professional offers a faster alternative to scrolling through long lists of values:

- **Search** – Type in the *Search* field and then press *Enter* to search for a value.
- **Type ahead** – Type in the *Search* field and, as you type, values that match the letters you have typed are displayed in the dialog box.

In the following exercise, you will type ahead to find the project code value *Comm-Commercial*.



Use type ahead to find a project code value.

1. In the *Search* field, type <co>.

You will not assign a project code value at this time.

2. Click to close the dialog box.

Defaults Tab

The Defaults tab is divided into two sections:

- **Defaults for New Activities**— Indicates the settings used when new activities are added to the project. Note that changing these settings will not affect existing activities.
- **Auto-numbering Defaults**— Sets how new activities are numbered in the project.
 - ◆ When the *Increment Activity ID based on selected activity* check box is selected, the prefix or suffix of the selected activity is applied to the activity that is being added.

For the activities in the *Office Building Addition* project, you will set the activity ID prefix to *BA*, and confirm the suffix as 1000 and the increment as 10. When adding activities, the first Activity ID will be numbered BA1000, the second Activity ID will be BA1010, etc. This numbering structure relates activities to the project and can be especially helpful when viewing activities from different projects.

? *How would Activity ID prefixes help when viewing activities from different projects?*

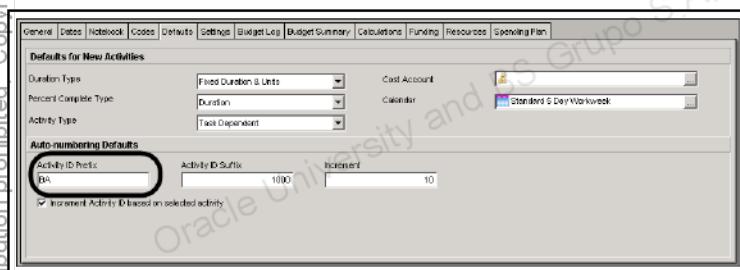


Figure 4-13:Activity ID Prefix is among the default settings that can be defined in the Defaults tab.

Set an Activity ID prefix.

1. Click the Defaults tab.
2. In the *Activity ID Prefix* field, type **<BA>**.
3. In the *Activity ID Suffix* field, confirm **1000**.
4. In the *Increment* field, confirm **10**.

Budget Log Tab

The Budget Log tab enables you to view or modify budget information for the current project/node.

Fields in the Budget Log tab:

- **Original Budget** – Estimate of the total budgeted or planned amount you require for this project, including all funding contributions.
- **Current Budget** – Sum of the actual budget plus approved budgets.
- **Proposed Budget** – Sum of the actual budget plus approved and pending budgets.
- **Budget Change Log** – Track changes to the actual budget.

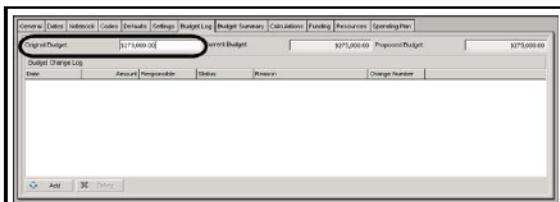


Figure 4-14: Type the Original Budget for the project.

☛ Record the Original Budget for the project.

1. Click the Budget Log tab.
2. In the *Original Budget* field, type **<275,000>**.

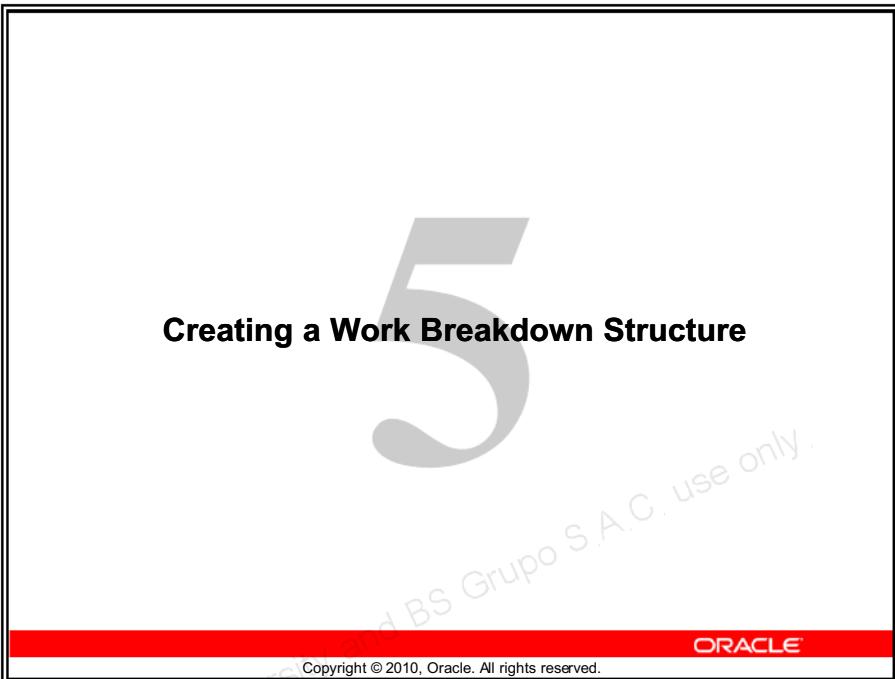
Lesson Review

Key Concepts

- There are three ways to create a project: Create a New Project wizard, importing a file, and copying an existing project.
- Use the Projects window to view high-level information for projects you can access.
- Use Project Details tabs in the Projects window to define default settings and properties for the selected project, such as Planned Start and Must Finish By dates.

Review Questions

1. Which tab in the Projects window would you click to change the project's Planned Start date?
 - a. General
 - b. Defaults
 - c. Dates
 - d. Settings
2. **True or False:** When creating a project, you must specify a date by which the project will finish.
3. On which tab can you specify auto numbering of Activity ID values?
 - a. Settings
 - b. Defaults
 - c. Dates
 - d. General



Lesson 5 – Creating a Work Breakdown Structure

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
15	10	20	5	50

Objectives

After completing this lesson, you should be able to:

- Define a Work Breakdown Structure (WBS).
- Create multiple levels of a WBS hierarchy.

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WBS

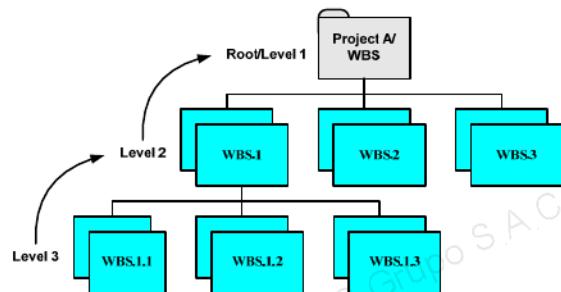
- A hierarchical arrangement of the products and services produced during, and by, a project.
 - Element represents a deliverable, product, or service.
 - Each element contains the activities needed to produce the deliverable.
- Enables you to divide a project into logical pieces for the purpose of planning and control.

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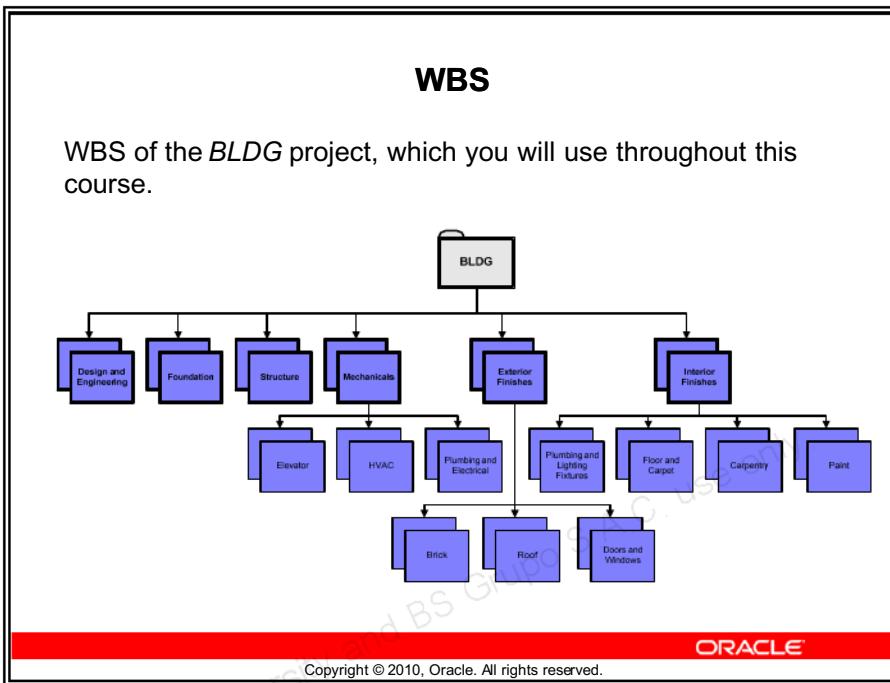
WBS

- Project is root node of WBS.
- Child/parent relationships between elements enable lower levels to be rolled up and summarized.



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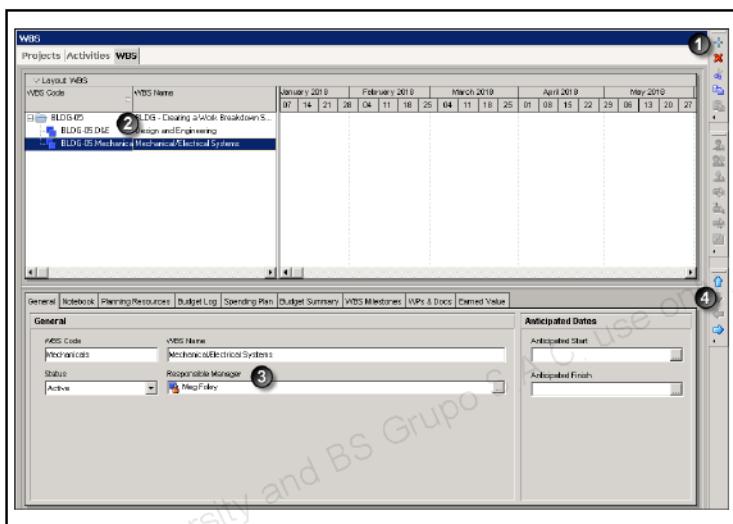


Notes



Overview: Creating a Work Breakdown Structure

Use the WBS window to create a Work Breakdown Structure. On the Project menu, click *WBS* to display the WBS window.



- ① Click to add WBS elements to the WBS Table.
- ② Specify a WBS Code and WBS Name for each new element in the WBS Table.
- ③ Use the General tab in WBS Details to specify a Responsible Manager for a WBS element.
- ④ Navigation arrows on the Move toolbar enable you to indent or outdent selected WBS elements and modify the overall WBS structure.

Practice: Creating a Work Breakdown Structure

In this practice, you will:

- Use the WBS window to add elements to the Work Breakdown Structure of the *Office Building Addition* project.
- Use WBS Details to assign a Responsible Manager to new elements of the WBS.
- Use navigation arrows to reorganize the WBS.

Viewing WBS Elements

When a project is created, a root-level WBS element is created. The WBS Code is the same as the Project ID; the WBS Name is the same as the Project Name.

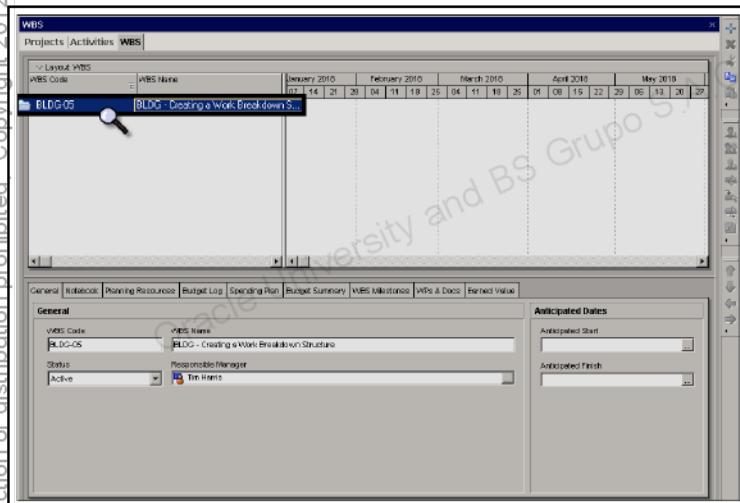


Figure 5-1: BLDG-05 is the root level of the WBS.

View the WBS root element for the project.

1. Open a project, *BLDG-05 BLDG - Creating a Work Breakdown Structure*.
2. On the Project menu, click *WBS*.
3. In WBS Details, confirm the General tab is selected.

Creating the WBS Hierarchy

WBS elements added to the root level element are automatically indented to form the second level of the hierarchy. The WBS code for each WBS element contains the code of its parent element. WBS codes are alphanumeric – they can consist of numbers, text, or both.

If parent's WBS Code is	WBS Codes of its children are
WBS	WBS.1, WBS.2
WBS.1	WBS.1.1, WBS.1.2
BLDG	BLDG.EX-FINISH, BLDG.INT-FINISH
BLDG.INT-FINISH	BLDG.INT-FINISH.PAINT, BLDG.INT-FINISH.FIXTURES

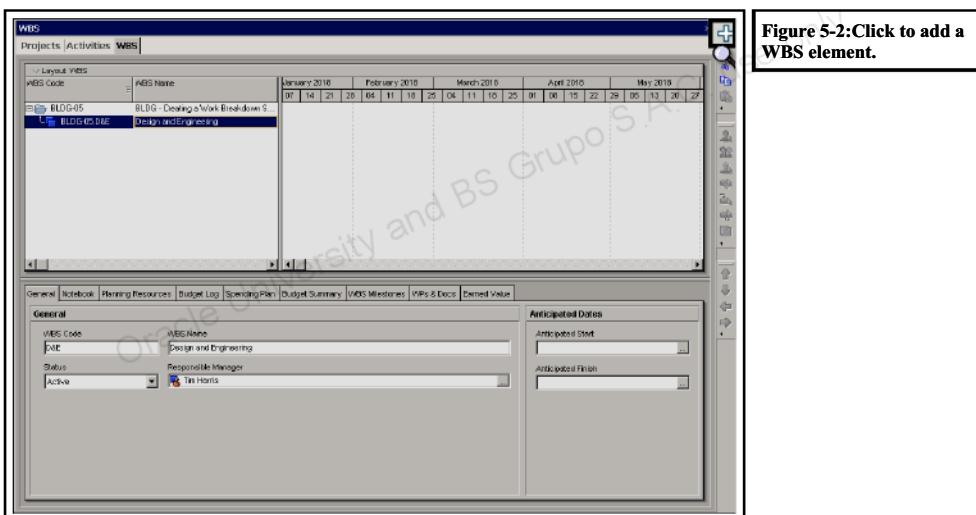


Figure 5-2: Click to add a WBS element.

1 Add a WBS element.

1. Click
2. In the *WBS Code* column, type <D&E>, and then press *Tab* on your keyboard.
3. In the *WBS Name* column, type <Design and Engineering>.
4. Press *Enter* on your keyboard.

When you create a new WBS element, it is indented as a “child” of the WBS element that is currently selected.

If you add a WBS element to the wrong level or in the wrong order, use the navigation arrows in the Move toolbar to adjust the structure of the WBS hierarchy.

? What happens to the activities assigned to a WBS element when the element is moved or deleted?

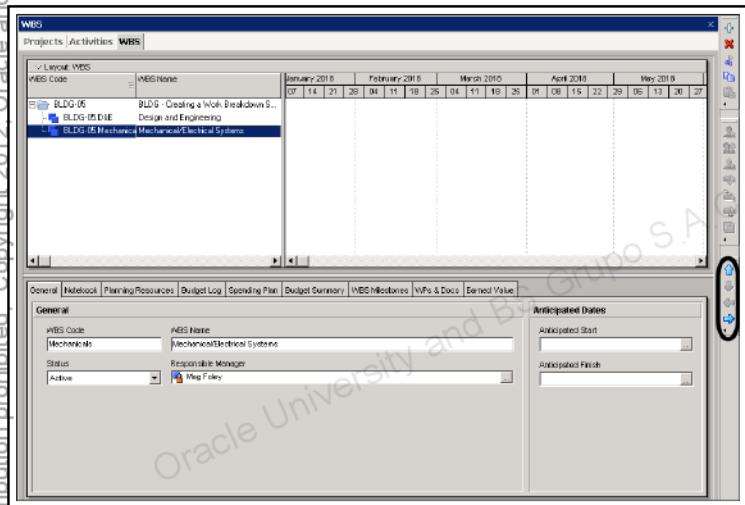


Figure 5-3: Use the navigation arrows to indent or outdent selected elements within the WBS.

Add a WBS element.

1. Confirm that the WBS element, *Design and Engineering*, is selected.
2. Click
3. In the *WBS Code* column, type <**Mechanicals**>, and then press *Tab*.
4. In the *WBS Name* column, type <**Mechanical/Electrical Systems**> and then press *Enter*.
5. In the *Responsible Manager* field in the General tab in WBS Details, click
6. Select *Meg Foley*, and then click
7. On the *Move* toolbar, click to outdent the *Mechanicals* WBS element.

The “child” WBS inherits attributes from the “parent” WBS. This is illustrated below where the WBS element you create, *Elevator*, inherits the Responsible Manager of its parent, *Mechanical/Electrical Systems*.

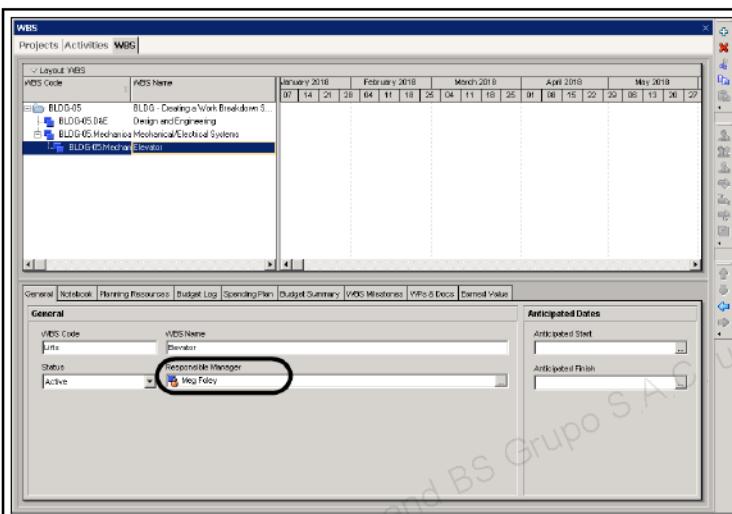


Figure 5-4: The WBS element, *Elevator*, is created as a child of the WBS element, *Mechanicals*, and inherits the parent's Responsible Manager assignment.



Add a WBS element.

1. Confirm that the WBS element, *Mechanical/Electrical Systems*, is selected.
2. Click 
3. In the *WBS Code* column, type <Lifts>, and then press *Tab* on your keyboard.
4. In the *WBS Name* column, type <**Elevator**>, and then press *Enter*.

 *Is it possible to make a WBS element the child of a different parent?*

To specify the level that WBS elements group to, click *Collapse To* on the Display Options bar. To expand or collapse elements of the WBS, click *Expand All* or *Collapse All* on the Display Options bar.

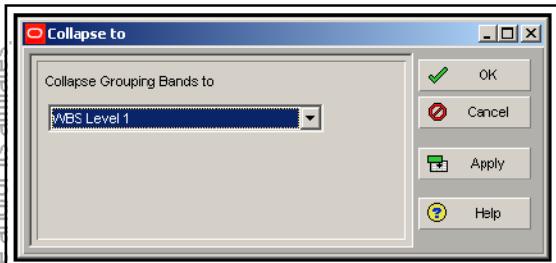


Figure 5-5: Right-click in the WBS window to display the Collapse to dialog box.

Add the next WBS element.

1. Select a WBS element, *Mechanicals*.
2. Click .
3. In the *WBS Code* column, type <**HVAC**>, and then press *Tab* on your keyboard.
4. In the *WBS Name* column, type <**HVAC**>, and then press *Enter*.
5. On the Layout Options bar, click *Collapse To*.
6. In the *Collapse Grouping Bands To* list, select *WBS Level 1*, and then click *OK*.
Note that only the root level of the WBS is displayed.
7. On the Layout Options bar, click *Collapse To*.
8. In the *Collapse Grouping Bands To* list, select *WBS Level 3*, and then click *OK* to restore the WBS to its expanded form.

Lesson Review

Key Concepts

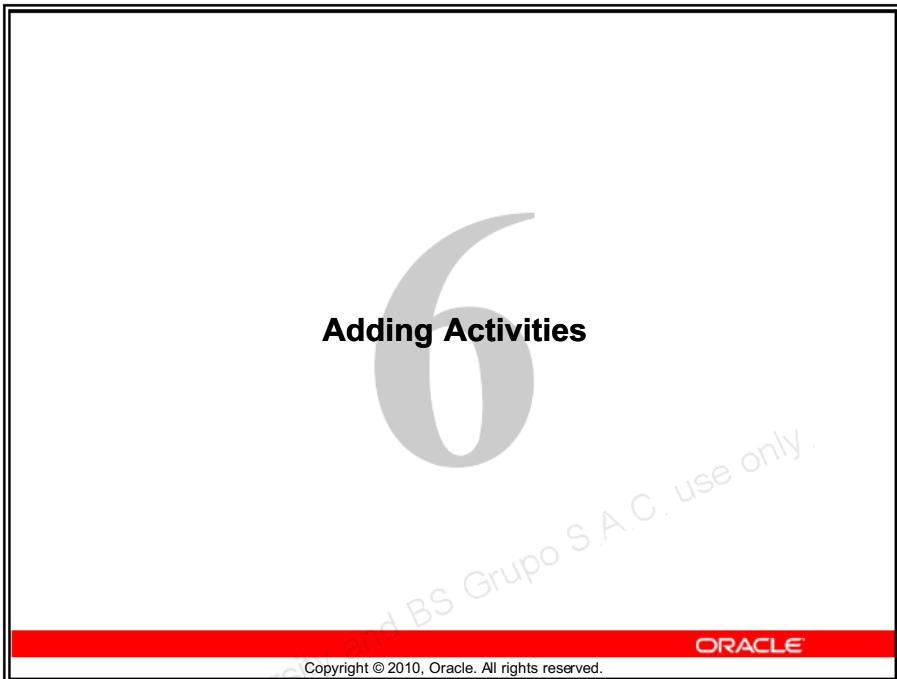
- The Work Breakdown Structure is a hierarchical arrangement of the products and services produced during and by a project.
- The highest level of the WBS is the project, and the lowest level consists of the individual activities required to produce the deliverables for each WBS element.
- Create the WBS in the Work Breakdown Structure window.
 - ◆ New elements are automatically indented under the selected parent element.
 - ◆ Use the navigation arrows to indent/outdent and to rearrange the WBS elements.

Review Questions

1. **True or False:** When you create a new project, the root level of the WBS is created with the same name as the project.
2. **True or False:** When you add a new WBS element it is automatically added at the same level as the highlighted WBS element.
3. **True or False:** Use navigation arrows to adjust the structure of the WBS hierarchy.

Notes





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Lesson 6 – Adding Activities

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
15	15	45	5	80

Objectives

After completing this lesson, you should be able to:

- Describe an activity and its components.
- Describe activity types.
- Add activities.
- Add a Notebook topic to an activity.
- Add steps to an activity.
- Assign activity code values to activities.



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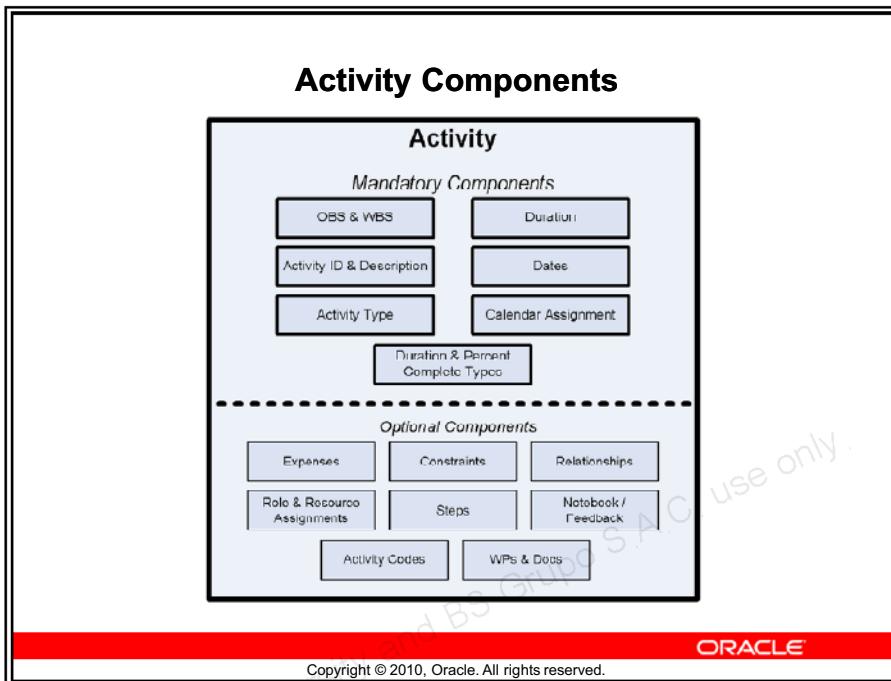
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Activities

- Fundamental work element of a project.
 - Also known as a task, item, event, or work package.
- Lowest level of a WBS.
 - Most detailed work unit tracked in the project schedule.
 - Contains all information about the work to be performed.
 - Smallest subdivision of work that directly concerns project manager.

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Activity Type

- Controls how activity's dates are calculated.
- Depends on the activity's function in the project and the calendar used for the activity during scheduling.
- P6 Professional supports six activity types:
 - Start Milestone
 - Finish Milestone
 - Task Dependent
 - Resource Dependent
 - Level of Effort
 - WBS Summary

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Start Milestone

- Used to mark the beginning of a project phase or to communicate project deliverables.
- Has zero duration.
- Has a Start date only.
- Constraints, steps, expenses, work products, and documents can be assigned.
- Roles cannot be assigned.
- Resources cannot be assigned except for the Primary Resource.

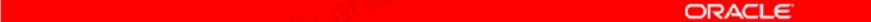
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Finish Milestone

- Used to mark the end of a project phase or to communicate project deliverables.
- Has zero duration.
- Has a Finish date only.
- Constraints, steps, expenses, work products, and documents can be assigned.
- Roles cannot be assigned.
- Resources cannot be assigned except for the Primary Resource.



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Task Dependent

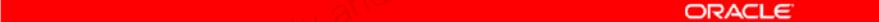
- Used when work needs to be accomplished in a given timeframe, regardless of the assigned resources' availability.
- Resources are scheduled to work according to the activity calendar.
- Duration is determined by the activity calendar.
- Roles and resources can be assigned.
- Constraints, steps, expenses, work products, and documents can be assigned.

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Resource Dependent

- Typically used when multiple resources assigned to the same activity can work independently.
- Resources are scheduled according to the individual resource's calendar.
- Roles and resources can be assigned.
- Constraints, steps, expenses, work products, and documents can be assigned.



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How Activity Type Affects Dates

- Activity duration = 2 days
- Scheduled to start Monday
- Requires three resources, each working two days
- Each of the three resources has a resource calendar:

	Mon	Tue	Wed	Thu	Fri
Laborer	X	W	X	W	X
Engineer	W	X	W	W	W
High-Capacity Crane	X	X	W	W	X

W = work day X = nonwork day

- How many days will activity be scheduled, based on activity type?
 - Task Dependent
 - Resource Dependent

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How Activity Type Affects Dates

Task Dependent: Scheduled for 2 days

	Mon	Tue	Wed	Thu	Fri
Laborer	X	W	X	W	X
Engineer					
High-Capacity Crane	W X	X	W	W	W X

Resource Dependent: Scheduled for 4 days

	Mon	Tue	Wed	Thu	Fri
Laborer	X	W	X	W	X
Engineer	W	X	W	W	W
High-Capacity Crane	X	X	W	W	X

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Question

Based on the previous slides, which resource would most likely require that the activity be categorized as Resource Dependent?

- 1: Laborer
- 2: Engineer
- 3. Specialized high-capacity crane

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Level of Effort

- Used for ongoing tasks dependent on other activities.
- Duration is determined by its predecessor and successor activities and its assigned calendar.
- Roles and resources can be assigned.
 • Constraints cannot be assigned.

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WBS Summary

- Used to summarize at the WBS level.
- Comprises a group of activities that share a common WBS level.
- Dates are based on the earliest Start date and the latest Finish date of the activities in the WBS level.
- Duration is based on its assigned calendar.
- Constraints cannot be assigned.

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Activity Codes

Activity codes enable you to classify and categorize activities according to your organizational and project needs.

- Filter activities.
- Build reports.
- Group and sort layouts.

The red bar spans the width of the content area below the activity codes section.

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Three Levels of Activity Codes

- **Global-level** – Available to all activities in the database.
 - Create an unlimited number of global-level activity codes.
 - Organize activities within a project or across EPS.
- **EPS-level** – Available to all activities within the EPS node and its children.
 - Create an unlimited number of EPS-level activity codes.
 - Organize activities within a project or across a portion of the EPS.
- **Project-level** – Available to activities only in the project in which the code is created.
 - Create up to 500 project-level activity codes per project.
 - Filter and organize activities based on unique, project-specific requirements.



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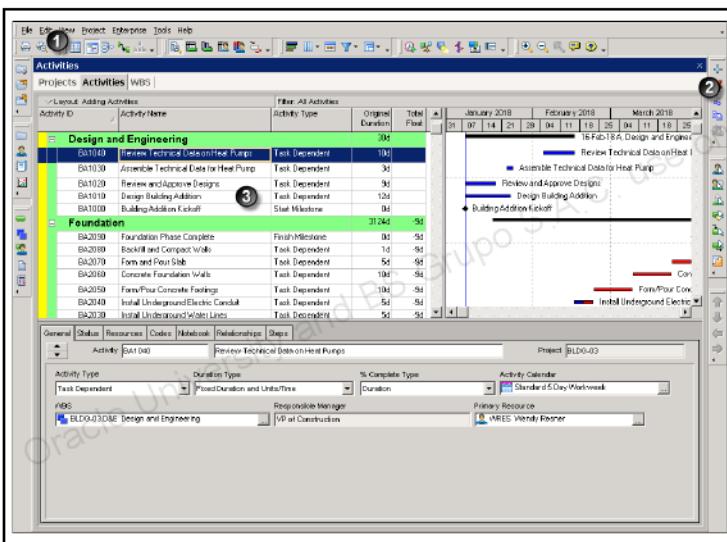
Notes



Overview: Adding Activities via the New Activity Wizard

There are four ways to add activities to a project: right-click in the Activity Table and select *Add*; click  on the Edit toolbar; click *Add* on the Edit menu; or press *Insert* on your keyboard.

Use Edit/Add or click  on the Edit toolbar to launch the New Activity wizard, which provides step-by-step guidance in adding activities to the project plan. The wizard ensures that all necessary information is entered properly. Once you become more familiar with the information required for adding new activities, you may prefer to forgo the use of the wizard and add activities manually.



- ① On the Edit menu, click *User Preferences* and then select the Assistance tab to enable the New Activity wizard.
- ② Use the Edit toolbar to add, delete, cut, copy, and paste activities.
- ③ The Activity Table lists the activities in the project.

Practice: Adding Activities via the New Activity Wizard

In this practice, you will:

- Enable the New Activity wizard in User Preferences.
- Add an activity using the New Activity wizard.

Adding an Activity via the New Activity Wizard

The project, *BLDG-06*, contains no activities, and the layout, *Adding Activities*, is simplified to show just the WBS and selected tabs in Activity Details.

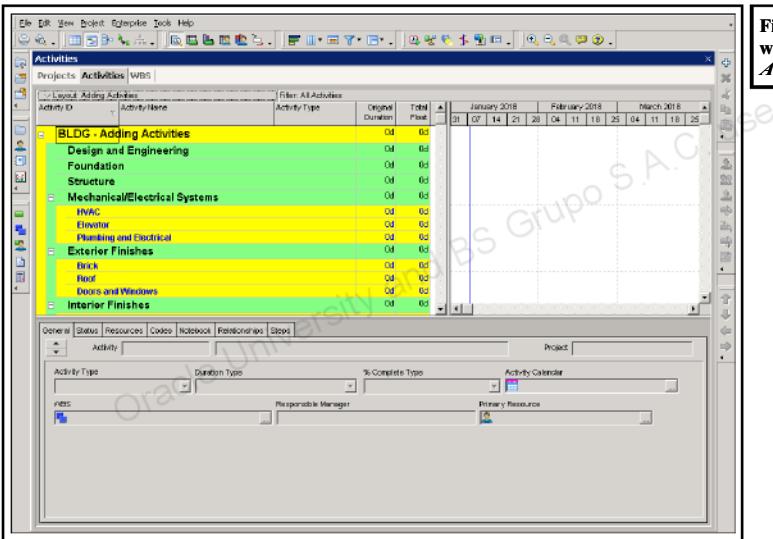


Figure 6-1: The Activities window with the *Adding Activities* layout displayed.

Open a project and layout.

1. Open a project, *BLDG-06 BLDG - Adding Activities*.
2. On the Layout Options bar, click *Layout, Open*.
3. When asked if you want to save changes to the present layout, click *No*.
4. Select a layout, *Adding Activities*, and then click *Open*.

Enabling the Wizard

The New Activity wizard walks you through the process of adding an activity. Once you become familiar with the process, you can disable the wizard in User Preferences and manually add activities to the project.

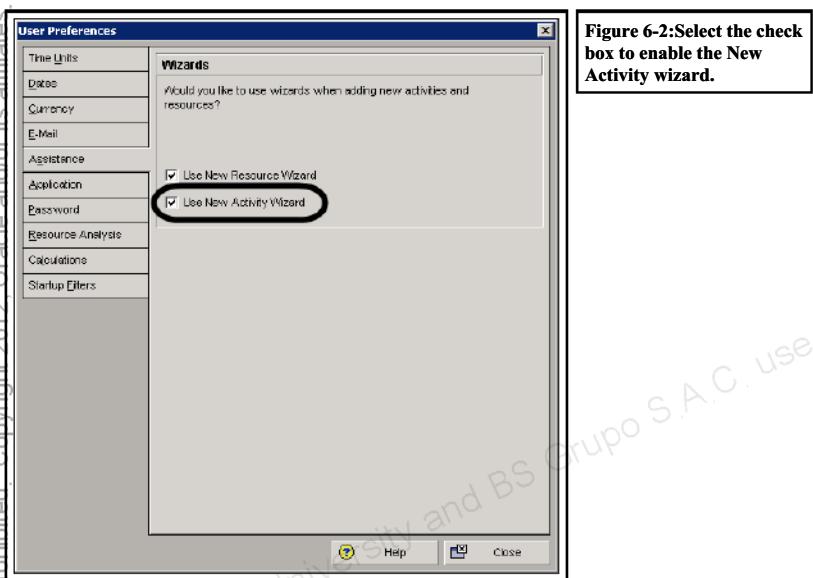


Figure 6-2:Select the check box to enable the New Activity wizard.

Enable the New Activity wizard in User Preferences.

1. On the Edit menu, click *User Preferences*.
2. Click the Assistance tab.
3. Confirm the *Use New Activity Wizard* check box is selected.
4. Click *Close*.

Launching the Wizard

To add an activity using the New Activity wizard, on the Edit menu, click *Add*.

Once launched, the New Activity wizard provides a brief description of the type of information to be entered in each screen.



Figure 6-3: Type a unique ID in the *Activity ID* field.

♂ Add an activity via the New Activity wizard.

1. On the Edit toolbar, click

Naming the Activity and Specifying a WBS

Type a unique Activity ID and Activity Name. You will assign the first activity to the *Design and Engineering* WBS element.



Figure 6-4: Verify the Activity ID and type an Activity Name.

2. In the *Activity ID* field, confirm *BA1000*.
- ?** *Where did this Activity ID come from?*
3. In the *Activity Name* field, type <**Building Addition Kickoff**>.
4. Click *Next*.

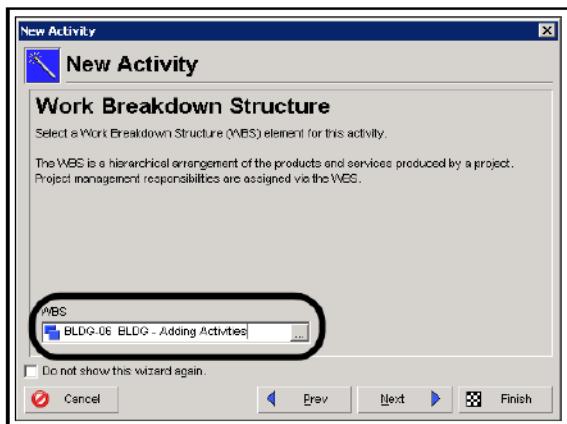


Figure 6-5: The WBS element assigned to the activity.

5. In the *WBS* field, click .
6. Select a WBS element, *Bldg-06.D&E – Design and Engineering*, and then click .
7. Click *Next*.

Assigning Activity Type

Activity Type controls how an activity's dates are calculated. Select the activity type according to the activity's function in the project and the calendar that should be used for the activity during scheduling. The wizard dialog box provides a brief description of each activity type.

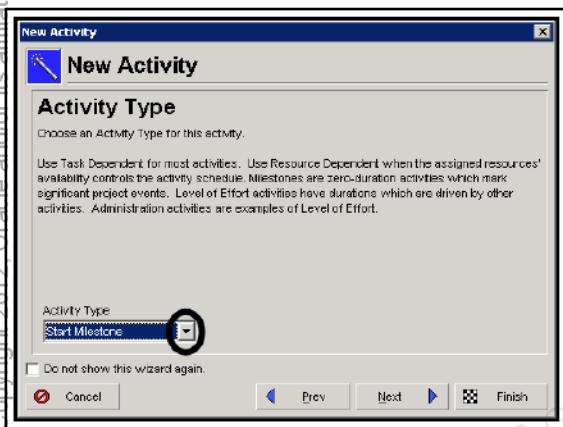


Figure 6-6: Click and select an activity type for the activity.

8. In the *Activity Type* list, select *Start Milestone*.



What is the default activity type for this project?

9. Click *Next*.

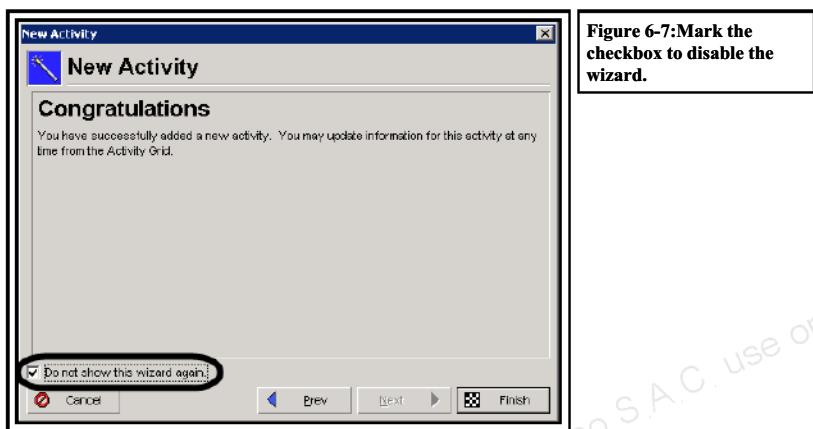
You will not add dependent activities or relationships at this time.

10. Confirm that *No, continue* is selected, and then click *Next*.

11. Confirm that *No, thanks* is selected, and then click *Next*.

Completing the New Activity Wizard

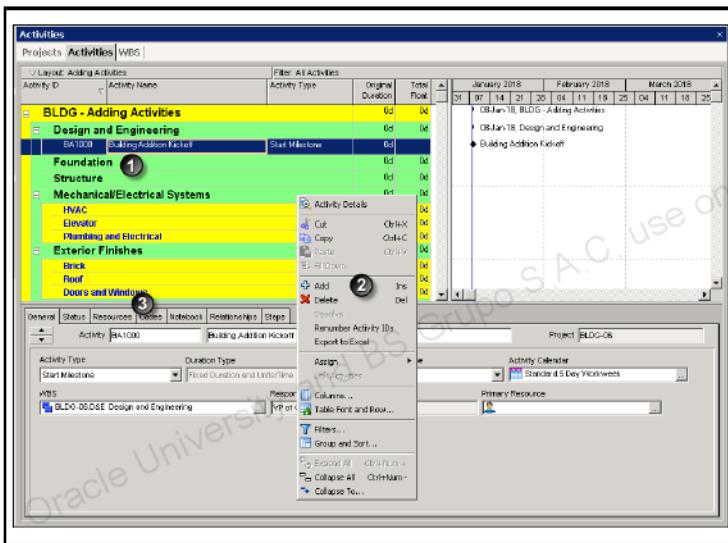
You have successfully added your first activity. You will now disable the wizard so that you can add additional activities manually.



12. Select the *Do not show this wizard again* check box.
13. When prompted, click *OK*.
14. Click *Finish*.

Overview: Adding Activities via Activity Details

There are a number of ways to add activities to a project plan other than using the New Activity wizard. Before adding a new activity, however, you should first select a WBS element in which the activity will reside, or select an existing activity in the Activity Table (The new activity will appear below the selected activity.). After you have added the new activity to the Activity Table, use the tabs in Activity Details to enter additional information.



- ① In the Activity Table, select a WBS element or an existing activity below which you want to add a new activity.
- ② Right-click on the Activity Table and click *Add* to add a new activity to the Activity Table.
- ③ Use the tabs in Activity Details to enter additional information about a new activity.

Practice: Adding Activities via Activity Details

In this practice you will:

- Use a variety of methods to add activities.
- Use the tabs in Activity Details to enter information about a new activity.
- Use the columns in the Activity Table to enter information about a new activity.

Adding an Activity via Activity Details

Once you become familiar with the information required, quickly add activities by using the tabs in Activity Details. First, select either the WBS element in which you want the activity to reside, or select an existing activity below which you want the new activity to appear.

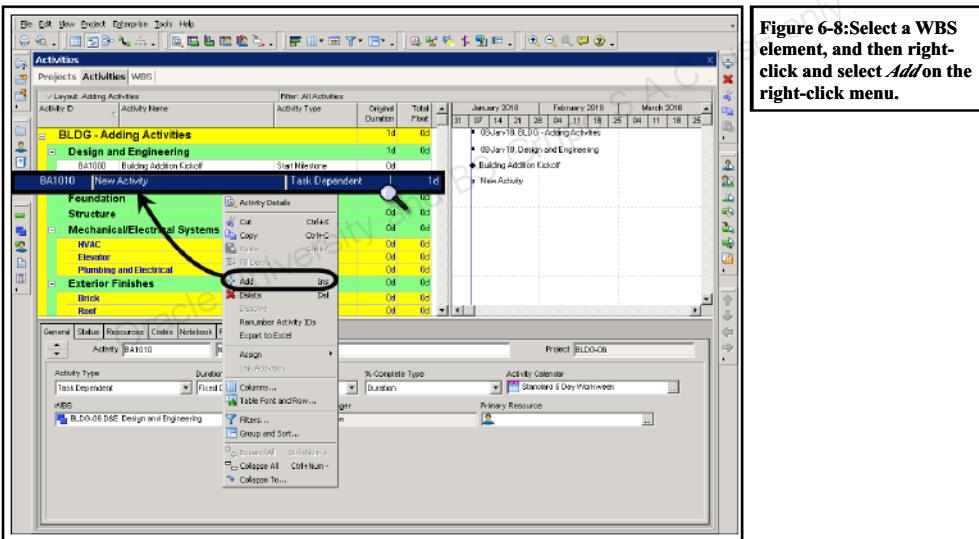


Figure 6-8: Select a WBS element, and then right-click and select *Add* on the right-click menu.

♂ Add an activity via Activity Details.

1. In the Activity Table, select a WBS element, *Design and Engineering*.
2. On the Edit menu, click *Add*, or right-click and on the menu, select *Add*.

You can also press *Insert* on your keyboard. Regardless of the method you choose, you should first select the WBS element in which you want to place the new activity or select an existing activity in that WBS element.

General Tab

Use the General tab to enter basic information about the activity, including Activity Type, discussed earlier in this lesson.

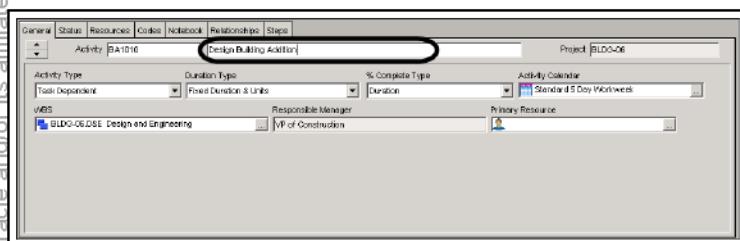


Figure 6-9: Type the Activity Name in the General tab.

Verify or enter activity information in the General tab.

1. In Activity Details, verify that the General tab is selected.
2. In the *Activity ID* field, confirm *BA1010*.
3. In the *Activity Name* field, type **<Design Building Addition>**, and then press *Enter* on your keyboard.
4. In the *Activity Type* list, confirm *Task Dependent*.

Status Tab

Use the Status tab to define the selected activity's duration, constraints, Start and Finish dates, labor and nonlabor units and costs, and material costs. Use the Status tab to view the selected activity's float, actuals, and completion percentages.

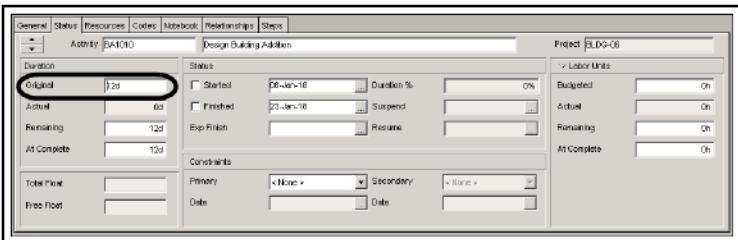


Figure 6-10: Type a new Original Duration in the Status tab.

Type an Original Duration in the Status tab.

1. In Activity Details, click the Status tab.
2. In the *Original Duration* field, type <12>, and then press *Enter*.

Note that the Finished date changes as a result of the entry. Note also that the length of the corresponding bar in the Gantt chart increases.

Notebook Tab

The Notebook tab enables you to assign notes to an activity. Notebook topics are typically instructions or descriptions that further describe the activity according to specific categories of information.

! *Can you suggest any useful Notebook topics?*



Figure 6-11: Click **Add** to add a Notebook topic to the activity.

Add a Notebook topic and description for the new activity.

1. Click the Notebook tab.
2. In the Notebook Topic section, click *Add*.
3. Select a topic, *Anticipated Problems*, and then click .
4. Click  to close the dialog box.
5. In the Anticipated Problems details section, click *Modify*.
6. Click in the dialog box and type <**Design changes may increase duration of activity.**>
7. Click *OK*.

Adding Activity Information via Columns

Use the columns in the Activity Table to enter activity information.

