

Lessons Learned – Schedule Development using Primavera P6™ Professional

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- Degree/University:
 - BS – Construction Management
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- Years of Experience / Background:
 - 25+ years in construction industry, primary focus on planning, scheduling, project controls, and claims services
 - Clients: Owners, Developers, Construction Managers, General Contractors, Subcontractors
 - Project experience: commercial, residential/custom homes, multi-family/student housing, retail, hospital, medical, hospitality, education, casino, correctional, infrastructure, public works and industrial sectors

Author Biography – Charlie Jackson

- Position / Company:
 - Senior Scheduler
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- Degree / University:
 - BA – Baylor University, Waco, TX
 - Journalism, Russian Language
- Years of Experience / Background:
 - 25+ years in the construction industry, primary focus on project controls (planning and scheduling)
 - Training scheduling best practices (P6 and Microsoft Project, P3, and SureTrak) and implementation
 - Clients – Owners, Developers, GCs, Subcontractors
 - Project experience: public works, infrastructure, retail and commercial, military housing, education, casino, pharmaceutical, oil and gas, and healthcare, data center

Introduction

Many specs are requiring the use of the latest Primavera software (P6™)

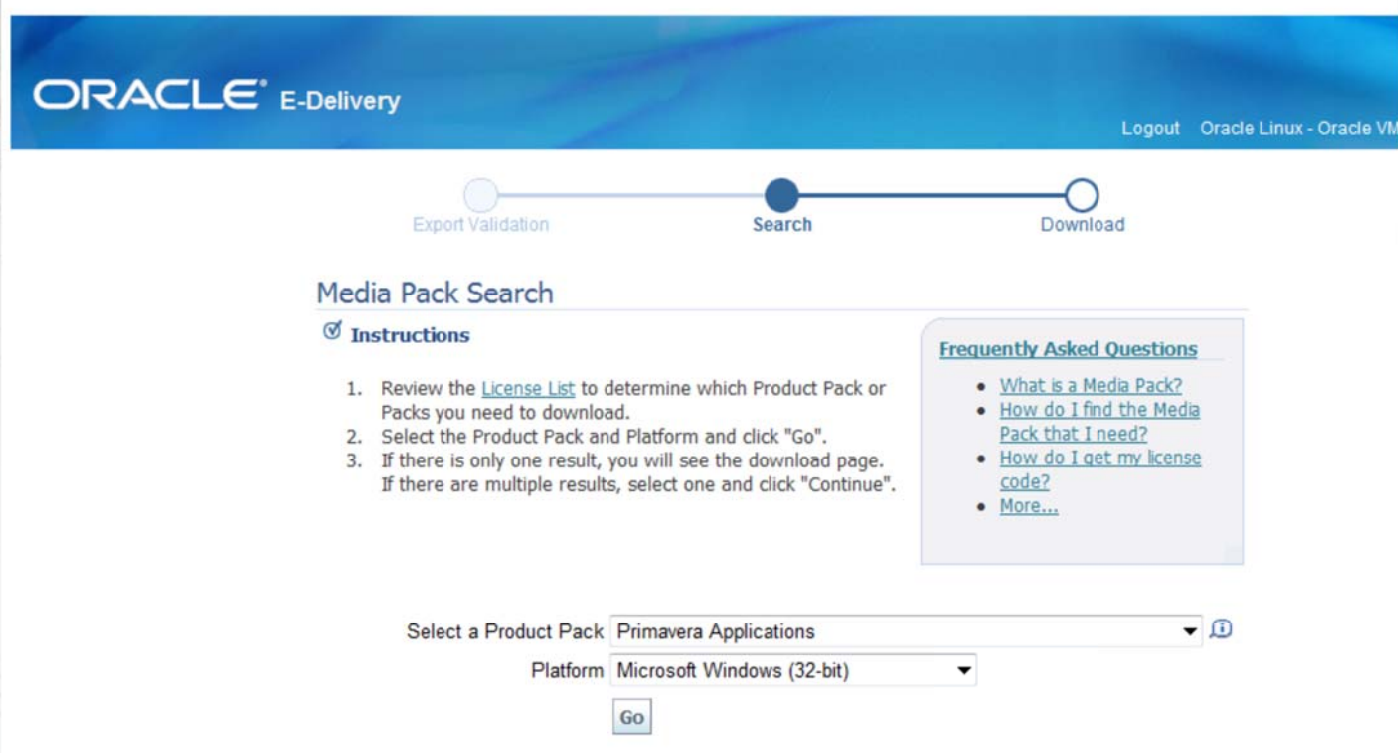
Our presentation focuses on the use of Primavera P6™ Professional* to accomplish the 1st 7 steps for Schedule Planning and Development (from AACE TCM 7.2)

Note: *Primavera client versions through 22.x

1. Plan for Schedule Planning and Development
2. Identify Activities
3. Develop Activity Logic
4. Estimate Durations
5. Establish Schedule Requirements
6. Allocate Resources
7. Optimize Schedule

Application Download & Installation

Oracle E-Delivery website: <http://edelivery.oracle.com>



The screenshot displays the Oracle E-Delivery website interface. At the top, the Oracle logo and "E-Delivery" text are on the left, and "Logout Oracle Linux - Oracle VM" is on the right. A progress bar below the header shows three steps: "Export Validation" (unselected), "Search" (selected), and "Download" (unselected). The main content area is titled "Media Pack Search" and includes a "Instructions" section with three numbered steps: 1. Review the [License List](#) to determine which Product Pack or Packs you need to download. 2. Select the Product Pack and Platform and click "Go". 3. If there is only one result, you will see the download page. If there are multiple results, select one and click "Continue". To the right of the instructions is a "Frequently Asked Questions" box with links for "What is a Media Pack?", "How do I find the Media Pack that I need?", "How do I get my license code?", and "More...". Below the instructions, there are two dropdown menus: "Select a Product Pack" with "Primavera Applications" selected, and "Platform" with "Microsoft Windows (32-bit)" selected. A "Go" button is positioned below the platform dropdown.