Layout: Adding Activities		Filter: All Activities		
Activity ID	Activity Name	Activity Type	Original Duration	Total Float
BLDG - Adding Activities				
	Design and Engineering		12d	0d
BA1000	Building Addition Kickoff	Start Milestone	0d	
BA1010	Design Building Addition	Task Dependent	12d	
BA1020	New Activity	Task Dependent	1d	
Foundation				
Structure				
Mechanical/Electrical Systems				
HVAC				
Elevator				
Plumbing and Electrical				
Exterior Finishes				
Brick				

Figure 6-12: Activity **BA1020** has been added to the project.

♂ Add an activity and enter information via columns.

1. In the Activity Table, select a WBS element, *Design and Engineering*.
2. Press *Insert* on your keyboard.
3. In the *Activity ID* column, confirm *BA1020*.

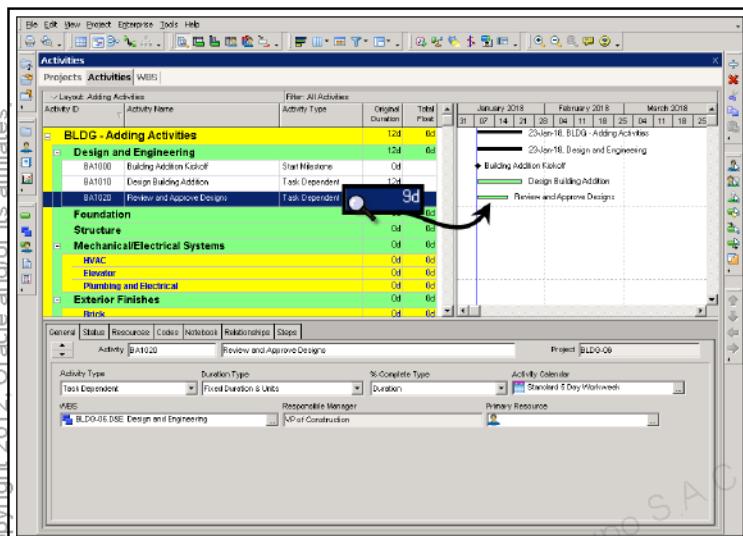


Figure 6-13: Type a new value in the *Original Duration* column in the Activity Table. Note that the activity bar increases in length as a result of the entry.

4. In the *Activity Name* column, type <**Review and Approve Designs**>
5. In the *Activity Type* column, confirm *Task Dependent*.
6. In the *Original Duration* column, type <9>, and then press *Enter* on your keyboard.

Note that the bar for activity *BA1020* increases in length as a result of your entry in the *Original Duration* column.

? Where else might you expect to see a change as a result of your entry in the *Original Duration* column?

Layout: Adding Activities		Filter: All Activities		
Activity ID	Activity Name	Activity Type	Original Duration	Total Float
BA-ADMIN	Project Administration	Level of Effort	1d	0d
BA1000	Building Addition Kickoff	Start Milestone	0d	0d
BA1010	Design Building Addition	Task Dependent	12d	0d
BA1020	Review and Approve Designs	Task Dependent	9d	0d
Foundation			0d	0d
Structure			0d	0d
Mechanical/Electrical Systems			0d	0d
HVAC			0d	0d
Elevator			0d	0d
Plumbing and Electrical			0d	0d
Exterior Finishes			0d	0d

Figure 6-14:The Level of Effort activity has been added in the root node of the WBS.

④ Add a Level of Effort activity.

1. In the Activity Table, select a WBS element, *BLDG – Adding Activities*.
2. On the Edit toolbar, click 
3. In the *Activity ID* column, type <BA-ADMIN>.
4. In the *Activity Name* column, type <Project Administration>.
5. Double-click in the *Activity Type* column and select *Level of Effort* from the list.

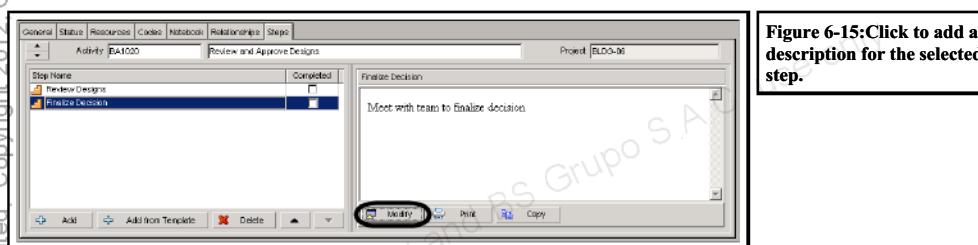
? *What kind of work might be included in this activity?*

Adding Steps to an Activity

Activity steps allow you to create a checklist for an activity and track the completion of each step. They can help identify critical procedures and provide guidance to resources assigned to the activity.

- An unlimited number of steps can be assigned to an activity.
- Steps do not have duration estimates or dates. They also can be marked completed.
- Resources cannot be assigned to individual steps.
- A detailed description of each step can be entered in the right section of the Steps tab.

In the Steps tab, click *Add* to create new steps for the activity. You can also click *Add from Template* to add steps that have been defined and saved as a template.



Add steps and descriptions to an activity.

1. In the Activity Table, select an activity, **BA1020 - Review and Approve Designs**.
2. In Activity Details, click the Steps tab.
3. In the Step Name section, click *Add*.
4. Type a name for the step, <**Review Designs**>, and press *Enter* on your keyboard.
5. In the Review Designs details section, click *Modify*.
6. Click in the dialog box and type a description for the step <**Review designs to be sure they meet customer requirements**> and then click *OK*.
7. Click *Add* to add a second step.
8. Type a name for the step, <**Finalize Decision**>, and press *Enter* on your keyboard.
9. In the Review Designs details section, click *Modify*.
10. Type a description <**Meet with team to finalize decision**> and then click *OK*.

Activity Codes

Use activity codes to view and roll up activities in the Activity Table; build reports in the Report wizard or Report Editor; organize a layout by grouping activities into specific categories; and select and summarize activities. Examples of activity codes include Phase, Area, Site, and Division.

Each activity code can contain an unlimited number of activity code values, which can be organized in a hierarchy for efficient search and selection.

Assigning Activity Codes

Assign activity code values either in the Codes tab in Activity Details or add a column for the activity code in the Activity Table.

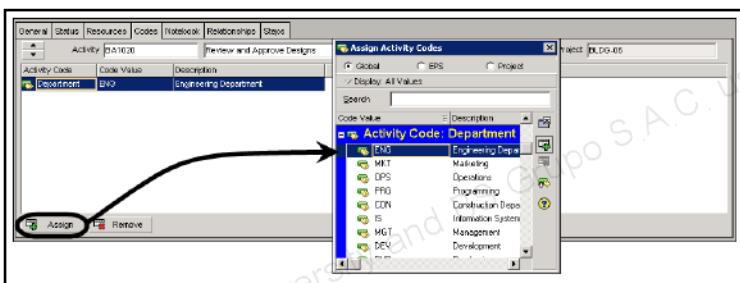


Figure 6-16: Click **Assign** to launch the Assign Activity Codes dialog box.

Assign an activity code to an activity.

1. Confirm that activity *BA1020 - Review and Approve Designs* is selected.
2. In Activity Details, click the Codes tab.
3. Click **Assign**.
4. On the Display Options bar, click *Filter By, All Values*.
5. On the Display Options bar, click *Collapse All*.
6. Click to expand *Activity Code: Department*.
7. Select an activity code value, *ENG –Engineering Department*, and then click .
8. Click to close the Assign Activity Codes dialog box.

Assigning Activity Codes to Multiple Activities

To assign an activity code to multiple activities, Ctrl+Click to select the activities, and then right-click and select *Assign, Activity Codes*.

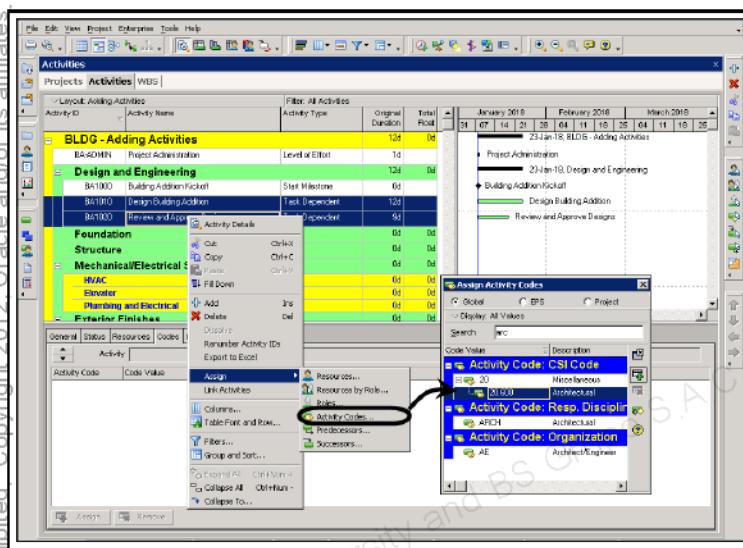


Figure 6-17: Click *Activity Codes* to assign an activity code to multiple activities.

Assign an activity code to multiple activities.

1. In the Activity Table, select an activity, *BA1010 - Design Building Addition*.
2. Ctrl+Click to select another activity, *BA1020 - Review and Approve Designs*.
3. Right-click a selected activity and select *Assign, Activity Codes*.
4. On the Display Options bar, confirm *All Values*.
5. In the *Search* field, type <arc>.
6. In *Activity Code: CSI Code* grouping band, select an activity code value, *20.600 – Architectural*.
7. Click to assign the code value, and then click to close the dialog box.
8. Click in the Gant chart to deselect the activities, and then select activities *BA1010* and *BA1020* individually to verify in the Codes tab that the activity code value has been assigned.

Streamlined Process to Add Activity Code Values

P6 Professional also enables you to define new activity code values directly from the Assign Activity Codes dialog box. You can add global-level, EPS-level, or project-level activity code values by clicking and then entering a Code Value and Code Value Description.

Application administrators can restrict users' ability to add activity code values through security settings. And, while it is possible to add activity code values at the global- or EPS-level, this feature was designed primarily to enable project managers to quickly add project-level code values.

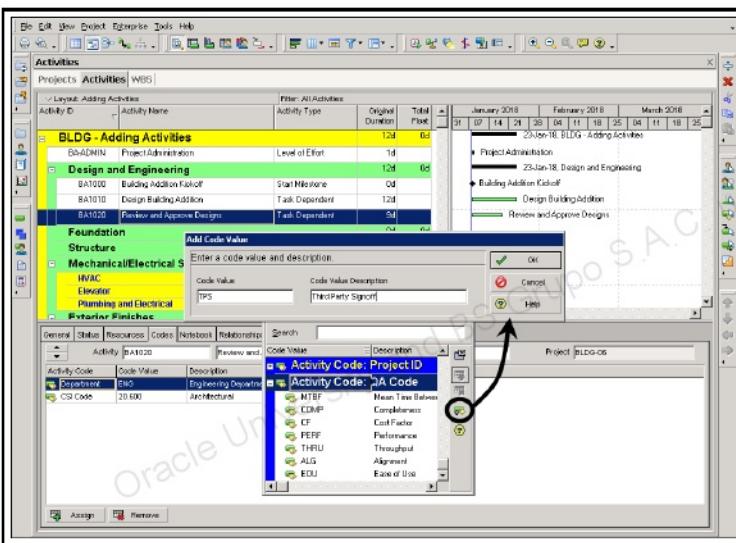


Figure 6-18: Click to define a new activity code value.

Define a new activity code value.

1. In the Activity Table, select an activity, *BA1020 – Review and Approve Designs*.
2. In the Codes tab in Activity Details, click *Assign*.
3. On the Display Options bar, click *Collapse All*.
4. Click to expand *Activity Code: QA Code*.
5. Click .
6. In the Add Code Value dialog box, type a *Code Value <TPS>* and a *Code Value Description <Third Party Signoff>*.

7. Click *OK*.
8. Expand the QA code value grouping band and select *TPS – Third Party Signoff*.
9. Click  to assign the code value.
10. Click .
11. Close the project.

Lesson Review

Key Concepts

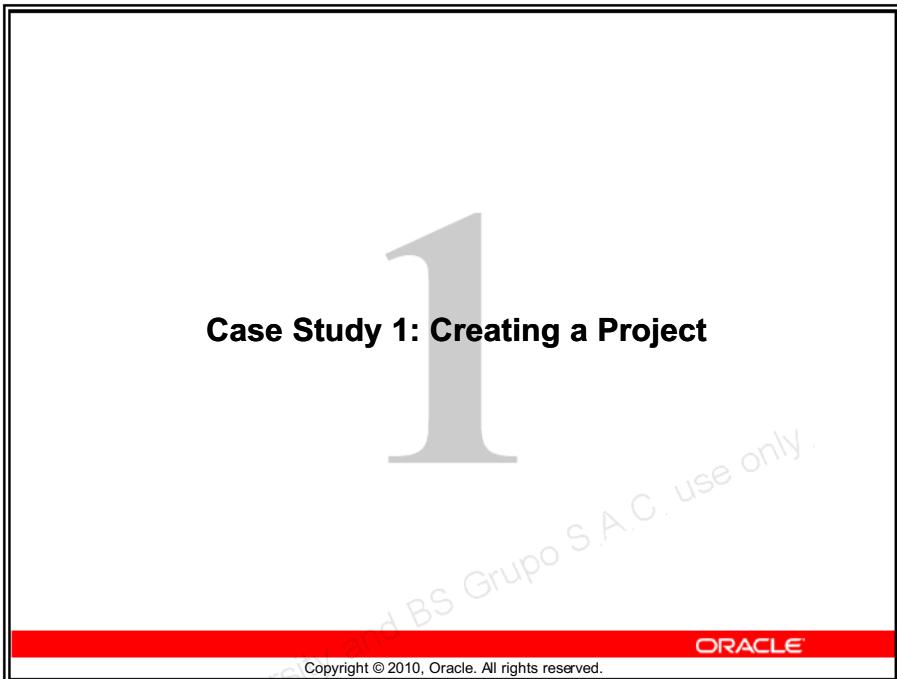
- There are four ways to add an activity to a project: On the Edit menu, click *Add*; press *Insert* on the keyboard; click , or right-click and click *Add* on the right-click menu.
- Enable the New Activity wizard in the User Preferences, Assistance tab, located on the Edit menu.
- Activity Type controls how an activity's dates are calculated.
- Use steps to create an activity checklist, and to track step completion.
- Use activity codes to group activities by a common attribute. Create unlimited code values for each activity code. Activity code types:
 - ◆ Global-level codes can be assigned to all activities in the database.
 - ◆ EPS-level activity codes can be assigned to all activities in the EPS.
 - ◆ Project-level activity codes can be assigned to activities in the projects in which they are created.

Review Questions

1. For which type of activity are dates determined by the availability of the resources assigned to the activity?
 - a. Task dependent
 - b. Resource dependent
 - c. Milestone
 - d. Level of effort
 2. **True or False:** The duration of a milestone is dependent on its predecessor/successor activities.
 3. **True or False:** Choose *Edit*, *User Preferences*, and then click the Assistance tab to enable the New Activity wizard.
-

Notes





Case Study 1– Creating a Project

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
				45

Creating a Project

Background

You are a project manager working for a general contractor, and your firm is using P6 Professional to manage the renovation of an apartment building. Following a meeting with the project team, you have been assigned to create the project and its Work Breakdown Structure.

Objectives

1. Create a new project using the information in the following table:

Project Data Item	Value
EPS	RENO - Renovation Projects
Project ID	RENO-1
Project Name	RENO - Creating a Project
Planned Start	05-Mar-18
Responsible Manager	VP of Renovation

2. Funding for the project has been approved. Add a Notebook topic, *Project Status*, indicating that the project budget was approved on 03-Dec-17 by Daphne Coombs, VP of Property Development. The budget is \$190,000.

3. Now that you have created the project in P6 Professional, create a WBS structure using the information in the table below:

Parent WBS Element	WBS Name
RENO-1	Design
RENO-1	Foundation
RENO-1	Structure
Structure	Floors
Structure	Load-Bearing Walls
Structure	Roof
RENO-1	Utility Systems
RENO-1	Exterior Finishes
Exterior Finishes	Brick
Exterior Finishes	Roof
Exterior Finishes	Doors & Windows
RENO-1	Interior Finishes
Interior Finishes	Carpentry
Interior Finishes	Floors & Carpeting
Interior Finishes	Plumbing & Lighting Fixtures
Interior Finishes	Paint

4. Add activities to the project as detailed in the table below:

WBS Element	Activity ID	Activity Name	Activity Type	Original Duration
Design				
	A1000	Start project	Start Milestone	0d
	A1010	Design renovations	Task Dependent	15d
	A1020	Review and approve designs	Task Dependent	5d
Foundation				
	A1040	Excavate foundation	Task Dependent	5d
	A1050	Install drainage system	Task Dependent	5d
	A1060	Inspect and repair foundation	Task Dependent	10d
	A1070	Backfill and compact	Task Dependent	3d
Structure				
	A1080	Erect protective fencing	Task Dependent	4d
	A1090	Remove interior finished surfaces	Task Dependent	4d
	A1100	Rebuild chimney	Task Dependent	5d

Notes



SECTION II

Scheduling the Project and Managing Data

Assigning Calendars

Creating Relationships

Scheduling

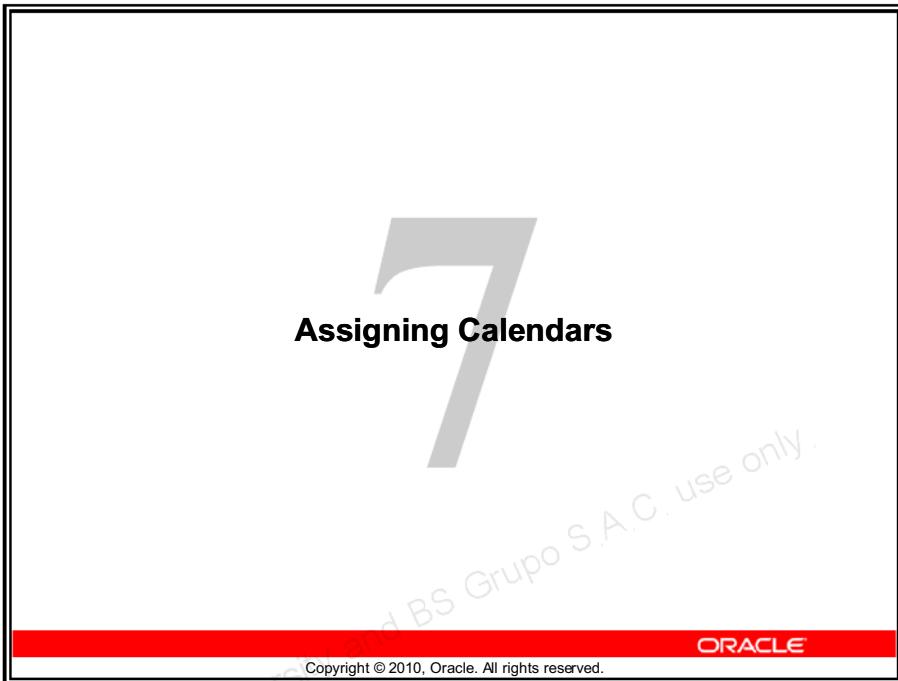
Assigning Constraints

Creating Layouts

Managing Work Products and Documents

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Lesson 7 – Assigning Calendars

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
10	15	10	5	40

Objectives

After completing this lesson, you should be able to:

- Define work time and non-work time.
- Explain the differences between global, project, and resource calendars.
- Create a new project calendar.

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Calendars

- Specify work time and nonwork time.
- Used for scheduling and leveling resources.
- An unlimited number of calendars can be created.
- All activities must have an assigned calendar.

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Calendar Pools

- There are three calendar pools:
 - Global
 - Project
 - Resource
- Determines whether the calendar is available to:
 - All projects, resources, and activities.
 - One project and its activities.
 - Resources only.

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Calendar Pools

- Global
 - Calendars that can be used by all projects and resources.
 - Example: 5-day workweek, 8 hours/day (usually with holidays and non-work days from the organization's calendar).
- Project
 - Project-specific calendars.
 - Example: 6-day workweek calendar to accelerate project.
- Resource
 - Resource calendar can be assigned to resource only – not to an activity.
 - Example: Personal vacation days for an individual resource.

The red bar spans the width of the slide content area.

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Resource Calendars

There are two types of resource calendars:

- Shared:
 - Share among multiple resources.
- Personal:
 - Assign to single resource.
 - Calendar is deleted if resource is deleted.
 - Resource can edit personal resource calendar.



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Work Time Types

A calendar can include four types of work time:

- Standard day
 - Work hours in day match calendar's work week.
- Nonwork
 - Zero working hours in day.
- Exception
 - Work hours in day do not match calendar's work week.
 - Example: Weekend work hours for a resource normally on a 5-day workweek.
- Nonwork Exception
 - A full day of nonwork time not covered by the standard work week (e.g., vacation).

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Calendars and Activity Types

Activity Type determines which calendar is used when a project is scheduled.

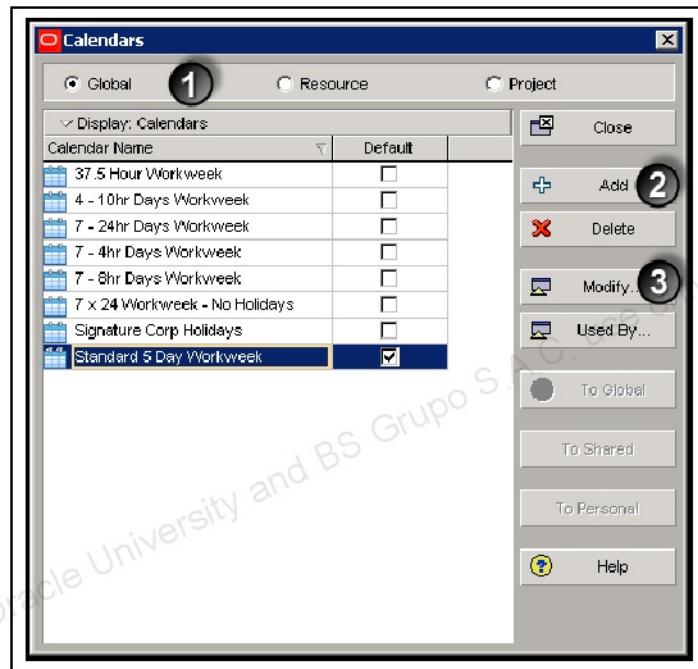
- **Task Dependent:** Resource assignments are scheduled according to the calendar assigned to the activity.
- **Resource Dependent:** Resource assignments are scheduled according to the calendar assigned to the resource.

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Overview: Creating Calendars

On the Enterprise menu, click *Calendars* to launch the Calendars dialog box, which enables you to create new calendars and modify existing ones.



- ➊ Select *Global*, *Resource*, or *Project* to display a calendar pool.
- ➋ To create a calendar, click *Add*, and then specify work time and non-work time.
- ➌ To view or modify a calendar, select it and click *Modify*.

Practice: Creating Calendars

In this practice you will:

- View a global calendar.
- Create a project calendar using an existing global calendar as a template.
- Set the workweek, exceptions, and non-work time for a project calendar.

Viewing the Global Calendar Pool

Global calendars can be assigned to projects, activities, and resources. They can also be used as templates to create new calendars.

- Select the *Default* check box next to a calendar to set the default calendar assignment for all new projects added to the database.
- Change the default calendar assignment for an individual project on the Defaults tab in Project Details.
- Link resource and project calendars to global calendars. Any changes made to a global calendar is automatically applied to all resource and project calendars linked to it.

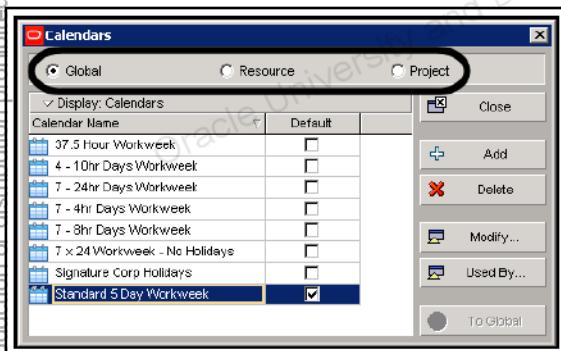


Figure 7-1: The Calendars dialog box can display global, resource, or project calendars.

View the global calendars.

1. On the Enterprise menu, click *Calendars*.
2. At the top of the Calendars dialog box, confirm *Global* is selected.

Viewing a Global Calendar

At the top of the dialog box, select *Total work hours/day* for a numeric total, or select *Detailed work hours/day* for an hour-by-hour view.

The colors in the calendar indicate the type of work time defined for each day:

- Light gray dates: standard work time
- Dark gray dates: non-work time
- White dates: exceptions

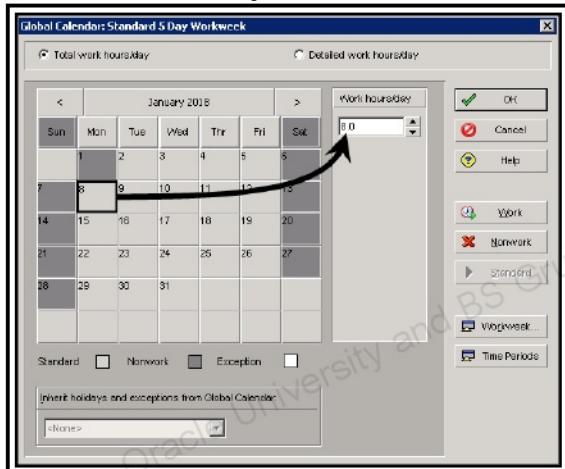


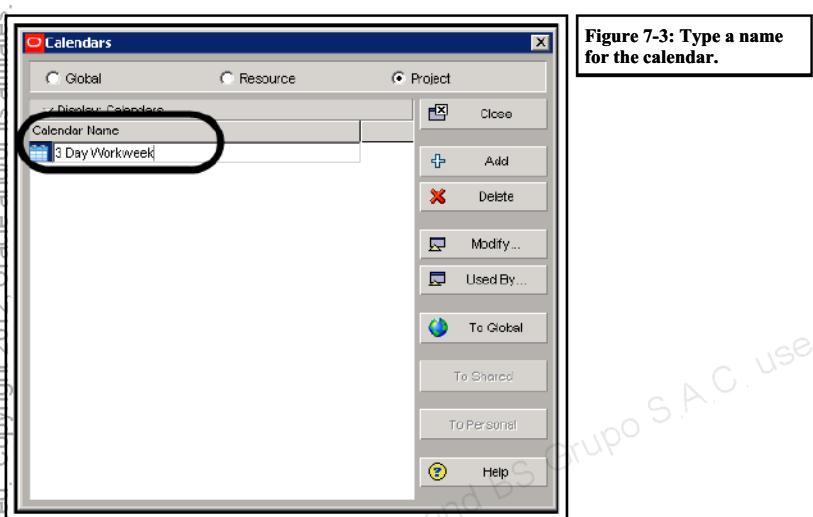
Figure 7-2: Select a date and then view work hours in that day.

Display the *Standard 5 Day Workweek* calendar.

1. Select a global calendar, *Standard 5 Day Workweek*.
2. Click *Modify* to view the calendar's workweek and non-work time.
3. Scroll to a month, *January 2018*.
4. Select a work day, *08-Jan*.
5. Select *Total work hours/day* to display work hours/day.
6. Click *OK*.
7. Click *Close*.

Adding a Project Calendar

Create a project calendar to reflect work time for a specific project. To create this calendar, you will use the *Standard 5 Day Workweek* global calendar as a template.



Create a project calendar.

1. Open a project, *BLDG-07 BLDG – Assigning Calendars*.
2. In the Calendars dialog box, select *Project*.
3. Click *Add*.
4. Select *Standard 5 Day Workweek*, and then click .
5. In the *Calendar Name* field, type <**3 Day Workweek**>, and then press *Enter*.

Linking the Holidays Calendar and Setting the Workweek

Instead of manually entering company holidays, the global calendar containing holidays can be linked to the new project calendar. Select the global calendar to use in the *Inherit holidays and exceptions from Global Calendar* list.

Click *Workweek* to set the number of work hours for each day.

Select *Total work hours/day* to view the total number of work hours in the selected day in the *Work hours/day* field.

Select *Detailed work hours/day* to view each work hour in the selected day. You also can set work time in 30-minute increments.

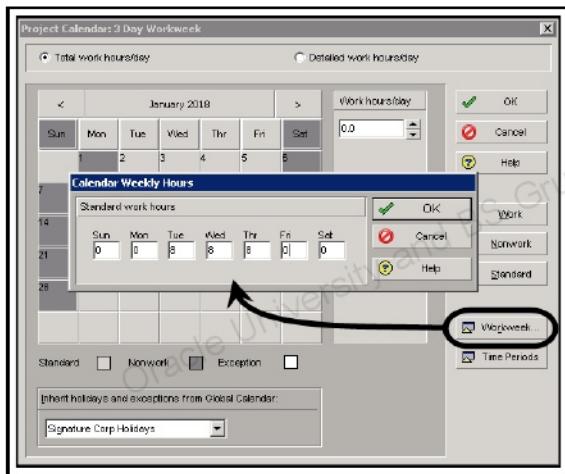


Figure 7-4: Click *Workweek* to assign work hours per day.

♂ Link a global calendar's holidays to the newly created calendar and set the workweek.

1. In the Calendars dialog box, confirm that *3 Day Workweek* is selected, and then click *Modify*.
2. Scroll to a month, *January 2018*.
3. In the *Inherit holidays and exceptions from Global Calendar* list, select *Signature Corp Holidays*.
4. Click *Workweek*.
5. In the Calendar Weekly Hours dialog box, type <0> hours for *Monday* and *Friday*, and then click *OK*.

Setting Non-Work Time

A project calendar may need to have non-work time days that are different than those in the global calendar to which it is linked. To allow this, you can manually enter non-work time into the project calendars.

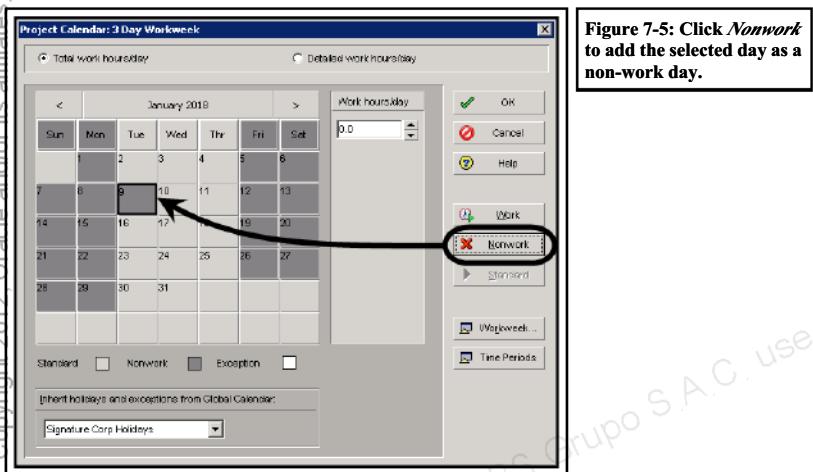


Figure 7-5: Click **Nonwork** to add the selected day as a non-work day.

Add a non-work day to the calendar.

1. In the 3 Day Workweek dialog box, select a day, **9-Jan-18**.
2. Click **Nonwork**.

Setting Exceptions

There are times when you need to set an exception in the calendar – a regularly scheduled non-workday that needs to become a workday. For example, you may need to change some non-work days to workdays because the project is behind schedule. When you schedule the project, activities that use the modified calendar will schedule accordingly.

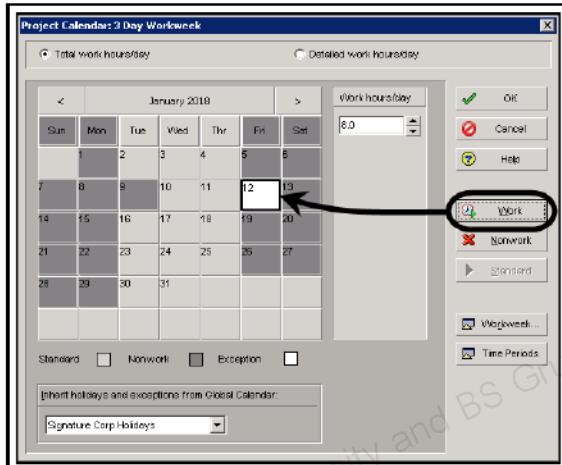


Figure 7-6: Click *Work* to make an exception for a selected non-work day.

Define an exception in the calendar.

1. Select a non-work day, *12-Jan-18*.
2. Click *Work*.
3. To save changes to the calendar, click *OK*.
4. Click *Close* to close the Calendars dialog box.

Viewing and Assigning Calendars

The calendar selected in the Defaults tab in Projects Details is automatically assigned to new activities.

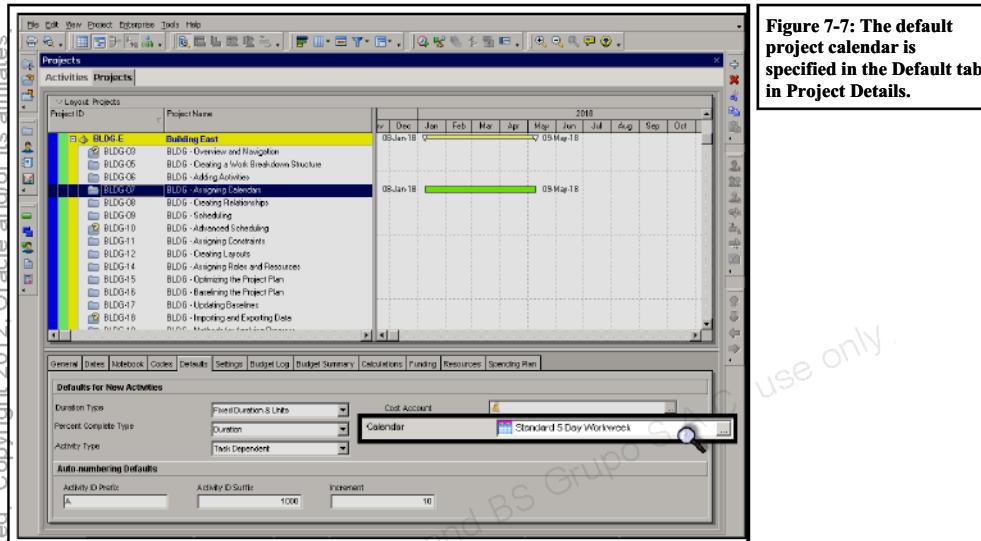


Figure 7-7: The default project calendar is specified in the Default tab in Project Details.

View default calendar.

1. Click the Projects tab near the top of the screen.
2. In the Project Table, select *BLDG-07*.
3. In Project Details, click the Defaults tab.

? *What calendar is assigned as the default calendar for this project?*

To assign a different calendar to an activity, manually change the assigned calendar on the General tab in Activity Details. Assign a specific calendar to a resource in the Details tab in Resource Details.

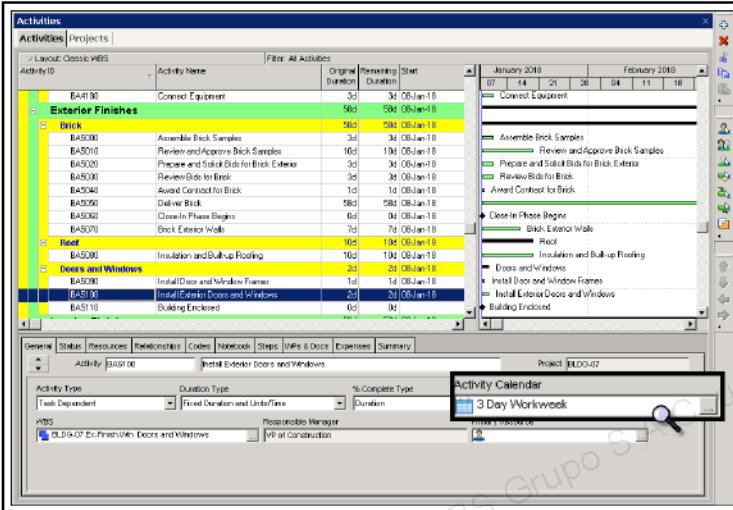


Figure 7-8: You can assign a new calendar to an activity in the General tab in Activity Details.

Assign calendar to an activity.

1. Click the Activities tab near the top of the screen.
2. In the Activity Table, select an activity, *BA5100 – Install Exterior Doors and Windows*.
3. In Activity Details, click the General tab.
4. In the *Activity Calendar* field, click .
5. On the Select Activity Calendar Display Options bar, click *Project Calendars*.
6. Select a project calendar, *3 Day Workweek*, and then click .

Dates in the project schedule will not reflect the new calendar assignment until the project is rescheduled.

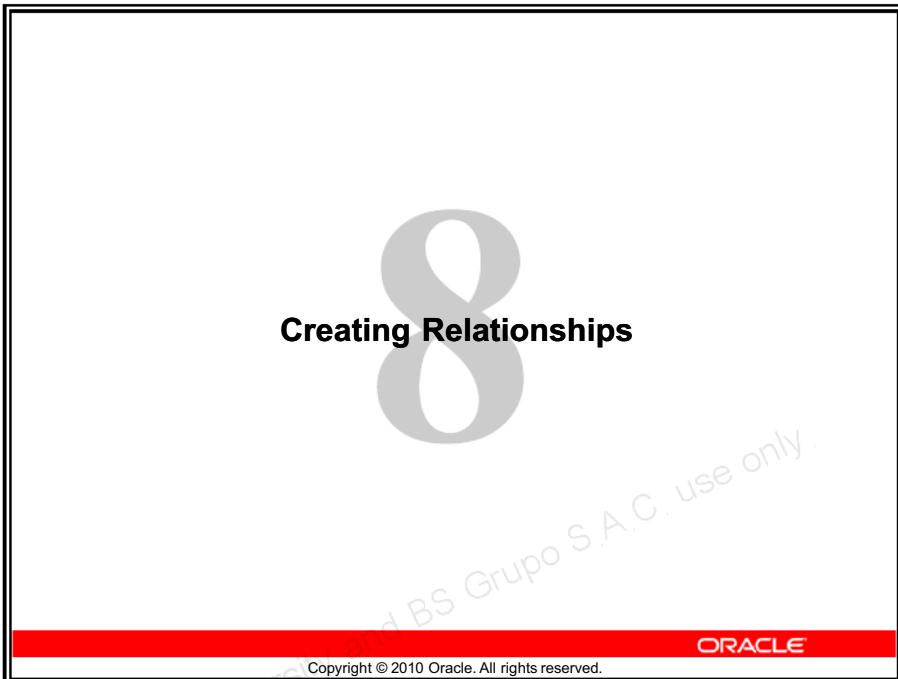
Lesson Review

Key Concepts

- Specify a calendar as global, project, or resource-specific.
- Assign global calendars to projects, activities, and resources.
- The calendar type determines whether you can use calendars on activities, resources, or both.
- The default project calendar is automatically assigned to new activities.

Review Questions

1. Which of the calendar pools can be used by resources?
 - a. Global
 - b. Project
 - c. Resource
 - d. a and b
 - e. a and c
2. **True/False:** Activity type determines whether an activity uses an activity calendar or the calendar of its assigned resource(s).
3. **True/False:** You cannot enter non-work days in a project calendar if it is linked to a global calendar.
4. Which type of work time refers to non-work time that would otherwise be worked?
 - a. Standard
 - b. Non-work
 - c. Exception
 - d. b or c



Lesson 8 – Creating Relationships

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
20	15	25	5	65

Objectives

After completing this lesson, you should be able to:

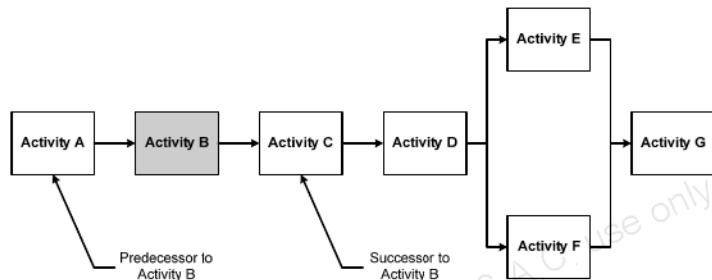
- View a network logic diagram.
- Describe the four relationship types.
- Create relationships in the Activity Network.
- Create relationships in Activity Details.

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Network Logic Diagram

A network logic diagram is a graphic representation of all of the activities in a project and their logical (dependent) relationships.



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Precedence Diagramming Method (PDM)

PDM is a technique for creating network logic diagrams.

- A box or rectangle represents each activity.
- Lines with arrows connect the boxes and represent the logical relationships between the activities.
 - **Predecessor** - Controls the start or finish of another activity.
 - **Successor** - Depends on the start or finish of another activity.
- Start with either the first activity in the network and enter each successor, or start with the last activity in the network and enter each predecessor.



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Relationship Types

There are four relationship types:

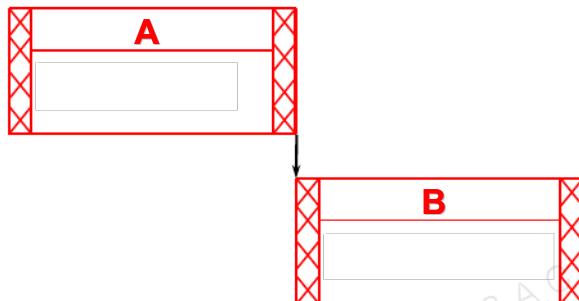
- **Finish to Start (FS)** – When A finishes, B can start.
- **Start to Start (SS)** – When A starts, B can start.
- **Finish to Finish (FF)** – When A finishes, B can finish.
- **Start to Finish (SF)** – When A starts, B can finish.

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Finish to Start (FS)

When activity A finishes, activity B can start. This is the most common type of relationship.



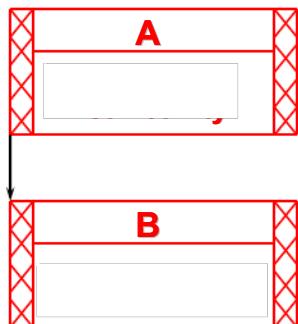
Example: When we finish writing the report, we can send it to the client.

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Start to Start (SS)

When activity A starts, then activity B can start.



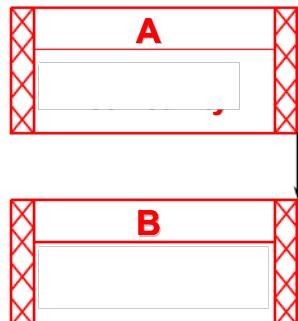
Example: When we start selling our new software, we will start offering support service.

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Finish to Finish (FF)

When activity A finishes, then activity B can finish.



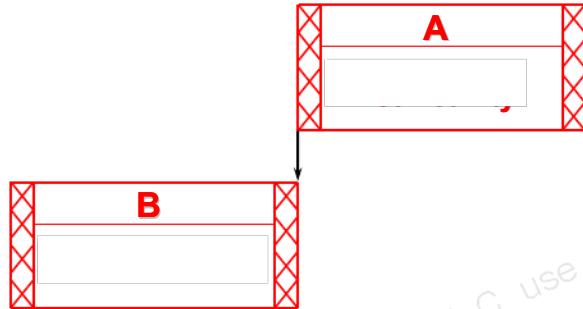
Example: When we finish testing, we can finish collecting data.

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Start to Finish (SF)

When activity A starts, then activity B can finish.



Example: When we begin manufacturing our own components, we can stop outsourcing them.

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Relationships with Lag

Lag specifies an offset or delay between an activity and its successor.

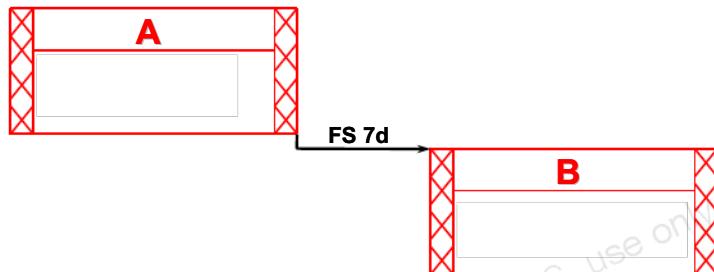
- Can be added to any relationship type.
- Can be a positive or a negative value.
- There are four calendar options for scheduling lag:
 - Predecessor activity calendar
 - Successor activity calendar
 - 24-hour calendar
 - Project default calendar

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Finish to Start with Lag

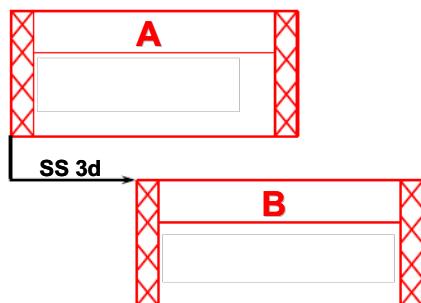
Activity B can start after activity A finishes and seven days have passed.



Example: After the concrete floor is poured and cures for seven days, we can begin constructing the walls.

Start to Start with Lag

After activity A starts and 3 days of work have passed, then activity B can start.



Example: We can start laying the drainage pipes three days after we start digging the trenches.

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Question

Which of the following statements is true?

1. A successor activity depends on the start or finish of another activity.
2. Lag specifies a delay between an activity and its successor.
3. Lag can be positive or negative.
4. 1 and 2
5. 1 and 2 and 3

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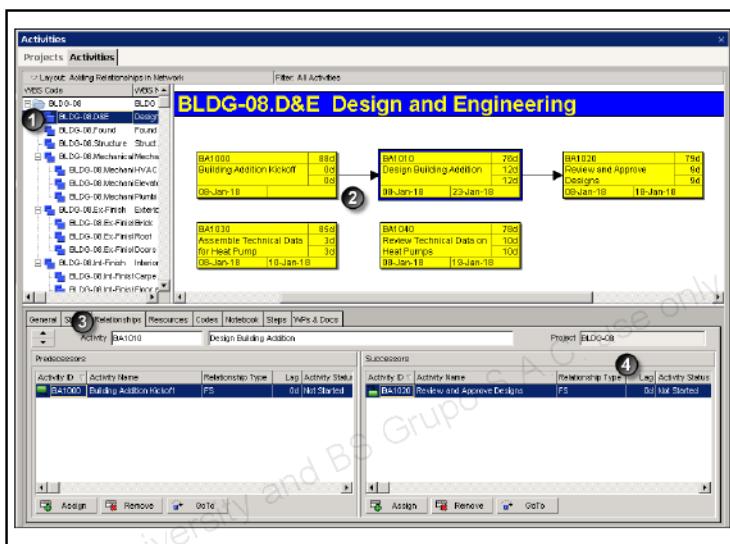
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Notes



Overview: Creating Relationships

Use the Activity Network to create relationships between activities graphically, or use the Predecessors and Successors panes on the Relationships tab in Activity Details.



- ➊ On the WBS Table, click a WBS element to display its activities in the Activity Network.
- ➋ In the Activity Network, view the activities contained in the selected WBS element and create relationships by clicking and dragging your mouse cursor from the edge of one activity to the edge of another.
- ➌ Use the Relationships tab in Activity Details to create and view relationships between an activity and its predecessor and successor activities.
- ➍ Use the *Lag* field on the Relationships tab to assign lag to the relationship between two activities.