Using either database engine Oracle or Microsoft SQL, install the client application and connect the client to the database.

Note: Do not use the sample database as the production environment.

Application Structures

GLOBAL versus PROJECT Structures

Project Management or P6™ organizes project information based on hierarchical structures. Each structure consists of at least one root or base level and multiple sub or lower levels.

At the highest level the projects are typically organized around an 'Enterprise Project Structure' (EPS) or grouping of the database of projects. Groups might include type, clients, phasing, etc. Projects are organized by common attributes based on the organizational requirements.

Data within P6 is either 'global' or general to the database of projects or to the individual user accessing multiple projects OR is 'project' specific meaning it is associated to a single project within the database.

The screenshot displays a software interface with a hierarchical tree view on the left and a 'Schedule Dates' form on the right. The tree view is titled 'Layout: Projects' and shows a hierarchy starting with 'COMPANY' (COMPANY NAME), followed by 'DIVISION A' (DIVISION (EDUCATION)), 'LOCATION A.1' (LOCATION (CALIFORNIA)), 'CLIENT A.1.1' (CLIENT (LASD)), and 'CLIENT A.1.2' (CLIENT (SDSD)). Under 'CLIENT A.1.1', there are three projects: Project A, Project B, and Project C. Under 'CLIENT A.1.2', there are three projects: Project D, Project E, and Project F. Below the tree view, there are three more divisions: 'DIVISION B' (DIVISION (FACILITIES)) and 'DIVISION C' (DIVISION (HEALTHCARE)). The 'Schedule Dates' form has tabs for 'General', 'Notebook', 'Planning Resources', 'Budget Log', 'Spending Plan', and 'Budget S'. The form contains three rows of date fields: 'Planned Start' and 'Must Finish By', 'Data Date' and 'Finish', and 'Actual Start' and 'Actual Finish'.

Plan for Schedule Planning & Development

P6 Considerations

- **Planning Considerations** – project level or contractual requirements as well as internal organizational requirements
 - Application Integration
 - Global/Project Structures
 - Project Definition and Coding – Global
 - Work Breakdown Structure (WBS) – Project
 - WBS Coding – Global
 - Activity Code Structures – both Global and Project
 - Activity Structures (ID's and Naming Conventions) – Project
 - Resources – Global
 - Calendars – both Global and Project
 - Resource / Cost Requirements – loading/allocation and maintenance
 - Durations and Defined Workday
 - Schedule Calculation Rules
 - Optimization and Reporting

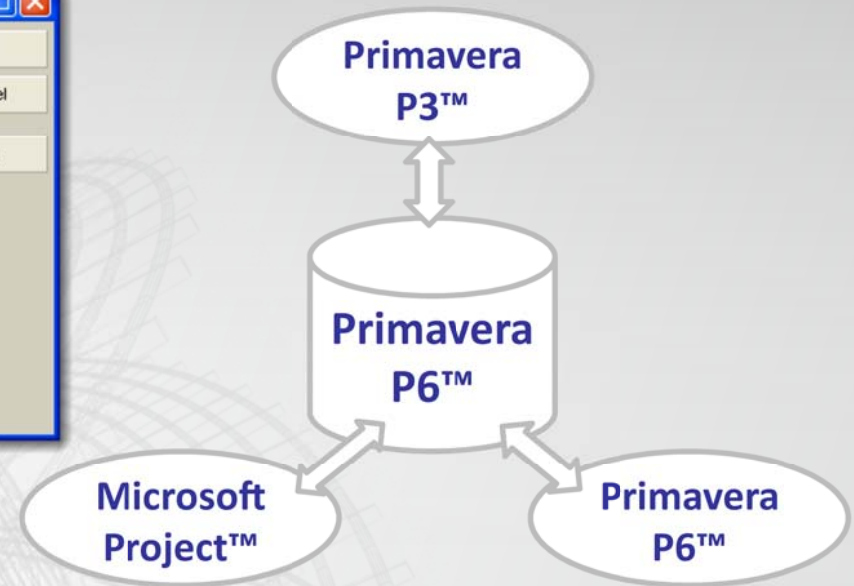
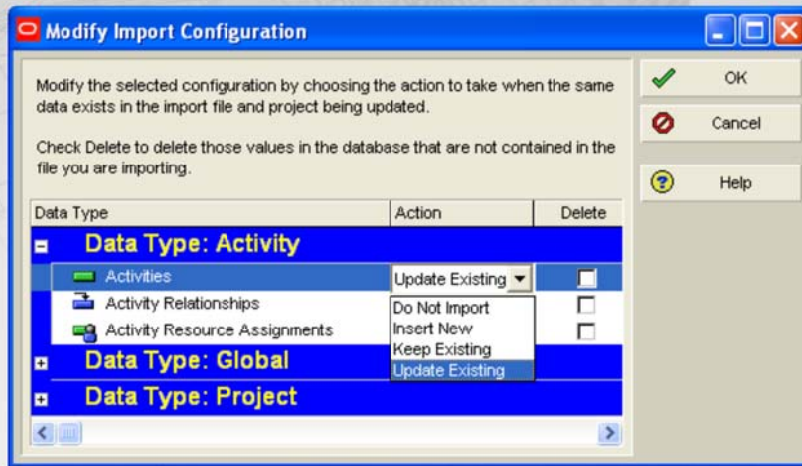
Maintain Consistency