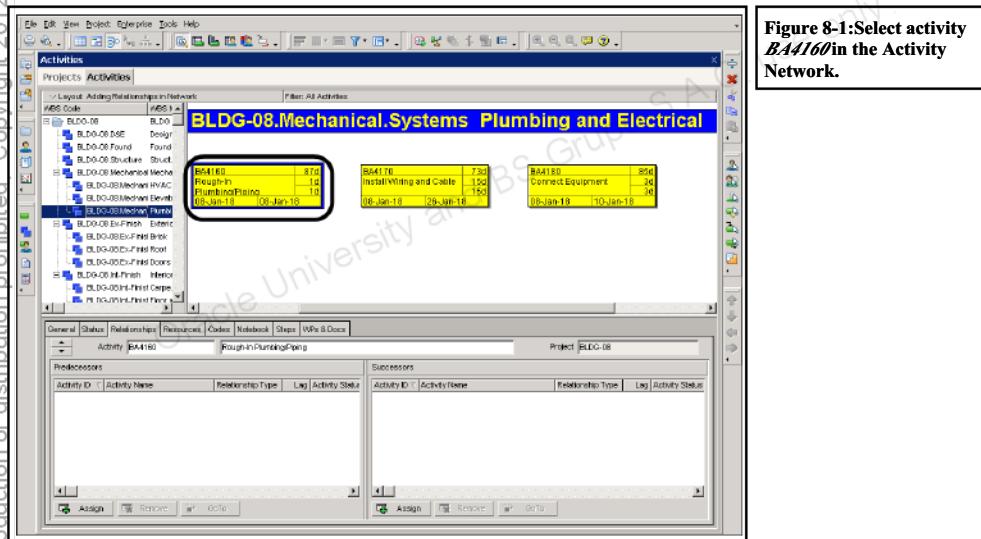
Practice: Creating Relationships

In this practice you will:

- Create a relationship graphically in the Activity Network.
- Create a relationship using the Relationships tab in Activity Details.
- Assign lag to a relationship.

Creating Relationships in the Activity Network

The Activity Network is useful for sequencing activities because it offers a graphical display of the activities and the relationships. Press *Alt* on your keyboard, and then click and drag your mouse to enlarge the size of activities viewable in the network.



Display the Activity Network.

1. Open a project, *BLDG-08 BLDG – Creating Relationships*.
2. Confirm that you are in the Activities window. (Or on the Project menu, click *Activities*.)
3. On the Layout Options bar, click *Layout, Open*.
4. Select a layout, *Adding Relationships in Network*, and then click *Open*.

5. In the WBS Table, select a WBS element, *Bldg-08.Mechanical Systems – Plumbing and Electrical*.
6. Press and hold *Alt* on your keyboard, and then click and drag your mouse to zoom in on activities in the Activity Network.
7. In the right pane of the Activity Network, select an activity, *BA4160 – Rough-in Plumbing/Piping*.

Creating a Start to Start Relationship

To create a relationship, click and drag your mouse cursor from one edge of an activity to another.

- The left edge of the activity represents the start of the activity.
- The right edge of the activity represents the finish of the activity.

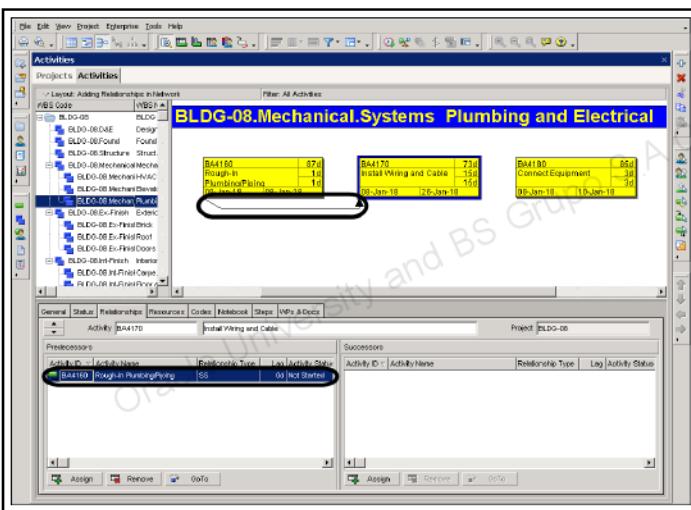


Figure 8-2: The line and arrow indicate a Start to Start relationship between the two activities. Note that the relationship is also listed on the Relationships tab in Activity Details.

>Create a Start to Start relationship between two activities.

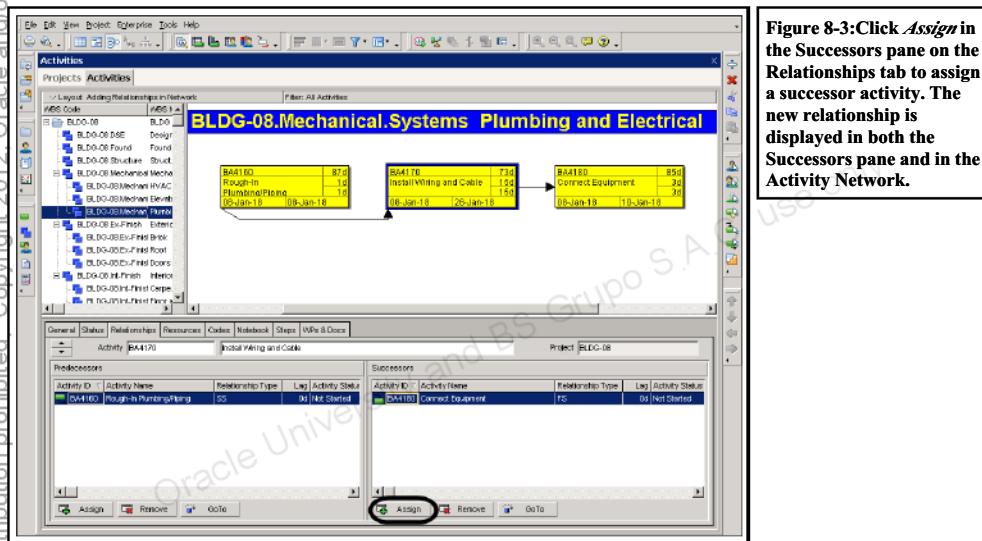
1. To create a SS relationship, place the mouse pointer to the left edge of an activity, *BA4160 - Rough-In Plumbing/Piping*.
The relationship arrow appears.
2. Click and drag the mouse to the left edge of successor activity, *BA4170 - Install Wiring and Cable*.
Note the relationship line and arrow in the Activity Network.
3. In the Relationships tab, view the relationship in the Predecessors pane.

Creating Relationships in Activity Details

You can also use the Relationships tab to create relationships. When creating a relationship in Activity Details, the default relationship type is Finish to Start.

Group and sort activities in the Assign Successors dialog box in a variety of ways, including by EPS and by List. On the Display Options bar, click *Group and Sort By* to view options.

? What are the other activity display options for the Assign Successors dialog box?



Create a Finish to Start relationship between two activities.

1. In the Activity Network, select an activity, *B44170 – Install Wiring and Cable*.
2. In the Successors pane on the Relationships tab, click *Assign*.
3. Select an activity, *B44180 – Connect Equipment*, and then click  to assign the selection.
4. Click  to close the dialog box.

Note that the relationship is now displayed in both the Successors pane and the Activity Network.

Using the GoTo Feature

Click  on the Relationships tab to change the selection in the Activity Table to the activity highlighted in the Predecessors or Successors pane.

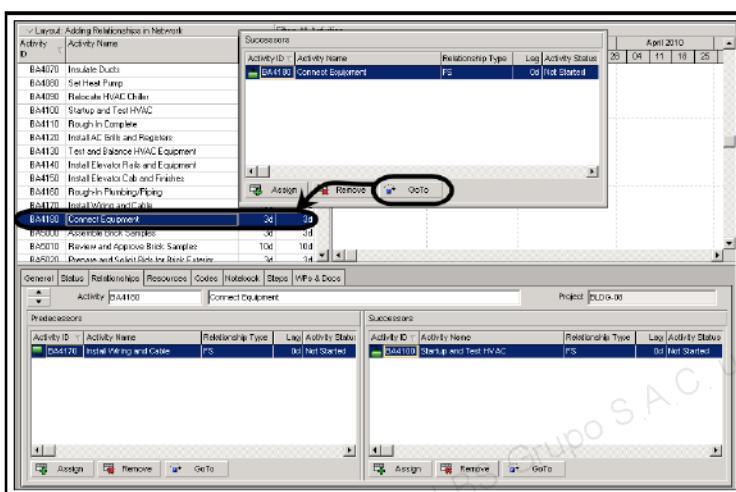


Figure 8-4: When you click **GoTo**, the activity selected on the Relationships tab is selected in the Activity Table and Activity Details.

Assign a successor activity using the GoTo feature.

1. On the Layout Options bar, click *Show on Top, Gantt Chart*.
2. In the Successors pane on the Relationships tab, select an activity, *B44180 – Connect Equipment*.
3. In the Successors window, click .
4. Note that activity *B44180* is now selected in the Activity Table and in Activity Details.
5. In the Successors pane on the Relationships tab, click .
6. Select an activity, *B44100 – Startup and Test HVAC*, and then click .

Assigning Lag

Use the columns on the Relationships tab to make adjustments to the relationship type or to assign lag.

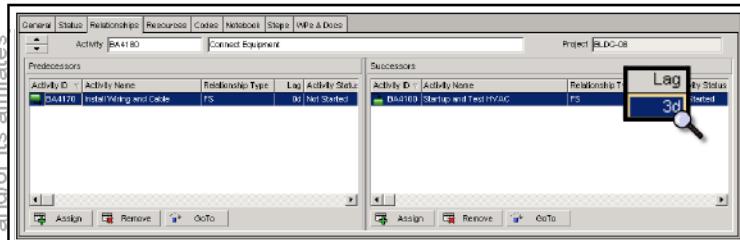


Figure 8-5: Type a value in the *Lag* column.

Assign lag to a relationship.

1. In the Activity Table, confirm that activity *B44180 – Connect Equipment* is selected.
2. In the Successors pane, click in the *Lag* field and type <3>.
3. Press *Enter* on your keyboard.

Viewing Relationships in the Gantt Chart

You can also view/modify relationships in the Activity Table and the Gantt chart.

- **Activity Table** – Displays the Predecessors and Successors columns.
- **Gantt chart** – Click the Relationship Lines icon  on the Top Layout toolbar to toggle relationship lines on and off.

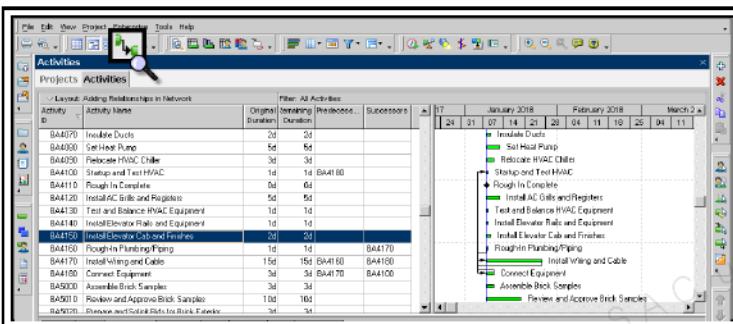


Figure 8-6: Click to toggle relationship lines on and off in the Gantt Chart.

View relationships between activities in the Activity Table and the Gantt chart.

1. On the Layout Options bar, click *Columns*. 
2. In the Available Options section, click  to expand *Lists*.
3. Select *Predecessors*, click  to move it to the Selected Options section, and then click  to position it at the bottom of the list.
4. In the Available Options section, select *Successors*, and click  to move it to the Selected Options section.

Confirm that *Successors* appears below *Predecessors* at the bottom of the Selected Options list.

5. Click *OK*.
6. Drag the vertical split bar to expose the new columns, and adjust column widths as necessary.
7. Double-click in the Gantt chart area to display the bars for the activities.
8. On the Toolbar, click  to view the relationships between the activities.

Note that even though relationships were added, the activities did not move from the project start date. When the project is scheduled, the activities will be positioned in the Gantt chart according to their relationships.

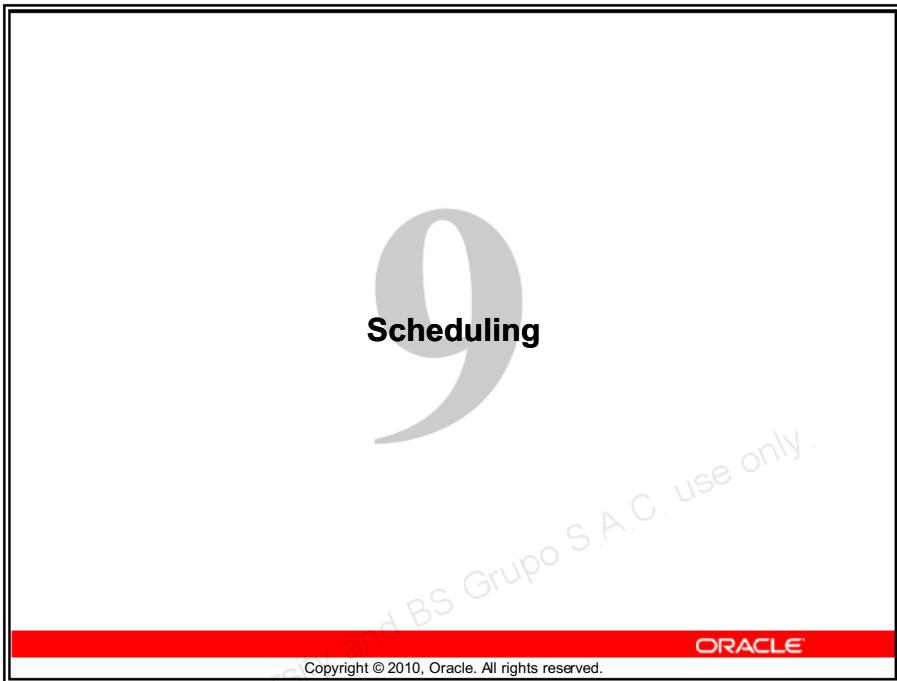
Lesson Review

Key Concepts

- Use the Precedence Diagramming Method to create a network logic diagram that shows the relationships between activities. Build the diagram using boxes to represent activities and arrows to represent logical relationships between the activities.
- P6 Professional supports four relationship types (Finish to Start, Start to Start, Finish to Finish, and Start to Finish) that identify the type of dependency that exists between an activity and its predecessor or successor.
- Lag is the offset or delay between an activity and its successor.
- Create relationships in the Activity Network via a graphical display or on the Relationships tab in Activity Details.

Review Questions

1. On the Relationships tab in Activity Details, which of the following is used to jump from the current activity to one of its predecessor or successor activities?
 - a. Jump
 - b. Search
 - c. Look
 - d. GoTo
2. What is the default relationship type in P6 Professional?
 - a. Finish to Start
 - b. Finish to Finish
 - c. Start to Start
 - d. Start to Finish
3. **True or False:** Lag is an offset or delay between an activity and its successor.
4. Which of the following can you use to schedule lag?
 - a. The predecessor activity's calendar assignment
 - b. The successor activity's calendar assignment
 - c. The 24-hour calendar
 - d. a or b
 - e. a or b or c



Lesson 9 – Scheduling

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
45	5	10	20	80

Objectives

After completing this lesson, you should be able to:

- Describe Critical Path Method (CPM) Scheduling.
- Perform a forward and a backward pass.
- Describe float and its impact on a schedule.
- Identify loops and open ends.
- Calculate a schedule.
- Analyze the scheduling log report.



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Critical Path Method Scheduling

The Critical Path Method (CPM) is the traditional technique for calculating project schedules and determining the minimum total project duration.

- Uses activity durations and relationships between activities to calculate schedule dates.
- Calculation is done in two passes – forward and backward – through the activities in a project.

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Critical Path

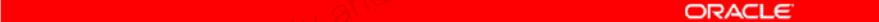
- The sequence of activities that determines a project's minimum total duration and completion date.
- Generally the longest continuous path of activities through the project.
- The duration of the activities on the critical path controls the duration of the entire project. A delay to any activity on the critical path will delay the Finish date of the project.

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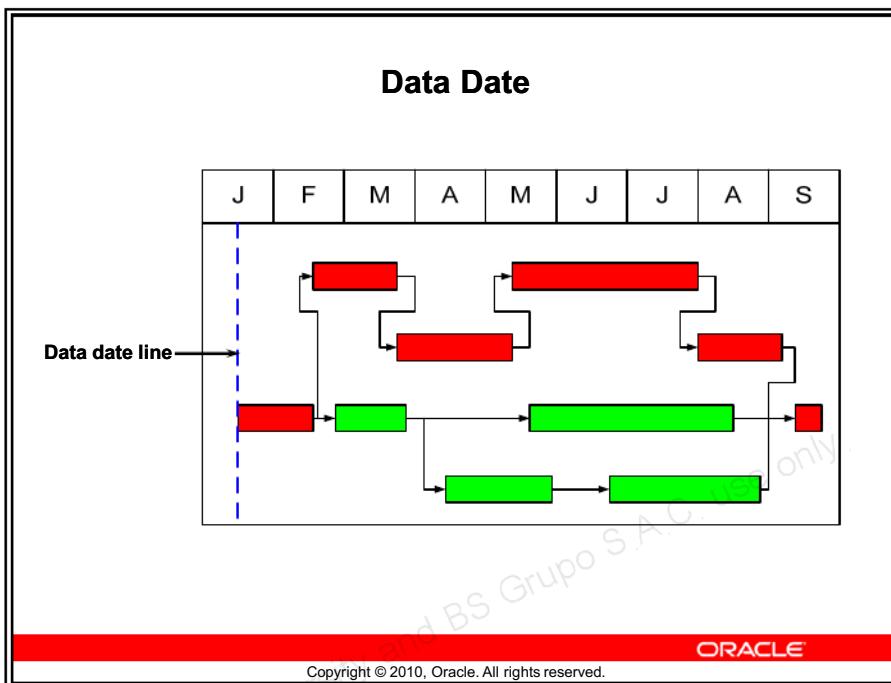
Data Date

- The date that is used as the starting point to schedule all remaining work.
- During the Planning phase, the data date should match the project Start date.



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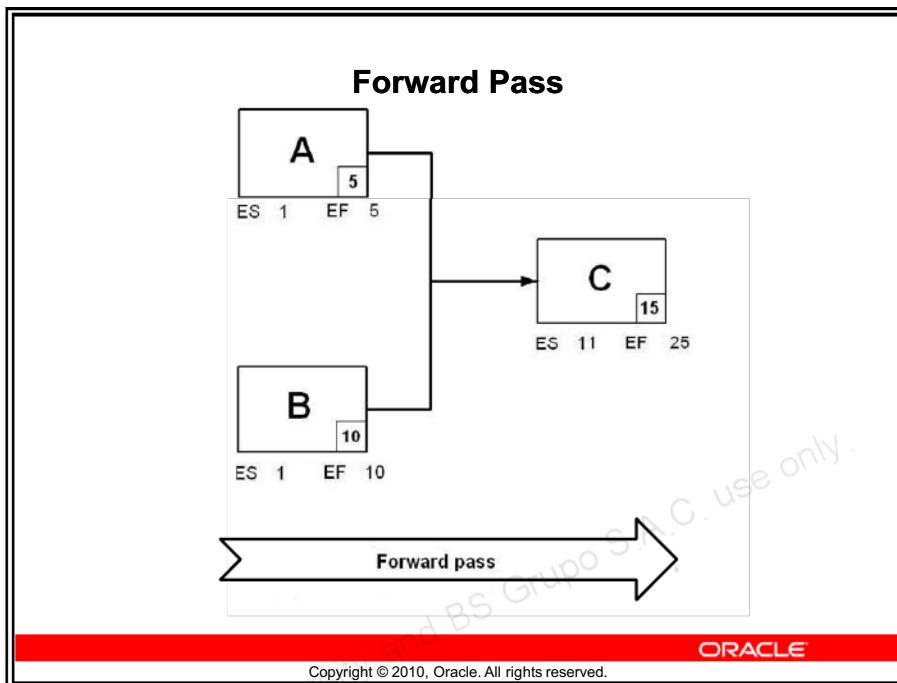
Forward Pass

- The forward pass calculates each activity's early dates.
- Early dates are the earliest times an activity can start and finish once its predecessor relationships have been satisfied.
- The calculation begins with the activities without predecessors.
- Early Start (ES) + Duration – 1 = Early Finish (EF)

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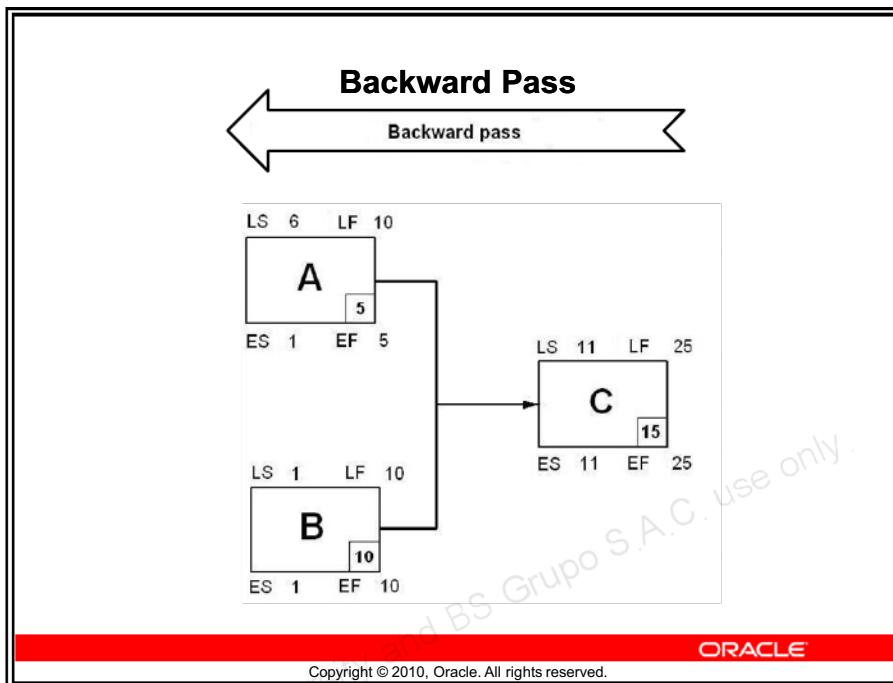
Backward Pass

- The backward pass calculates each activity's late dates.
- Late dates are the latest times an activity can start and finish without delaying the end date of the project.
- The calculation begins with the activity with the latest Early Finish date without a successor.
- For projects without a Must Finish By date, activities without successors are assigned a Late Finish equal to the latest Early Finish date.
- $\text{Late Finish (LF)} - \text{Duration} + 1 = \text{Late Start (LS)}$

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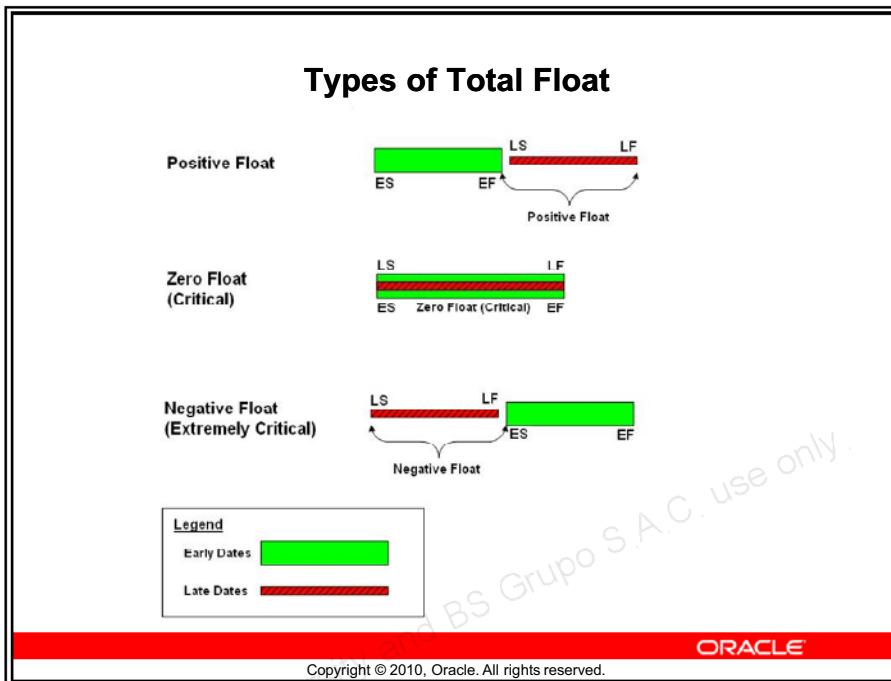
Total Float

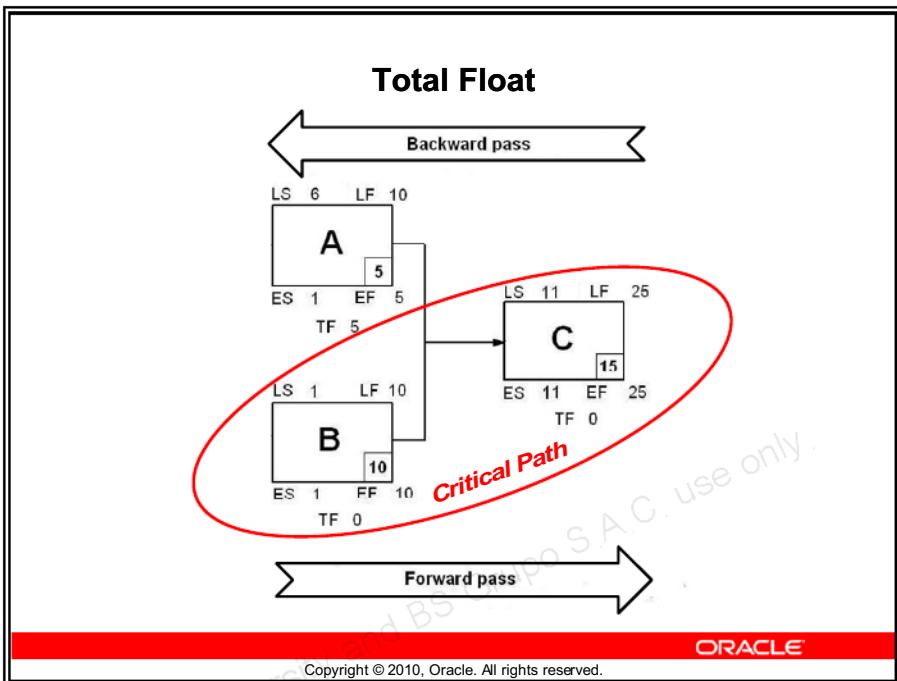
- The amount of time an activity can be delayed from its Early Start without delaying the project.
- The difference between an activity's late dates and early dates.
- Total Float is automatically calculated each time you schedule the project. You cannot edit an activity's float values directly.
- Late date – early date = Total Float (TF)

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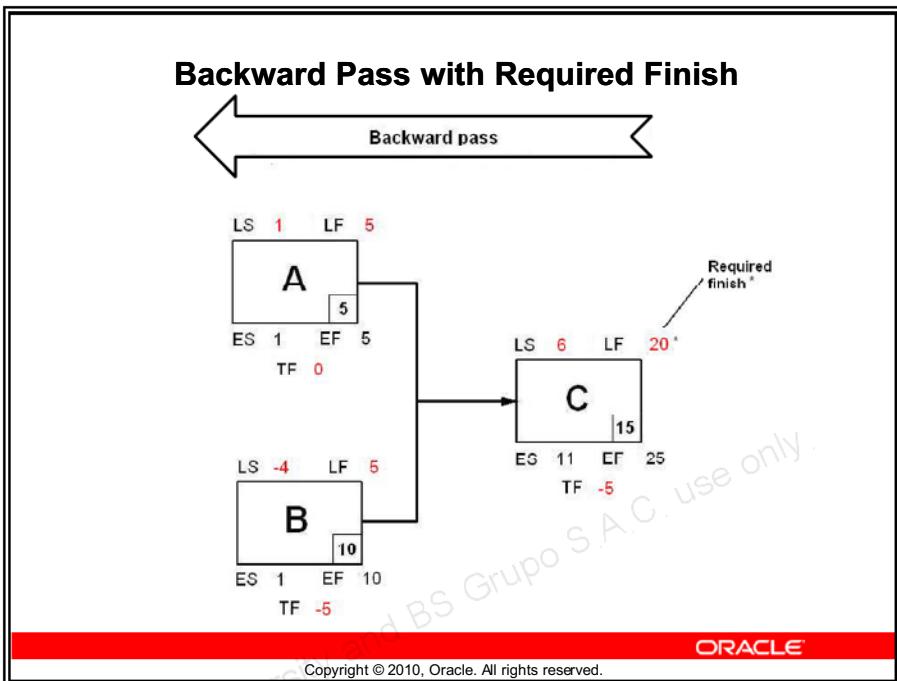
Must Finish By Date

A common scenario is a project with a required Must Finish By date:

- Specifies when the project must finish regardless of the network's duration and logic.
- Is used only during the backward pass to calculate late dates.

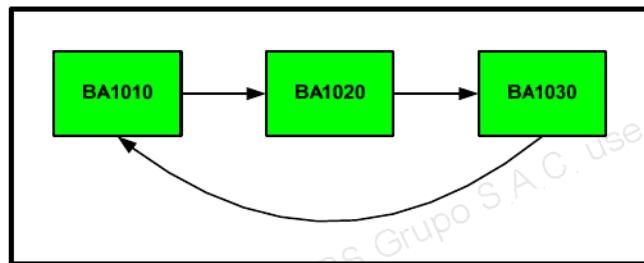


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Circular Relationships (Loops)

- Loops indicate circular logic in an activity path.
- The schedule can not be calculated until the loop is eliminated. To eliminate a loop:
 - Determine proper logic.
 - Reschedule the project.



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Open Ends

- Open ends are activities without either a predecessor or successor.
 - **No predecessor** — Activity uses data date as its Early Start.
 - **No successor** — Activity uses project finish as its Late Finish.
- Open-ended activities can portray an unrealistic amount of positive total float.

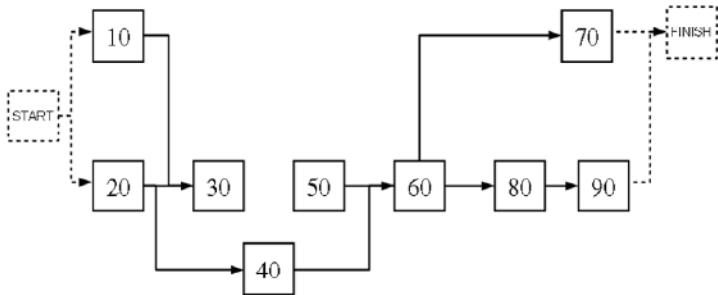
It is recommended that each project have only two open ends: the first activity (Start milestone) and the last activity (Finish milestone).

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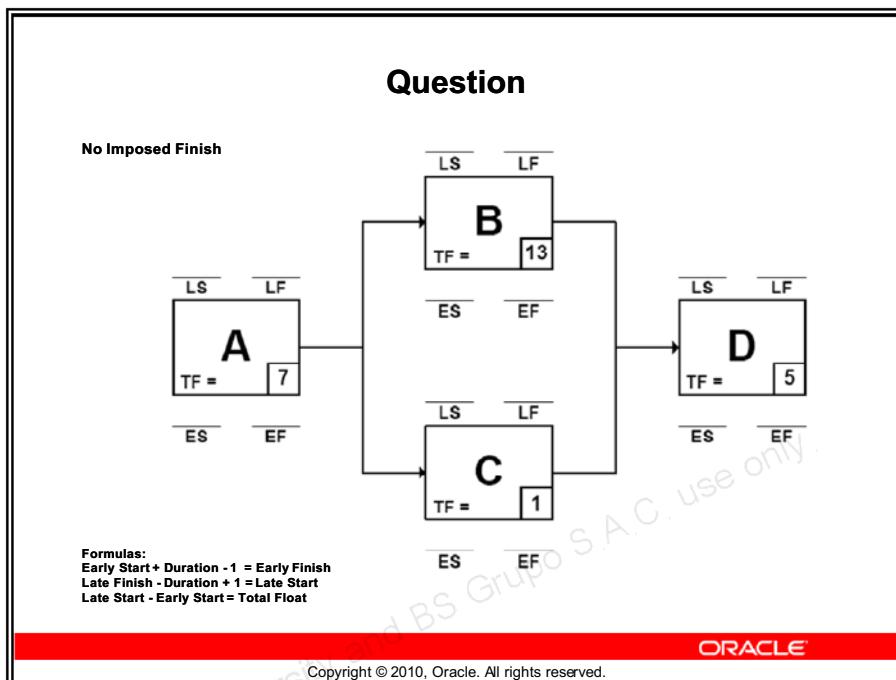
Question



Notice that there is no relationship between activities 30 and 50, creating two additional open ends. What will happen when this network is scheduled?

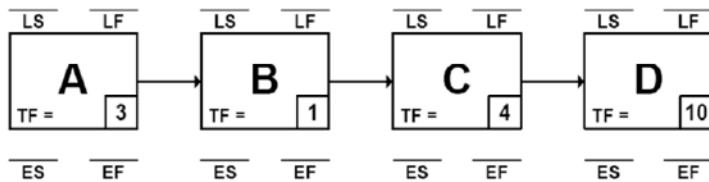
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Question

Imposed Finish Date of 12



Formulas:

Early Start + Duration - 1 = Early Finish
Late Finish - Duration + 1 = Late Start
Late Start - Early Start = Total Float

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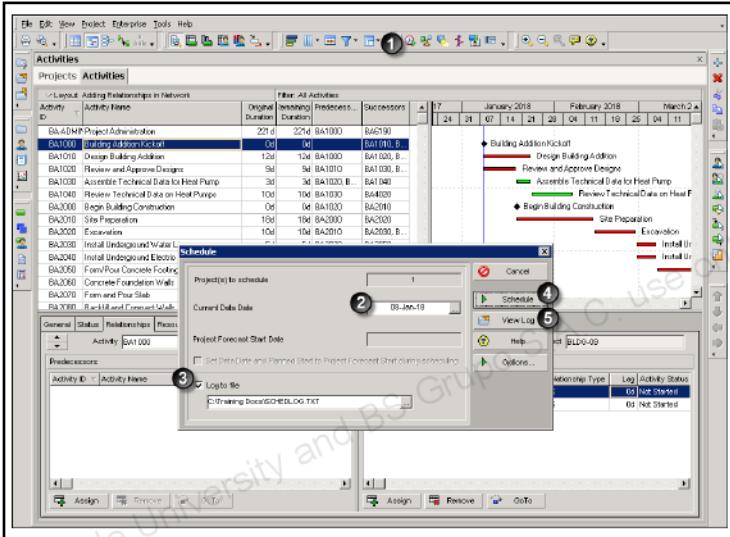
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Notes



Overview: Scheduling a Project

When you schedule a project, activity dates are calculated according to durations and logic. After the project is scheduled, note the change in the position of activities on the Gantt chart. Activities are displayed according to their calculated start and finish dates. Bars for critical activities are displayed in red.



- 1 On the Tools toolbar, click to schedule a project. You can also click *Schedule* on the Tools menu, or press *F9* on your keyboard.
- 2 In the Schedule Project dialog box, select a current *Data Date*.
- 3 Select the *Log to file* check box to record the results of scheduling.
- 4 Click *Schedule* to schedule the project.
- 5 Click *View Log* to view the scheduling log file.

Practice: Scheduling a Project

In this practice, you will:

- Schedule a project.
- Review the Schedule Log.

Scheduling a Project

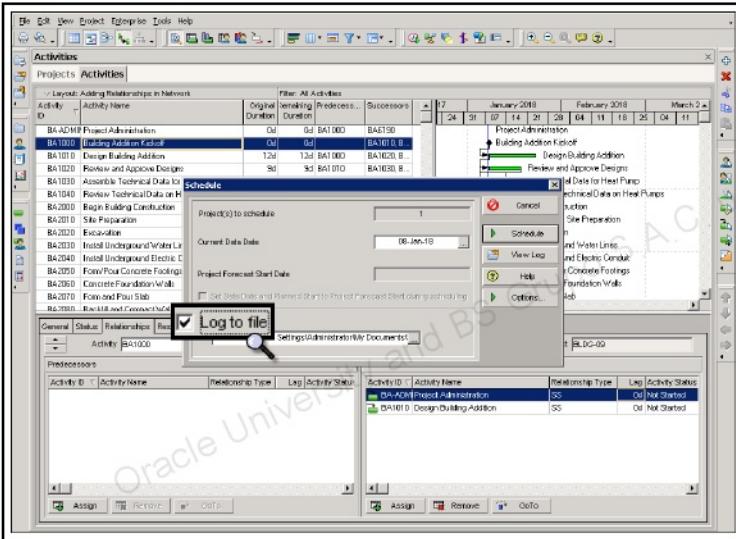


Figure 9-1: Select the check box to create a Schedule Log. After scheduling, note the new positions of activities in the Gantt chart.

Schedule a project.

1. Open a project, *Bldg-09 – BLDG - Scheduling*.
2. Confirm that you are in the Activities window. (Or on the Project menu, click *Activities*.)
3. Confirm the Gantt chart is displayed in the top layout.

? *Before the project is scheduled, where are all of the project activities aligned in the Gantt chart?*

4. On the Tools menu, click *Schedule* (or press *F9* on your keyboard).

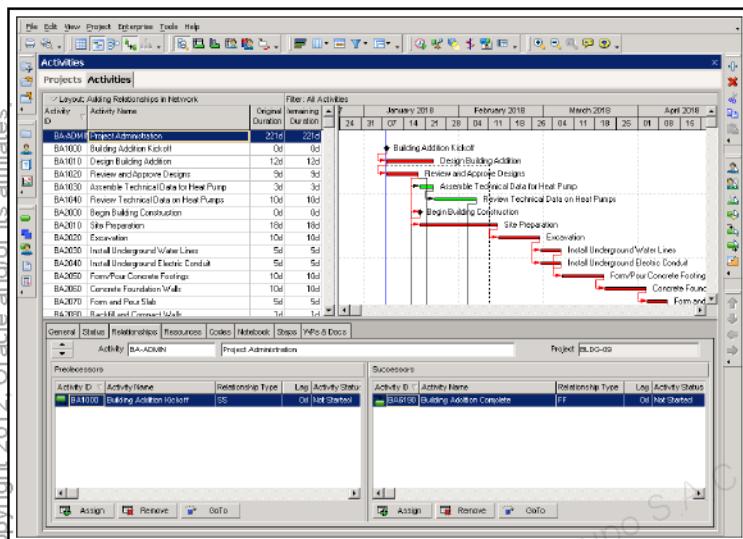


Figure 9-2:The scheduled project.

5. In the Schedule dialog box, confirm the Current Data Date, *08-Jan-18*.
6. Select the *Log to File* check box.
7. In the *Log to File* field, browse to a path, *C:\Training Docs*.

The first time you schedule you may get prompted to create a log file. Click *OK*. Click the ellipsis next to the *Log to file* field. Select the directory where the log file will be stored.

8. Click *Schedule*.

? *Following scheduling, what determines the positions of project activities in the Gantt chart?*

Viewing the Schedule Log

The Schedule Log records scheduling results, including:

- Scheduling/leveling settings
- Statistics
- Critical activities
- Errors, warnings, and exceptions
- Scheduling/leveling results

```

SCHED.DLG - Notepad
File Edit Format View Help
Scheduling/Leveling report - 23-Aug-10 - PM.exe
-----
Default Project.....BLDG-09
Projects: BLDG-09.....BLDG - Scheduling
scheduling/Leveling settings:
-----
General
Scheduling .....
    Use logic .....
    Ignore Relationships to and from other projects .....
    Make open-ended activities critical .....
    Use Expected Finish date .....
    Scheduling automatically when changes affect dates .....
    Level resources during scheduling .....
    Recalculate assignment costs after scheduling .....
    When calculating lag between tasks use .....
        calculate start-to-start lag from .....
        define critical activities as total float less than or equal to .0
    Compute Total Float As .....
    Calculate float based on .....
    Calendar for scheduling Relationship Lag .....
Advanced
    Calculate multiple float paths.....
Statistics:

```

Figure 9-3: Settings and statistics are listed in the Schedule Log.

View the Schedule Log.

1. On the Tools menu, click *Schedule* (or press *F9* on your keyboard).
2. In the Schedule dialog box, click *View Log*.

Before proceeding, answer the following questions:

- **How many activities are in the project?**
- **How many of them are critical?**
- **How many project activities do not have predecessors and/or successors?**
- **What are they?**
- **How many relationships are in the project?**
- **What is the latest early finish date for the project?**

3. In the Notepad File menu, click *Exit*.
4. Click *Cancel* to exit the Schedule dialog box.

Driving Relationships

An activity may have a relationship with a predecessor that determines its Early Start. This is called a driving relationship. A solid relationship line indicates a driving relationship. A dashed relationship line indicates a non-driving relationship.

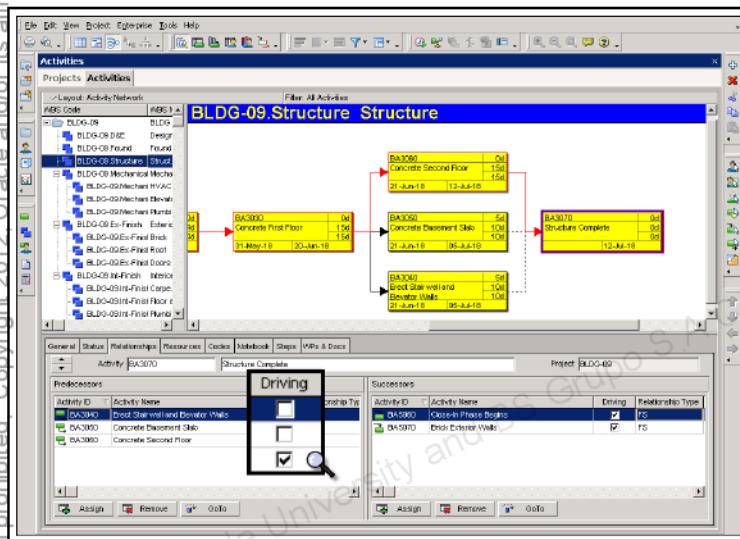


Figure 9-4: The *Driving* column indicates whether a predecessor activity is driving the start of activity *BA3070*. Also, notice in the Activity Network the solid and dashed relationship lines between *BA3070* and its predecessor activities.

View driving and nondriving relationships for an activity.

1. On the Layout Options bar, click *Layout*, *Open*.
2. Select a layout, *Activity Network*, and then click *Open*.
3. In the WBS Table, select a WBS element, *Bldg-09.Structure*.
4. Press and hold *Alt* on your keyboard, and then click and drag your mouse to enlarge the size of activities in the network.
5. In the Activity Network, select an activity, *BA3070*.
6. In Activity Details, click the Relationships tab.

Note that neither *BA3040* nor *BA3050* drive the start of *BA3070* -- but that *BA3060* does drive it. This is indicated by the *Driving* field in the Relationships tab and by the relationship lines in the Activity Network.

Lesson Review

Key Concepts

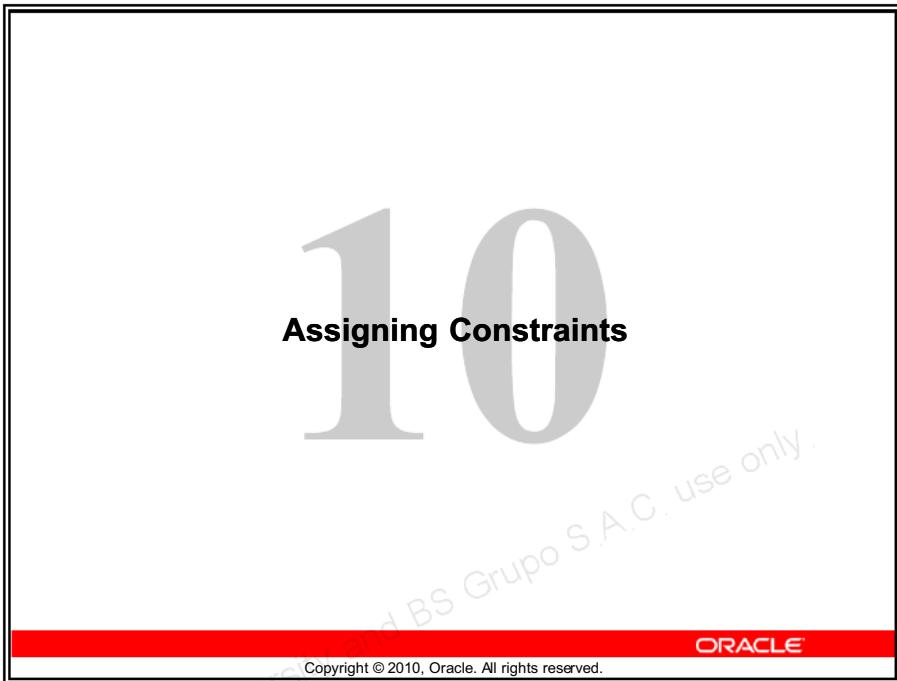
- After relationship logic has been defined, schedule the project.
- When scheduling using the Critical Path Method, activity Early Start and Finish dates are calculated during a forward pass, and the Late Start and Finish dates are calculated during the backward pass.
- The data date is used as a starting point when scheduling all remaining work for the project.
- After scheduling, activities will have a total float that represents the amount of time an activity can be delayed without delaying the project.
- After scheduling, results are recorded in a Schedule Log.

Review Questions

1. **True or False:** A schedule's late dates are calculated during the backward pass.
2. Which of the following is not a type of float?
 - a. Positive
 - b. Open-end
 - c. Negative
 - d. Total
3. **True or False:** The critical path is the path of activities through the project that determines the project end date.
4. Which of the following are included on the Schedule Log?
 - a. Statistics
 - b. Critical activities
 - c. Warnings
 - d. a and b
 - e. a and b and c

Notes





Lesson 10 – Assigning Constraints

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
15	10	20	5	50

Objectives

After completing this lesson, you should be able to:

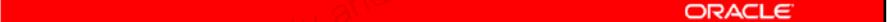
- Describe available constraint types.
- Apply Must Finish By constraint to a project.
- Apply a Start On or After constraint to an activity.
- Add a Notebook topic to a constrained activity.

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Constraints

- Date restrictions used to reflect project requirements that cannot be built into the network logic.
- More accurately reflect real-world aspects of a project.
- Provide added control of a project.
 - Apply to the entire project or to individual activities.
 - Commonly used project-level constraint: Must Finish By
 - Commonly used activity-level constraint: Start On or After
- No more than 10 percent of a project's activities should be constrained.



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Must Finish By

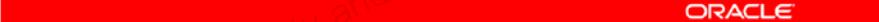
- Used when an overall project deadline must be met.
- Forces all activities in the project to finish by the date (and time) specified.
- Establishes the date from which late dates are calculated in the backward pass.
- Affects the Total Float of the entire project.