1. Global Structures
2. Project Structures

Plan for Schedule Planning & Development

Application Integration

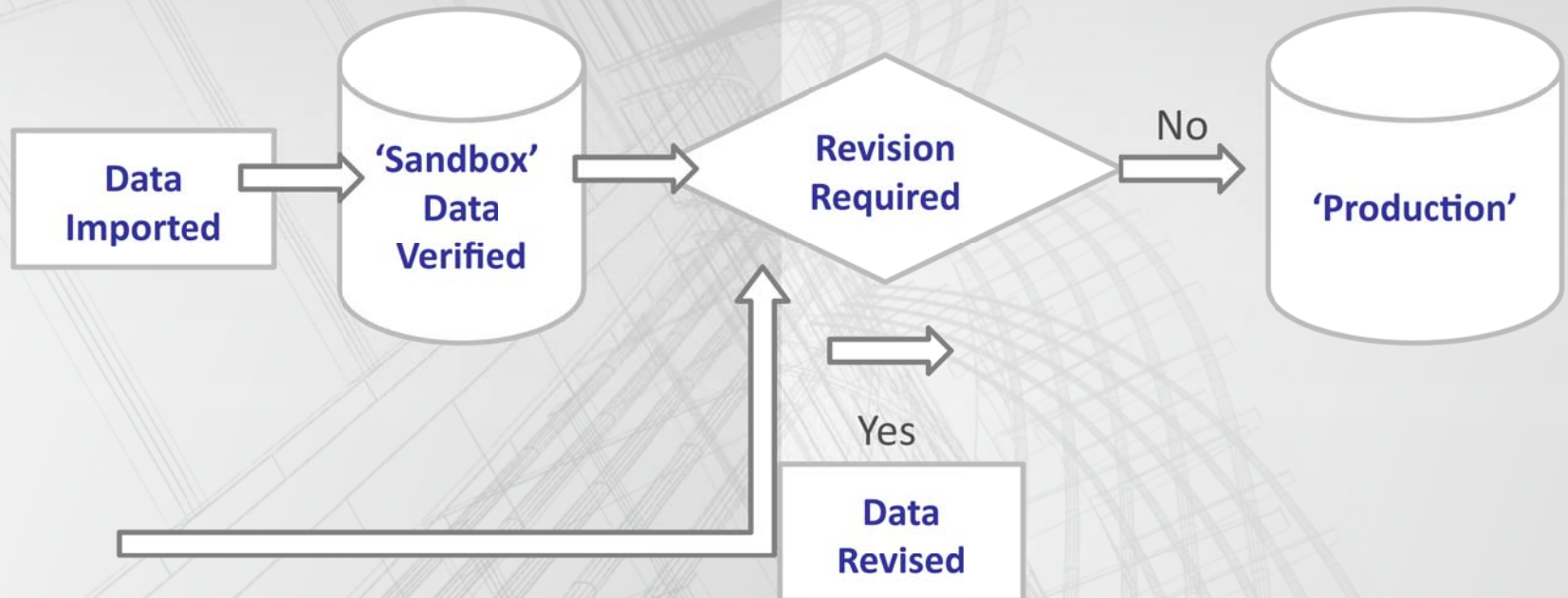
- Scheduling System Integration Considerations
 - Export Format and Import Templates – XML/XER exports and Import Configurations



- Integration with Primavera P3™
- Integration with Microsoft Project™
- Integration with other Primavera P6™ (other versions)

Plan for Schedule Planning & Development

- Organization of Databases within Primavera P6™
 - Production database – working, ‘live’ database
 - Intermediary/‘Sandbox’ database – review (possible training) database, used for data scrubbing



Plan for Schedule Planning & Development

- Enterprise Project Structure (EPS)
- Organizes projects in the database
- By Division , Location, Client, etc.

The screenshot displays a project management software interface. On the left, a tree view shows the project hierarchy:

- COMPANY COMPANY NAME
 - DIVISION A DIVISION (EDUCATION)
 - LOCATION A.1 LOCATION (CALIFORNIA)
 - CLIENT A.1.1 CLIENT (LASD)
 - Project A Project A
 - Project B Project B
 - Project C Project C
 - CLIENT A.1.2 CLIENT (SDSD)
 - Project D Project D
 - Project E Project E
 - LOCATION A.2 LOCATION (GEORGIA)
 - CLIENT A.2.1 CLIENT (ASD)
 - Project F Project F
 - DIVISION B DIVISION (FACILITIES)
 - DIVISION C DIVISION (HEALTHCARE)

On the right, a Gantt chart shows project schedules from 2007 to 2010. The chart is organized by quarter (Q1-Q4) for each year. Green bars represent project durations:

- Project A: 01-Jun-08 A to 31-Jul-10
- Project B: 01-Jun-08 A to 29-Sep-10
- Project C: 20-Jul-07 A to 30-Jun-10
- Project D: 05-May-08 A to 30-Jun-10
- Project E: 03-Sep-07 A to 30-Jun-10
- Project F: 01-Jun-08 A to 31-Jul-10