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Start On or After

- Used to set the earliest date an activity can begin.
- Forces the activity to start no earlier than the constraint date.
- Pushes the activity's early start date to the constraint date.
Affects the early dates of the activity's successors.



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Additional Start Constraints

- **Start On** — Forces an activity to start on the constraint date:
 - Shifts both early and late start dates to the constraint date.
- **Start On or Before** — Used to specify dates submitted by contractors or vendors.
Forces an activity to start no later than the constraint date:
 - Shifts the late start to the constrained date.
 - Affects the late dates of its predecessors.
 - Used to place a deadline on the start of the activity.

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Additional Finish Constraints

- **Finish On** — Forces an activity to finish on the constraint date:
 - Shifts both early and late finish dates to the constraint date.
- ~~Used to satisfy intermediate project deadlines.~~
Finish On or Before — Forces an activity to finish no later than the constraint date:
 - Pulls the late finish date to the constraint date.
 - Affects the late dates of its predecessors.
 - Used to set intermediate completion points in the project.
- **Finish On or After** — Forces an activity to finish no earlier than the constraint date:
 - Shifts the early finish to the constrained date.
 - Affects the early dates of its successors.

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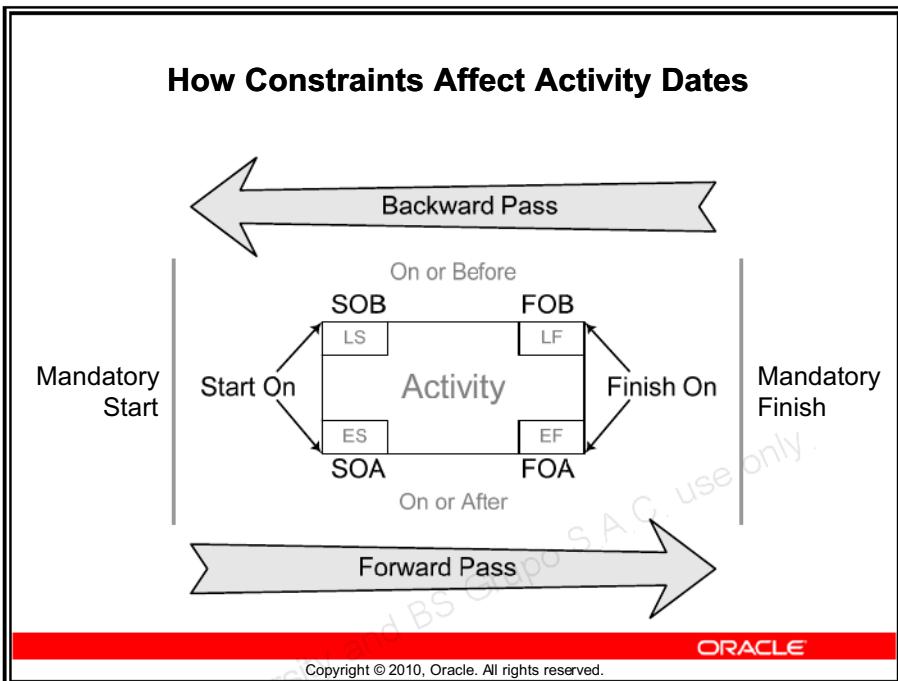
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Additional Constraints

- **As Late as Possible** — Delays activity as late as possible without delaying successors:
 - Shifts early dates as late as possible.
- **Mandatory Start and Finish** — Forces early and late dates to be equal to the constraint date:
 - Also called a zero free float constraint.
 - Affects late dates of predecessors and early dates of successors.
 - May violate network logic.

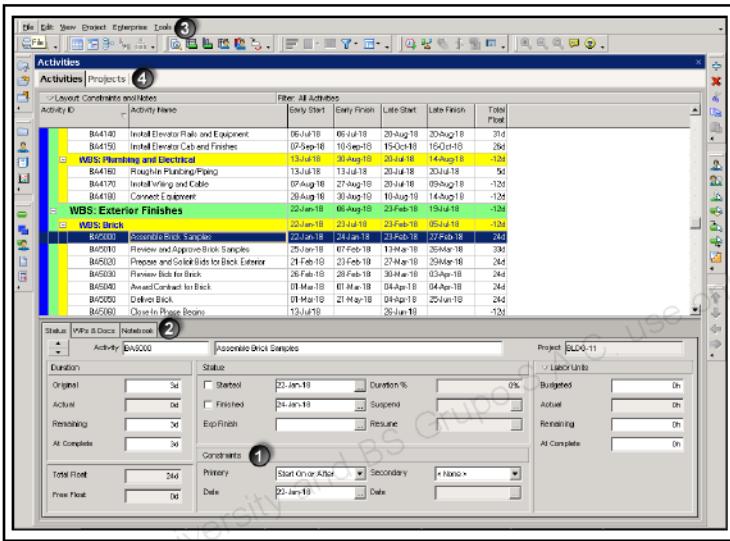
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Overview: Assigning Constraints

Project-level constraints are assigned in the General tab in Project Details. Activity-level constraints are assigned in the Status tab in Activity Details.



- 1 Use the Constraints section on the Status tab in Activity Details to assign primary and secondary constraints to an activity.
- 2 Use the Notebook tab in Activity Details to document constraints after you assign them.
- 3 On the Tools menu, click *Schedule* to reschedule a project after assigning a constraint. Use columns in the Activity Table to check activity dates and Total Float before and after assigning constraints.
- 4 Click the Projects view tab to navigate to the Projects window where you can assign a Must Finish By constraint in the Dates tab in Project Details.

Practice: Assigning Constraints

In this practice you will:

- Assign a *Must Finish By* constraint to a project.
- Assign a *Start On or After* constraint to an activity.
- Reschedule projects after assigning constraints.
- Document a constraint with a Notebook topic.

Assigning a Must Finish By Constraint to a Project

The *Must Finish By* constraint is commonly used when an overall project deadline must be met. It is assigned to the project in the Dates tab in Project Details.

By default, the time associated to the *Must Finish By* date is set to 12:00 am. This means that if the project must finish by the end of day on 1-Nov, the specified constraint date would be 02-Nov.

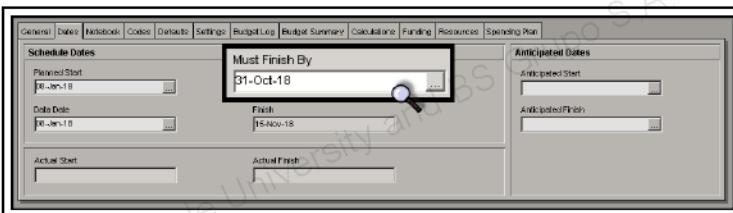


Figure 10-1: Assign a *Must Finish By* constraint in the Dates tab in Project Details.

Assign a *Must Finish By* constraint.

1. Open a project, *BLDG-10 BLDG – Assigning Constraints*.
2. Click the Projects tab near the top of the screen.
3. In the Project Table, select a project, *Bldg-10 BLDG – Assigning Constraints*.
4. In Project Details, click the Dates tab.
5. In the *Must Finish By* field, click 
6. Select a date, *31-Oct-18*.

Rescheduling the Project

A project must be rescheduled after a constraint has been applied in order to calculate new dates and to assess the constraint's impact on Total Float.

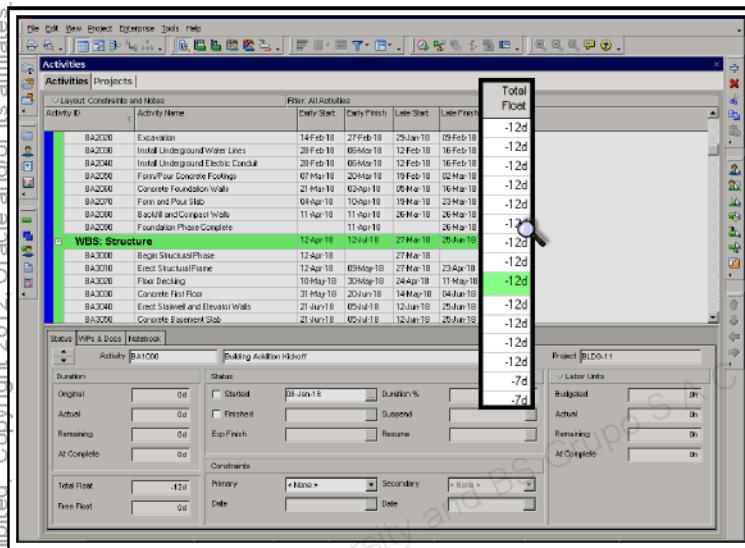


Figure 10-2: After rescheduling, many of the activities show negative Total Float because the Must Finish By date, 31-Oct-18, is earlier than the project's calculated Early Finish date, 15-Nov-18.

Reschedule the project.

1. Click the Activities tab near the top of the screen.
 2. On the Layout Options bar, click *Layout, Open*.
 3. Select a layout, *Constraints and Notes*, and then click *Open*.
- Scroll down the Activity Table and note that all values in the *Total Float* column are greater than or equal to zero days.
4. On the Tools menu, click *Schedule* (or press *F9* on your keyboard).
 5. Confirm the Current Data Date, *08-Jan-18*, and then click *Schedule*.
 6. In the Activity Table, view the values in the *Total Float* column.

? Why do so many activities now have a negative Total Float?

Assigning a Constraint to an Activity

Next, you will use the *Start On or After* constraint to specify the earliest date an activity can begin. Activity-level constraints are assigned in the Status tab in Activity Details. A maximum of two constraints – primary and secondary – can be applied to any single activity.

The *Assemble Brick Samples* activity is scheduled to start 16-Jan-18. However, brick samples are on back order and will not be available until 22-Jan-18. You will assign a constraint to reflect the new date.

Figure 10-3: Assign constraints to an activity in the Constraints section of the Status tab in Activity Details.

Assign a constraint to an activity.

1. In the Activity Table, select an activity, *BA5000 - Assemble Brick Samples*.
 2. In Activity Details, confirm that the Status tab is selected.
 3. On the Status tab, in the Constraints section *Primary* list, select a constraint, *Start On or After*.
 4. In the associated *Date* field, click and select a date, *22-Jan-18*.
- ?** *Before rescheduling, what are the activity's early dates and what is its Total Float?*
5. On the Tools menu, click *Schedule* (or press *F9* on your keyboard).
 6. In the Schedule dialog box, confirm the Current Data Date, *08-Jan-18*, and then click *Schedule*.
- ?** *Following rescheduling, what are the activity's early dates and Total Float?*

Adding a Notebook Topic

When you assign a constraint to an activity, you should also document the reason for its use.

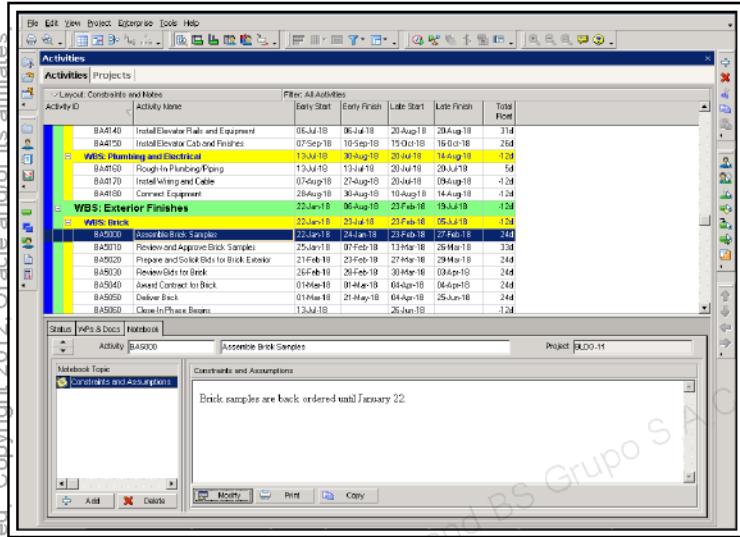


Figure 10-4: Assign a Notebook topic to document the reason for the constraint.

Lesson Review

Key Concepts

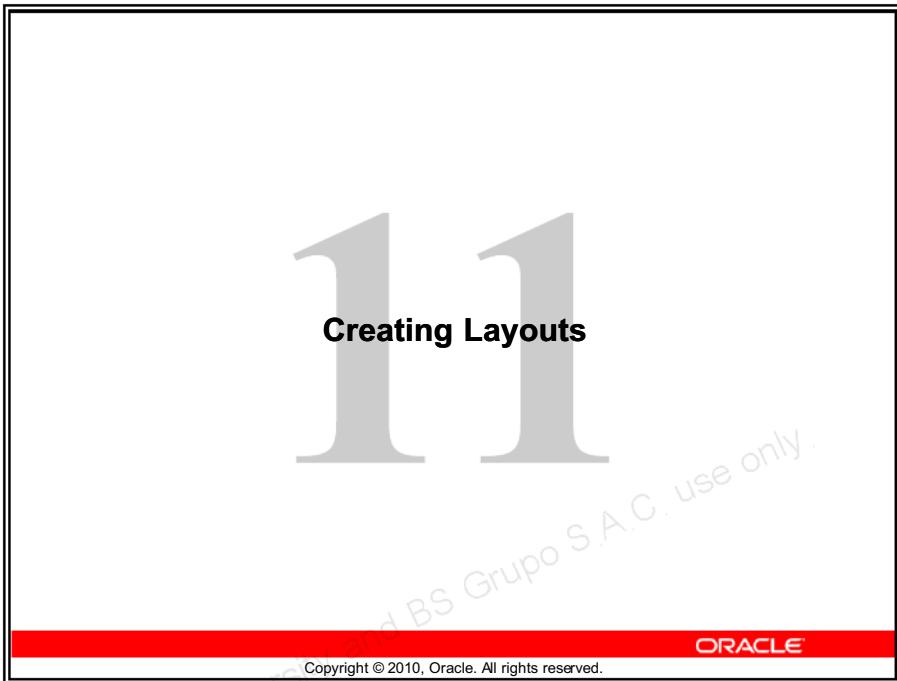
- Assign constraints to activities and projects to reflect real-world restrictions.
- A maximum of two constraints can be assigned to an activity.
- The *Must Finish By* constraint is used when an overall project deadline must be met.
- Use the *Start On or After* constraint to specify the earliest date an activity can begin.

Review Questions

1. Which of the following applies to the *Start On or After* constraint?
 - Affects an activity's early dates and the early dates of successor activities.
 - Affects an activity's late dates and the late dates of successor activities.
 - Violates network logic.
 - Delays an activity as long as possible without affecting its successors.
2. **True or False:** You should always use a Notebook topic to document the reason for assigning a constraint.
3. Which constraint pulls the Late Finish to the constrained date?
 - Start On or After
 - Finish On or After
 - As Late as Possible
 - Finish On or Before
4. How many constraints can be assigned to a single activity?
 - 1
 - 2
 - 3
 - An unlimited number

Notes





Lesson 11 – Creating Layouts

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
10	20	40	5	75

Objectives

After completing this lesson, you should be able to:

- Group activities according to specific criteria.
- Sort activities.
- Apply a filter.
- Create a filter.



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Grouping

- A flexible way to organize data into categories that
- share a common attribute.
Can be used to create customized layouts.
- Organized by grouping bands.

The screenshot shows a grouped timeline report for a building addition project. The timeline is divided into months from January 2010 to July 2010. Each month group contains a list of tasks with their start and end dates. Arrows point from the bullet points in the list above to the month groups in the report. The report includes an ORACLE logo at the bottom.

Month	Task	Start Date	End Date
Jan 2010	Building Addition Kickoff	11-Jan-10	
	Design Building Addition	11-Jan-10	
	Review And Approve Design	11-Jan-10	
	Begin Building Construction	22-Jan-10	
	Site Preparation	22-Jan-10	
Feb 2010	Evaluation	17-Feb-10	
Mar 2010	Install Underground Water Lines	03-Mar-10	
	Install Underground Electric Condit.	03-Mar-10	
	Excavate Foundation	10-Mar-10	
	Concrete Foundation Walls	24-Mar-10	
Apr 2010	Form and Pour Slab	07-Apr-10	
	Excavate and Compact Walls	14-Apr-10	
	Foundation Phase Complete		
	Begin Structural Phase	15-Apr-10	
	Erect Structural Frame	15-Apr-10	
May 2010		13-May-10	
	Floor Decking	13-May-10	
Jun 2010		03-Jun-10	
	Concrete First Floor	03-Jun-10	
	Erect Stairwell and Elevator Walls	24-Jun-10	
	Concrete Basement Slab	24-Jun-10	
	Concrete Second Floor	24-Jun-10	
Jul 2010		15-Jul-10	

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Grouping

	2010
■ Jan 2010	20d
BA1010	Site Preparation
BA1010	Excavating
BA1020	Dug-in Building Addition
BA1030	Review and Approve Designs
BA4000	Begin Building Construction
BA1000	Building Addition Kickoff
■ Feb 2010	10d
BA2020	Excavation
■ Mar 2010	25d
BA2060	Concrete Foundation/Walls
BA2050	Form/Pour Concrete Footings
BA2040	Install Underground Electric Cables
BA2030	Install Underground Water Lines
■ Apr 2010	26d
BA3010	Erect Structural Frame
BA2070	Form and Pour Slab
BA2080	Backfill and Compact Walls
BA3000	Begin Structural Phase
BA2090	Foundation Phase Complete
■ May 2010	14d
BA3120	Floor Decking
■ Jun 2010	30d
BA3060	Concrete Second Floor
BA3130	Concrete First Floor
BA3120	Concrete Basement Slab
BA3140	Erect Stairwell and Elevator Walls
■ Jul 2010	17d
BA5000	Insulation and Built-up Roofing
BA5010	Brick Exterior Walls
BA4070	Structure Complete
BA5080	Close-In Phase Begins
■ Aug 2010	18d

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- Activities can be grouped:
 - By hierarchical fields (WBS, activity codes, project codes).
 - By data fields (dates, costs, Total Float, other numeric data).
- Can be used to:
 - Quickly view subtotal data in grouping bands.
 - View summary bars in the Gantt Chart.
 - Summarize data for reporting purposes.

Sorting

- Determines the sequence in which activities are listed within grouping bands.
- Based on data item, you can sort:
 - Alphabetically
 - Numerically
 - Chronologically
- Click on column header to quickly sort ascending, descending

Jan 2010 11-Jan-10	
BA1000	11-Jan-10
BA1010	11-Jan-10
BA1020	11-Jan-10
BAADMIN	11-Jan-10
BA2000	22-Jan-10
BA2010	22-Jan-10
BA4010	22-Jan-10
BA5000	25-Jan-10*
BA1030	28-Jan-10
BA5010	28-Jan-10

Sorted by Start date
Ascending

Jan 2010 11-Jan-10	
BA5010	28-Jan-10
BA1030	28-Jan-10
BA5000	25-Jan-10*
BA6040	22-Jan-10
BA2010	22-Jan-10
BA2000	22-Jan-10
BAADMIN	11-Jan-10
BA1020	11-Jan-10
BA1010	11-Jan-10
BA1000	11-Jan-10

Sorted by Start date
Descending

Feb 2010 02-Feb-10	
BA1040	02-Feb-10
BA6050	03-Feb-10
BA4020	16-Feb-10
BA6060	16-Feb-10
BA2020	17-Feb-10*
BA4030	19-Feb-10
BA4040	23-Feb-10
BA5020	24-Feb-10
BA6070	24-Feb-10
BA4050	24-Feb-10

Sorted by Start date
Ascending

Feb 2010 02-Feb-10	
BA4050	24-Feb-10
BA6070	24-Feb-10
BA5020	24-Feb-10
BA4040	23-Feb-10
BA4030	19-Feb-10
BA2020	17-Feb-10*
BA6060	16-Feb-10
BA4020	16-Feb-10
BA6050	03-Feb-10
BA1040	02-Feb-10

Sorted by Start date
Descending

Mar 2010 01-Mar-10	
BA1050	01-Mar-10

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Filtering

- Determines which activities are displayed in a layout.
- Enables you to create customized layouts that:
 - Limit the number of activities displayed.
 - Help you focus on a particular group of activities (critical activities, for example).

The diagram illustrates the process of filtering project activities. On the left, a full project timeline from January 2010 to February 2010 is shown. A large red arrow labeled "Filter" points from the original timeline to a smaller version on the right. The right-hand timeline shows only the activities from BA1000 to BA2000, effectively filtering out BA4000 and BA5000.

Jan 2010		
BA-ADMN	Project Administration	-12d
BA1000	Building Addition Kickoff	-12d
BA1010	Design Building Addition	-12d
BA1020	Review and Approve Designs	-12d
BA1030	Assemble Technical Data for Heat Pump	21d
BA2000	Begin Building Construction	-12d
BA2010	Site Preparation	-12d
BA5000	Assemble Brick Samples	21d
BA5010	Review and Approve Brick Samples	30d
BA6040	Assemble and Submit Flooring Samples	1d
Feb 2010		

Jan 2010		
BA1000	Building Addition Kickoff	-12d
BA1010	Design Building Addition	-12d
BA1020	Review and Approve Designs	-12d
BA2000	Begin Building Construction	-12d
BA2010	Site Preparation	-12d
Feb 2010		

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Question

True or False: Grouping, sorting, and filtering can all be included in the same layout.

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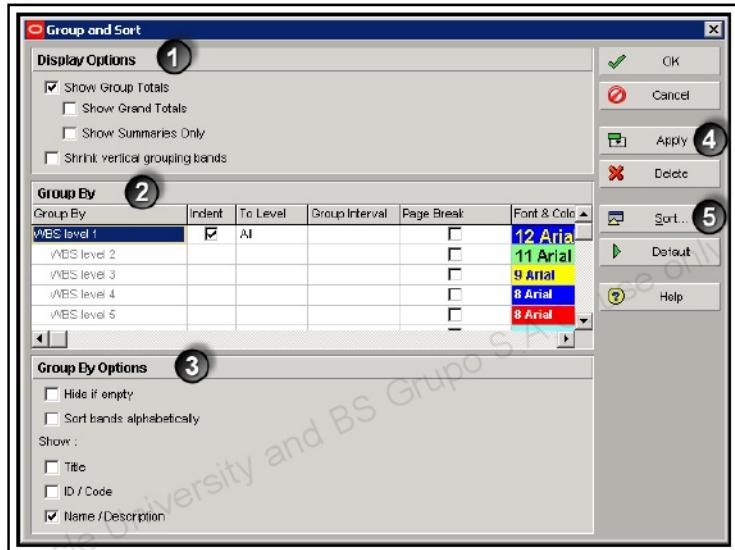
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Notes



Overview: Grouping and Sorting

Grouping and sorting in layouts is available in all windows. On the Display Options bar, click *Group and Sort* to access the Group and Sort dialog box. Once a layout has been modified to your satisfaction, you can save it as a new layout, which can then be applied to other projects opened in the window.



- 1 Use the Display Options section to choose to show total and/or summary data values on grouping bands in layouts and dialog boxes.
- 2 Use the Group By section to choose which data items to use for organizing information in layouts and other grouped data displays.
- 3 Use the Group By Options section to select whether to show/hide empty grouping bands and whether to sort bands alphabetically.
- 4 Click *Apply* to view grouping and sorting before closing the dialog box.
- 5 Click *Sort...* to access sorting options.

Practice: Grouping and Sorting

In this practice you will:

- Group data by date in the Activities window.
- Collapse and expand the grouped data.
- Sort the grouped data.
- Save the layout containing the new data grouping scheme.

Grouping Data

Grouping is a flexible way to organize data into categories that share a common attribute.

You can group data to create customized layouts. You can also use grouping to quickly view subtotal data in the group title bands, view summary bars in the Gantt chart, and summarize data for reporting purposes.

- Grouping is available in all windows and most dialog boxes.
 - ◆ Each window or dialog box has its own grouping options.
 - ◆ Some windows have customized/pre-defined groups.
- Activities can be grouped by hierarchical fields such as WBS, activity codes, and project codes.
- Activities can be grouped by data fields such as dates, costs, Total Float, and other numeric data.

Group and Sort Dialog Box

The Group and Sort dialog box is used to specify the organization of activities on the screen.

- **Show Group Totals** –Choose to display or hide the total values for grouping bands. If you select the *Show Group Totals* check box, you have the additional options to *Show Grand Totals* and *Show Summaries Only*.
 - ◆ Show Grand Totals – Select to display a grand total row at the top of the layout.
 - ◆ Show Summaries Only – Select to hide the activities within each group title band.
- **Shrink Vertical Grouping Bands** –Minimize the width of the vertical grouping bands displayed in the Activity Table. This setting is available in windows that have the *Group and Sort by*, *Customize* layout option.
- **Group By** –Lists data items used to group the current display.
 - ◆ Indent – Available if the selected data item is hierarchical.
 - ◆ To Level – Indicates the number of levels to display when grouping by a hierarchical data item.
 - ◆ Group Interval – Indicates the interval by which you want to group the selected data item.
 - ◆ Font & Color – Displays the font/color for each group title band.
- **Hide if empty** –Select to hide the group title bands that do not contain activities.
- **Sort Bands Alphabetically** –Select the check box to sort the grouping bands alphabetically rather than their order in their respective hierarchy. This check box is disabled for any grouping that is not hierarchical.
- **Show Title** –Select to display the name of the field that the layout is grouped by; the value is also displayed.
- **Show ID/Code** –Select the check box to display the ID or code value on the grouping band.
- **Show Name/Description** – Select the check box to display the name or description on the grouping band.

First, open a project and display the Group and Sort dialog box.

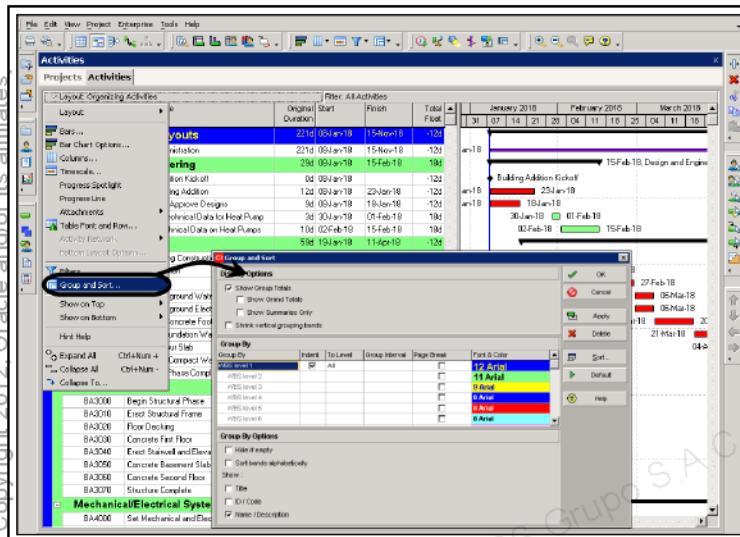


Figure 11-1: The Group and Sort dialog box is accessed from the Layout Options bar.

View the Group and Sort dialog box.

1. Open a project, *BLDG-11 BLDG – Creating Layouts*.
2. Confirm that you are in the Activities window. (Or on the Project menu, click *Activities*.)
3. On the Layout Options bar, click *Layout, Open*.
4. Select a layout, *Organizing Activities*, and then click *Open*.
5. On the Layout Options bar, click *Group and Sort*.

Grouping by Date

You will use the Group and Sort dialog box to group a layout by date, enabling you to identify activities that are scheduled to occur within a particular time period.

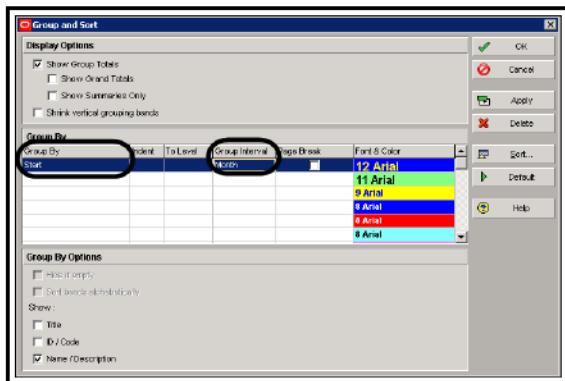


Figure 11-2: Select values in the *Group By* and the *Group Interval* columns.

Group data by Start date and save as a new layout.

1. In the Group and Sort dialog box, click in the first cell of the *Group By* column, and select *Start* from the list.
2. Double-click in the *Group Interval* column, and select *Month*.
3. Click *OK*.

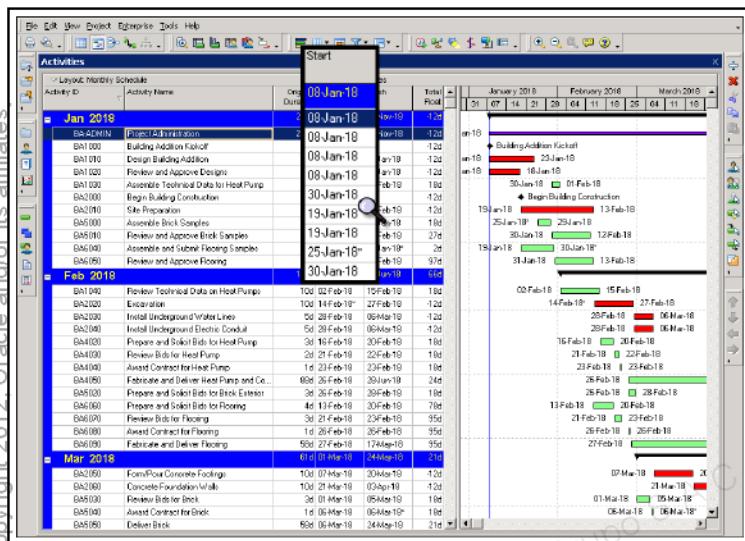


Figure 11-3: Activities in the Activity Table are grouped by Start date.

4. On the Layout Options bar, click *Layout, Save As*.
5. In the *Layout Name* field, type <**Monthly Schedule**>, and then click *Save*.

Collapsing/Expanding Grouped Data

Collapse grouping bands to control the level of detail that displays. This functionality is especially useful if you want to focus on a specific portion of the layout.

- In the Activity Table, view summary information for the displayed columns.
- In the Gantt chart, summary bars are displayed to represent the Start/Finish dates in each grouping band.

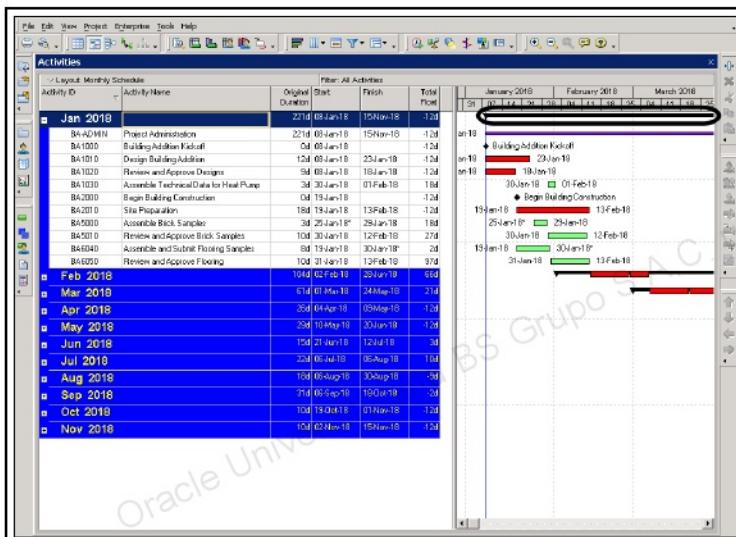


Figure 11-4: A summary bar is displayed for each grouping band.

Collapsing grouping bands in the Activity Table.

1. On the Layout Options bar, click *Collapse All*.
2. Click to expand a grouping band, *Jan 2018*.

Sorting Activities

Sorting determines the sequence in which activities are listed within each grouping band. Based on the data item you choose, you can sort alphabetically, numerically, or chronologically.

Sorting by a Single Criterion

To sort by a single criterion, click the appropriate data item's column title.

- indicates ascending sort order
- indicates descending sort order

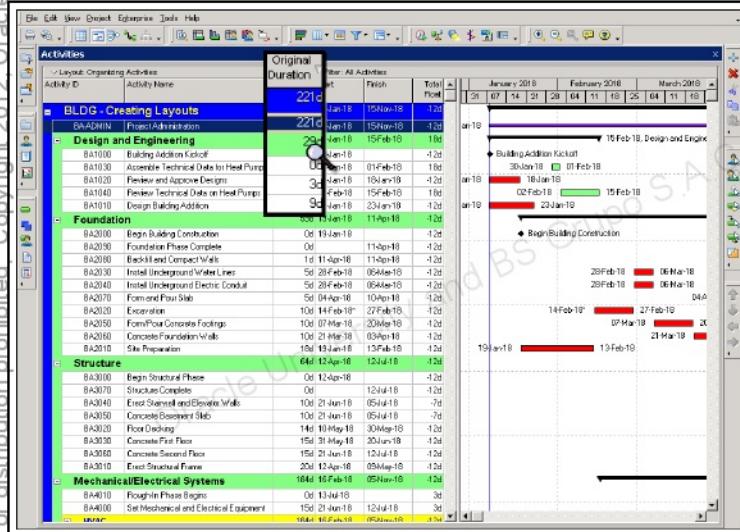


Figure 11-5: The sort icon indicates that the layout is sorted by the associated data item.

- Click a column title to sort the layout by the associated data item.

1. On the Layout Options bar, click *Layout, Open*.
2. Select a layout, *Organizing Activities*, and then click *Open*.

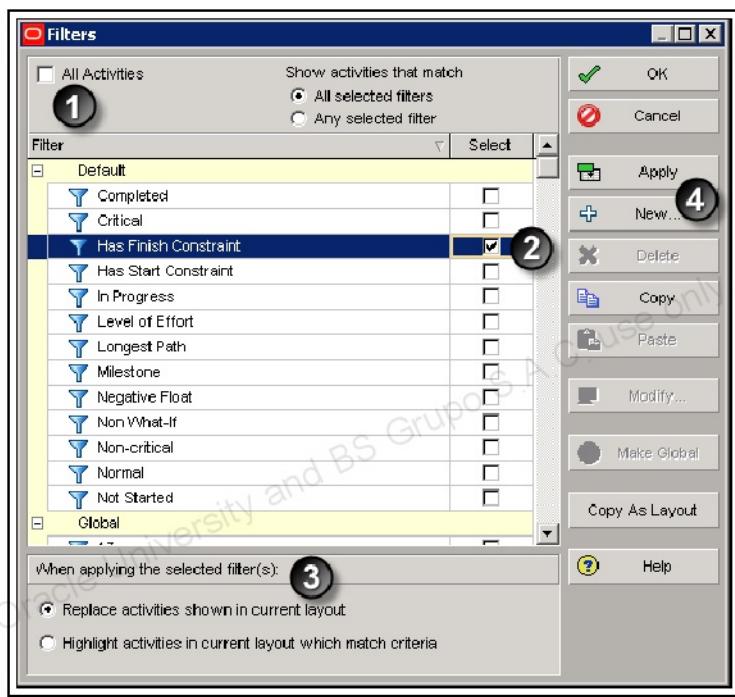
The icon indicates that the layout is currently sorted by Activity ID.

3. Click a column title, *Original Duration*.

As indicated by the icon, activities within each grouping band are now sorted by Original Duration.

Overview: Filtering

On the Layout Options bar, click *Filters* to access the Filters dialog box, which enables you to select pre-existing filters or to create new filters.



- ① Use the Filters dialog box to select one or more existing default, global, or user-defined filters to apply to a layout. Select *All Activities* to show all activities in the layout.
- ② Select a check box to specify a filter, and then click *Apply* to execute the filter.
- ③ Choose whether to use a filter to replace or highlight activities in the layout.
- ④ Click *New* to create a new filter.

Practice: Filtering

In this practice you will:

- View the Filters dialog box.
- Run a default filter.
- Create a new filter.
- Run multiple filters simultaneously.
- Use the *All Activities* option in the Filters dialog box to refresh the layout.

Filtering Activities

A filter is a set of instructions that determines which activities are displayed in a layout.

Filters enable you to create customized layouts that limit the number of activities displayed. This is useful for helping you focus on a particular group of activities – critical activities, for example.

- A set of pre-defined filters is provided, as is the ability to create user-defined filters of your own.
- Filters are divided into the following groupings:
 - ◆ Default
 - Available to all users.
 - Copy and use as basis for a new filter.
 - Cannot delete or modify.
 - ◆ Global
 - Available to all users.
 - ◆ User-defined
 - Available to current user for all projects to which he/she has access.
 - ◆ Layout
 - Filter can be applied only in specified layout.
 - Precludes changes in global filters affecting layout.
- One or more filters may be applied to a layout at a time.
- Multiple criteria for selection may be used within a single filter.
- Filter specifications can be saved and re-applied.
- Filters can be saved as part of a layout.

Filters Dialog Box

- **All Activities** –Select to show all activities in the current layout.
- **Show activities that match** –When more than one filter is marked, you must select one of the following options:
 - ♦ All selected filters – Select to include the activities that meet the criteria of each selected filter.
 - ♦ Any selected filter – Select to include the activities that meet the criteria of at least one of the selected filters.
- **Replace activities shown in current layout** –Displays only the activities that meet the criteria of each selected filter.
- **Highlight activities in current layout which match criteria** –Highlights only the activities in the current layout that meet the criteria of each selected filter.

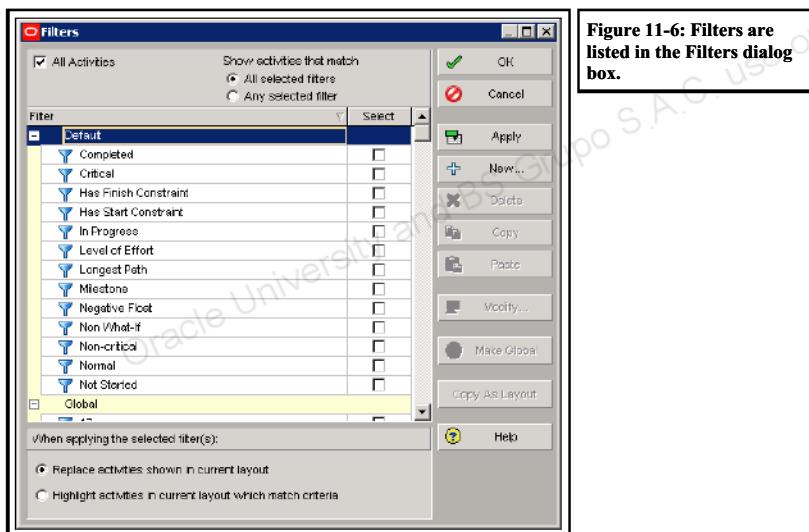


Figure 11-6: Filters are listed in the Filters dialog box.

View the Filters dialog box.

1. On the Layout Options bar, click *Layout, Open*.
2. Select a layout, *Filtering*, and then click *Open*.
3. On the Layout Options bar, click *Filters*.

Applying a Default Filter

To view critical activities only, run the *Critical/default* filter.

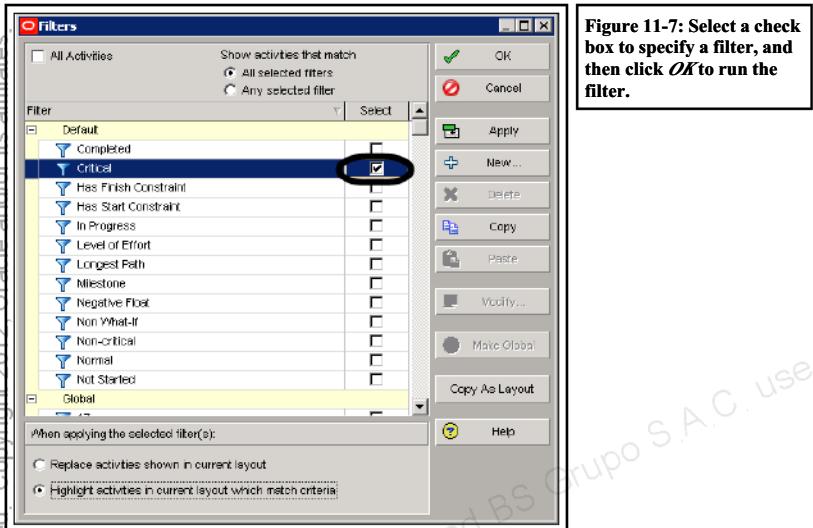


Figure 11-7: Select a check box to specify a filter, and then click *OK* to run the filter.

Use a filter to highlight critical activities.

1. In the Filters dialog box, select the *Critical* check box.
2. In the *When applying the selected filter(s)* field, select *Highlight activities in current layout which match criteria*.
3. Click *OK* to execute the filter.

The layout now displays all activities in the project but highlights only the critical activities.

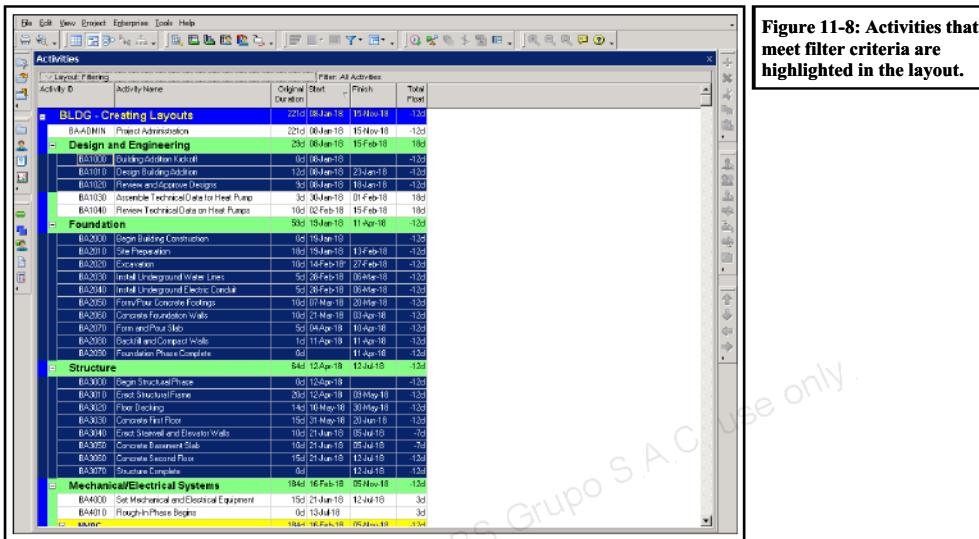


Figure 11-8: Activities that meet filter criteria are highlighted in the layout.

? Why are activities BA1030 and BA1040 not highlighted?

? The activity, BA-AMIN, has negative Total Float. Why is it not highlighted?

Creating a Filter

You can create filters based on a single criterion or on multiple criteria.

A convenient single-criterion filter to use throughout the life cycle of a project is a lookahead filter. It displays the activities that are scheduled to occur within a given time period – the next month, for example.

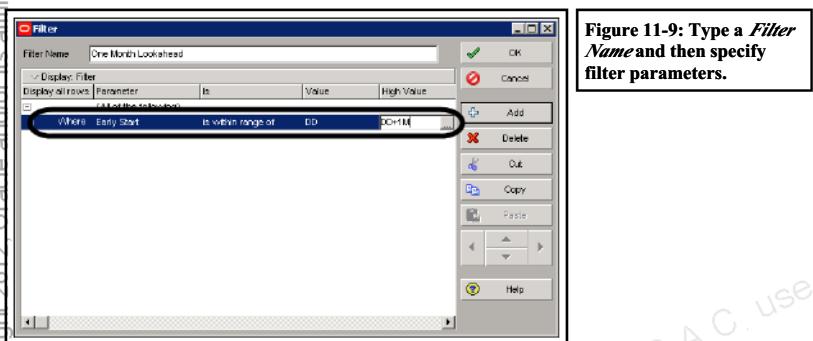


Figure 11-9: Type a Filter Name and then specify filter parameters.

Define a filter to display activities scheduled to occur in the next month.

1. On the Layout Options bar, click *Filters*.
2. In the Filters dialog box, click *New*.
3. In the *Filter Name* field, type **<One Month Lookahead>**.
4. Click in the *Parameter* cell and select *Early Start*.
5. Double-click in the *Is* cell and select *is within range of*.
6. Double-click in the *Value* cell and then click .
7. Select *DD-Earliest Data Date*.
8. Double-click in the *High Value* cell and type **<DD+1M>**.

This value indicates data date plus one month.

9. Click *OK* to close the Filter specification dialog box.

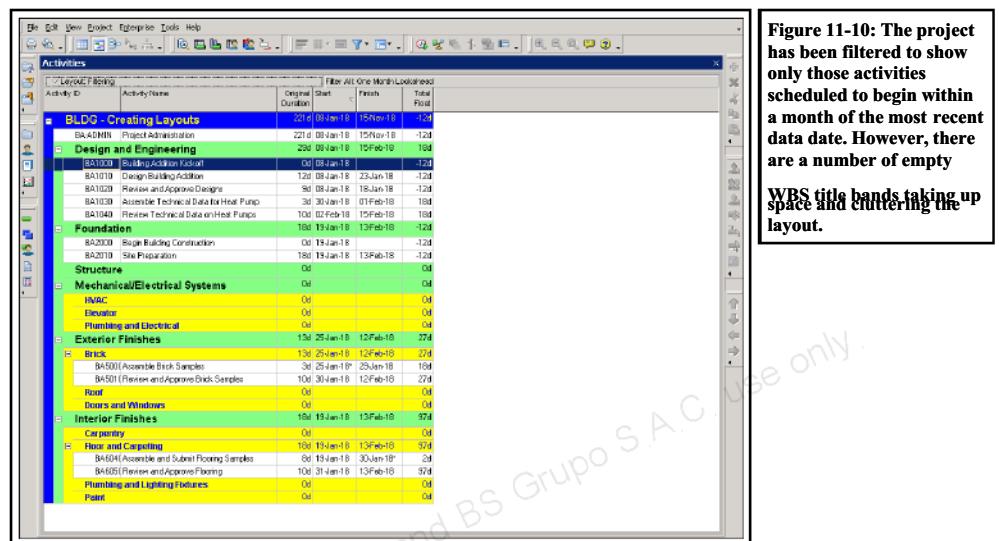


Figure 11-10: The project has been filtered to show only those activities scheduled to begin within a month of the most recent data date. However, there are a number of empty WBS title bands taking up space and cluttering the layout.

10. In the Filters dialog box, confirm that the new filter, *One Month Lookahead*, is selected.
11. Confirm that *Replace activities shown in current layout* is selected.
12. Click *OK* to execute the filter.

After executing the filter, the layout shows a number of WBS title bands that contain no activities scheduled to start in the next month. These empty WBS elements clutter the layout and can be distracting to viewers. However, you can remove the empty grouping bands using an option in the Group and Sort dialog box.