At the bottom, a 'Schedule Dates' section contains input fields for:

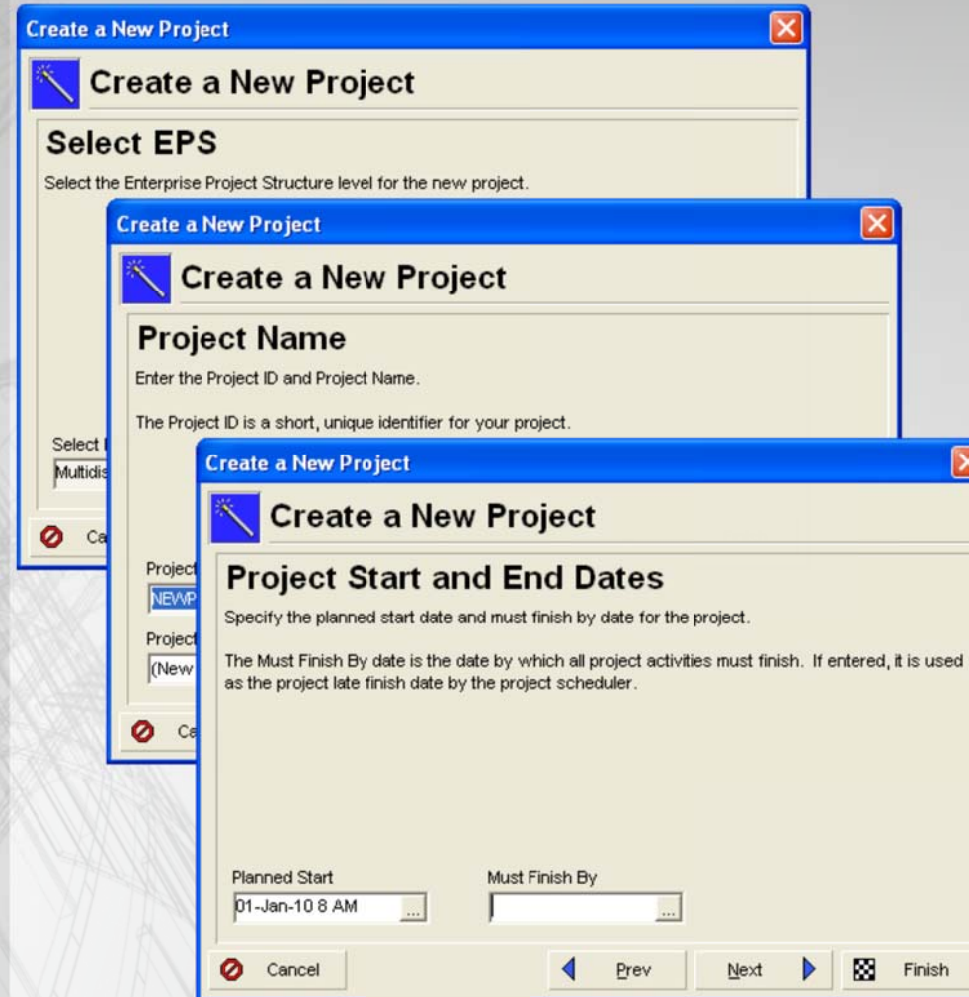
- Planned Start
- Must Finish By
- Data Date
- Finish
- Actual Start
- Actual Finish

An 'Anticipated Dates' section contains input fields for:

- Anticipated Start
- Anticipated Finish

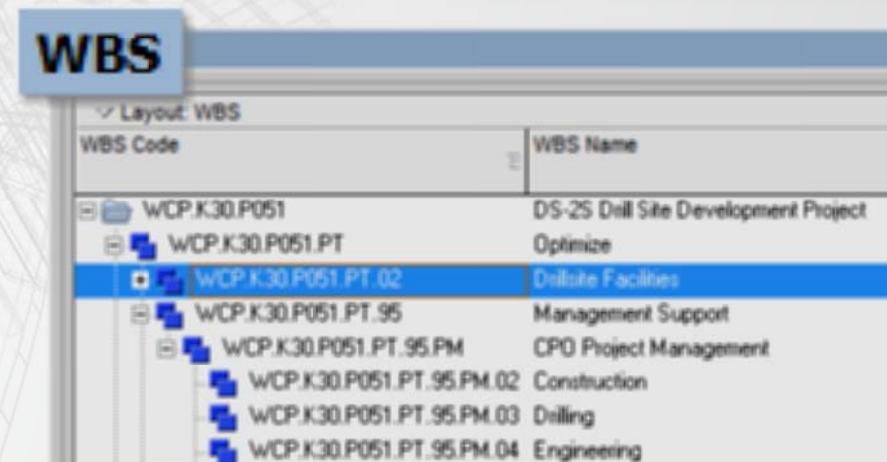
Plan for Schedule Planning & Development

- Adding the Project (using the Create a New Project 'wizard')
 - Enter the Project Basics
 - Project ID (20 alpha-numeric characters recommended) to uniquely identify the individual schedule file or type of schedule (e.g. Current, Baseline, What-if, TIA, etc.)
 - Schedule Planned Start
 - Must Finish By (if required)



Identify Project Structure – Activities

- Start with Structures – foundation for schedule organization
- Work Breakdown Structure (WBS) – Project specific
 - Hierarchical breakdown of the project (e.g. Phase, Area, Location, etc. and/or Cost Breakdown)
 - Used in standard layouts (reports)
 - Standard for grouping activities within Primavera
 - Used for Earned Value calculation settings
 - Copy / Paste functionality
 - Pred/Succ organization
 - WBS Summary Activities



The screenshot shows a software interface for a Work Breakdown Structure (WBS). A blue box with the text 'WBS' is positioned above the table. The table has two columns: 'WBS Code' and 'WBS Name'. The structure is hierarchical, with expandable/collapsible icons to the left of each code. The 'Drillsite Facilities' row is highlighted in blue.

WBS Code	WBS Name
WCP.K30.P051	DS-2S Drill Site Development Project
WCP.K30.P051.PT	Optimize
WCP.K30.P051.PT.02	Drillsite Facilities
WCP.K30.P051.PT.95	Management Support
WCP.K30.P051.PT.95.PM	CPO Project Management
WCP.K30.P051.PT.95.PM.02	Construction
WCP.K30.P051.PT.95.PM.03	Drilling
WCP.K30.P051.PT.95.PM.04	Engineering

Identify Project Structure – Activities

- Start with Structures
 - WBS Categories – **GLOBAL**
 - Code WBS levels (Admin menu, Admin Categories)
 - Group activities across the Enterprise

The image shows two screenshots related to project structure management. The left screenshot is a table with three columns: WBS Code, WBS Name, and WBS Categories. The right screenshot is a dialog box titled 'Admin Categories' showing a list of 'Baseline Types'.

WBS Code	WBS Name	WBS Categories
Project B	Project B	
Project B.1	Project Phasing & Constraints	Requirements Definition
Project B.1.1	Phase 1	Requirements Definition
Project B.1.2	Phase 2	Requirements Definition
Project B.1.3	Phase 3	Requirements Definition
Project B.1.4	Constraints	Requirements Definition
Project B.2	General Conditions	Requirements Definition
Project B.3	Construction	
Project B.3.1	Phase 1	Design and Engineering
Project B.3.1.1	Demolition	Design and Engineering
Project B.3.1.2	Site Work	Design and Engineering
Project B.3.1.3	Building 1	Design and Engineering

The 'Admin Categories' dialog box shows a list of 'Baseline Types' with the following items:

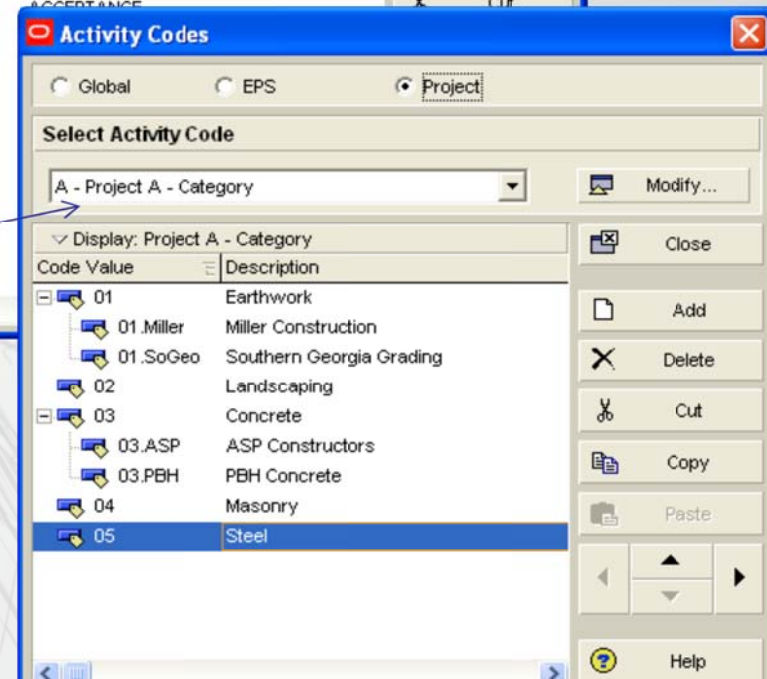
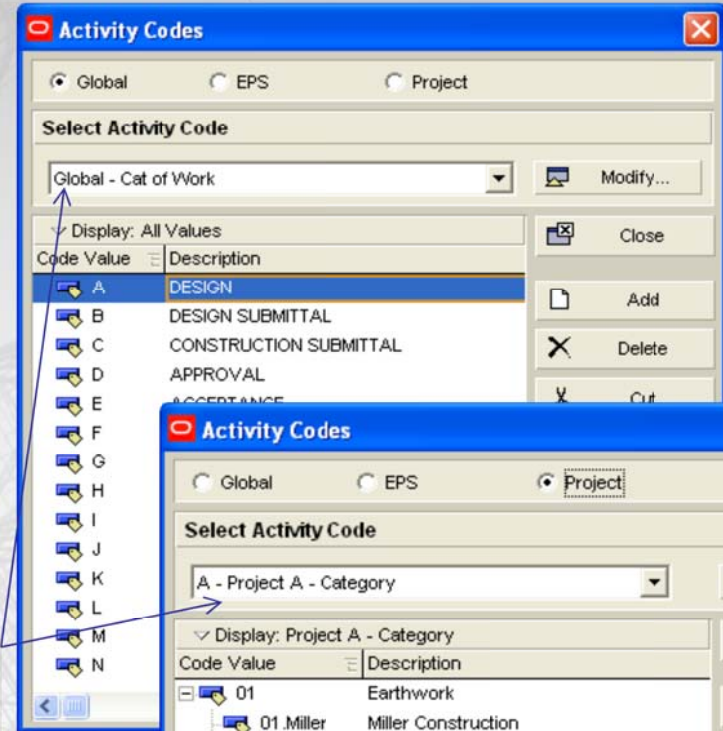
- Initial Planning Baseline
- Customer Sign-Off Baseline
- Management Sign-Off Baseline
- Mid Project Status Baseline
- What-if Project Plan Baseline