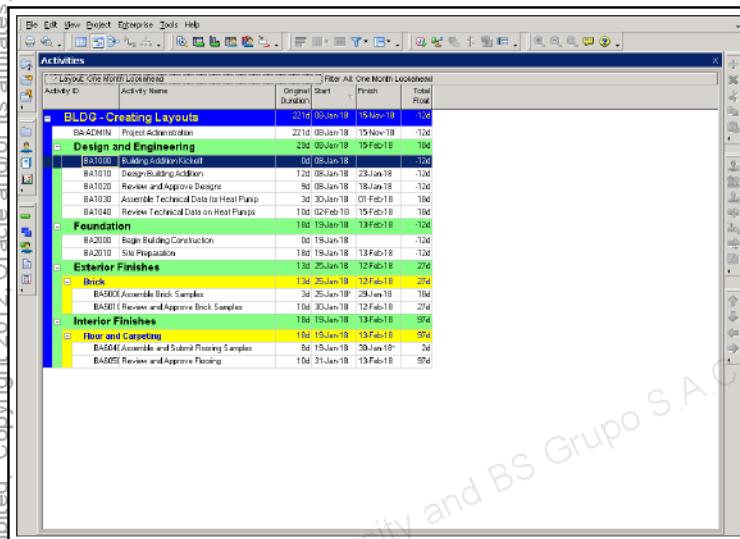


Figure 11-11: Group/sort and filter options are combined to create a layout that is clean and focuses only on those activities starting within a month of the data date.

13. On the Layout Options bar, click *Group and Sort*.
14. In the Group By Options section, select the *Hide if empty* check box.
15. Click *OK*.
16. On the Layout Options bar, click *Layout, Save As*.
17. Type a Layout Name, **<One Month Lookahead>**.
18. Click *Save*.

Using Multiple Filters

If you cannot achieve the results you want with a single filter, you can run two or more filters simultaneously.

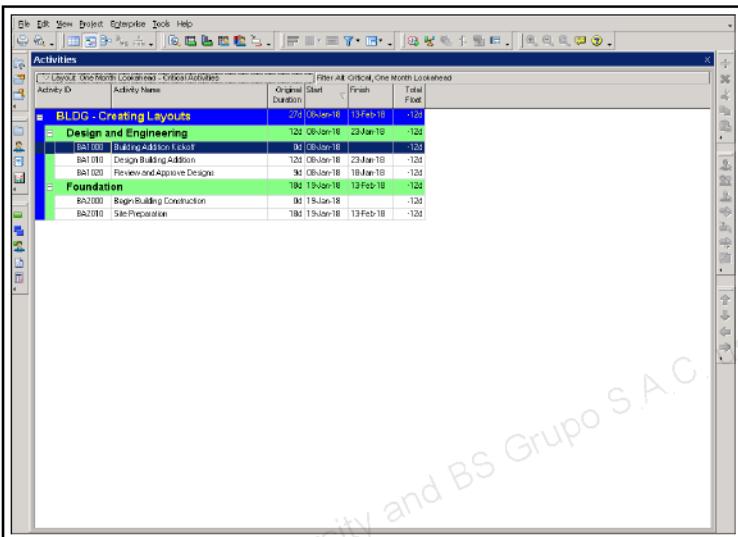


Figure 11-12: The layout now focuses on critical activities starting within a month of the data date.

Execute two filters simultaneously.

1. On the Layout Options bar, click *Filters*.
2. Select the *Critical* check box.
3. Scroll down and confirm that the *One Month Lookahead* check box is also selected.
4. In the *Show activities that match* field, confirm that *All selected filters* is selected.
5. Click *OK* to execute the filters.
6. On the Layout Options bar, click *Layout, Save As*.
7. Type a Layout Name, <**One Month Lookahead – Critical Activities**>
8. Click *Save*.

Note that all grouping bands are not displayed in the layout. Only those bands that have activities that meet the filter criteria are displayed.

Applying the *All Activities* Filter

To refresh your screen with all activities, you can run the *All Activities* filter.

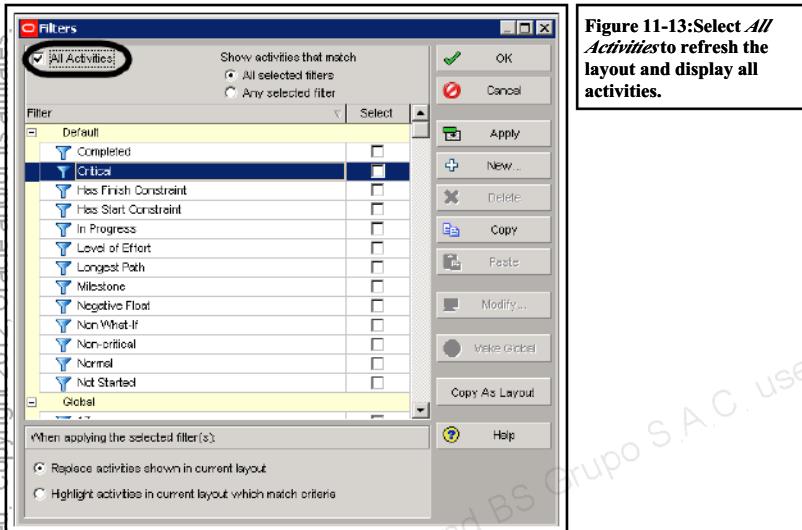


Figure 11-13: Select *All Activities* to refresh the layout and display all activities.

Execute the *All Activities* filter.

1. On the Layout Options bar, click *Filters*.
2. At the top of the Filters dialog box, select the *All Activities* check box.
3. Click *OK* to execute the filter.

Lesson Review

Key Concepts

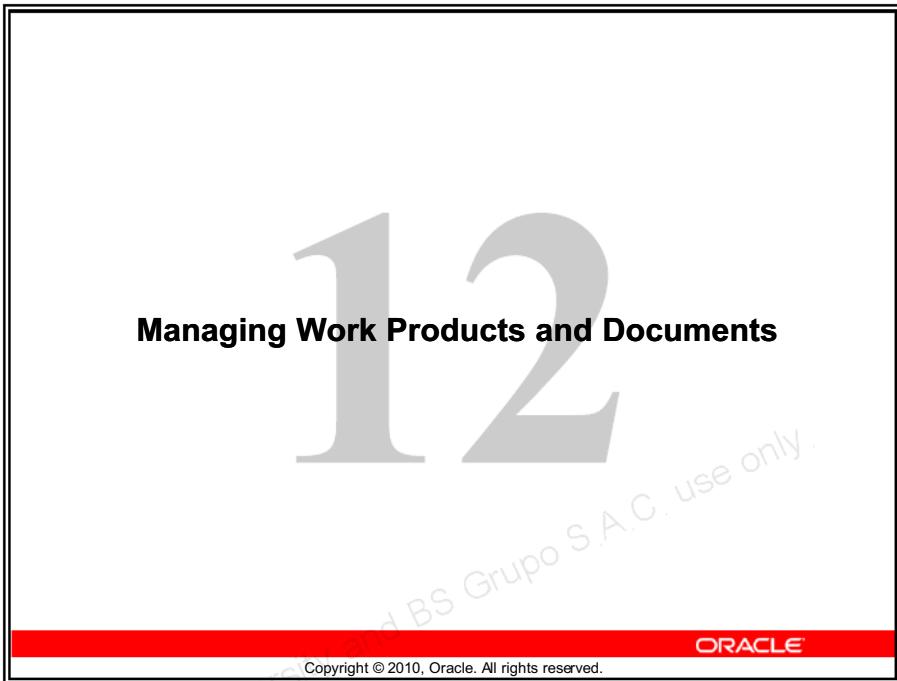
- Use grouping and sorting to organize activities in a layout.
- Grouping is available in all windows and most dialog boxes.
- The Group and Sort dialog box provides options to show grand totals and summaries and to modify the font and color for each grouping selected. You can also sort the groups alphabetically, numerically, or chronologically.
- Use filters to customize a layout or to show only those activities that satisfy the filter criteria. You can apply multiple filters to a layout.

Review Questions

1. Which of the following statements about default filters is false?
 - a. They are available to all users.
 - b. They can be deleted.
 - c. They cannot be modified.
 - d. They can be copied.
2. **True or False:** Multiple filters may be applied to a layout simultaneously.
3. **True or False:** Grouping refers to the order in which selected data items are displayed in a layout.
4. Which of the following can be used to group activities?
 - a. Dates
 - b. Costs
 - c. Activity codes
 - d. a and b
 - e. a and b and c

Notes





Lesson 12 – Managing Work Products and Documents

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
5	5	20	5	35

Objectives

After completing this lesson, you should be able to:

- Describe the difference between a work product and a reference document.
- Create a document record.
- Link the document record to a project document or work product.
- Assign the project document to an activity or WBS.

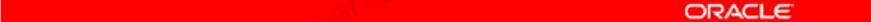
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Project Documents

Project documents can be classified as either a work product or a reference document:

- **Work product** – A document that is a project or activity deliverable and will be turned over to the project's end user or customer.
- **Reference document** – A document that can be referenced by a project participant for the purpose of providing standards or guidelines for performing work.

The red bar spans the width of the content area below the title.

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Linking Documents

Documents are not stored in the P6 Professional database. Instead, create a document record and then link to the document source.

P6 Professional
Create document record



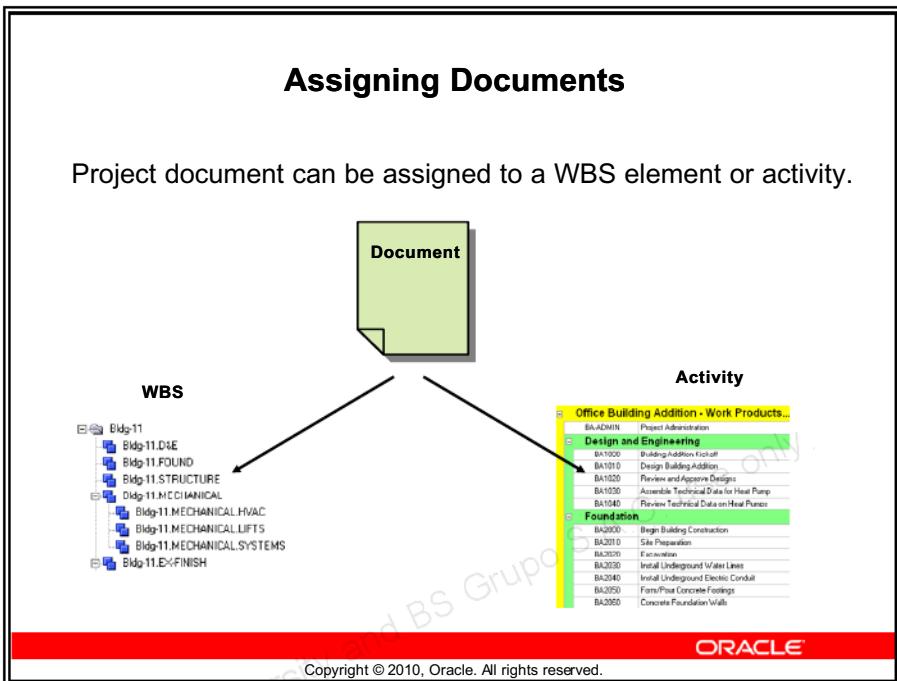
Document repository
Store documents



Link

ORACLE

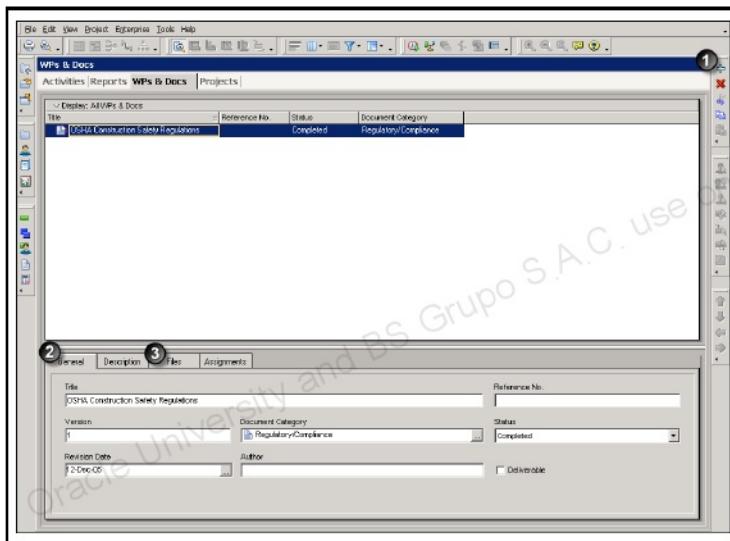
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Overview: Using the Work Products and Documents Window

The Work Products and Documents window enables you to catalog and track project-related documents.

- Maintain general information about a document, such as author, status, and revision date.
- Specify a link to the document.
- Assign a document to a WBS element or activity.



- ➊ Click to create a document record.
- ➋ Use the tabs in Work Products and Document Details to enter information into a new document record or to edit the information in an existing record.
- ➌ Use the Files tab to specify the private location and public location of the document.
Use the Assignments tab to assign the document to an activity or WBS element.

Practice: Using the Work Products and Documents Window

In this practice you will:

- Create a document record and then link the document record to the relevant document.
- Assign a project document to an activity and view a project document from the activity to which it is assigned.

Creating a Document Record

Documents do not reside in P6 Professional. To access documents, a document record must be created in the Work Products and Documents window.

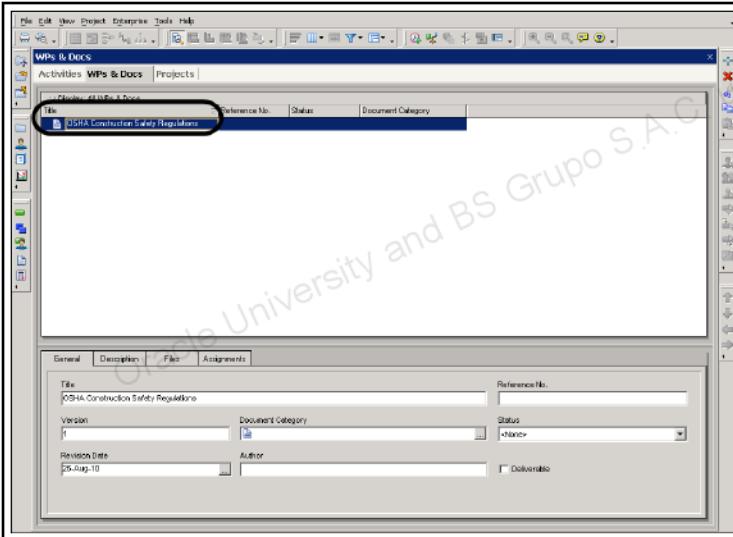


Figure 12-1: Type a document title in the Title field in the Work Products and Documents Table.

>Create a project document record.

1. Open a project, *BLDG-12 BLDG - Work Products and Documents*.
2. On the Project menu, click *WPs & Docs*.
3. Click 
4. In the *Title* field in the Work Products and Documents Table, type a document title, **<OSHA Construction Safety Regulations>** and then press *Enter* on your keyboard.

The General Tab

Use the General tab in Work Product and Document Details to assign a document category, status, and revision date.

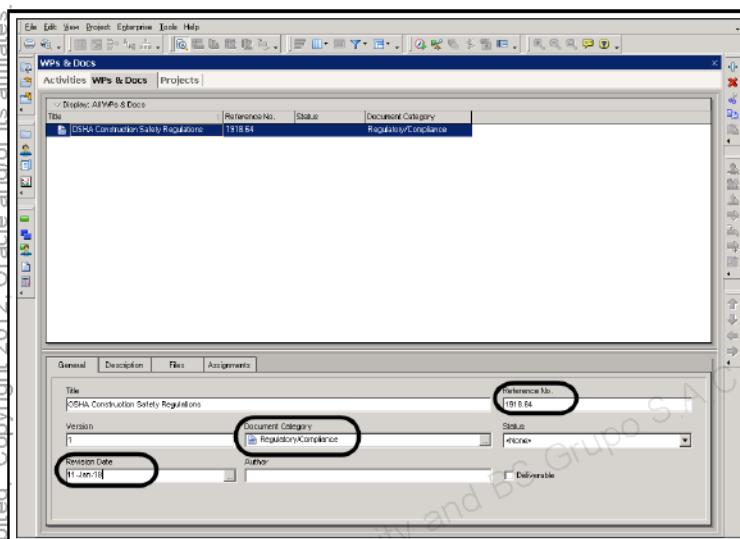


Figure 12-2: Use the General tab to enter a Reference No., Document Category, and Revision Date for the document record. The entries display in the WPs and Docs Table as well.

Assign a Document Category, Reference Number, and Revision Date to a document record.

1. On the General tab, in the *Reference No.* field, type **<1918.64>**.
2. In the *Document Category* field, click .
3. Select a category, *Regulatory/Compliance*, and then click .
4. In the *Revision Date* field, click  and then select a date, *11-Jan-18*.

Files Tab

After you add a document record, you must establish a link to the document itself by specifying a file path. There are two kinds of document location references:

- **Private Location** –References can be viewed only by P6 Professional users.
- **Public Location** –References can be viewed by all project participants, including timesheet users.

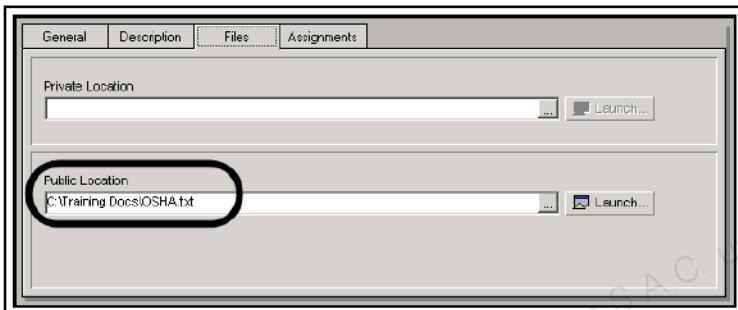


Figure 12-3: Assign a Public Location to the document record, and then click *Launch* to view the document itself.

Assign a Public Location to a document record.

1. In WP & Doc Details, click the Files tab.
2. In the *Public Location* field, click .
3. Browse to a file location, *C:\Training Docs*.
4. Select a file, *OSHA.txt*, and then click *Open*.
5. In WP & Doc Details, click *Launch* to view the document.
6. On the File menu in Notepad, click *Exit* when you are finished viewing the file.

Assigning a Project Document to an Activity

Assign project documents to WBS elements and activities. For example, during a project's planning phase, you may assign a document to a WBS element. As the details of your project develop and the applicability of the document to specific activities becomes evident, you can assign that same document to those activities.

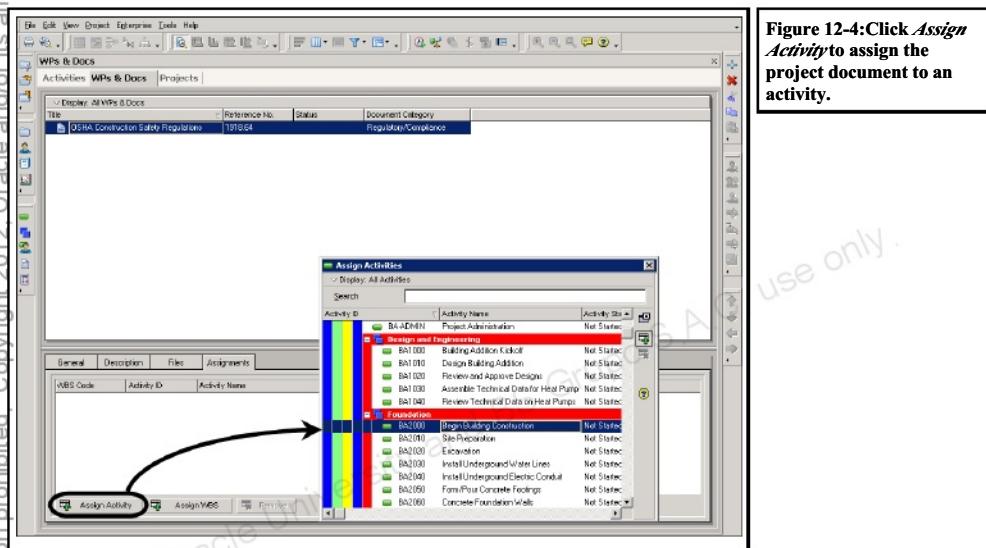


Figure 12-4: Click *Assign Activity* to assign the project document to an activity.

Assign a document to an activity.

1. In WP & Doc Details, click the Assignments tab.
2. Click *Assign Activity*:
3. Select an activity, *BA2000 – Begin Building Construction*.
4. Click to assign the document to the activity.
5. Click to close the Assign Activities dialog box.

When a document is assigned to an activity, the assignment can be viewed in the WPs & Docs tab in Activity Details.

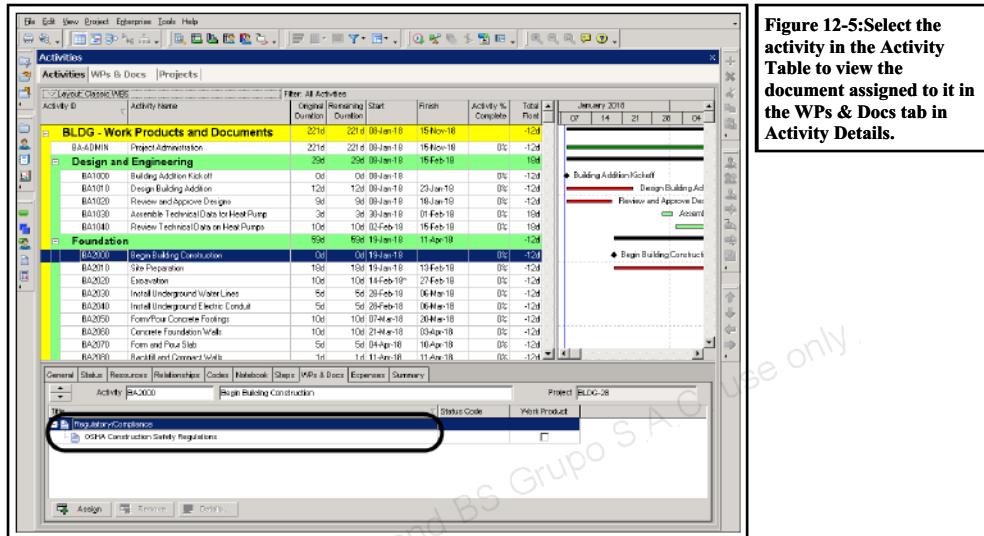


Figure 12-5:Select the activity in the Activity Table to view the document assigned to it in the WPs & Docs tab in Activity Details.

View a document assignment in Activity Details.

1. On the Project menu, click *Activities*.
2. In the Activity Table, select an activity, *BA2000 – Begin Building Construction*.
3. On the Layout Options bar, click *Layout, Open*.
4. Select a layout, *Classic WBS*, and then click *Open*.
5. In Activity Details, click the WPs & Docs tab.
6. Verify that the *OSHA Construction Safety Regulations* document has been assigned to the activity.

Viewing Document Details

Use the Work Product and Document Details dialog box to view details about and/or open the selected work product or document. Fields in the dialog box are summarized below:

- **Title** – The name of the selected work product or document.
- **Author** – The name of the person who created the selected work product or document.
- **Version** – The selected work product or document's version number.
- **Date** – The entered Revision Date.
- **Private/Public Location** – The selected work product or document's file name.
- **Launch Private/Public Location** – Opens the work product or document in its native application.
- **Description** – A narrative description of the selected work product or document.

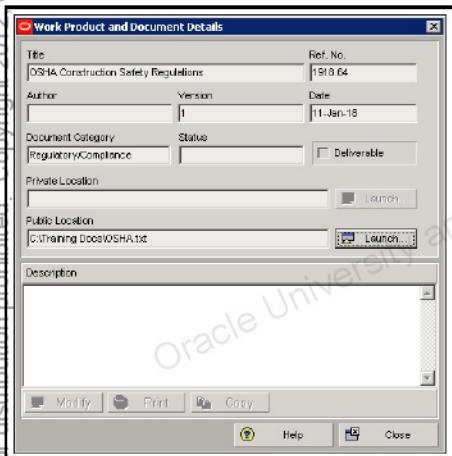


Figure 12-6: Click *Launch* to view the document.

View a document from Activity Details.

1. In the WP & Docs tab in Activity Details, select a document, *OSHA Construction Safety Regulations*.
2. At the bottom of the tab, click *Details*.
3. Click *Launch*. The document opens in its native application, which in this case is Notepad.
4. When you are finished viewing the document, on the Notepad File menu, click *Exit*.
5. Click *Close* to close the Work Product and Document Details dialog box.

Lesson Review

Key Concepts

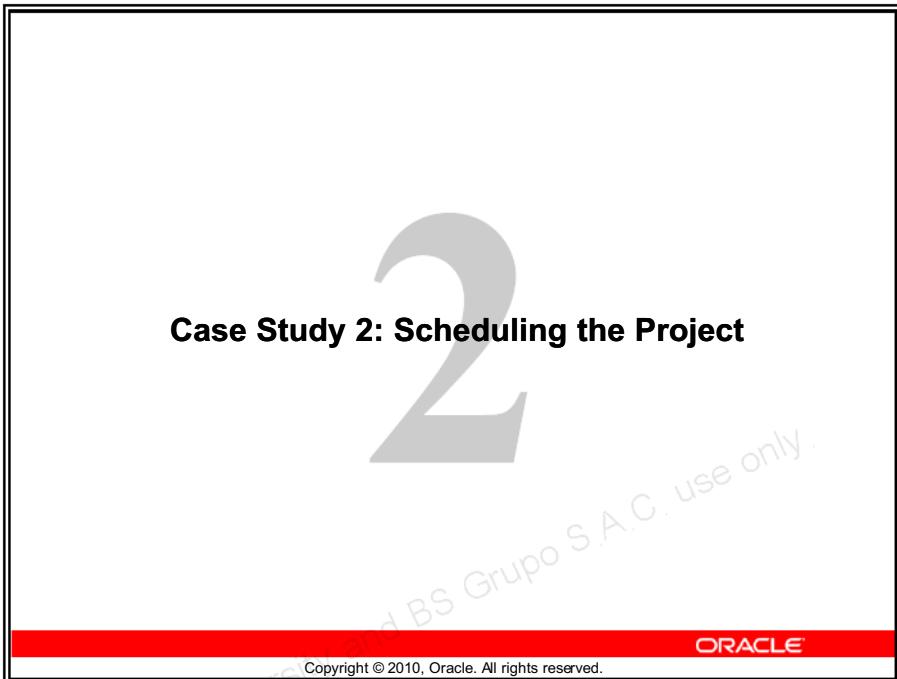
- Documents do not reside in the P6 Professional database. To access documents via Primavera, a document record must be created in the Work Products and Documents window.
- After adding a document record, specify its private and/or public location. Specifying a public location enables all project participants to view the document.
- Designate a document as a work product or reference document and assign it to an activity or WBS element.
- Maintain general information of each project document such as version, revision date, and author.

Review Questions

1. **True or False:** A private document can be viewed only by the user who created it.
2. **True or False:** Work products and documents can be assigned only to activities.

Notes





Case Study 2 – Scheduling the Project

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
				45

Scheduling the Project

Background

The building renovation project is about to begin, and the building owner asks about the project's schedule. You inform her that the project cannot be scheduled until relationships between activities are specified.

Objectives

- Open a project, *RENO-2 – RENO Scheduling the Project*, and open a layout, *Creating Relationships*. Create relationships between activities as indicated in the table below. Some relationships have already been created for you.

Activity ID	Activity Name	Predecessor(s)	Successor(s)	Relationship Type
A1140	Inspect and repair exterior and interior load-bearing walls	A1090	A1150, A1170, A1180, A1190	Finish to Start
A1150	Strip off roof cover	A1140, A1330	A1160	Finish to Start
A1160	Inspect and repair roof structure	A1150	A1220	Finish to Start
A1170	Upgrade electrical system	A1110, A1140	A1240	Finish to Start
A1180	Upgrade plumbing system	A1110, A1140	A1240	Finish to Start
A1190	Upgrade heating system	A1110, A1140	A1240	Finish to Start
A1200	Wash brick exterior	A1330	A1210	Finish to Start
A1210	Inspect and repair brickwork	A1200	A1320	Finish to Start
A1220	Install underlayment and shingling	A1160	A1340	Finish to Start
A1230	Install new door and window assemblies	A1320	A1340	Finish to Start
A1340	Remove scaffolding	A1100, A1220, A1230	A1350	Finish to Start
A1350	Remove protective fencing	A1340	A1250	Finish to Start
A1240	Install drywall	A1170, A1180, A1190, A1370	A1280	Finish to Start
A1250	Final walkthrough	A1290, A1300, A1350	A1260	Finish to Start
A1270	Finish carpentry and millwork	A1280	A1310	Finish to Start
A1290	Install plumbing fixtures	A1310	A1250	Finish to Start
A1300	Install lighting fixtures	A1310	A1250	Finish to Start
A1310	Paint building interior	A1270	A1290, A1300	Finish to Start

- Schedule the project with a data date of 05-Mar-18. What is the scheduled Finish date?
-

2. The building owner has indicated that she plans to hold a building dedication and ribbon-cutting ceremony on Wednesday, 25-Jul-2018.
 - a. Assign a Must Finish By constraint of 25-Jul-18 to the project.
 - b. Schedule the project with a data date of 05-Mar-18. What is the Total Float on the project? (You may have to drag the vertical split bar to the right to expose the *Total Float* column in the *Creating Relationships* activity layout.)
3. As time for the project to start draws near, you receive notice from one of your suppliers that, due to retooling by the manufacturer, the special architectural shingles you ordered will not be available until 15-Jun-2018. The supplier asks if you would prefer to substitute different shingles, but you decide to keep the original order intact.
 - a. Assign a Start On or After constraint of 15-Jun-2018 to activity *A1220*.
4. Schedule the project again (data date = 05-Mar-18).
 - a. Does the constrained activity affect the finish date of the project? If no, why not?

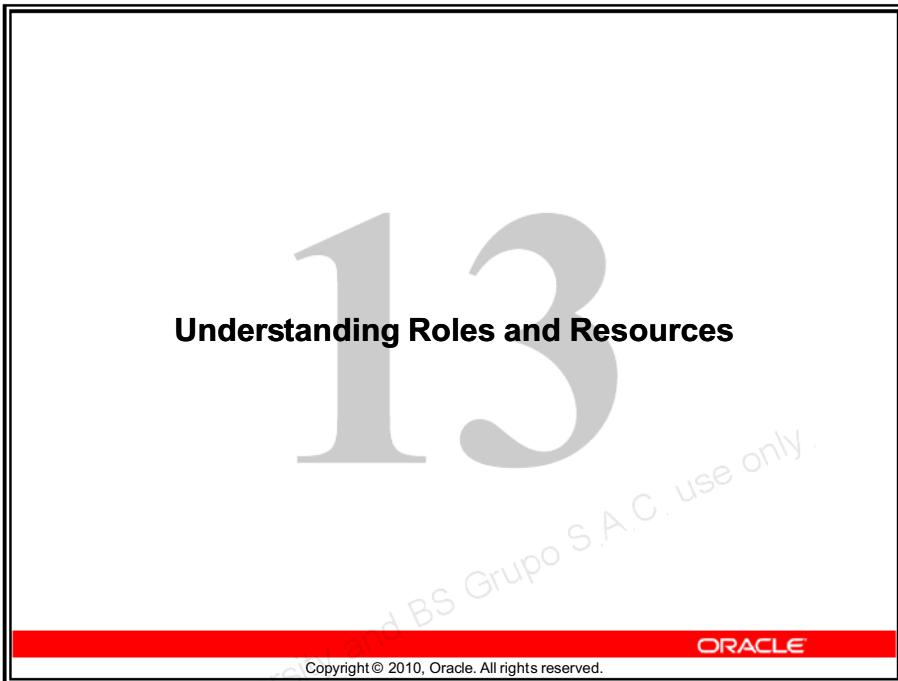
SECTION III

Assigning Resources and Baselining

- Understanding Roles and Resources**
- Assigning Roles and Resources**
- Optimizing the Project Plan**
- Baselining the Project Plan**
- Importing and Exporting Data**

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Lesson 13 – Understanding Roles and Resources

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
15	10	20	5	50

Objectives

After completing this lesson, you should be able to:

- Describe roles.
- View the roles dictionary.
- Describe resources.
- Identify the differences between labor, nonlabor, and material resources.
- View the resource dictionary.

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Roles and Resources

Role: A job title or skill needed to complete an activity.

Resource: The specific individual used to complete the activity.



Project Manager



Tim Harris

ORACLE

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Roles and Resources

- Both are enterprise data – available for use across all projects.
 - Both are usually defined by the application administrator.
- Roles are associated with resources according to their function.
 - Each resource can also be assigned one primary role, which defines the resource's core skill or responsibility in the organization.
- Roles can be placeholders in activity assignments until specific resources are assigned to do the work.

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Roles and Resources



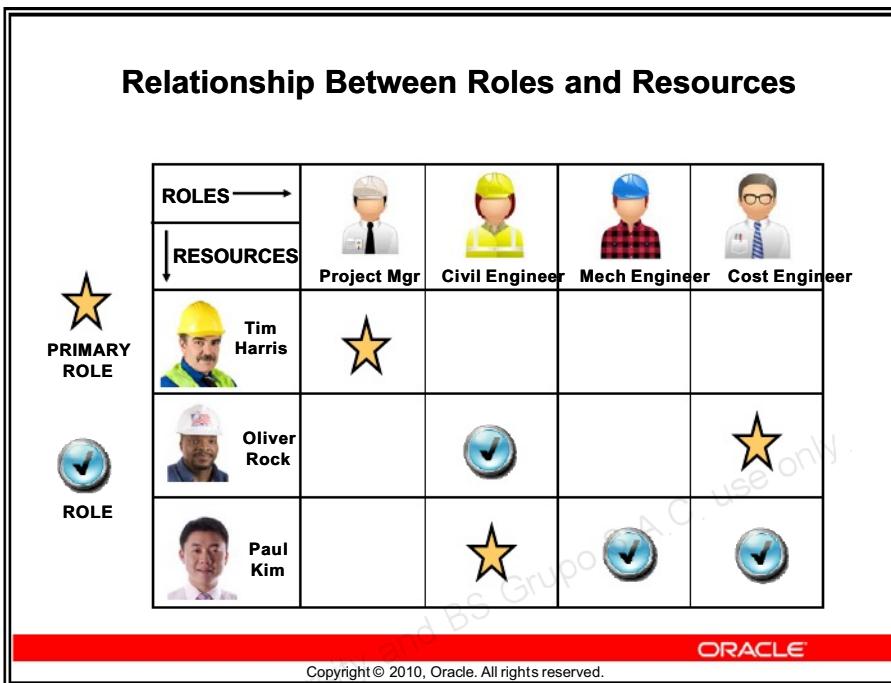
Resource: Paul Kim

Roles: Civil Engineer, Cost
Engineer, Mechanical Engineer

Primary Role: Civil Engineer

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Resource Types

Labor (people)

- Resources and roles
- Measured in units of time.
- Generally re-used between activities/projects.
Recorded in terms of price/unit (for example, \$50/hour).



Nonlabor (equipment)

- Measured in units of time.
- Recorded in terms of price/unit (for example, \$500/hour).



Material (consumables)

- Measured in units other than time (for example, \$5/sq.ft.).

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Overview: Understanding Roles

The Roles dialog box enables you to view the roles dictionary and add/delete roles. Four tabs are available for detailed information.



- ① Use the Display Options bar to show roles for the enterprise or for the current project only.
 - ② In the Roles window, display roles in ascending, descending, or hierarchical order.
- Use the tabs in Role Details to view specific information about selected role:
- General** – Lists the Role ID and Role Name. The *Responsibilities* field lists the skills required to perform the role.
 - Resources** – Lists the resources that are capable of performing the responsibilities associated with the role as well as each one's proficiency.
 - Prices** – Provides five price per unit values.
 - Limits** – Specifies allocation limit(s) for a role. Multiple limits can be established based on effective dates.
- ④ Use arrows to move roles into different nodes in the dictionary.

Practice: Understanding Roles

In this practice you will:

- View data in the Roles dictionary.

Viewing the Roles Dialog Box

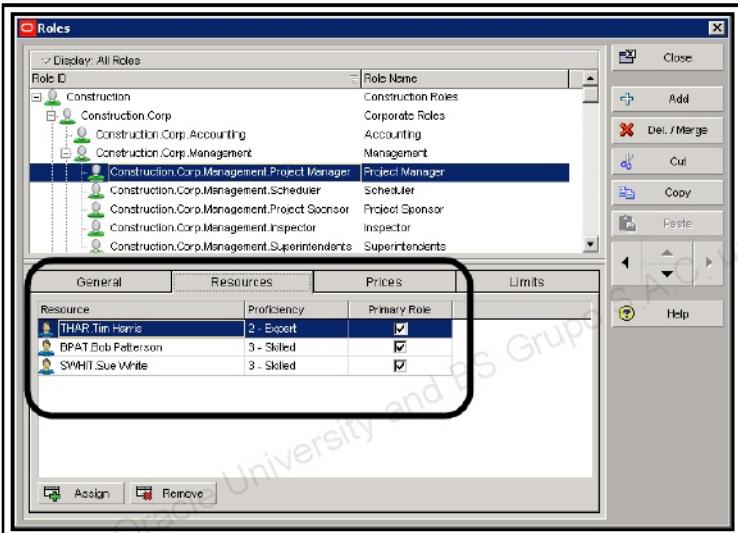


Figure 13-1: The Resources tab in the Roles dialog box displays resources who can perform the responsibilities associated with the selected role.

View the Roles dialog box.

1. On the Enterprise menu, click *Roles*.
 2. On the Roles dialog box Display Options bar, click *Filter By, All Roles*.
 3. Select a role, *Construction.Corp.Management.Project Manager – Project Manager*.
 4. Click the General tab.
- ?** *What are the academic/work requirements for the selected role?*
5. Click the Resources tab.
- ?** *Among the listed resources, who is the most proficient in the selected role?*

Prices Tab

The Prices tab is used to specify pay rates for a role. This allows for high-level budgetary planning in the absence of specific resources who may have differing pay rates.

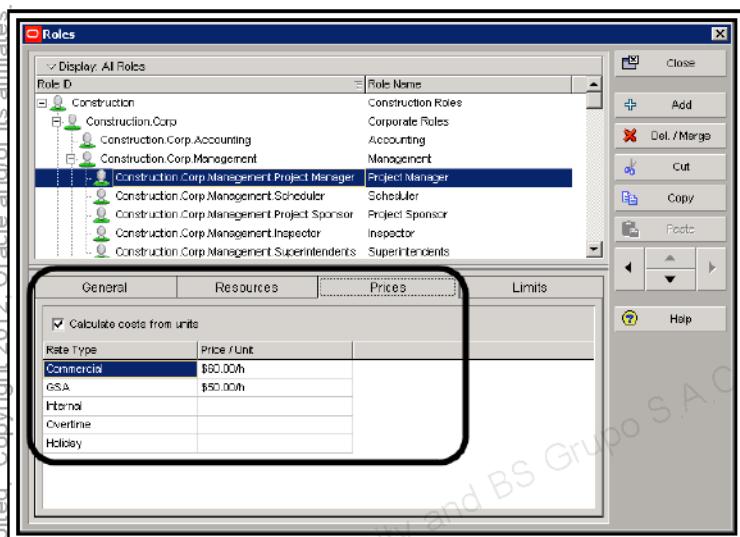


Figure 13-2: Multiple rates can be assigned to a role.

View rates for a role.

- Click the Prices tab.

- ! *What are the rates for Commercial and U.S. General Services Administration?*
- ! *What is the purpose of assigning rates to a role when the resources who ultimately perform actual work might have different rates than those listed?*

Limits Tab

The Limits tab is used to specify available quantities (limits) for a role. Setting limits helps you quickly identify areas of role overallocation in a Resource/Role Usage Profile. You can define an unlimited number of limits for a role by specifying a unique effective date for each limit.

By default, P6 Professional calculates a limit for each role using the combined available units of all resources having that particular role as their primary role. For example, if there are four resources in the resource dictionary with the primary role of Electrical Engineer and each is available for 8 hours/day, then the calculated role limit for Electrical Engineer is 32 hours/day. Other resources with the role of Electrical Engineer – but a different primary role – are not included in the role limit for Electrical Engineer.

This method of calculating role limits is approximate and may not accurately reflect a role's planned allocation. For that reason, the Resource Analysis tab in User Preferences allows you to display role limits in the Resource Usage Profile and Spreadsheet based on calculated primary resources' limits (as explained above) or based on custom role limits that you define.

In the example below, you will view an existing role limit.

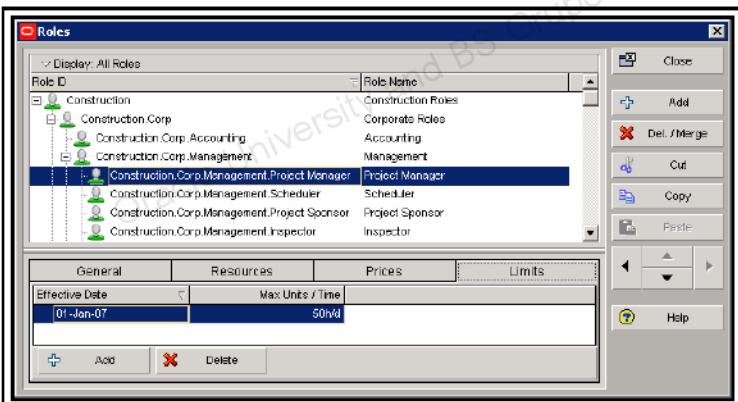


Figure 13-3: Single or multiple limits can be set for each role.

View the Limits tab.

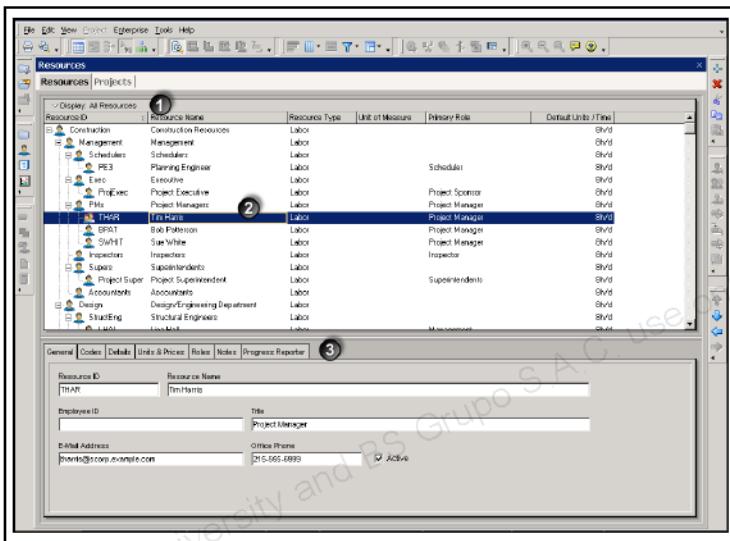
1. Click the Limits tab and view the role allocation limit.

? *What is the allocation limit for Project Manager?*

2. Click *Close* to exit the Roles dialog box.

Overview: Understanding Resources

The Resources window contains information about all resources within the organization. Information can be viewed in columns and in Resource Details tabs.



- 1** Use the Display Options bar to filter, group, and sort resources.

- 2** Display and select resources in the Resources window.

Use the tabs in Resource Details to view information on selected resource:

General – View, edit general information.

Codes – Assign resource codes.

Details – Specify calendar, default units/time and other related information.

Units & Prices – Set rate(s) based on effective dates.

Roles – Assign role(s) to resource.

Notes – Enter notes about resource.

Progress Reporter – Specify approval manager and login for timesheets application.

Practice: Understanding Resources

In this practice, you will:

- View data in the Resources window.

Viewing Resources

Before accessing the Resources window, you will close any projects that may be open. Resources are enterprise data and are defined independently of any project or activity.

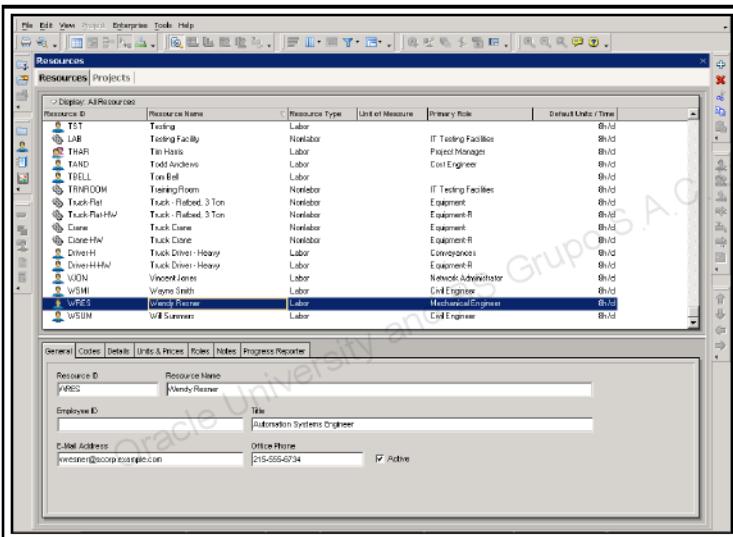


Figure 13-4: The Resources window displays information on all resources across the organization.

Display resource data in the Resources window.

1. On the Enterprise menu, click *Resources*.
2. On the Display Options bar, click *Filter By, All Resources*.
3. Click a column header, *Resource Name*, to sort alphabetically.
4. Select a resource, *WRES – Wendy Resner*.

Resource Details

Use Resource Details to add, view, and edit detailed information about the selected resource.

General Tab

The General tab enables you to enter general information about the selected resource.

The screenshot shows the Oracle Database Resource Details window with the General tab selected. The window has tabs at the top: General, Codes, Details, Lines & Prices, Roles, Notes, and Progress Reporter. The General tab is active. The main area contains fields for Resource ID (AMES), Resource Name (Mandy Resner), Employee ID, Title (Automation Systems Engineer), E-Mail Address (mresner@scorp.e.com), Office Phone (215-555-6734), and Active status (checked). A note indicates that the Active status is checked.

Figure 13-5: The General tab displays basic information, such as office phone number and e-mail address.

View the General tab.

1. Click the General tab.

Codes Tab

The Codes tab enables you to assign resource code values, which help categorize resources for easier grouping, sorting, and organizing.

The screenshot shows the Oracle Database Resource Details window with the Codes tab selected. The window has tabs at the top: General, Codes, Details, Lines & Prices, Roles, Notes, and Progress Reporter. The Codes tab is active. The main area shows a table with columns: Resource Code (Location), Code Value (East), and Code Description (Eastern US). A note indicates that the Location code value is East and the description is Eastern US. At the bottom are buttons for Assign and Remove.

Figure 13-6: Resource code values are useful for organizing resource data.

View the Codes tab.

1. Click the Codes tab.

! *Can you think of a situation in which resource codes would be useful?*

Details Tab

The Details tab enables you to enter the selected resource's type classification, currency and overtime settings, and profile.