Identify Project Structure – Activities

- Start with Structures – hierarchical activity structure
- Activity Codes structure (Enterprise menu, Activity Codes)
 - Global
 - EPS
 - Project
- Consider existing structures
 - Use standard naming convention to avoid system confusion (data transfer)

Global Code –
'Global' + *Code Name*

Project Code –
'Project Identifier' + *Code Name*



Identify Project Structure – Activities

- Edit, User Preferences, Application: User can choose to show code value or description

User Preferences

Time Units

Dates

Currency

E-Mail

Assistance

Application

Resource Analysis

Calculations

Startup Filters

Personal Information

Startup Window

Application Startup Window
Activities

Show the Issue Navigator dialog at startup

Show the Welcome dialog at startup

Group and Sorting

Labels on grouping bands

Show ID / Code

Show Name / Description

Codes

Specify how to display code values

Code Value

Description

Columns

Load Financial Period data

Select the financial period range to view in columns

to

?

Help

Close

Activity ID	Activity Name	I-Subcontractor
ENV-C-1260	Install Brick East	Mason
ENV-C-1300	Install Brick at Clearstory	Mason
ENV-C-1120	Install Window Framing at Clearstory	Storefronts
ENV-C-1090	Install Window Framing South	Storefronts
ENV-C-1100	Install Window Framing West	Storefronts
ENV-C-1110	Install Window Framing East	Storefronts
ENV-C-1160	Install Glazing at Clearstory	Storefronts
ENV-C-1130	Install Glazing South	Storefronts
ENV-C-1150	Install Glazing East	Storefronts
ENV-C-1140	Install Glazig West	Storefronts
ENV-C-1170	Install Roof Insulation	Roofing

Identify Activities

- Activity ID – *must be unique*
 - Smart ID (i.e. CSI division or location identifier)
 - 20 (*in v20.x*) alpha-numeric characters but consider limiting to 10 characters if importing / exporting to P3/SureTrak, or older versions of P6
- Auto-numbering (Project Details, Defaults tab)
- Can be modified easily in P6 v.7 and later (Edit menu, Renumber Activity IDs)
 - Increment Activity ID
 - Auto number
 - Replace Beginning Characters
- Do not alter IDs after schedule it is published

Auto-numbering Defaults

Activity ID Prefix	Activity ID Suffix	Increment
<input type="text" value="A"/>	<input type="text" value="1000"/>	<input type="text" value="10"/>

Increment Activity ID based on selected activity

Renumber Activity IDs

Increment Activity ID based on selected activities
Increment Value:

Auto-number
Prefix: Suffix: Increment Value:

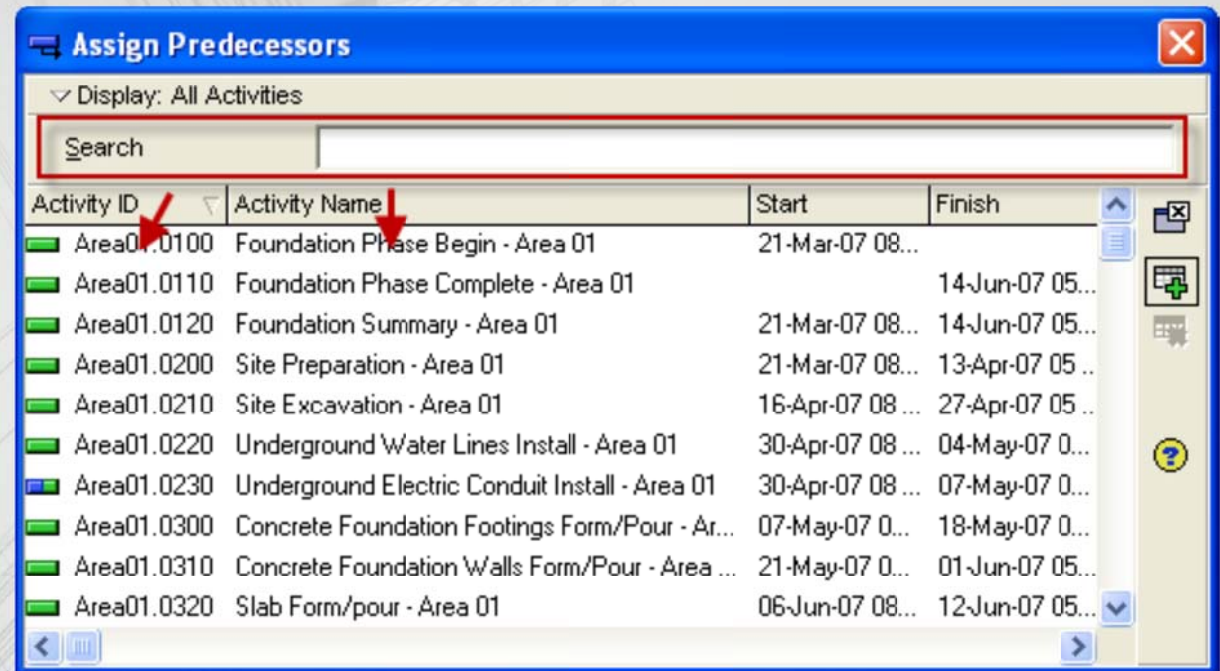
Replace beginning characters
Number of characters: Replace with:

Renumber selected activities in baselines

OK Cancel Help

Identify Activities

- Activity Name
 - Clear, concise, and consistent
 - Keyword as left-most word in name (i.e. Subject or Noun + Verb) – a helpful for Sorting, Searching in Predecessor/Successor windows
 - 120 characters (system limit) but limit to 48 characters if importing / exporting to P3 / SureTrak



Activity ID	Activity Name	Start	Finish
Area01.0100	Foundation Phase Begin - Area 01	21-Mar-07 08...	
Area01.0110	Foundation Phase Complete - Area 01		14-Jun-07 05...
Area01.0120	Foundation Summary - Area 01	21-Mar-07 08...	14-Jun-07 05...
Area01.0200	Site Preparation - Area 01	21-Mar-07 08...	13-Apr-07 05...
Area01.0210	Site Excavation - Area 01	16-Apr-07 08...	27-Apr-07 05...
Area01.0220	Underground Water Lines Install - Area 01	30-Apr-07 08...	04-May-07 0...
Area01.0230	Underground Electric Conduit Install - Area 01	30-Apr-07 08...	07-May-07 0...
Area01.0300	Concrete Foundation Footings Form/Pour - Ar...	07-May-07 0...	18-May-07 0...
Area01.0310	Concrete Foundation Walls Form/Pour - Area ...	21-May-07 0...	01-Jun-07 05...
Area01.0320	Slab Form/pour - Area 01	06-Jun-07 08...	12-Jun-07 05...

Identify Activities

- Six Activity Types
 - Milestones – Start and Finish Milestones
 - Task Dependent and Resource Dependent
 - Level of Effort and WBS Summary
 - Default Activity Type is set at project level (Project Details, Defaults tab)

General | Dates | Defaults | Notebook | Budget Log | Spending Plan | Budget Su

Defaults for New Activities

Duration Type: Fixed Duration & Units

Percent Complete Type: Duration

Activity Type: Task Dependent

- Finish Milestone
- Level of Effort
- Resource Dependent
- Start Milestone
- Task Dependent**
- WBS Summary

- Modify Activity Type per activity (Activity Details, General tab)

General | Status | Resources | Relationships | Predecessors | Successors | Codes

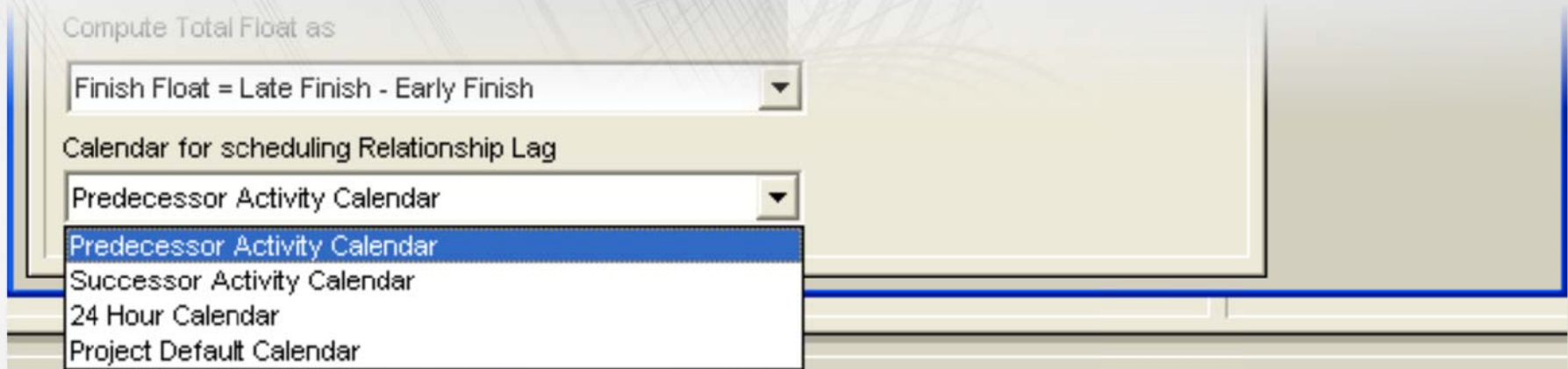
Activity MI-0020 SUBSTANTIAL COMPLETION

Activity Type: Finish Milestone

Duration Type: Fixed Duration and Units/Time

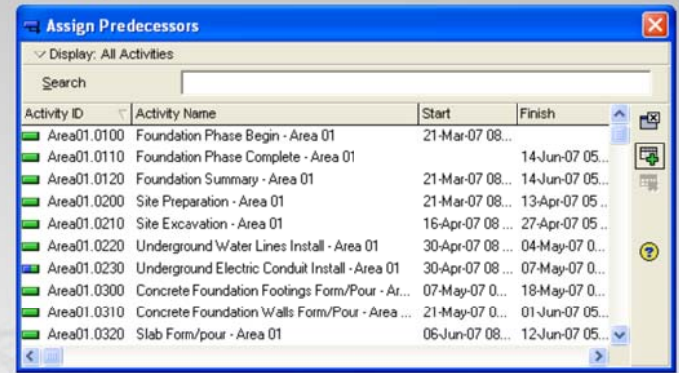
Develop Schedule Logic

- Four Precedence Relationship Types
 - Finish to Start (FS), Finish to Finish (FF), Start to Start (SS), Start to Finish (SF)
- Lags and Leads
 - Scheduling Option (Tools menu, Schedule, Options) to choose which calendar determines lags / leads