- **Resource Type** –Indicates whether the resource is labor, nonlabor, or material.
- **Unit of Measure** –Used for material resources. Click to specify what unit the resource utilizes.
- **Currency** –Indicates the currency associated with the resource's costs.
- **Overtime Allowed** –Select to indicate that the resource can enter overtime hours in timesheets or in the Resources tab in Activity Details.
- **Overtime Factor** –Indicates the value by which the resource's standard price should be multiplied to determine the overtime price.
- **Calendar** –Indicates the calendar used to identify the resource's availability.
 - ♦ **Create Personal Calendar**– Click to create and assign a personal resource calendar for the selected resource. This button is disabled if the selected resource is already assigned a personal resource calendar or if you are not authorized to add, delete, or edit resource calendars.
- **Default Units/Time** –Indicates the units/time that will be applied when the resource is assigned to an activity.
- **Auto Compute Actuals** –Select to automatically calculate the resource's actual quantity of work according to the project plan.
- **Calculate costs from units** –Select to calculate the cost of an activity based on the assigned units.

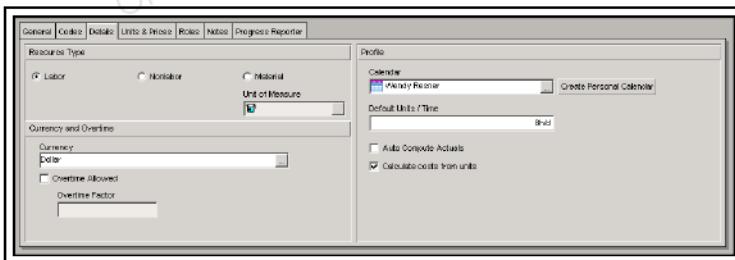


Figure 13-7:The Details tab displays the resource's calendar and currency settings.

View the Details tab.

1. Click the Details tab.

Units & Prices Tab

The Units & Prices tab enables you to set prices and availability according to time frame.

- **Effective Date** –Indicates the effective start date for price and availability.
- **Max Units/Time** –Specifies a numeric value or percentage that the resource can perform in a single work period, according to effective date, e.g., 8 h/d (100%) = full-time or 4 h/d (50%) = part-time. Setting this limit allows you to quickly identify areas of resource overallocation in resource profiles/spreadsheets.
- **Price/Unit** –Use to set the resource's price for a single work unit, linked to an effective date.

Effective Date	Max Units / Time	Commercial
01-Jan-00	8hr8	\$20.00/h
01-Jan-01	8hr8	\$21.20/h
01-Jan-03	8hr8	\$26.60/h
01-Jan-05	8hr8	\$29.20/h
01-Jan-07	8hr8	\$32.20/h
01-Jan-09	8hr8	\$35.40/h
01-Jan-11	8hr8	\$38.00/h

Figure 13-8:Multiple effective dates and rates can be set for each resource.

Lesson Review

Key Concepts

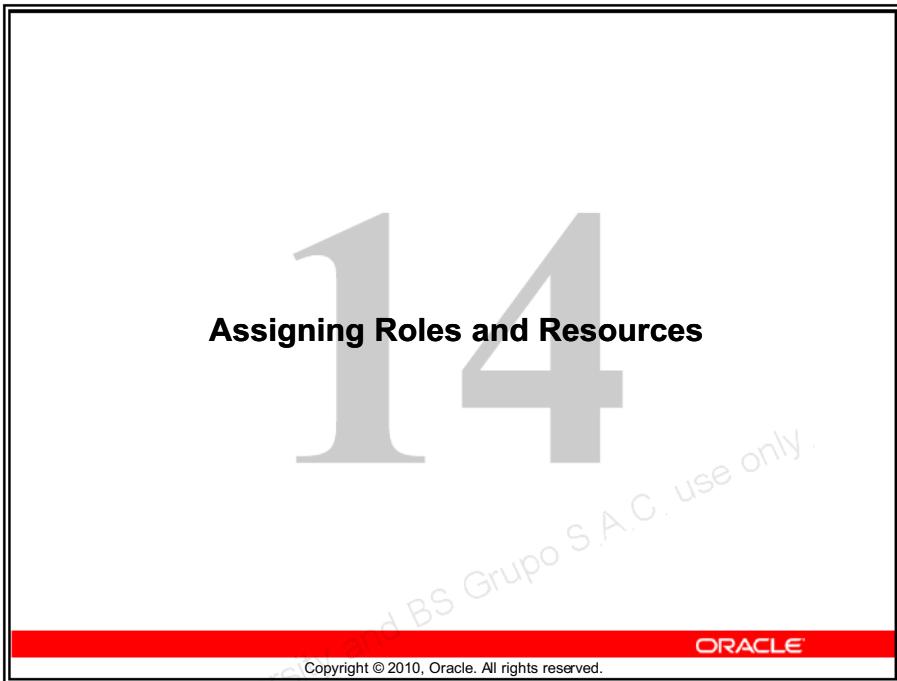
- A role is a job title or skill – for example, *Trainer* or *Manager*.
- A resource is someone – or something – used to complete an activity.
- Roles can be assigned to resources to aid in resource management. Multiple roles, including a single primary role, can be assigned to each resource.
- Resources are divided into three categories: Labor (people), Nonlabor (equipment), and Material (measured in units other than time, such as \$5.00/square foot).
- Roles are defined in the Roles dictionary.
- Resources are defined in the Resources window, where you can use Resource Details to view and edit information about resources.

Review Questions

1. **True or False:** When resources are defined, they are assigned to a specific project and cannot be shared with other projects.
2. Which of the following is a resource type?
 - a. Labor
 - b. Nonlabor
 - c. Equipment
 - d. a and b
 - e. a and b and c
3. **True or False:** A resource can have more than one primary role.

Notes





Lesson 14 – Assigning Roles and Resources

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
10	10	35	5	60

Objectives

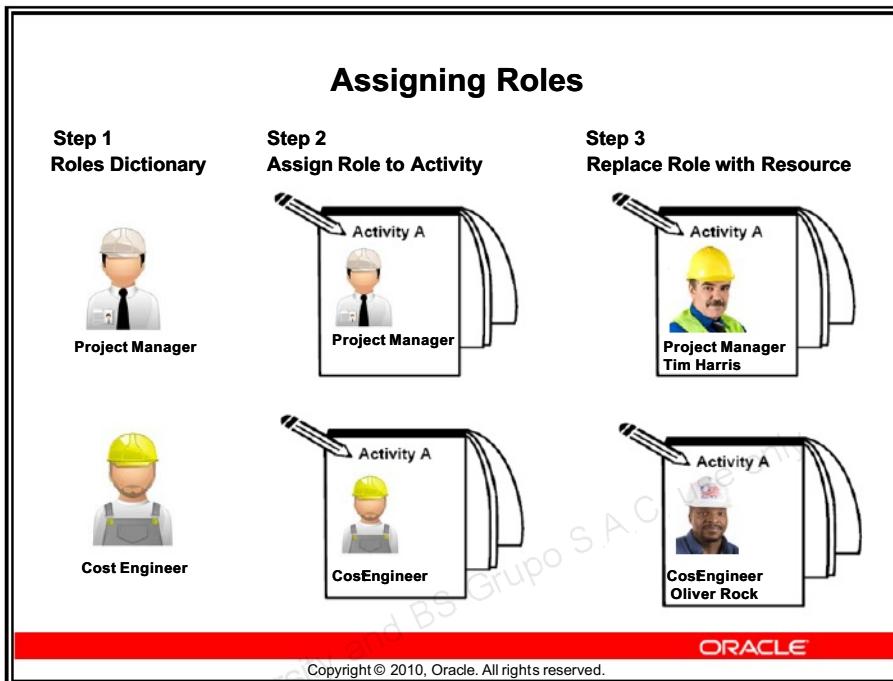
After completing this lesson, you should be able to:

- Assign roles to an activity.
- Assign rates on roles.
- Assign resources to an activity by role and directly from the resource dictionary.
- Adjust Budgeted Units/Time for a resource.
- Assign expenses to activities.



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Assigning Resources

Assign by role:

- At least one role must be assigned to an activity.
- Replace role assignment with a specific resource.
- Replace single role assignments individually or multiple role assignments simultaneously.

Assign directly from the resource dictionary:

- Labor resources without role assignments.
- Required method when assigning nonlabor and material resources.

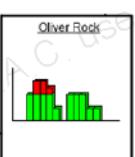
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Steps for Resource Management

1. Define resource in the resource dictionary.


Resource: Oliver Rock
Roles: Cost Engineer, Purchasing
Primary Role: Cost Engineer
MIN UTILTIME: 0hrs
Rates: Commercial \$32/h
QSA \$28/h
Internal \$26/h
2. Assign resource to activities.


Activity A
Oliver Rock
3. Analyze resources and costs.


Oliver Rock
Resource Cost Analysis

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Question

Which of the following is a benefit of assigning roles to activities?

1. Roles can act as placeholders until specific resources are assigned.
2. Roles can help project managers and resource managers identify appropriate resources for specific activities.
3. Roles can provide cost estimates and determine preliminary budget requirements during project planning.
4. All of the above

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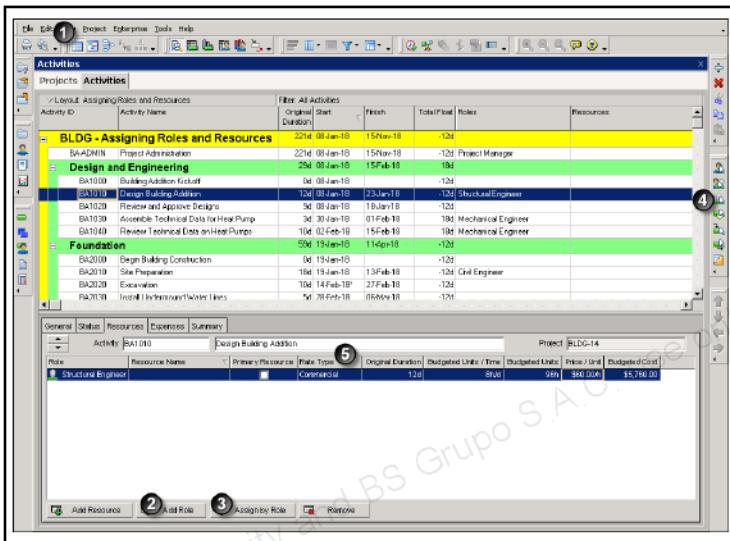
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Overview: Assigning Roles

Roles are assigned on the Resources tab in Activity Details.



- ① On the Edit menu, click *Assign, Roles* to assign a role to an activity.
- ② Click *Add Role* to assign a single or multiple roles to an activity.
- ③ Click *Assign by Role* to assign a resource to an activity according to the resource's assigned role.
- ④ On the Assign toolbar, click *Roles* to assign one or more roles to multiple activities simultaneously.
- ⑤ Use the *Rate Type* column on the Resources Tab in Activity Details to review or change the rate type assigned to a role.

Practice: Assigning Roles

In this practice you will:

- Assign roles to activities.
- Assign a rate type on a role.

Assigning Roles to an Activity

To assign a role to an activity, click *Add Role* on the Resources tab in Activity Details.

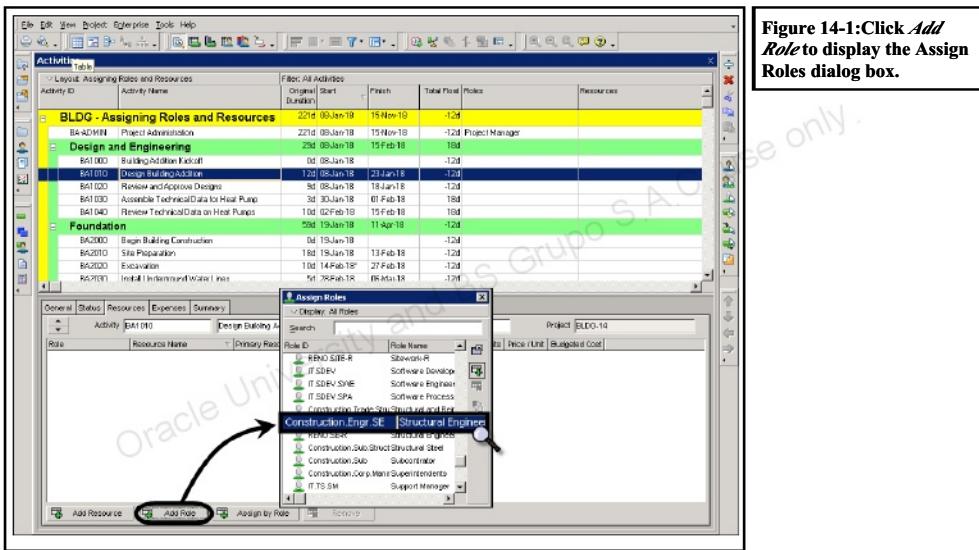


Figure 14-1: Click *Add Role* to display the Assign Roles dialog box.

Assign a role to an activity.

1. Open a project, *BLDG-14 BLDG – Assigning Roles and Resources*.
2. Confirm that you are in the Activities window. (Or on the Project menu, click *Activities*.)
3. On the Layout Options bar, click *Layout, Open*.
4. Select a layout, *Assigning Roles and Resources*, and then click *Open*.
5. In the Activity Table, select an activity, *BA1010 – Design Building Addition*.
6. In Activity Details, click the Resources tab.

7. At the bottom of the tab, click *Add Role*.
8. On the Display Options bar, click *Filter By, All Roles*.
9. Click on the *Role Name* column header to sort role names alphabetically and select a role, *Construction Engr.SE – Structural Engineer*.
10. Click  to assign the role to the activity.
11. Click  to close the Assign Roles dialog box.

Assigning Multiple Roles to an Activity

Use Ctrl+Click to select and assign multiple roles to a single activity.

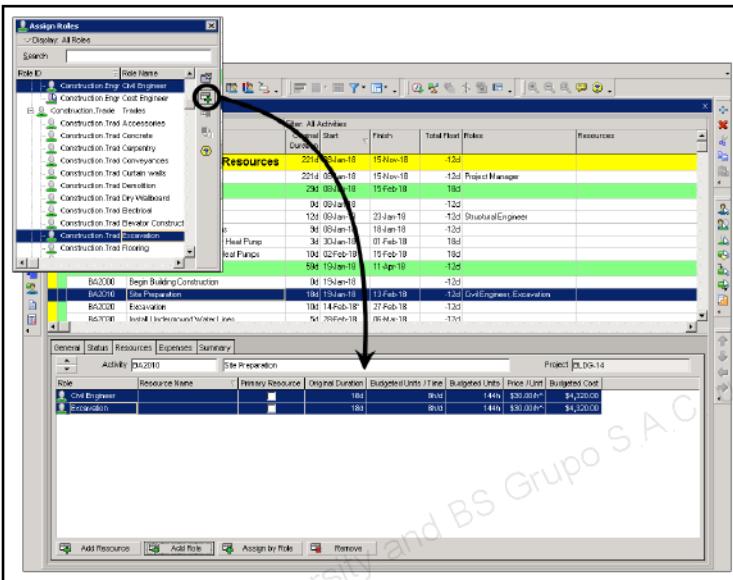


Figure 14-2: Multiple roles are selected in the Assign Roles dialog box.

Assign multiple roles to an activity.

1. In the Activity Table, select an activity, *BA2010 – Site Preparation*.
2. On the Resources tab, click *Add Role*.
3. Select a role, *Construction.Engr.CE – Civil Engineer*.
4. Ctrl+Click to select a second role, *Construction.Trade.Excav – Excavation*.
5. Click to assign the roles to the activity.
6. Click to close the Assign Roles dialog box.

Assigning a Single Role to Multiple Activities

To assign a single role to multiple activities, select activities in the Activity Table and then on the Edit menu, click *Assign, Roles*. You can also click  on the Assign toolbar.

To select multiple activities, if the activities you want to select are contiguous, select the first activity and then Shift+Click to select the last activity. If the activities you want to select are not contiguous, use Ctrl+Click to select activities individually.

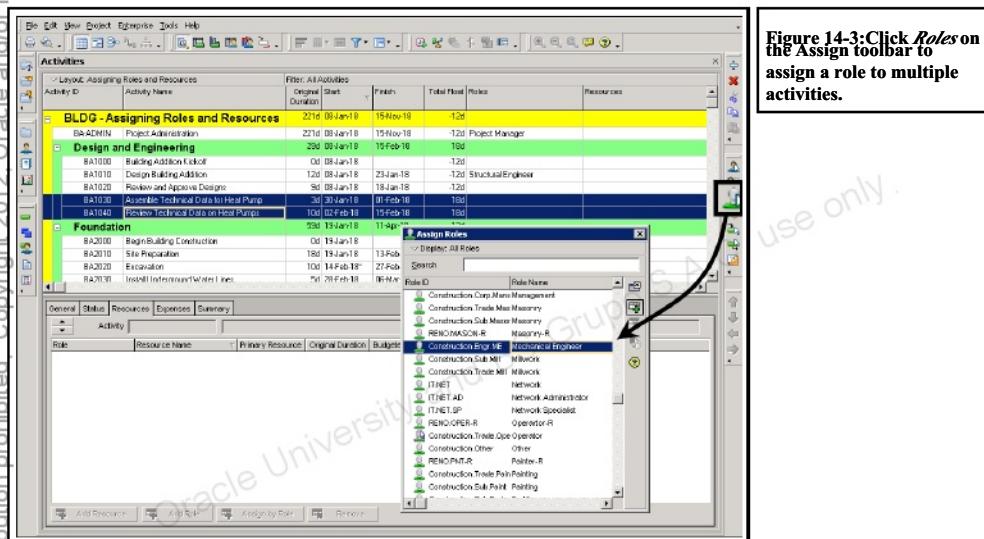


Figure 14-3: Click *Roles* on the Assign toolbar to assign a role to multiple activities.

Assign a role to multiple activities.

1. In the Activity Table, Ctrl+Click and select activities *BA1030* and *BA1040*.
2. On the Edit menu, click *Assign, Roles*.
3. Select a role, *Construction.Engr.ME – Mechanical Engineer*.
4. Click  to assign the role to the activities.
5. Click  to close the Assign Roles dialog box.
6. View activities *BA1030* and *BA1040* to confirm the role assignments.

? Where can you confirm the role assignments?

Assigning Rates on Roles

Rate types are assigned to roles in the Resources tab in Activity Details.

The rate type determines the price/unit used to calculate costs for the assignment. When you select a rate type, the monetary value is updated automatically in the *Price/Unit* column. The names for each rate type are defined by the application administrator.

General		Status	Resources	Expenses	Summary
Activity		BA1010	Design Building Addition		
			Project JDD-14		
Role	Resource Name	Primary Resource	Original Duration	Budgeted Units / Time	Budgeted Unit Cost / Unit
Structural Engineer			12d	8hr	\$4,800.00

Add Resource Add Role Assign by Role Remove

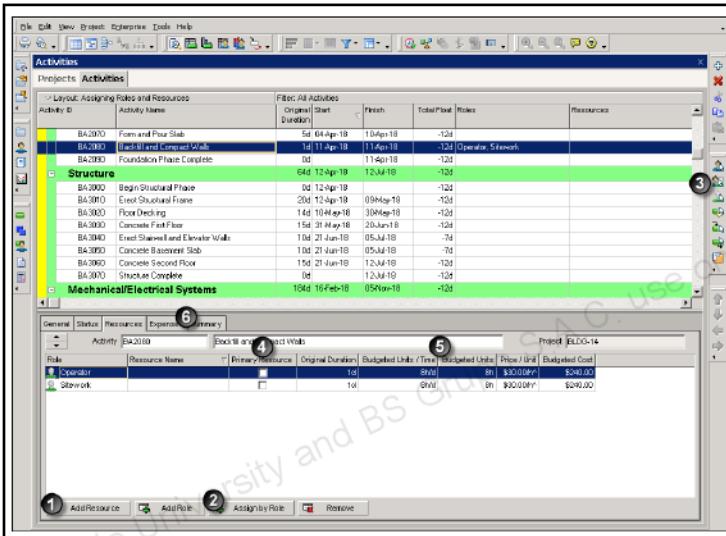
Figure 14-4: Double-click in the *Rate Type* field to assign a new rate to the role assignment.

Display the *Rate Type* column and change a rate type for a role assignment.

1. In the Activity Table, select an activity, *BA1010*.
 2. In the Resources tab in Activity Details, right-click a column header and then click *Customize Resource Columns*.
 3. Add the column *Rate Type* (in the General grouping band) between *Budgeted Units* and *Price/Unit*.
 4. Click *OK*.
 5. In the *Rate Type* column for a role, *Structural Engineer*, view the assigned rate type.
- ?** *What is the assigned rate type for the role?*
6. Double-click in the *Rate Type* field, and select *CSA* from the list.
 7. In the Confirmation dialog box, click *Yes*.
- ?** *What is the Internal rate, and what is the new budgeted cost?*

Overview: Assigning Resources and Costs

Procedures for assigning resources are similar to those for assigning roles and likewise are performed in the Activities window. Most costs are assigned as a function of the resource assignments with which they are associated. Expenses are entered separately in the Expenses tab Activity Details.



- ① Click *Add Resource* to assign one or more resources directly from the resource dictionary to a selected activity.
- ② Click *Assign by Role* to replace one or more role assignments with specific resources in a selected activity.
- ③ On the Assign toolbar, click *Rsrc by Role* to simultaneously replace one or more role assignments with specific resources in multiple activities.
- ④ Use the *Primary Resource* check box in the Resources tab to designate a primary resource for an activity.
- ⑤ Use the *Budgeted Units / Time* and *Budgeted Units* columns to adjust the amount of work planned for a resource after the resource has been assigned.
- ⑥ Use the Expenses tab in Activity Details to enter non-resource, one-time expenses for an activity.

Practice: Assigning Resources and Costs

In this practice, you will:

- Assign a resource to an activity by replacing a role assignment.
- Assign resources to multiple activities by simultaneously replacing multiple role assignments.
- Assign a resource to a Level of Effort activity and adjust the resource's Budgeted Units/Time value.
- Assign a nonlabor resource to an activity.
- Designate a primary resource on an activity.
- Assign a material resource to an activity and specify the resource's Budgeted Units.
- Assign an expense to an activity.
- View resource costs and expenses for an activity.

Steps for Resource Management

Efficient resource management is a key component of successful project management. The basic steps for resource management in P6 Professional are:

1. Define resources in the Resources window:
 - Define resource availability.
 - Set up the resource name, description, cost, roles, and attributes that control the resource's effects on the schedule.
2. Assign resources in the Activities window:
 - Enter the resource name and the amount of work planned.
 - The cost is calculated based on the resource quantity and the price/unit that was defined in the Resources window.
3. Analyze resources and costs in the Activities window:
 - Use the Resource Usage Profile to view resource quantity/cost information graphically. The profile helps you analyze when, and to what extent, a resource is allocated.
 - Use the Resource Usage Spreadsheet to view resource quantity/cost information in a tabular format. Like the Resource Usage Profile, the spreadsheet helps you analyze resource allocation.
 - Use columns to view total costs.

Assigning Resources by Role

Make resource assignments by replacing a role assignment with a specific resource. At least one role must be assigned to an activity in order to assign resources by role. When you assign by role, only those resources assigned to the role are displayed in the Assign Resources by Role dialog box.

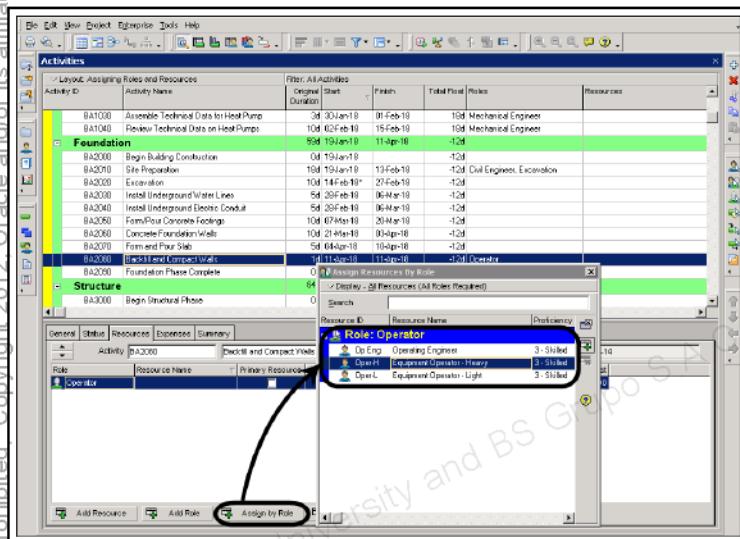


Figure 14-5: Click *Assign by Role* to replace a role assignment with a specific resource. The *Assign Resources by Role* dialog box lists only those resources that have the role required to fill the assignment.

Assign a resource by role.

1. In the Activity Table, select an activity, *BA2080 – Backfill and Compact Walls*.
2. In the Resources tab in Activity Details, click *Assign by Role*.
3. On the Display Options bar, click *Filter By*.
4. Select *All Resources*.
5. Confirm that *All Roles Required* is highlighted, and click *OK*.
6. Select a resource, *Oper-H – Equipment Operator – Heavy*, and then click .

Price/Unit Confirmation

When assigning resources by role, a confirmation dialog box is displayed if the resource selected to replace the role has different default quantity/cost settings than the role. These settings include Price/Time, Units/Time, and Overtime Factor values.

Confirmation dialog box options:

- **Yes** – Applies the resource's quantity/cost settings to the resource assignment.
- **No** – Retains the role's quantity/cost settings and applies them to the resource assignment.

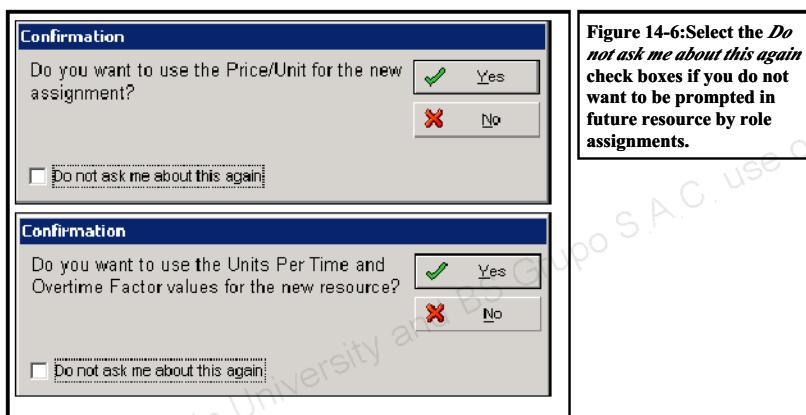


Figure 14-6: Select the *Do not ask me about this again* check boxes if you do not want to be prompted in future resource by role assignments.

7. In the Confirmation dialog box, mark *Do not ask me about this again*.
8. Click *Yes* to apply the resource's Price/Unit settings.
9. In the second Confirmation dialog box, mark *Do not ask me about this again*.
10. Click *Yes* to apply the resource's Units/Time and Overtime Factor values.
11. Click to close the Assign Resources by Role dialog box.

Assigning by Role to Multiple Activities

Select multiple activities and assign the same resource by role to them simultaneously. You can also assign multiple resources by role to multiple activities simultaneously.

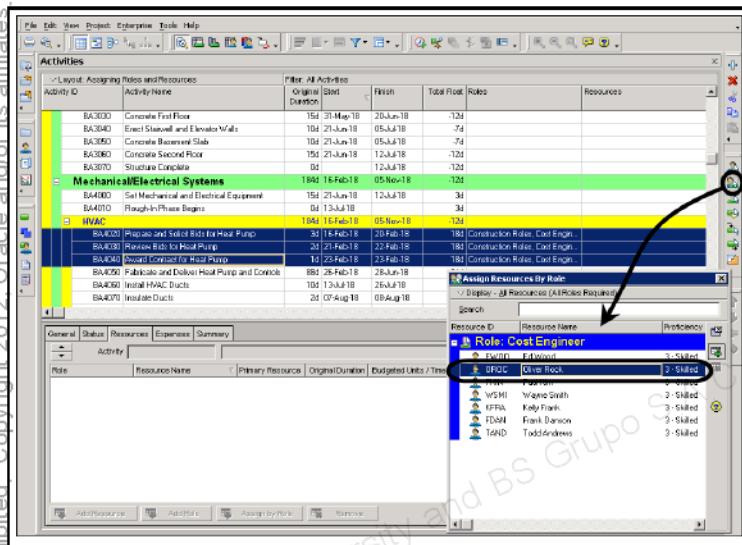


Figure 14-7: Select the resource to fill a role assignment in multiple activities.

Assign a resource by role to multiple activities.

1. In the Activity Table, Ctrl+Click to select multiple activities, *BA4020*, *BA4030*, and *BA4040*.
 2. On the Edit menu, click *Assign, Resources by Role*.
- Only resources with the role Cost Engineer are displayed.
3. Select a resource, *OROC – Oliver Rock*.
 4. Click to assign the resource.
 5. Click to close the Assign Resources by Role dialog box.

! How can you confirm the resource assignments?

Adjusting Resource Assignment Units

Depending on numerous factors — including the type of activity or type of resource — you may need to adjust Budgeted Units or Units/Time when assigning a resource.

- **Budgeted Units** — The number of units — hours, for example — that a resource is assigned to work on the activity.
- **Units/Time** — The number of units (hours) that a resource is scheduled to work in a specific time period — for example, 8 hours/day.

When you assign a resource to an activity, this calculation is performed: **Duration x Units/Time = Units**.

Assigning a Resource to a Level of Effort Activity

Assigning a resource to a Level of Effort activity is a condition that often requires an adjustment of units/time or units. Because a resource does not typically work full-time on a Level of Effort activity, the units/time must be adjusted after making the assignment.

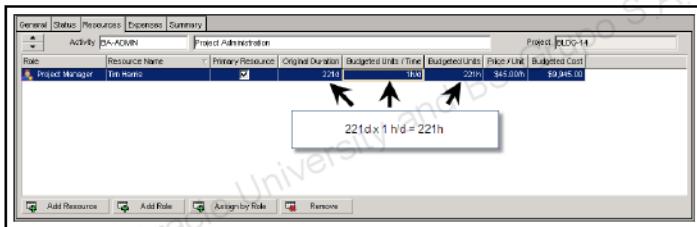


Figure 14-8: The resource is assigned to work only one hour/day on the Level of Effort activity.

Assign a resource to a Level of Effort activity.

1. In the Activity Table, select an activity, *BA-ADMIN – Project Administration*.
2. In the Resources tab in Activity Details, click *Assign by Role*.
3. Select a resource, *THAR – Tim Harris*.
4. Click to assign the resource, and then click to close the dialog box.

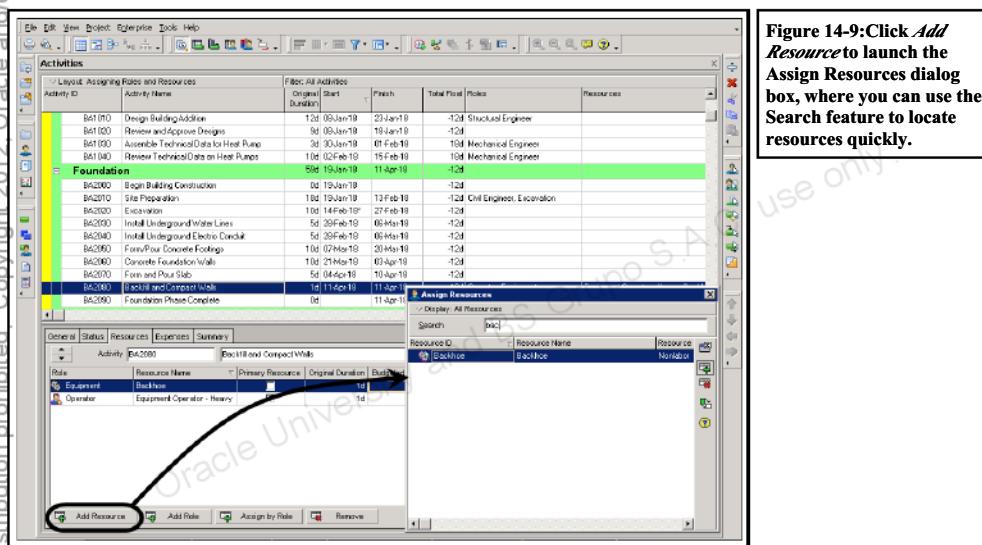
Earlier you marked *Do not ask me again* in the confirmation box asking if you want to use the Units Per Time and Overtime Factor values for the new resource. Therefore, you must adjust the Units/Time manually.

5. In the *Budgeted Units/Time* field on the Resources tab, type <1>, and then press *Enter*.

Assigning a Resource Directly

Not all organizations use roles as placeholders in activities. Some assign resources directly from the resource dictionary. And even organizations that generally use roles must assign resources directly when assigning nonlabor and material resources. Use resources in the dictionary on any activity, and, except for milestone activities, an unlimited number of resources can be assigned.

In the following exercise, use the *Search* feature to quickly search the resource dictionary for a backhoe, a nonlabor resource that is required to work on the *Backfill and Compact Walls* activity.



Assign a nonlabor resource to an activity.

1. In the Activity Table, select an activity, *BA2080 – Backfill and Compact Walls*.
2. In the Resources tab in Activity Details, click *Add Resource*.
3. On the Display Options bar, click *Filter By, All Resources*.
4. In the *Search* field, type *<bac>*.
5. Select a resource, *Backhoe*, and then click  to assign the resource.
6. Click  to close the Assign Resources dialog box.

Adjusting Budgeted Units/Time to Specify Resource Quantity

As you already learned in assigning a resource to a Level of Effort activity, it is sometimes necessary to adjust a resource assignment's units or units/time. In the following exercise, you will adjust Budgeted Units/Time to indicate that two laborers – at 8h/d each – will work on an activity.

Activity		BA2060		Concrete Foundation Walls		Project		BLDO-14	
Role		Resource Name		Primary Resource		Original Duration		Budgeted Units / Time	
				<input checked="" type="checkbox"/>		80d		80h	
Carpentry						80d	80h	\$21,600	\$1,728.00
Ironworker						70d	80h	\$32,500	\$2,600.00
Laborer-Construction						100d	160h	\$30,000	\$1,200.00

Add Resource Add File Assign by Role Remove

Figure 14-10: In the **Budgeted Units/Time** column, **16h/d** indicates that two Laborers will work on the activity.

Assign resources and then adjust Budgeted Units/Time.

- In the Activity Table, select an activity, *BA2060 – Concrete Foundation Walls*.
- In the Resources tab in Activity Details, click *Add Resource*.
- Click the *Resource ID* column heading to alphabetize the resources.
- Select a resource, *Carp – Carpenter*, and then click to assign.
- Select a resource, *Irwk – Ironworker*, and then click to assign.
- Select a resource, *Labor-C – Laborer-Construction*, and then click to assign.
- Click to close the Assign Resources dialog box.
- In the *Budgeted Units/Time* column for a resource, *Laborer-Construction*, type **<16>**, and then press *Enter* on your keyboard.

Designating a Primary Resource

The primary resource is the person responsible for coordinating an activity's work. An activity can have one primary resource or none.

- Only the primary resource is able to send feedback to the project manager via timesheets to inform the project manager of the status of an activity.
- A primary resource can be assigned to a milestone activity for the purpose of updating the milestone through timesheets. This assignment is made in the General tab in Activity Details.
- A primary resource can also update activity steps via timesheets.
- If multiple resources are assigned to an activity, the first resource assigned is designated as the primary resource by default. This designation can be changed by selecting the *Primary Resource* check box in the Resources tab in Activity Details.

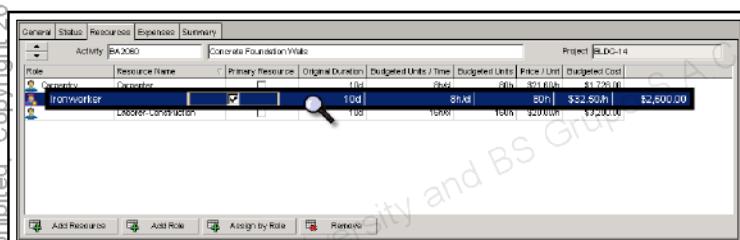


Figure 14-11: The Ironworker is designated as the primary resource.

Assign a primary resource to an activity.

- In Activity Details, view the primary resource for activity *B42060 – Concrete Foundation Walls*.

Who is the primary resource?

- In the *Primary Resource* column, select the *Ironworker* check box.

Note that selecting the check box for the ironworker clears the check box for the carpenter. An activity can have only one primary resource.

In addition to the check box, is there any other indication as to who is the primary resource?

Assigning a Material Resource

Material resources are not measured in units of time. For example, polyform is measured in linear feet, and concrete is measured in cubic yards. Units of measure are created by the application administrator. After a unit of measure has been created, it is assigned to the appropriate material resources in the Resource dictionary.

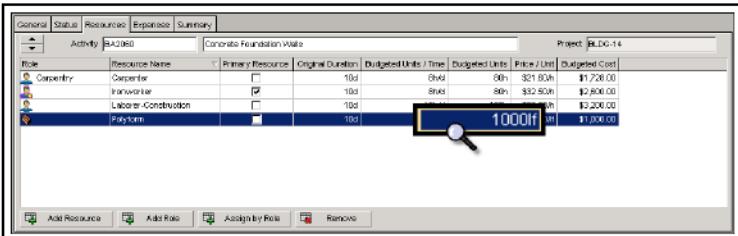


Figure 14-12:Material resources are not measured in units of time. In this example, polyform is measured in linear feet (lf).

Assign a material resource to an activity.

1. In the Activity Table, confirm that activity *BA2060 – Concrete Foundation Walls* is selected.
2. In the Resources tab in Activity Details, click *Add Resource*.
3. In the *Search* field, type <pol>.
4. Select a resource, *Polyform – Polyform*, and click  to assign.
5. Click  to close the Assign Resources dialog box.
6. In the *Budgeted Units* field for the new resource, type <1000>, and then press *Enter* on your keyboard.

Planning Costs

There are two types of costs:

- **Resource** – Calculated based on resource assignments.
- **Expense** – Lump sum costs that are entered manually.

Resource Costs

The cost of a resource can be calculated based on the Price/Unit defined in the Resource dictionary and the Budgeted Units assigned to the activity.

- Budgeted Cost = Budgeted Units x Price/Unit

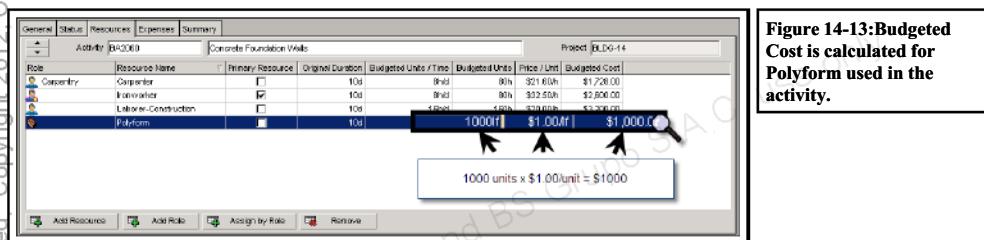


Figure 14-13: Budgeted Cost is calculated for Polyform used in the activity.

View the Budgeted Cost for a resource in an activity.

1. In the Activity Table, confirm that activity *BA2060 – Concrete Foundation Walls* is selected.
2. In the Resources tab in Activity Details, view the *Budgeted Cost* column.

Expenses

Expenses are non-resource costs associated with a project. They are typically one-time expenditures for non-reusable items. Examples of expenses include facilities, travel, overhead, and training.

Expenses are manually assigned at the activity level. You can enter a single lump sum expense or you can enter the number of units and the Price/Unit.

- Expense categories can be assigned to classify the expense.
- Expenses can be accrued at the start, end, or uniformly over the duration of an activity.
- A unit of measure can be used to label the quantity – for example, *each*, *pounds*, or *square feet*.

Expense Item	Expense Category	Accrual Type	Budgeted Units	Unit of Measure	Price/Unit	Aj. Completion Cost
Concrete Masters	Materials	Uniform over Activity	1,000	Unit	\$10,000.00	\$10,000.00

Figure 14-14: An expense has been added to the activity.

♂ Add an expense to an activity.

1. In Activity Details, click the Expenses tab.
2. At the bottom of the tab, click *Add*.
3. Type an Expense Item <Concrete Masters>.
4. Double-click in the *Expense Category* field.
5. Select a category, *Materials*, and then click .
6. In the *Accrual Type* field, confirm *Uniform over Activity*.
7. In the *Budgeted Units* field, type <1>, and then press *Enter* on your keyboard.
8. In the *Unit of Measure* field, type <Job>, and then press *Enter*.
9. In the *Price/Unit* field, type <\$10,000>, and then press *Enter*.

Summary Tab

Use the Summary tab to display unit, cost, or date information for the selected activity.

Select *Display cost* at the bottom of the tab to display the itemized and total costs of the selected activity.

Activity costs are broken down into:

- Labor Cost
- Nonlabor Cost
- Material Cost
- Expenses
- Total Cost

	Budgeted	Actual	Remaining	% Complete	All Completion	Complete Variance
Labor Cost	\$7,528.00	\$0.00	\$7,528.00	0%	\$7,528.00	\$0.00
Nonlabor Cost	\$0.00	\$0.00	\$0.00	0%	\$0.00	\$0.00
Material Cost	\$1,000.00	\$0.00	\$1,000.00	0%	\$1,000.00	\$0.00
Expenses	\$1,000.00	\$0.00	\$1,000.00	0%	\$1,000.00	\$0.00
Total Cost	\$8,528.00	\$0.00	\$8,528.00	0%	\$8,528.00	\$0.00

At the bottom of the table, there are three checkboxes: Display units, Display cost, and Display dates. The 'Display cost' checkbox is checked.

Figure 14-15: Choose to display units, costs, or dates in the Summary tab.

Display cost calculations for an activity after expenses have been entered.

1. In the Activity Table, confirm that activity *BA2060* is selected.
2. In Activity Details, click the Summary tab.
3. At the bottom of the tab, select *Display cost*.

? What is the total cost of the activity?

Lesson Review

Key Concepts

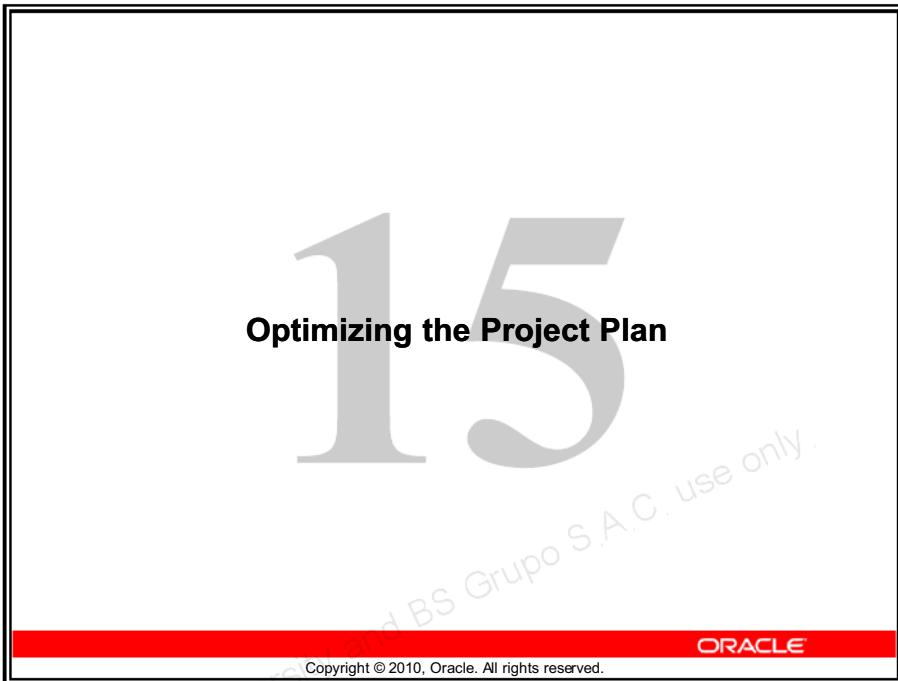
- Role assignments can be used as placeholders and replaced later with specific resources.
- Three steps in resource management are defining resources, assigning resources, and analyzing resources.
- Resource assignments can be made by replacing a role assignment with a specific resource. At least one role must be assigned to an activity in order to assign resources by role.
- If a role is not designated as a placeholder in an activity, you can assign a resource directly from the resource dictionary.
- When you assign a resource to an activity, the calculation **Duration x Units/Time = Units** is performed.
- When you assign a resource, you can adjust Units/Time or Budgeted Units. You can also designate a primary resource.

Review Questions

1. To which of the following can roles be assigned?
 - a. Resources
 - b. Activities
 - c. WBS elements
 - d. a and b
 - e. a and b and c
2. **True or False:** A maximum of 10 resources can be assigned to an activity.
3. What type of resource is not measured in units of time?
 - a. Labor
 - b. Nonlabor
 - c. Material
 - d. None of the above
4. **True or False:** Expenses are non-resource costs that are assigned to a project's activities.

Notes





Lesson 15 – Optimizing the Project Plan

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
20	20	30	5	75

Objectives

After completing this lesson, you should be able to:

- Analyze schedule dates.
- Shorten a project schedule.
- Analyze resource availability.
- Resolve resource overallocation.
- Analyze project costs.

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Project Constraints

Successful projects must balance multiple constraints:

- Scope
- Quality
- Schedule
- Budget
- Resources
- Risk

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Analyzing Schedule Dates

- Finish date – Most important date in the schedule:
 - Compare the scheduled Finish date to the Must Finish By date.
 - If the scheduled Finish date is later than the Must Finish By date, the project must be rescheduled.
 - Finish date is calculated; it cannot be edited.
- Project deliverables should also be scheduled to finish by the dates imposed by project sponsors.
 - Identify milestone dates and ensure that the schedule meets them.

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Shortening the Project

- Focus on critical activities.
- Refine duration estimates.
 - Break down long activities.
 - Assign additional resources to reduce duration.
- Use relationships to overlap activities.
- Apply/modify constraints.
- Change calendar assignments.
 - Put critical activities on a longer workweek.
 - Add exceptions to non-work time.

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Analyzing Resource Allocation

- Determine which resources are overallocated.
- Identify activities contributing to resource overallocation.
- Remove overallocation from appropriate resources.
 - Replace the overallocated resource with another available resource.
 - Increase the resource's workweek.
 - Increase the hours/day that the resource works.
 - Assign additional resources to the activity.

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Analyzing the Budget

- Review budgeted costs for individual activities, WBS elements, and the entire project.
- Confirm that costs are within budget.

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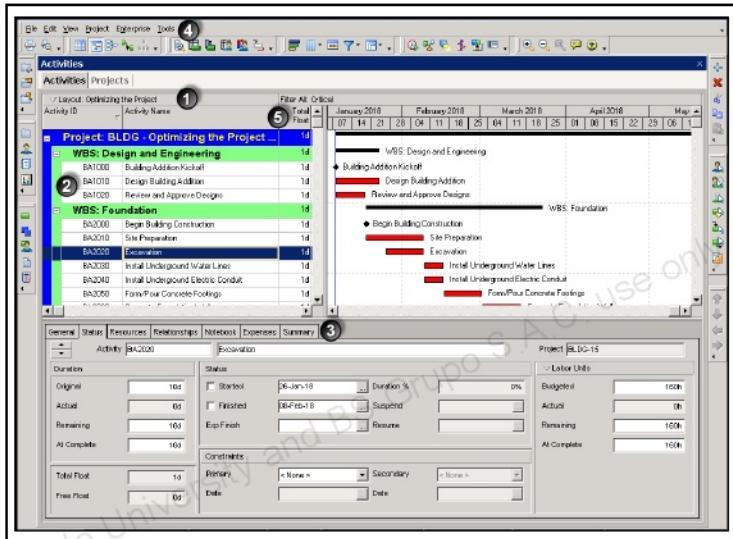
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Notes



Overview: Optimizing the Schedule

The procedures necessary for optimizing the schedule are performed primarily in the Activities window, although you will also need to display the Projects window to view the dates tab in Project Details to compare the Must Finish By date to the Finish date.



- ➊ Use the Layout Options bar to filter the layout to show critical activities only.
- ➋ Use the Activity Table to select activities whose durations, relationships, or constraints you want to modify.
- ➌ Use the tabs in Activity Details to view and/or modify an activity's duration, relationships, and constraints, and to document any changes.
- ➍ On the Tools menu, click *Schedule* (or press *F9* on your keyboard) to reschedule the project after making any changes.
- ➎ Use the *Total Float* column in the Activity Table to check activities' Total Float after making changes to the schedule.

Practice: Optimizing the Schedule

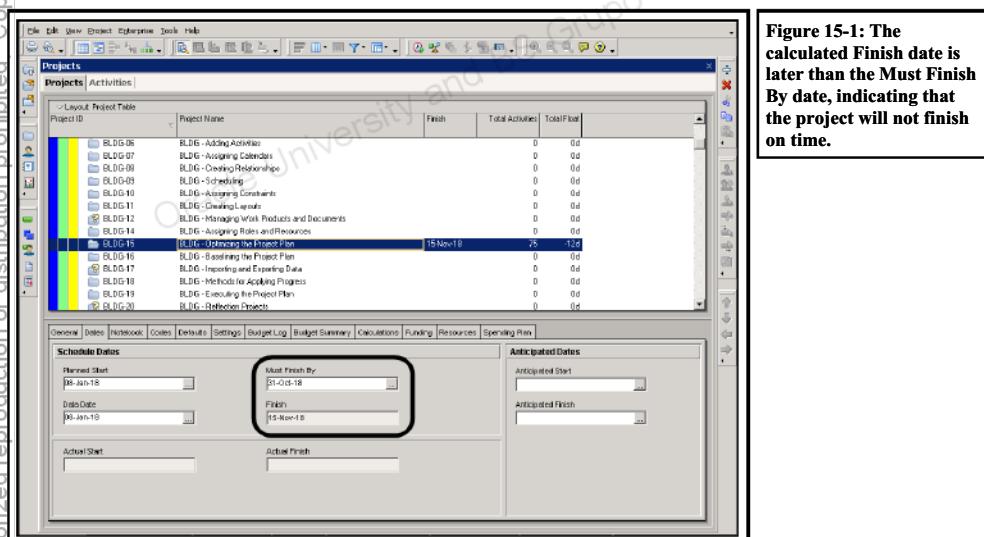
In this practice you will:

- Compare a project's Finish date to its Must Finish By date.
- Define a project's critical path.
- Filter a project to view only its critical activities.
- Shorten a project by modifying activity duration estimates, relationships, and constraints.

Comparing the Calculated Finish Date to the Must Finish By Date

You can quickly determine whether the project will finish on time by viewing the Dates tab in Project Details.

Contractually, the Office Building Addition project must be finished by 31-Oct-18. The project must actually finish by the close of business on 30-Oct-18 – the Must Finish By constraint is at 12:00 am (midnight) on 31-Oct. The schedule indicates that the project will not finish on time.



View the Finish date and the Must Finish By date.

1. Open a project, *BLDG-15 BLDG – Optimizing the Project Plan*.
2. Click the Projects window tab near the top of the screen.

3. On the Layout Options bar, click *Layout*, *Open*.
4. Select a layout, *Project Table*, and then click *Open*.
5. In the Project Table, select a project, *BLDG-15*.
6. In Project Details, click the Dates tab and compare the Must Finish By date to the calculated Finish date.
- ? *Is the project scheduled to finish on time?*
- ? *How many days behind schedule is the project?*

Focusing on Critical Activities

To shorten the project, focus on critical activities. These represent the longest continuous path of activities through a project and determine the project Finish date. If you make changes to a critical activity, the project's finish date is likely to be affected.

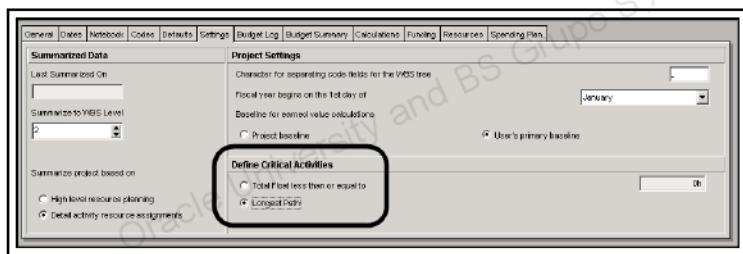


Figure 15-2: Define critical activities on the Settings tab.

Define critical activities in Project Details.

1. In Project Details, click the Settings tab.
2. In the Define Critical Activities section, select *Longest Path*.

Viewing Critical Activities

In the Activities window, use a default filter to display only critical activities in the top layout.

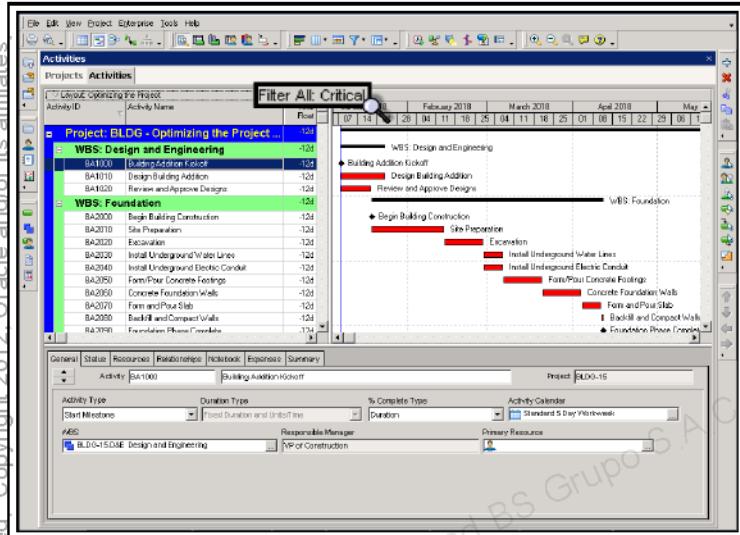


Figure 15-3: The layout is filtered to show critical activities only.

View critical activities.

1. Click the Activities tab near the top of the screen to navigate to the Activities window.
2. On the Layout Options bar, click *Layout, Open*.
3. Select a layout, *Optimizing the Project*, and then click *Open*.
4. On the Layout Options bar, click *Filters*.
5. Select the *Critical* check box, and then click *OK*.

Shortening the Project

If schedule analysis leads you to conclude that the Must Finish By date cannot be met, concentrate your efforts on shortening the schedule. Several methods defined below can help you accomplish this goal.

Refining Duration Estimates

Begin the analysis by reviewing the activities with the longest duration. In general, these activities offer the greatest flexibility in altering durations.

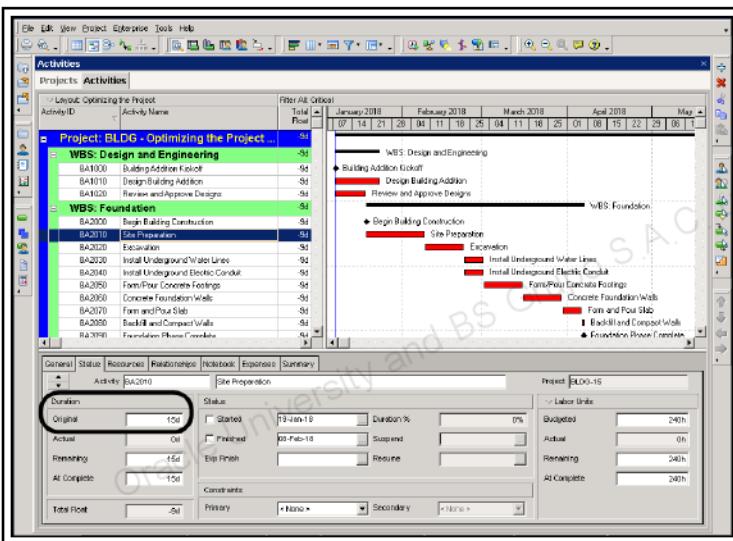


Figure 15-4: Change the original duration of the activity. Remember that you must reschedule the project in order to see the impact of the change on Total Float.

Shorten an activity duration.

1. In the Activity Table, select an activity, *BA2010 - Site Preparation*.
2. In Activity Details, click the Status tab.
3. In the *Original Duration* field, type <15>, and then press *Enter* on your keyboard.
4. On the Tools menu, click *Schedule* (or press *F9* on your keyboard).
5. Click *Schedule*.

? *What is the Total Float for the project now?*

Modifying Relationships

If you need to compress the schedule further, review the relationships between activities on the critical path.

For example, there is a Finish to Start relationship between the activities *BA2010 – Site Preparation* and *BA2020 – Excavation*. You determine that these activities can be performed at the same time. Change the relationship to Start to Start with 5 days of lag.

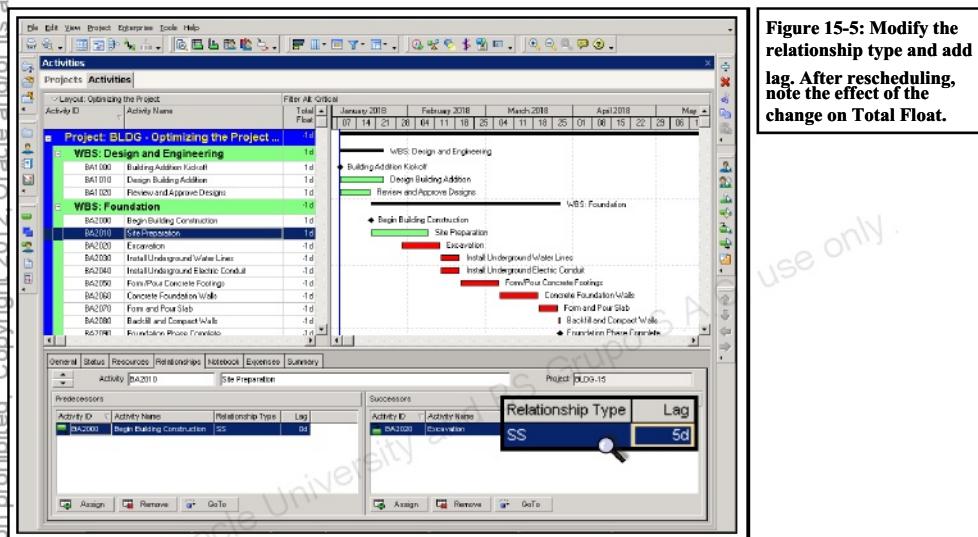


Figure 15-5: Modify the relationship type and add lag. After rescheduling, note the effect of the change on Total Float.

Change a relationship type and add lag.

1. In the Activity Table, confirm that *BA2010 – Site Preparation* is selected.
2. In Activity Details, click the Relationships tab.
3. In the Successors pane, double-click in the *Relationship Type* column for activity *BA2020 – Excavation*, and select *SS* from the list.
4. In the *Lag* field, type <5>, and then press *Enter* on your keyboard.
5. On the Tools menu, click *Schedule* (or press *F9* on your keyboard).
6. In the Schedule dialog box, click *Schedule*.

? What is the Total Float for the project now?

Modifying Constraints

Constraints assigned earlier in the project life cycle may need to be modified based on the latest information from the project team. If you modify or delete a constraint, be sure to also modify or delete the Notebook topic that was created to document the constraint.

A resource has become available to work on the activity *BA2020 – Excavation*. You can now remove the *Start On or After* constraint from the activity.

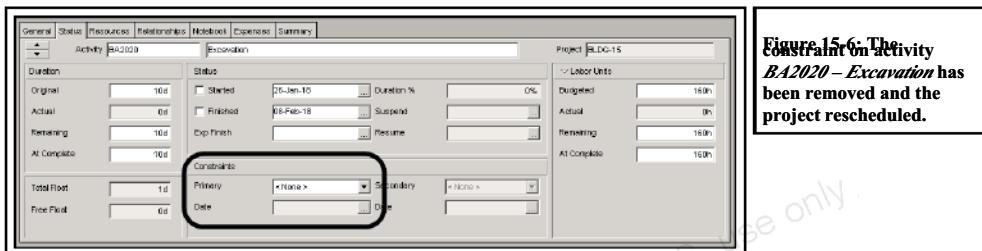


Figure 15-6 The constraint on activity *BA2020 – Excavation* has been removed and the project rescheduled.

Remove a constraint from an activity.

1. In the Activity Table, select an activity, *BA2020 - Excavation*.
2. In Activity Details, click the Status tab.
3. In the Constraints section *Primary* list, select *None*.
4. Click the Notebook tab.
5. In the Notebook Topic pane, confirm that *Constraints and Assumptions* is selected.
6. In the right pane, click *Modify*.
7. Click in the editor window, move the cursor to a blank line, and type <**Resource available. Constraint removed.**>
8. Click *OK*.
9. On the Tools menu, click *Schedule* (or press *F9* on your keyboard).
10. Click *Schedule*.

? *What is the Total Float for the project now?*

Confirming Project Dates

To see if the project will now finish on time, confirm that no negative Total Float exists on any of the activities in the project.

A thorough review indicates that the calculated Finish date, *29-Oct-18*, is now two days before the Must Finish By date, *31-Oct-18*, giving the project a Total Float of 1 day.

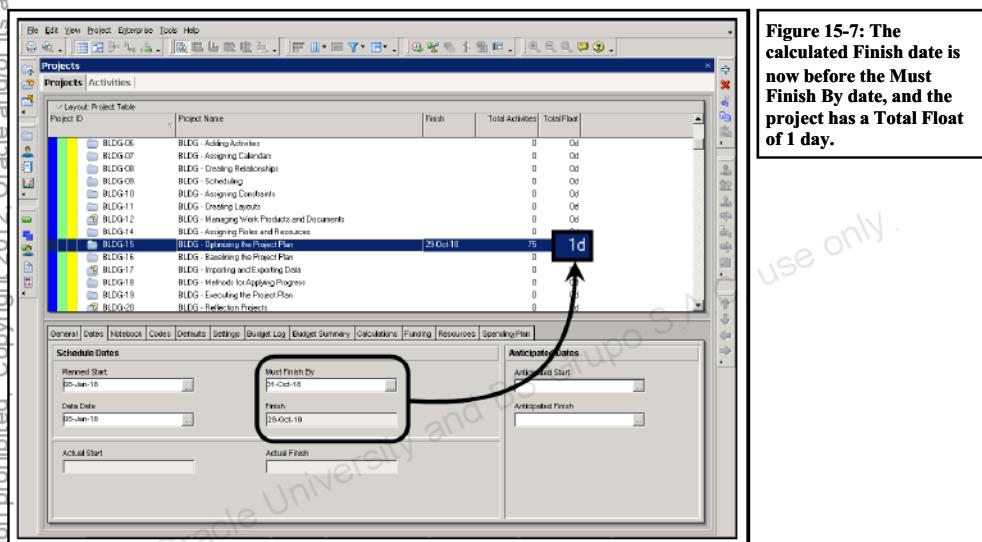


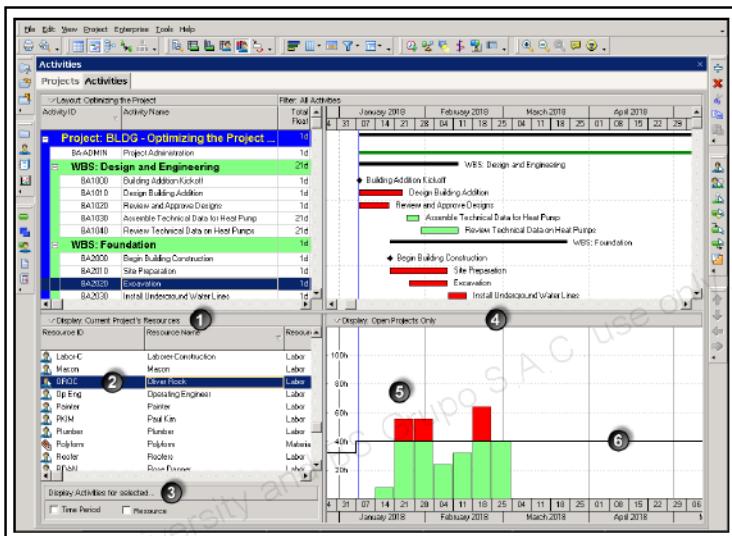
Figure 15-7: The calculated Finish date is now before the Must Finish By date, and the project has a Total Float of 1 day.

Confirm the Finish date and Total Float.

1. Click the Projects tab near the top of the screen to navigate to the Projects window.
2. In the Project Table, select a project, *Bldg-15*.
3. In Project Details, click the Dates tab.
4. Confirm the calculated Finish date, *29-Oct-18*, and the Must Finish By date, *31-Oct-18*.
5. In the Project Table, view the *Total Float* column and confirm that Total Float for the project is 1 day.

Overview: Optimizing Resources

Use the Resource Usage Profile to optimize resources in the project plan. It enables you to view resource allocation and identify activities to which resources are assigned.



- ① Use the Resource Usage Profile left pane Display Options bar to filter the resources displayed in the resource hierarchy.
- ② Use the resource hierarchy to select resources whose allocations you want to check.
- ③ Use the *Display Activities for selected* options to identify the activities contributing to a resource's overallocation. (Only available when right pane is set to Open Projects Only.)
- ④ Use the Resource Usage Profile right pane Display Options bar to format the resource usage graph.
- ⑤ Use the Resource Usage Profile right pane to analyze allocation of selected resources.
- ⑥ Use the Resource limit line to show the maximum number of hours the selected resource can work within the displayed time frame.

Practice: Optimizing Resources

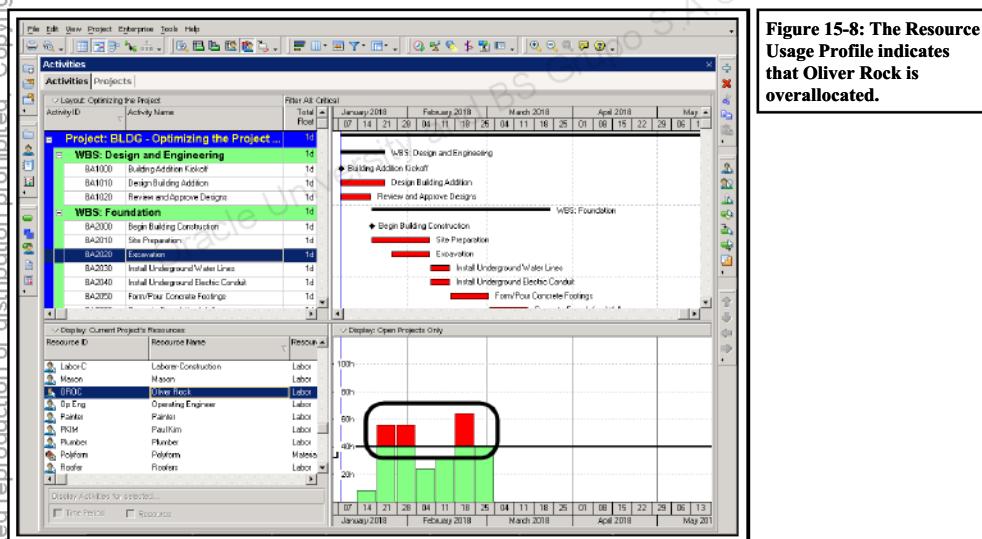
In this practice you will:

- Investigate resource overallocation.
- Identify the activities contributing to the overallocation of a selected resource.
- Correct resource overallocation by replacing the overallocated resource in an activity with another available resource.

Analyzing Resource Allocation

You have optimized the schedule, and the project will now be completed by the deadline. Our next step is to ensure that resources are allocated appropriately.

You will use the Resource Usage Profile to determine which resources are overallocated or underutilized and then adjust resource assignments as necessary to accommodate the workload.



Use the Resource Usage Profile to identify overallocated resources.

1. Click the Activities tab near the top of the screen to navigate to the Activities window.
2. On the Layout Options bar, click *Filters*.

3. In the Filters dialog box, select the All Activities check box and then click *OK*.
4. On the Layout Options bar, click *Show on Bottom, Resource Usage Profile*.
5. On the Resource Usage Profile left-pane Display Options bar, click *Filter By, Current Project's Resources*.
6. In the Resource Usage Profile left pane, click on a column header, *Resource Name*, to sort alphabetically.
7. Select a resource, *OROC – Oliver Rock*.

Identifying the Cause of Resource Overallocation

The Resource Usage Profile provides an easy method for tracing the cause of resource overallocation.

In the following exercise, you will use a filter to identify the activities contributing to Oliver Rock's overallocation during January and February of 2018.

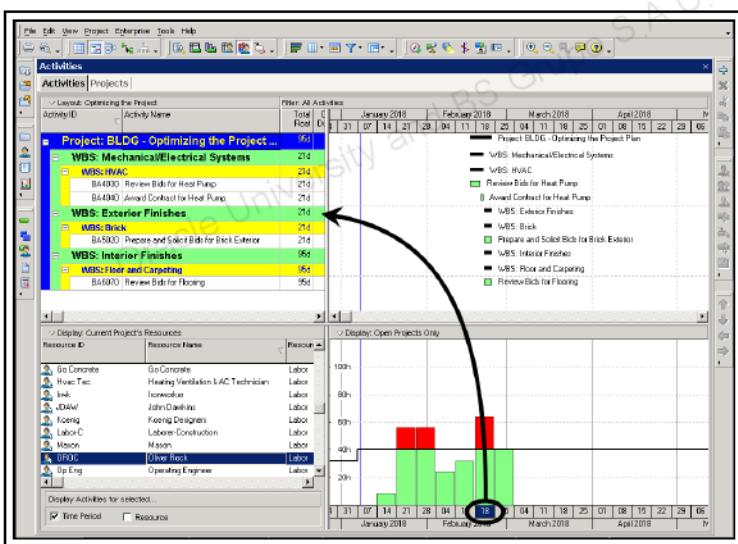


Figure 15-9: Click a week in the timescale to view the activities causing the over-allocation in that time period.

Identify the activities causing resource overallocation.

1. On the Resource Usage Profile right pane Display Options bar, click *Show All Projects* to remove the check mark.

2. In the *Display Activities for selected* section in the left pane of the Resource Usage Profile, select the *Time Period* check box.
 3. In the histogram timescale, click on a week, *21-Jan-18*, and view the activities causing overallocation in the top layout.

? What are the activities causing overallocation during the selected week?

4. In the histogram timescale, click on a week, *28-Jan-18*.

? What are the activities causing overallocation during the selected week?

5. In the histogram timescale, click on a week, *18-Feb-18*.

? What are the activities causing overallocation during the selected week?

Correcting Overallocation

There are several methods to remove the overallocation from a resource:

- Replace the overallocated resource with another available resource.
 - Increase the resource's workweek.
 - Increase the hours/day that the resource works.
 - Assign additional resources to the activity.

After analyzing Oliver Rock's overallocation, you have decided to use a different resource for activities

BA5010 - Review and Approve Brick Samples and BA5020 - Prepare and Solicit Bids for Brick Exterior.

Wayne Smith is not allocated to work in this time period, so he can be assigned to the activities.

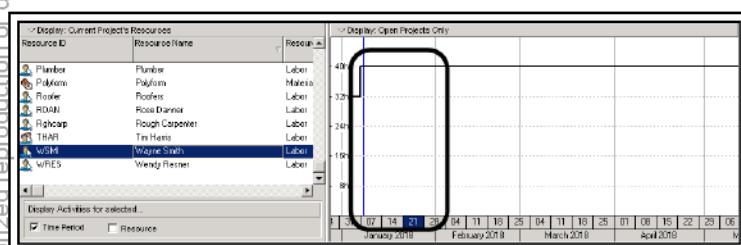


Figure 15-10: Resource Wayne Smith is available to work on activities during the selected time period.



1. In the Resource Usage Profile resource hierarchy, select a resource, *WSMI – Wayne Smith*.
 2. Confirm that Wayne is available to work on the activity during the week of January 21.

Removing the Overallocated Resource

If the selected activities have an associated role assignment, you can quickly change resources in multiple activities by first selecting the activities and then on the Edit menu, clicking *Assign, Resources by Role*.

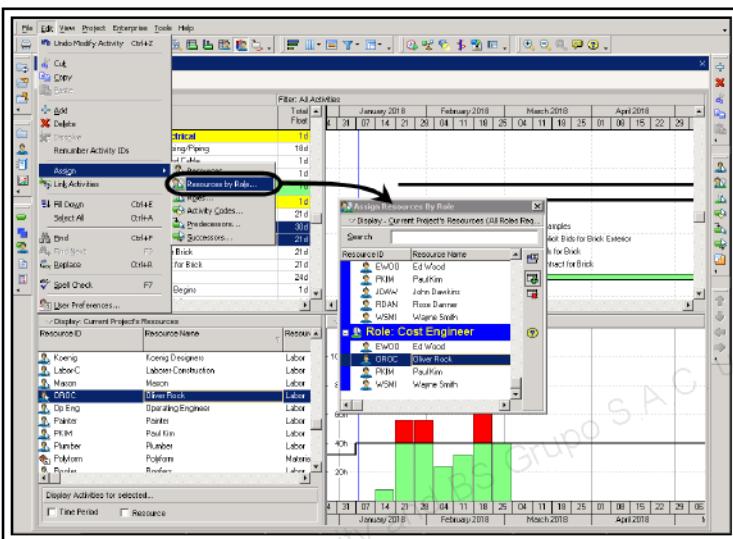


Figure 15-11: Click to launch the *Assign Resources By Role* dialog box.

Remove resource assignments.

1. In the *Display Activities for selected* section in the left pane of the Resource Usage Profile, clear the *Time Period* check box.
2. In the resource hierarchy, select a resource, *OROC – Oliver Rock*.
3. In the Activity Table, select activities *B45010* and *B45020*.
4. On the Edit menu, click *Assign, Resources by Role*.
5. In the Assign Resources By Role dialog box, select a resource, *Oliver Rock*.
6. Click to remove Oliver Rock from the selected activities.

Assigning an Alternative Resource

Next, assign Wayne Smith to work on the two activities.

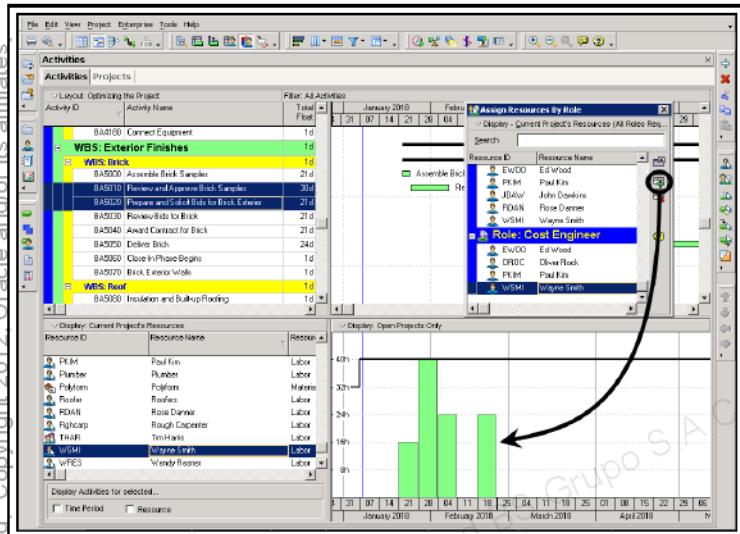


Figure 15-12: Click to assign Wayne Smith to the selected activities.

Assign an alternative resource to the activities.

1. In the Activity Table, confirm that activities *BA5010* and *BA5020* are selected.
2. In the Assign Resources By Role dialog box, select a resource in the *Cost Engineer* band, *Wayne Smith*, and then click .
3. Click  to close the Assign Resources by Role dialog box.

Reviewing Allocation

Finally, use the Resource Usage Profile to check allocation for Oliver Rock, who was removed from the activities, and Wayne Smith, who was assigned to the work in his place.

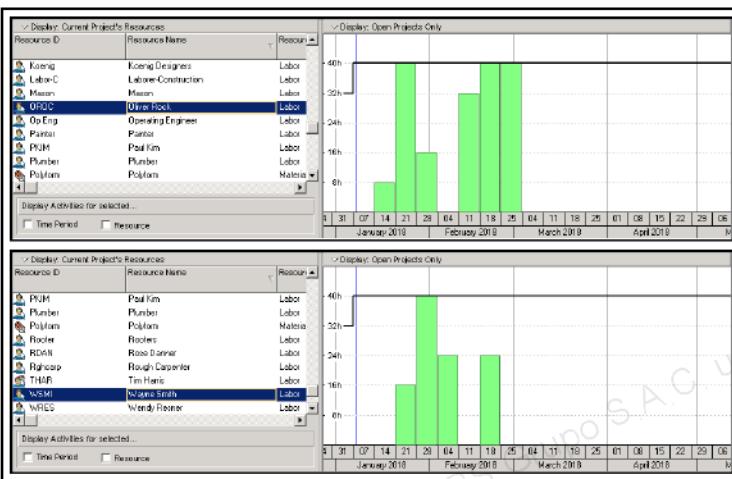


Figure 15-13: Assigned hours for Oliver Rock (top) and Wayne Smith (bottom) both show no overallocation.

View updated resource allocations.

1. On the File menu, click *Refresh data* (or press *F5* on your keyboard).
2. In the Resource Usage Profile resource hierarchy, select a resource, *Oliver Rock*, and view his updated allocation.
3. Select another resource, *Wayne Smith*, and view his updated allocation.

Replacing a Resource

Click  in the Assign Resources dialog box to quickly replace one resource with another in a single activity or in multiple activities simultaneously. Note that this functionality is available only when assigning a resource directly – it is not available in the Assign Resources by Role dialog box.

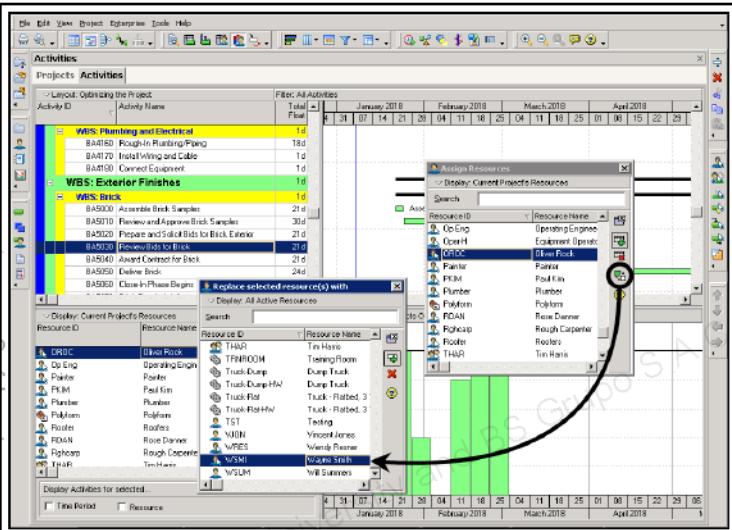


Figure 15-14: Click the *Replace Resource* icon to replace a resource assignment.

View the steps for replacing a resource.

1. In the Activity Table, select an activity, *B45030 – Review Bids for Brick*.
2. On the Edit menu, click *Assign, Resources*.
3. In the Assign Resources dialog box, select a resource, *Oliver Rock*.
4. Click .
5. In the Replace selected resource(s) with dialog box, select a resource, *Wayne Smith*.
6. Click  to replace Oliver Rock with Wayne Smith.
7. Click  to close each of the dialog boxes.

Overview: Optimizing the Budget

Detailed budget analysis is beyond the scope of this training course and generally beyond the scope of a project manager's responsibility. Nevertheless, project managers need to know how to review a budget to know whether actual costs may exceed budgeted costs and whether to take corrective action.

A layout with cost columns will be used in the Activities window to facilitate review of the budget.

Activity Name	Filter All Activities	Budgeted Labor Cost	Budgeted Nonlabor Cost	Budgeted Material Cost	Budgeted Expense Cost	Budgeted Total Cost
BLDG - Optimizing the Project Plan	\$19,098.00	\$6,000.00	\$16,000.00	\$45,000.00	\$25,000.00	\$125,098.00
Design and Engineering	\$15,404.00	\$0.00	\$2,000.00	\$5,000.00	\$0.00	\$22,904.00
BA1000 - Project Administration	\$9,309.00	\$0.00	\$0.00	\$0.00	\$0.00	\$9,309.00
BA1000 - Building Addition Kick-off	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
BA1010 - Design Building Addition	\$9,408.00	\$0.00	\$0.00	\$0.00	\$0.00	\$9,408.00
BA1010 - Review and Approve Design	\$2,159.00	\$0.00	\$0.00	\$0.00	\$0.00	\$2,159.00
BA1030 - Assemble Technical Data for Heat Pump	\$729.00	\$0.00	\$0.00	\$500.00	\$0.00	\$1,230.00
BA1040 - Review Technical Data on Heat Pumps	\$3,116.00	\$0.00	\$0.00	\$5,000.00	\$0.00	\$8,116.00
Foundation	\$35,200.00	\$6,000.00	\$10,000.00	\$12,000.00	\$0.00	\$64,200.00
BA2000 - Begin Building Construction	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
BA2010 - Site Preparation	\$7,200.00	\$0.00	\$0.00	\$0.00	\$7,200.00	\$7,200.00
BA2020 - Excavation	\$4,160.00	\$0.00	\$0.00	\$0.00	\$4,160.00	\$4,160.00
BA2030 - Install Underground Water Lines	\$1,200.00	\$0.00	\$0.00	\$0.00	\$1,200.00	\$1,200.00
BA2040 - Install Underground Electric Conduit	\$6,000.00	\$0.00	\$0.00	\$0.00	\$6,000.00	\$6,000.00
BA2050 - Form/Pour Concrete Foundations	\$8,400.00	\$0.00	\$0.00	\$800.00	\$0.00	\$8,200.00
BA2060 - Concrete Foundation Walls	\$5,600.00	\$0.00	\$16,000.00	\$10,000.00	\$0.00	\$31,400.00
BA2070 - Form and Pour Slab	\$4,000.00	\$0.00	\$0.00	\$400.00	\$0.00	\$4,200.00
BA2080 - Backfill and Compact Walls	\$249.00	\$0.00	\$0.00	\$0.00	\$0.00	\$249.00
BA2090 - Foundation Phase Complete	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Structure	\$35,940.00	\$0.00	\$0.00	\$8,720.00	\$0.00	\$44,660.00
BA3000 - Begin Structural Phase	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
BA3010 - Floor Structural Frame	\$4,600.00	\$0.00	\$0.00	\$1,000.00	\$0.00	\$5,600.00
BA3020 - Floor Decking	\$3,300.00	\$0.00	\$0.00	\$1,120.00	\$0.00	\$4,420.00
BA3030 - Column/Joist Posts	\$7,200.00	\$0.00	\$0.00	\$1,200.00	\$0.00	\$8,400.00
BA3040 - Erect Stairwell and Elevator Walls	\$2,400.00	\$0.00	\$0.00	\$0.00	\$2,400.00	\$2,400.00
BA3050 - Complete Basement Slab	\$12,000.00	\$0.00	\$0.00	\$1,600.00	\$0.00	\$13,600.00
BA3060 - Complete Second Floor	\$7,200.00	\$0.00	\$0.00	\$1,200.00	\$0.00	\$8,400.00
BA3070 - Structure Complete	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Mechanical/Electrical Systems	\$17,414.00	\$0.00	\$0.00	\$5,500.00	\$0.00	\$22,914.00

- ➊ Use the Layout Options bar to select a layout with the appropriate cost columns.
- ➋ Use the cost columns to review budgeted costs for labor, nonlabor, and material resources as well as expenses, and budgeted total costs for individual activities, WBS elements, and the entire project.

Practice: Optimizing the Budget

In this practice you will:

- Review cost figures to determine if they are within budget.

Analyzing the Budget

There are many options for analyzing the budget. By displaying cost columns in the Activity Table and grouping and sorting project activities in different ways, you can review the budgeted costs of individual activities, specific project areas (WBS elements, phases, timeframes, etc.) or the entire project.

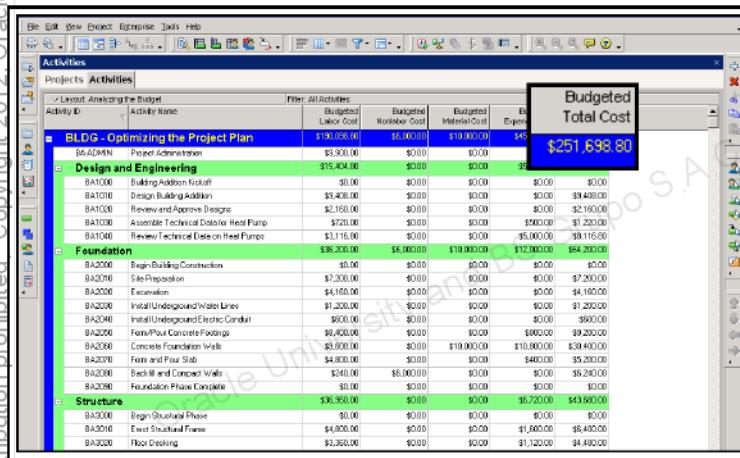


Figure 15-15: The layout shows Budgeted Total Cost for each activity as well as rolled up values for each WBS band and for the entire project.

Review project cost information.

- On the Layout Options bar, click *Layout, Open*.
- Select a layout, *Analyzing the Budget*, and then click *Open*.
- Scroll to the top of the screen to view the rolled-up value for Budgeted Total Cost.
- Click the Projects tab near the top of the screen to navigate to the Projects window.
- In the Project Table, select the open project, *BLDG-15*.
- In Project Details, click the Budget Log tab and view the Original Budget.

? Is the project within budget?

Lesson Review

Key Concepts

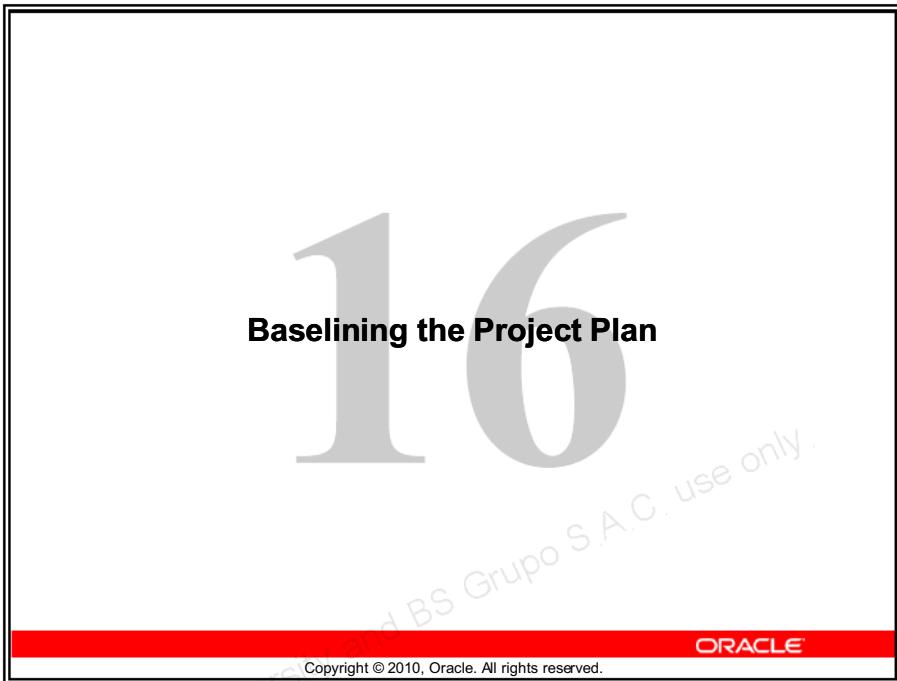
- Optimizing the project plan is the last step in planning your project. Ensure that the project plan meets its date, resource, and cost requirements.
- If the calculated *Finish* date of the project is beyond the *Must Finish By* date, the project must be shortened. You can compare the dates in the Dates tab in Project Details.
- You can use various methods to shorten the project, such as refining duration estimates, modifying relationships, and applying constraints. Focus your efforts on critical activities.
- Use the Resource Usage Profile to ensure that resources are not overallocated.
- Evaluate costs to ensure that the project can be completed within budget.

Review Questions

- True or False:** You can quickly determine whether the project will finish on time by reviewing the Status tab in Project Details.
- Which of the following is a method for removing resource overallocation?
 - Decrease the resource's workweek
 - Assign the resource to more activities in the selected time frame
 - Re-assign work to a different resource
 - All of the above
- True or False:** To be successful at shortening a project, you must focus on critical activities.
- Which of the following is an alternative for shortening the duration of a project?
 - Use relationships to overlap activities
 - Add resources to reduce durations
 - Review long activities to determine if duration can be refined
 - Change calendar assignments
 - All of the above

Notes





Lesson 16 – Baselining the Project Plan

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
10	15	25	5	55

Objectives

After completing this lesson, you should be able to:

- Create a baseline plan.
- Display baseline bars on the Gantt chart.
- Modify the bars on the Gantt chart.

The red bar spans the width of the content area below the objectives section.

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What is a Baseline?

- A copy of the project plan used as a basis for comparison when evaluating the progress of an updated project.
 - Create a baseline before updating a schedule for the first time.
- Provides a target against which to track a project's cost, schedule, and resource performance.

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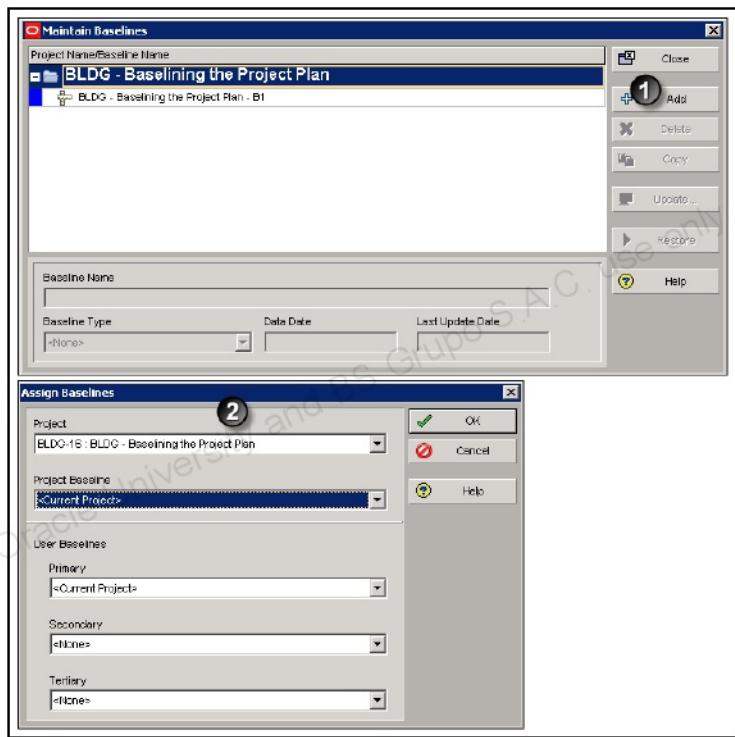
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Notes



Overview: Baselining the Project Plan

The Maintain Baselines dialog box enables you to add, delete, copy, and restore baselines. Use the Assign Baselines dialog box to assign a project baseline and up to three user baselines. (Both dialog boxes are accessed via the Projects menu.) After baselines are assigned, click *Bars* on the Layout Options bar to customize how bars are displayed in the Gantt chart.



- ① Click *Add* to create a baseline in the Maintain Baselines dialog box. You can also delete and copy baselines. Click *Update* to select the data you want to automatically update for the selected baseline, and then run the *Update Baseline* utility. Click *Restore* to restore the selected baseline as a separate project that you can manually modify.
- ② Assign Baseline Dialog box enables you to assign a project baseline and up to three user baselines.

Practice: Baselining the Project Plan

In this practice you will:

- Create and categorize a baseline and then assign it to a project.
- Display and format baseline bars in the Gantt chart.
- Customize the Activity Table to accommodate the display of baseline bars in the Gantt chart.

Managing Baselines

Baseline functionality in P6 Professional enables you to:

- Capture a snapshot of a project at a particular point in time.
 - ◆ Baselines do not exist as separate projects that you can access. They exist only in conjunction with the projects to which they are associated.
- Save an unlimited number of baselines per project.
 - ◆ The number of baselines you can create is controlled by your application administrator.
- Designate one project baseline and up to three user baselines at a time for comparison to the current project.
- Assign a baseline type to categorize a baseline. Examples include initial planning, what-if, or mid-project baselines. Baseline types, which are usually created by an application administrator, are used to standardize baselines and can help benchmark performance across multiple projects.
- P6 Professional enables you to copy baselines when you copy a project.

Creating a Baseline

Create a baseline either by:

- Copying the currently opened project.
- Converting another project into a baseline.

When you create a baseline, you must select the project to which it is associated. You can only assign baselines to opened projects. All opened projects are displayed in the Maintain Baselines dialog box.

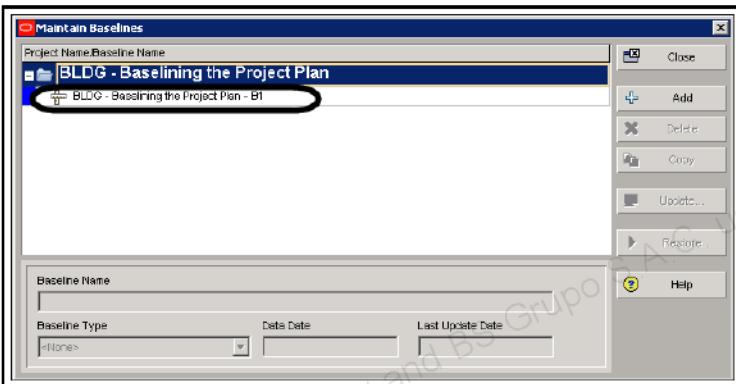


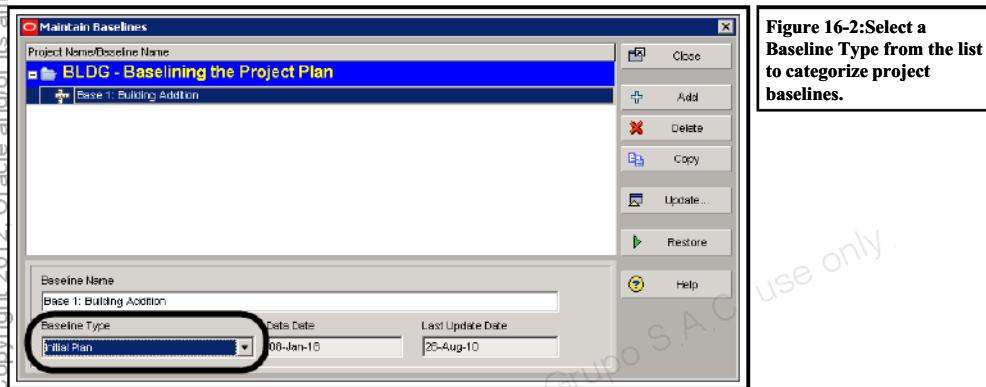
Figure 16-1:A baseline has been created.

Create a baseline.

1. Open a project, *BLDG-16 BLDG – Baselining the Project Plan*.
2. Confirm that you are in the Activities window.
3. On the Layout Options bar, click *Layout, Open*.
4. Select a layout, *Activity List*, and then click *Open*.
5. On the Project menu, click *Maintain Baselines*.
6. Click *Add*.
7. Confirm that *Save a copy of the current project as a new baseline* is selected.
8. Click *OK*.

Categorizing the Baseline

Assign a baseline type to categorize the baseline based on how you intend to use it. For example, the *Initial Plan* baseline type can be used for your initial project plan. Another baseline type, *Mid-Project Status*, can be used after the project is underway. Baseline types are also useful in organizing multiple baselines in the project.



Rename the baseline and designate it as the Initial Plan baseline.

1. Select a baseline, *BLDG – Baselining the Project Plan – BI*.
2. In the *Baseline Name* field, type <**Base 1: Building Addition**>.
3. In the *Baseline Type* list, select *Initial Plan*.
4. Click *Close*.

Assigning a Baseline

Use the Assign Baselines dialog box to choose a project baseline and/or user baseline for the project. If no baseline is designated as active, the current project plan is used as the baseline.

- **Project baseline** – Baseline selected by the project manager for the project.
 - ◆ Used for schedule, resource, and cost comparison.
 - ◆ Controlled by a security privilege.
- **User baseline** – User-specific; each user can choose a different baseline for comparison to the current project.
 - ◆ Primary user baseline: Used for schedule, resource, and cost comparisons.
 - ◆ Secondary and tertiary user baselines: Used for schedule comparisons only.

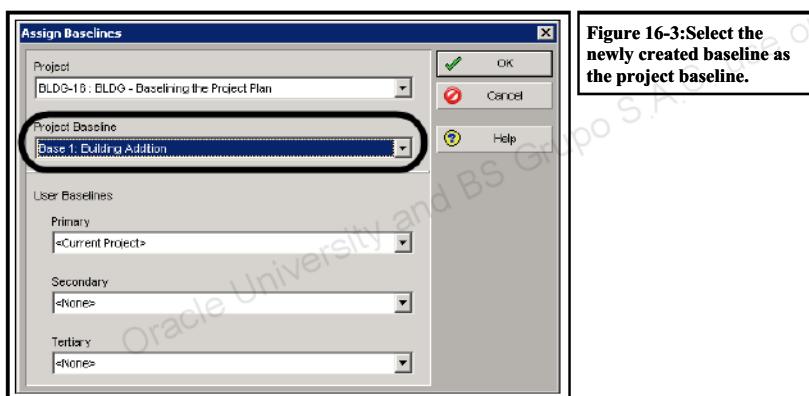


Figure 16-3:Select the newly created baseline as the project baseline.

>Select the newly created baseline as the project baseline.

1. On the Project menu, click *Assign Baselines*.
2. In the *Project Baseline* list, select *Base 1: Building Addition*.
3. Click *OK*.

Update Baseline Options

If there are significant changes in the project after it is underway, you may choose to update the baseline to reflect the changes. You can create a new baseline based on the current state of the project or update the existing baseline. The advantage of updating the baseline is that you retain the record of past performance against the original baseline.

The Update Baselines dialog box offers numerous options to update activity and resource data in the new baseline:

- **When updating activity data, include**—Specify the types of activity data you want to update when you update the baseline.
- **When updating resource assignment data, include**—Choose to update existing resource/role assignment data. If you choose to update existing resource/role assignment data, you may also choose to update the budgeted units and cost, and/or actual units and cost for the resource/role assignments.
- **Add new resource and role assignments**—Choose to add new resource/role assignment data.

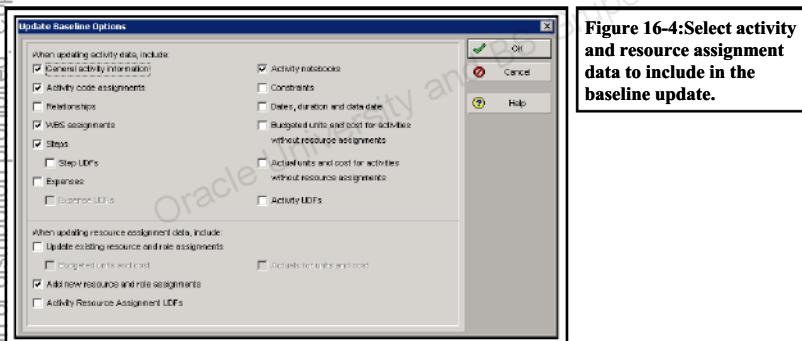


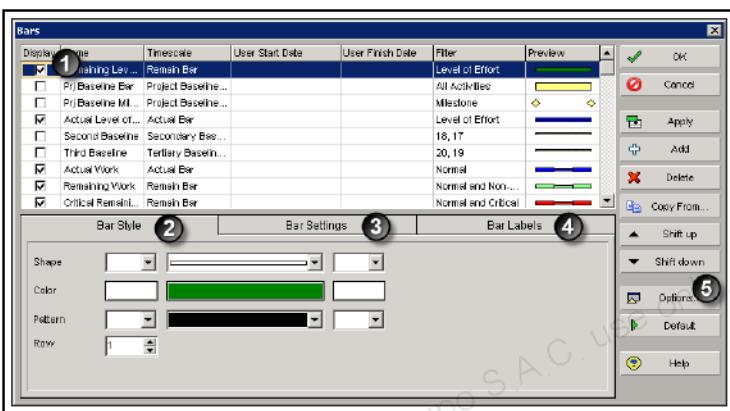
Figure 16-4: Select activity and resource assignment data to include in the baseline update.

View the Update Baselines dialog box.

1. On the Project menu, click *Maintain Baselines*.
2. Select a baseline, *Base 1: Building Addition*.
3. Click *Update*.
4. Click *Close*.

Overview: Viewing Baseline Bars

Use the Bars dialog box to create a baseline bar and define its properties. Display the baseline bar in the Gantt chart.



- ① Select a check box in the *Display* column to display the bar in the Gantt chart.
- ② Use the Bar Style tab to specify the shape, color, pattern and row position for the selected bar.
- ③ Use the Bar Settings tab to specify how to display summary information and how to display nonwork time on the selected bar.
- ④ Use the Bar Labels tab to create a label and specify its position on the selected bar.
- ⑤ Click to specify Gantt chart background line and legend options.

Practice: Viewing Baseline Bars

In this practice you will display baseline bars in the Gantt chart.

Viewing Baseline Bars

The Bars dialog box allows you to modify the type, size, color, row position, and shape of the bars displayed in the Gantt chart.

- **Timescale** – Bar is drawn based on the timescale selected, for example, Actual Bar drawn from Actual Start date to Actual Finish date.
- **Filter** – Bar is drawn for all activities that match the criteria listed in the filter displayed.

Bar Style Tab

The Bar Style tab enables you to specify the shape, color, and pattern of bars and endpoints.

- **Shape** – Shape of the selected bar's endpoints and the weight and position of the bar.
- **Color** – Color of the selected bar and its endpoints.
- **Pattern** – The fill pattern of the selected bar.
- **Row** – Position of the bar in the Gantt chart.

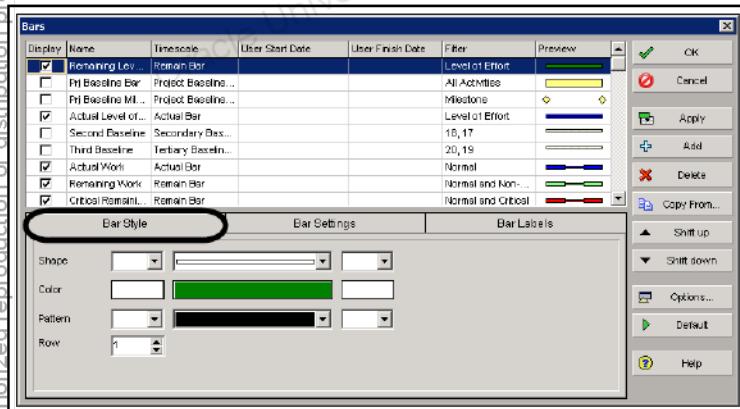


Figure 16-5: The Bar Style tab enables you to specify the shape, color, pattern, and row of bars displayed in the Gantt chart.

Display the Bars dialog box.

1. On the Layout Options bar, click *Bars*.

Displaying Baseline Bars

Display baseline bars in the Gantt chart to visually compare the baseline plan's schedule dates to the current project plan's schedule dates.

In addition to bars displayed by default, you can create additional bars based on date fields and filters.

Select a value in the *Row* field to determine placement of a bar in the Gantt chart.

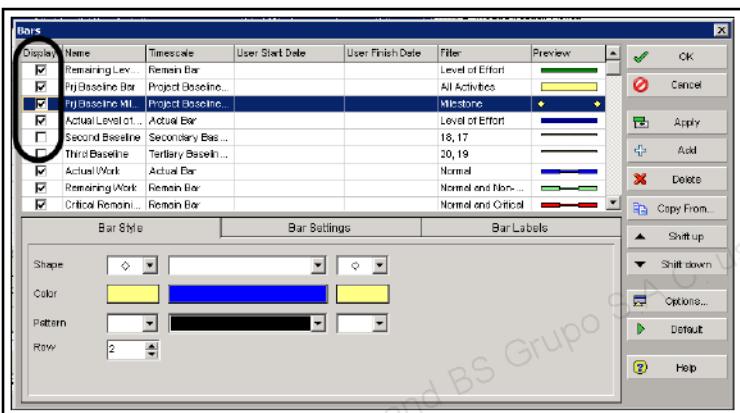


Figure 16-6:Mark the *Display* checkbox next to the bars you want to display in the Gantt chart.



Display baseline bars.

1. In the *Display* column, select the *Prj Baseline Bar* check box.
2. Confirm that the Bar Style tab is selected.
3. In the *Row* field, confirm 2.
4. In the *Display* column, select the *Prj Baseline Milestone* check box.
5. In the *Row* field, confirm 2.
6. Click *OK* to close the Bars dialog box.

Customizing the Activity Table

To customize the layout even further, select display options for the Activity Table. These include the font of the text and the height of the rows, which you can specify in the Table, Font and Row dialog box.

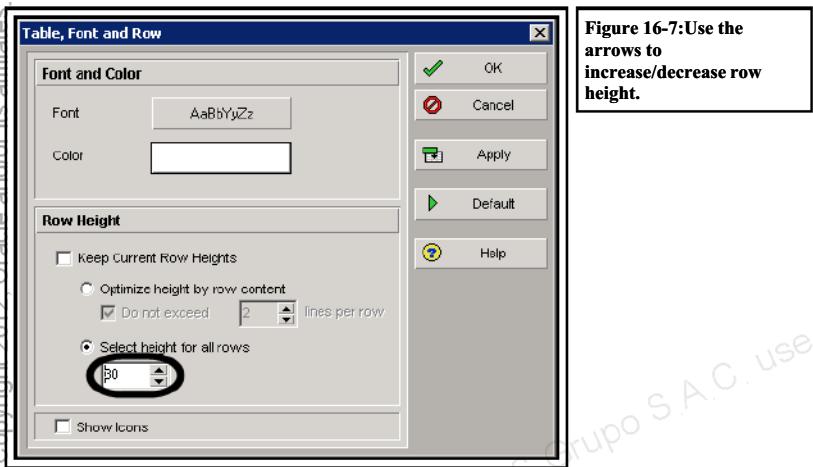


Figure 16-7: Use the arrows to increase/decrease row height.

Change row height in the Activity Table.

1. On the Layout Options bar, click *Show on Bottom, No Bottom Layout*.
2. On the Layout Options bar, click *Table Font and Row*.
3. In the Row Height section, clear the *Keep Current Row Heights* check box.
4. Confirm that the option *Select height for all rows* is selected.
5. Click arrows to increase row height to *30*.
6. Click *OK*.

Saving the Layout

If you are pleased with the layout, save it with a new name.

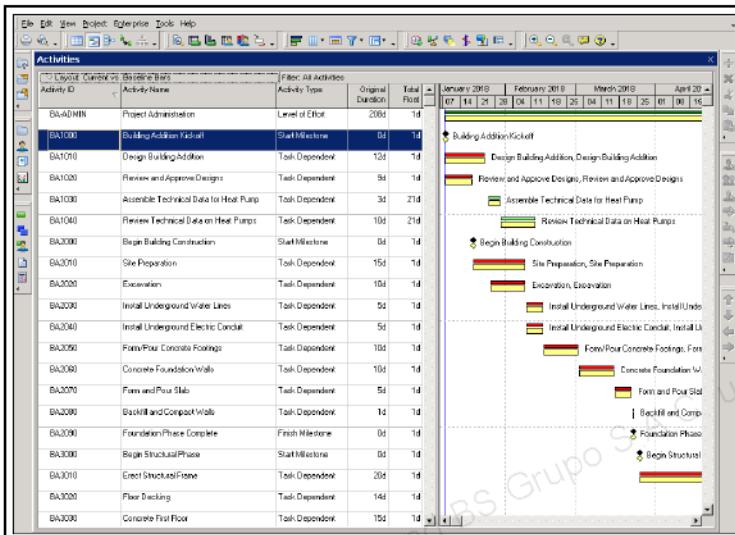


Figure 16-8: The layout has been saved with a new name.

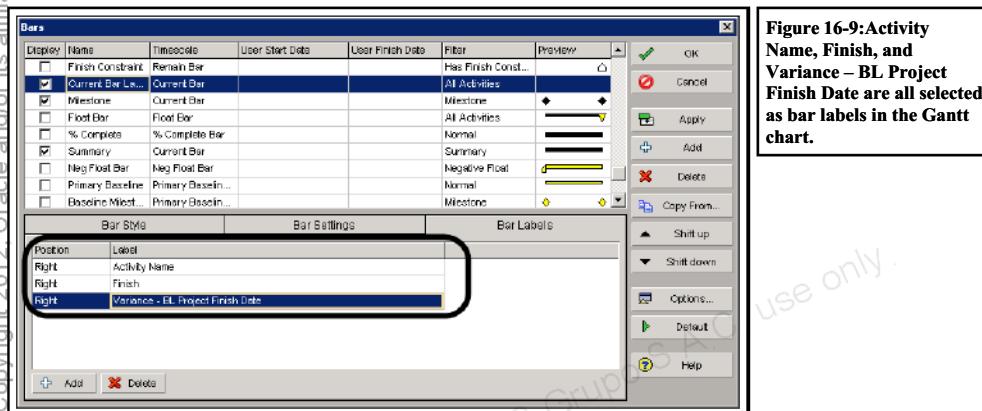
Save the layout.

1. On the Layout Options bar, click *Layout, Save As*.
2. Type a new *Layout Name <Current vs. Baseline Bars>*.
3. Click *Save*.

Bar Labels Tab

Labels can be placed on any of the bars listed in the dialog box. When adding a label, specify its position relative to the bar.

Add dates to the bars to quickly determine the Start and Finish dates of activities in the Gantt chart.



Add labels to the Current Bar Labels bar.

1. On the Layout Options bar, click *Bars*.
2. Select a bar, *Current Bar Labels*.
3. Click the Bar Labels tab.
4. At the bottom of the tab, click *Add*. (Do not click *Add* on the right side of the dialog box.)
5. In the *Position* column, confirm *Right*.
6. Click in the *Label* column, and then select *Finish* in the list.
7. At the bottom of the dialog box, click *Add*.
8. In the *Position* column, confirm *Right*.
9. Click in the *Label* column, and then select *Variance – BL Project Finish Date*.
10. Click *OK* to close the Bars dialog box.

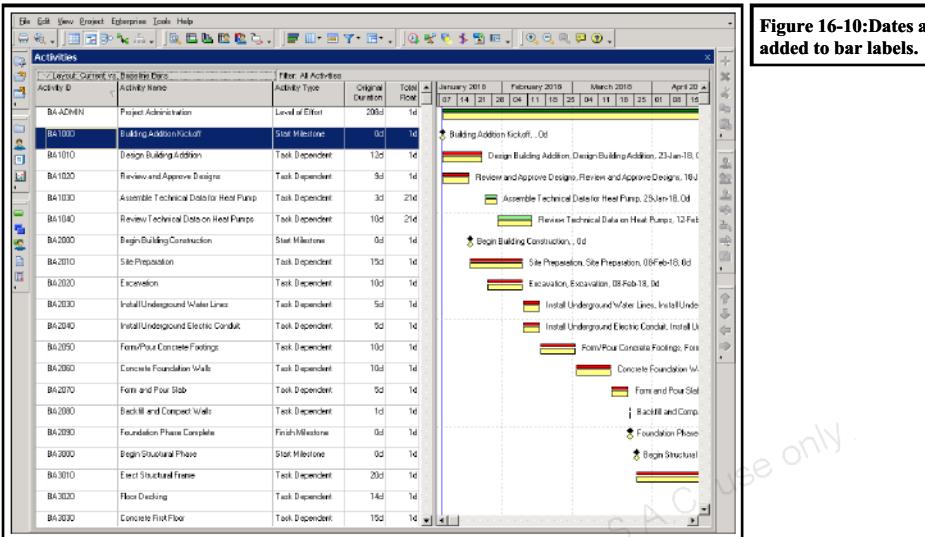


Figure 16-10:Dates are added to bar labels.

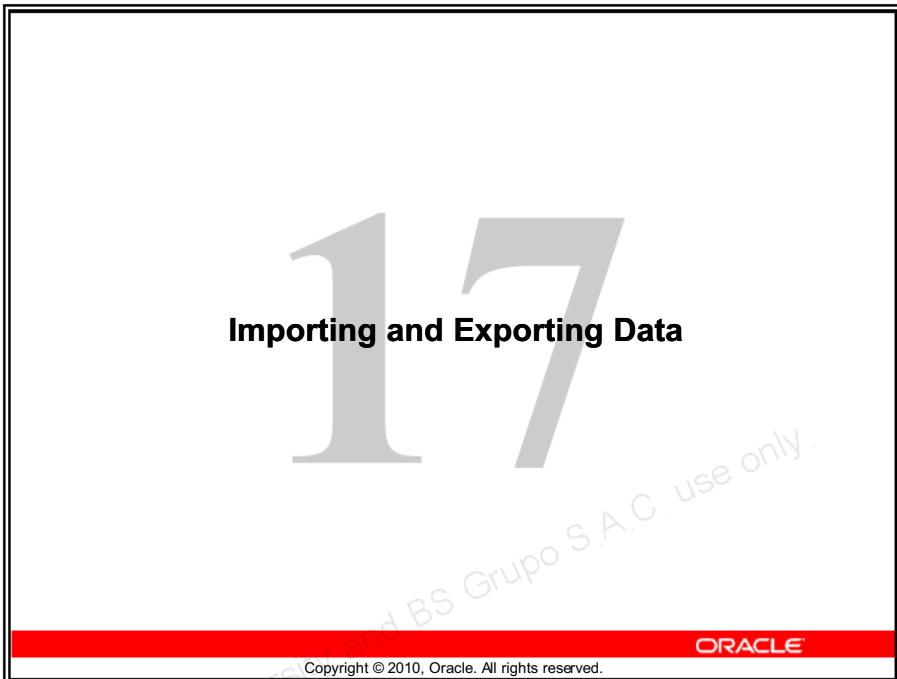
Lesson Review

Key Concepts

- A baseline is a copy of a project that you can compare to the current project in order to evaluate progress. Create a baseline plan before updating a schedule for the first time.
- Create a baseline either by copying the currently opened project or by converting another project into a baseline.
- Assign a baseline type to categorize and standardize baselines across all projects.
- A project baseline is the baseline selected by the project manager for the project and is controlled by a security privilege. User-baselines can be designated by each user and are used for schedule comparison only.
- The Bars dialog box allows you to modify the type, size, color, row position, and shape of the baseline bars displayed in the Gantt chart.

Review Questions

1. **True or False:** Only one baseline can be compared to a current schedule at any given time.
2. Which of the following can be compared using a project baseline?
 - a. Schedule data
 - b. Resource data
 - c. Cost data
 - d. All of the above
3. **True or False:** A maximum of one project baseline and three user baselines can be created for any single project.



Lesson 17 – Importing and Exporting Data

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
5	10	10	5	30

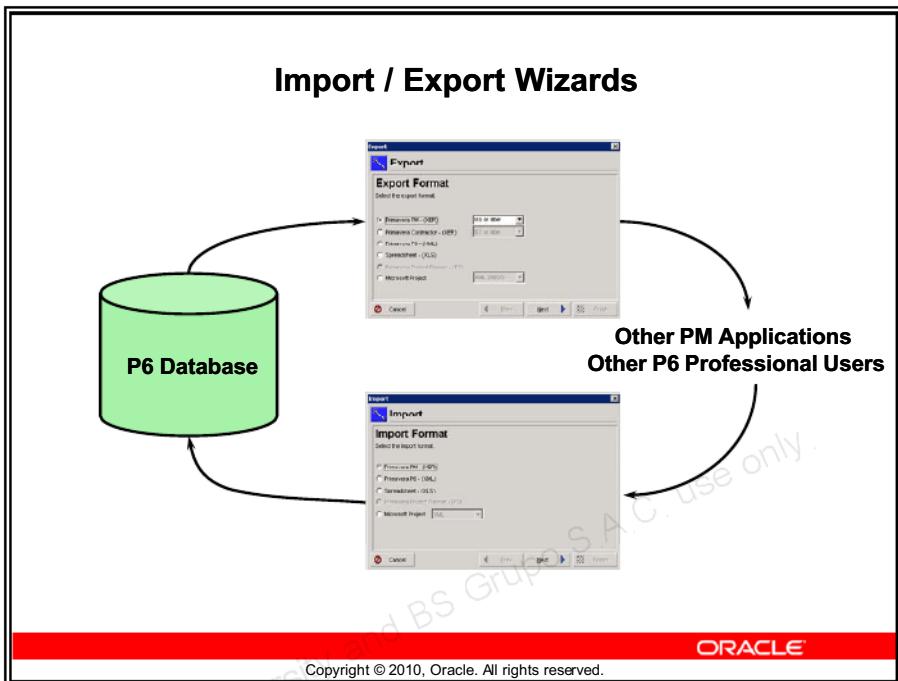
Objectives

After completing this lesson, you should be able to:

- Describe the process of importing and exporting data.
- Export a project.
- Import a project.

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Reasons to Import/Export Project Data

- Share project information with:
 - Other P6 EPPM users.
 - Users of other project management tools.
 - Your organization's human resource and accounting departments.
- Archive projects or create backups.
 - Single or multiple projects can be imported/exported at one time.
 - The Export wizard enables you to choose the format and data type (activities, resources, expenses, or complete projects) that you want to export.

The ORACLE logo is displayed on a red horizontal bar.

ORACLE

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Import/Export Formats

Primavera PM (XER)

- P6's proprietary format.
- Independent of database type used (Oracle or MS SQL).

Primavera PM (XML)

- Share project information between P6 EPPM databases.
- Compatible with Microsoft Project 2002 or later.

Spreadsheet (XLS)

- Compatible with Excel and other spreadsheet applications.

Primavera Project Planner (P3)

- Share project information with Oracle Primavera Project Planner version 3.x.

Microsoft Project (MPX, XML)

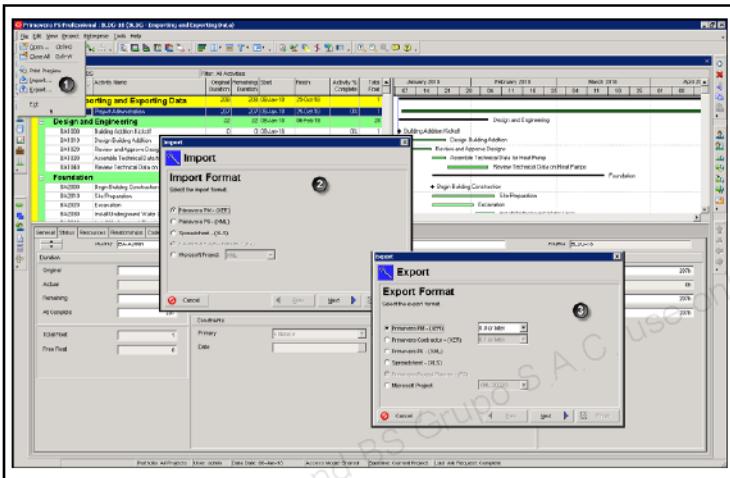
- Integrate with Microsoft Project and other third-party tools.

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Overview: Importing and Exporting Data

P6 Professional provides Import and Export wizards to guide you through the process of importing or exporting project data to or from the P6 database.



- ① On the File menu, click *Import* or *Export* to launch the corresponding wizard.
- ② Use the Import wizard to import project data into the P6 database.
- ③ Use the Export wizard to export project data from the P6 database.

Practice: Importing and Exporting Data

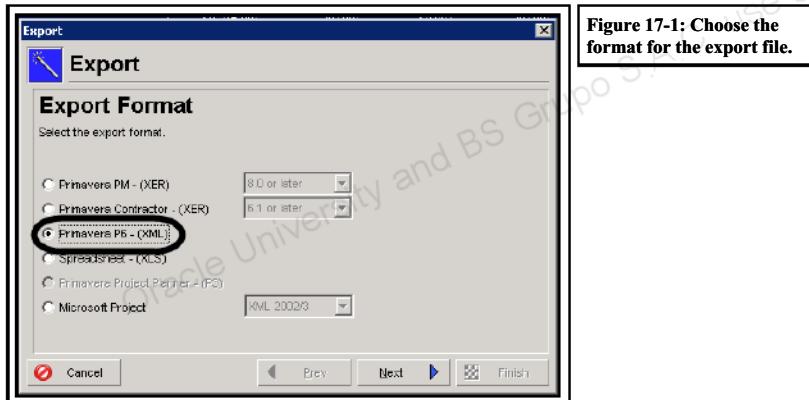
In this practice you will:

- Use the Export wizard to export a project.
- Use the Import wizard to import a project.
- View the imported project in the Project Table.

Export Wizard

The *BLDG* project has been optimized and baselined. Before progress is applied to the project, it is best to create a backup by exporting the project.

First, launch the Export wizard from the File menu.



Export a project using the Export Project wizard.

1. Open a project, *BLDG-17 BLDG – Importing and Exporting Data*.
2. On the File menu, click *Export*.
3. In the Export wizard, select an Export Format, *Primavera P6 – (XML)*, and then click *Next*.

Project(s) to Export

In the Export wizard, choose the project(s) you want to export from a list of currently open projects.

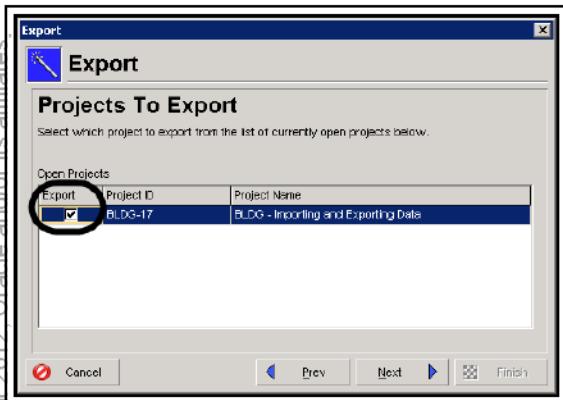


Figure 17-2: Select a check box in the *Export* column to choose the project(s) you want to export.

File Name

Specify the name of the file and the location where the file will be saved. When exporting in XML format, you can choose whether or not to include project level layouts with the export. Without layouts, the project will be exported in XML format. With the layouts, a ZIP file will be created.

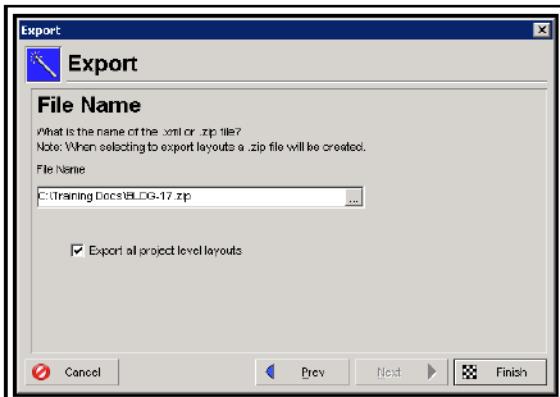


Figure 17-3: Browse to select a location for saving the export file.

Specify a file name.

1. Select the *Export all project level layouts* check box.
2. In the *File Name* field, click and browse to the location, *C:\Training Docs*.
3. In the Save File dialog box, type the file name, <BLDG-17>.
4. Confirm the export format, *Zip File (*.zip)*.
5. Click *Save*.
6. Click *Finish*.
7. Click *OK* to confirm that the export was completed.

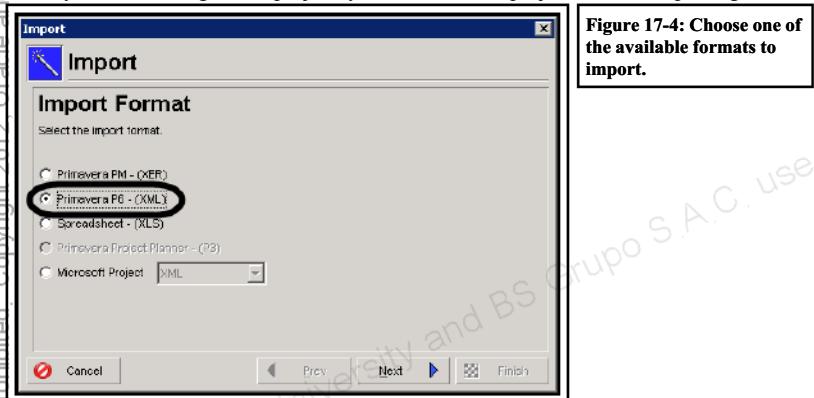
Import Wizard

The Import wizard guides you through the steps for importing projects. The project you want to import data into must be open. If you are creating a new project, no project needs to be open.

Import Format

You must import the project using the same format used to export.

Since you are creating a new project, you will close all projects before importing.



Import the project file that you exported earlier in the lesson.

1. On the File menu, click *Close All*.
2. At the confirmation prompt, click *Yes*.
3. On the File menu, click *Import*.
4. In the Import wizard, select an Import Format, *Primavera P6 - (XML)*.
5. Click *Next*.

File Name

Browse to the location of the file you want to import.

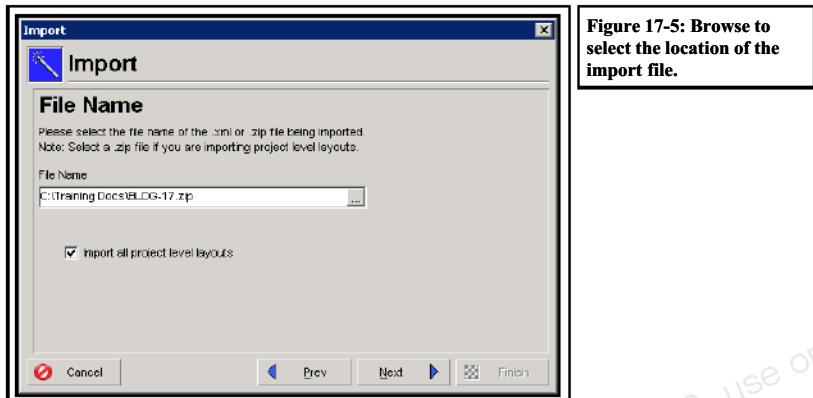


Figure 17-5: Browse to select the location of the import file.

>Select a file name.

1. Confirm the file to import, *C:\Training Docs\BLDG-17.zip*.
2. Confirm that the *Import all project level layouts* check box is selected.
3. Click *Next*.

Import Project Options

Select the options you want to use for importing the project.

- **Project ID** – Lists the project(s) in the XML file.
- **Import Action** – To prevent data from being overwritten, select one of the following options:
 - ◆ Create New Project — Creates a new project from the project being imported.
 - ◆ Update Existing Project — The existing project in the database will be updated by the project being imported. This option is available only when the project is open.
- **Import To** – Specify the target project or where in the EPS to create a new project.

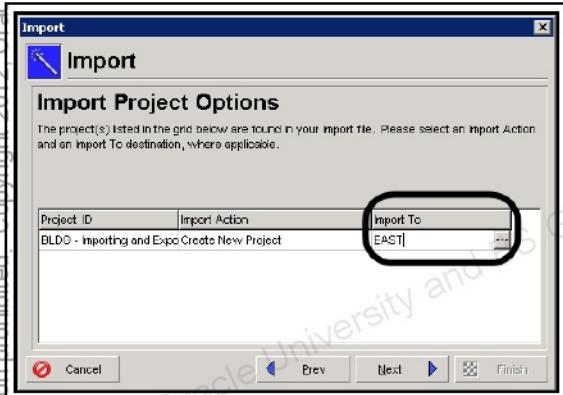


Figure 17-6: Select the EPS to which to import the project.

>Select an EPS node to which to import the project.

1. Confirm the Import Action, *Create New Project*.
2. Double-click in the *Import To* field, and then click
3. In the Select EPS to add into dialog box, select an EPS node, *BLDG-E Building East*.
4. Click to assign the node, and then click *Next*.

Updating Project Options

When importing a project, some data may conflict with existing global or project data. In the wizard, you can create and save update configurations that specify the action to take when the same data exists in the import file and the project being updated.

Multiple configurations can be created and saved. However, you can select only one configuration when importing a file.

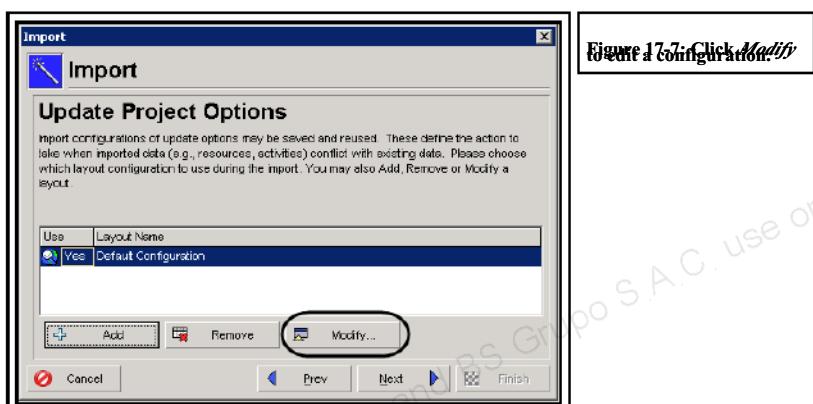


Figure 17-7 Click *Modify*.

Update project options.

1. In the *Layout Name* field, confirm *XML Import Configuration*.
2. Click *Modify*.

Modifying Import Configuration

The import configurations determine how to update project data. The Modify Import Configuration dialog box lists activity, global, and project data types. Select an action for each data type.

- **Action** – Specify how to update the selected data.
 - ◆ Keep Existing – Maintains the record in the database and does not overwrite any of its information by the record being imported. If the record does not exist, it will be added.
 - ◆ Update Existing – Overwrites the existing information in the database with the record being imported. If the record does not exist, it is added.
 - ◆ Insert New – Imports a new record, regardless if a match is found, and appends a number to generate a unique name.
 - ◆ Do Not Import – No records are imported.
- **Delete** – Select to indicate that the import file is the "master copy." If the record is not in the import file, it will be deleted from the database.
 - ◆ The *Delete* field applies to activities, risks, thresholds, and issues.
 - ◆ Global data types are not affected by this setting.

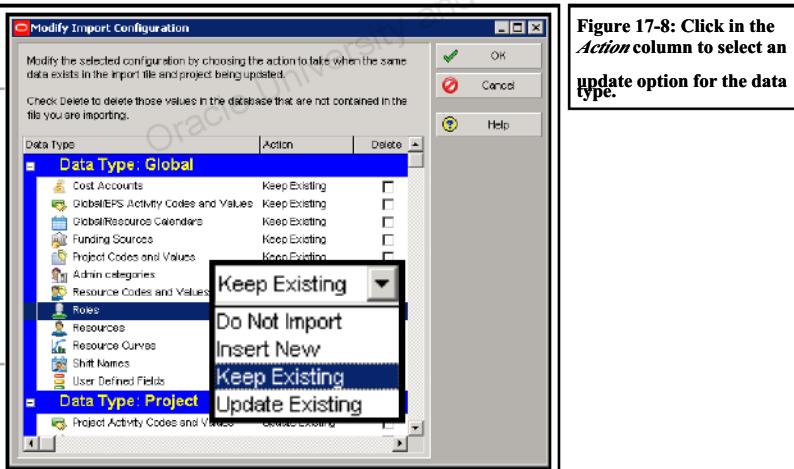


Figure 17-8: Click in the Action column to select an update option for the data type.

Review import configuration options.

1. Click *OK* to accept defaults, and then click *Next*.

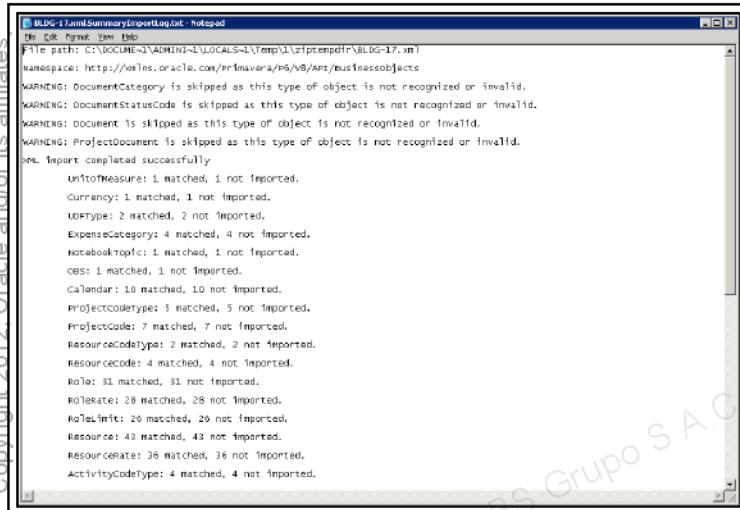
Completing the Import



Figure 17-9: Click *Finish* to complete the import.

Viewing the Import Log File

P6 Professional generates a log file detailing the actions taken during the import process.



The screenshot shows a Notepad window titled "BLDG-17.jml.SummaryImportLog.txt - Notepad". The window displays a log file with the following content:

```
File path: C:\ORACLE\ADMIN\1\LOCALS\1\Temp\1\xptempdir\BLDG-17.jml
Namespace: http://orion.oracle.com/prmnavera/v6/v8/api/businessobjects
WARNING: DocumentCategory is skipped as this type of object is not recognized or invalid.
WARNING: DocumentStatusCodes is skipped as this type of object is not recognized or invalid.
WARNING: Document is skipped as this type of object is not recognized or invalid.
WARNING: ProjectDocument is skipped as this type of object is not recognized or invalid.
pm. Import completed successfully
    UnitOfMeasure: 1 matched, 1 not imported.
    Currency: 1 matched, 1 not imported.
    UoPType: 2 matched, 2 not imported.
    ExpenseCategory: 4 matched, 4 not imported.
    NotebookTopic: 1 matched, 1 not imported.
    OBS: 1 matched, 1 not imported.
    Calendar: 10 matched, 10 not imported.
    ProjectCodeType: 3 matched, 5 not imported.
    ProjectCode: 7 matched, 7 not imported.
    ResourceCodeType: 2 matched, 2 not imported.
    ResourceCode: 4 matched, 4 not imported.
    Role: 31 matched, 31 not imported.
    RoleRate: 28 matched, 28 not imported.
    RoleLimit: 20 matched, 20 not imported.
    Resource: 43 matched, 43 not imported.
    ResourceRate: 36 matched, 36 not imported.
    ActivityCodeType: 4 matched, 4 not imported.
```

Figure 17-10: A log file is generated during the import process.

Viewing the New Project

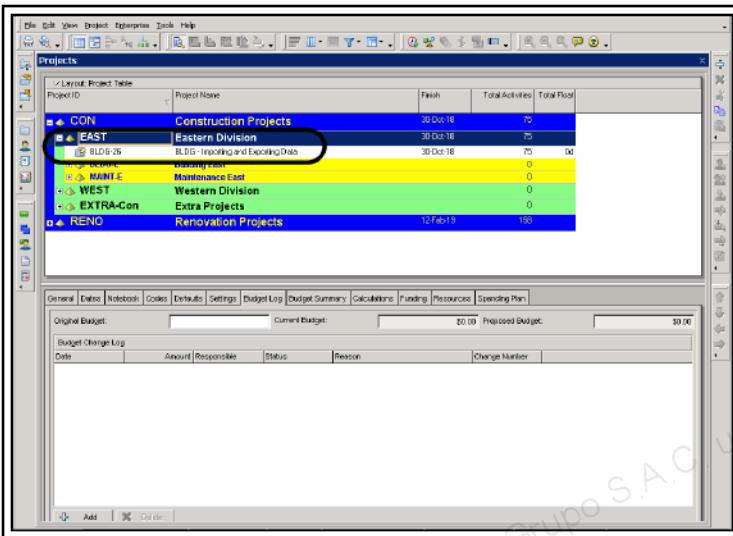


Figure 17-11: The new project has been added and is open.

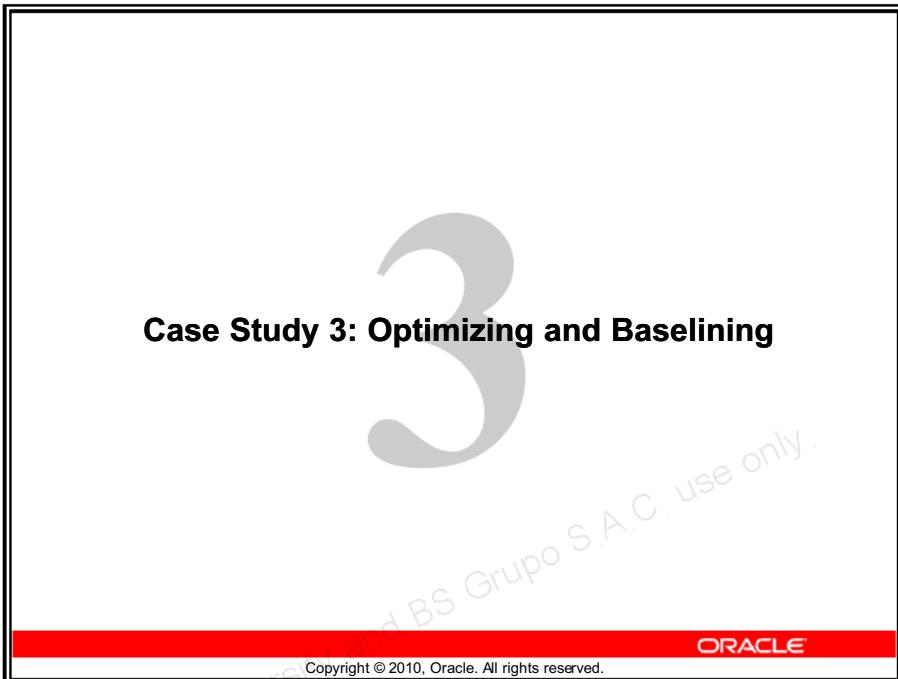
Lesson Review

Key Concepts

- Import and export project data to and from the P6 database.
- Use the import and export wizards to select the project information to import and export.
- You can select the type of information to import or export: activities, resource data, expenses, or full projects.

Review Questions

1. **True or False:** You can export multiple projects in an XER file.
2. From which of the following file formats can you import a project?
 - a. P3
 - b. XER
 - c. MPX
 - d. XLS
 - e. All of the above
3. **True or False:** Export enables you to back up projects in a database.
4. **True or False:** When P6 Professional imports updated data, it always overwrites the existing information in the database.



Case Study 3 – Optimizing and Baselining

Lecture Time (minutes)	Demo Time (minutes)	Practice Time (minutes)	Interactive Time (minutes)	Lesson Total (minutes)
				60

Optimizing and Baselining

Background

The building renovation project has been created and scheduled with a start date of 05-Mar-18. As project manager, you will assign resources, optimize the project plan to ensure it can be completed by the Must Finish By date, and then assign a baseline.

Objectives

1. Open a project, *RENO-3 RENO – Optimizing and Baseling*, and a layout, *Classic WBS*.
2. Assign resources to activities as indicated in the table below.

Activity ID	Activity Name	Resource ID	Resource Name	Budgeted Units/Time
A1010	Design renovations	SWID	Scott Widdall	8h/d
A1160	Inspect and repair roof structure	BMANTH	Bryce Manthorne	2h/d
A1190	Upgrade heating system	INSPECT-R	Inspector-Renovation	1h/d

3. Schedule the project with a data date of 5-Mar-18.
4. In Project Details, compare the scheduled Finish date to the Must Finish By date.
 - a. What is the Finish date? _____
 - b. What is the Must Finish By date? _____
 - c. Is the project scheduled to finish on time? _____
5. Below are three options for reducing the duration of the project. Which option would you choose and why?
 - ◆ **Option 1:** The durations of the three activities in the *Utility Systems* WBS have been generously estimated. The three activities can each be reduced by 4 days.
 - ◆ **Option 2:** The Finish to Start relationship between activities *A1090* and *A1110* includes 7 days of lag. This lag can be reduced to 3 days.
 - ◆ **Option 3:** The special-order shingles required for activity *A1220* are available sooner than expected. The Start On or After constraint can be removed, enabling the activity to start 9 days earlier.
6. After making the change to the project above, reschedule the project with a data date of 05-Mar-18.

- a. Is the project now scheduled to finish on time? _____
7. Now that the schedule has been optimized, your next step is to ensure that no project resources are overallocated. Use the Resource Usage Profile to check each project resource for overallocation. (Set the left pane to display Current Project's Resources, and set the right pane to display Open Projects Only.)

a. Are any project resources overallocated? _____

b. Which weeks show overallocation for the resource?

Week #1 _____ Week #2 _____ Week #3 _____

- c. Using the table below, list the overallocated resource's activities that occur in the weeks showing overallocation.

Activity IDs for Week #1	Activity IDs for Week #2	Activity IDs for Week #3

- d. Which activity occurs in all three weeks?
- e. Replace the overallocated resource with another resource, Joe Couto, in the least number of activities necessary to resolve the existing overallocation. After making changes, press *F5* on your keyboard to refresh the data. Which activities did you assign the new resource to?
8. Now that the schedule and resources have been optimized, ensure that the cost is acceptable as well. The *RENO-3* project has an scinal budget of \$190,000. Is the project still within budget?
- _____

9. With the schedule, resources, and costs optimized, the project is ready to begin. But first, you should baseline the project.
- a. Create a project baseline and a primary user baseline.
- b. Display the primary baseline in the Gantt chart.
- c. Save the project plan and export it to C:\Training Docs in XML format.
-