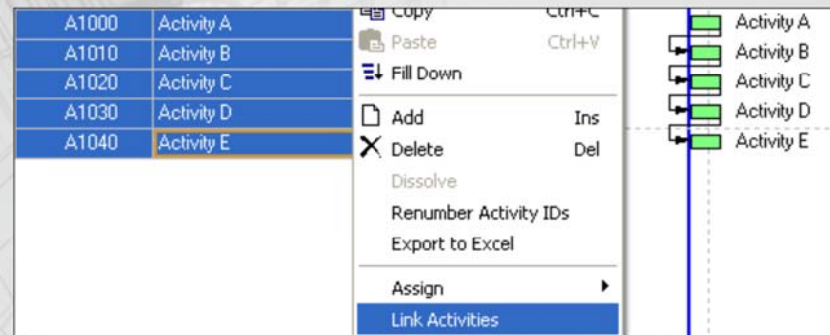


Develop Schedule Logic

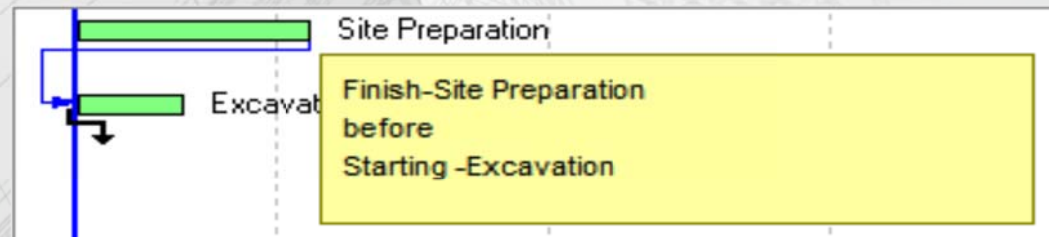
- Three Methods for Assigning Relationships
- Predecessor and Successor Windows (Group and Sort by, Columns)



- Linking Activities (no 'Unlink' option)

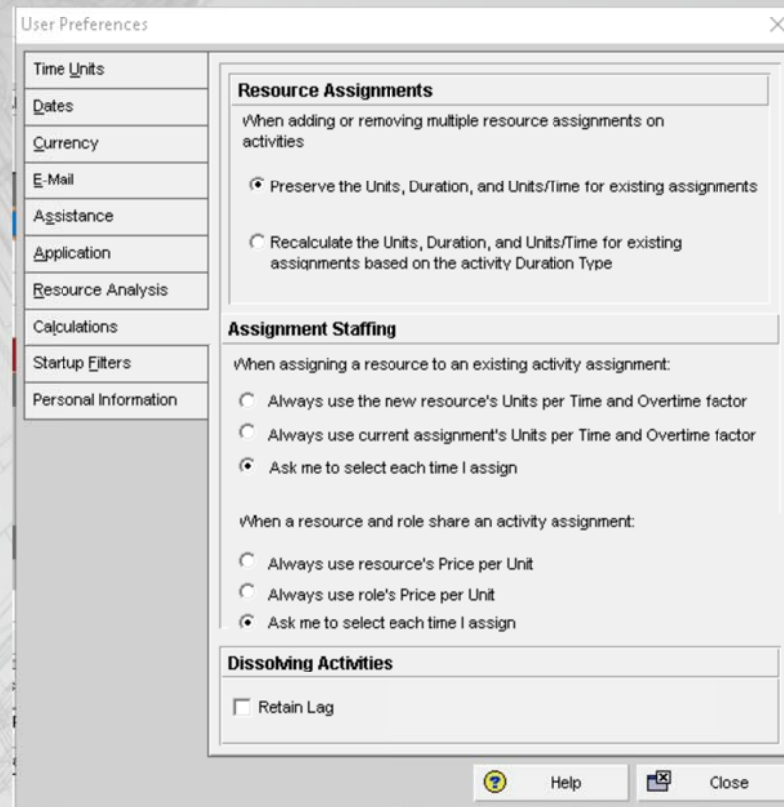


- 'Drawing' Relationships



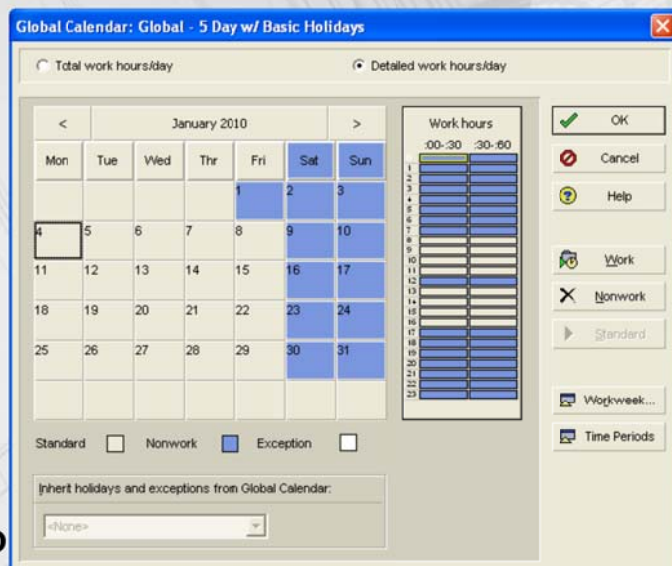
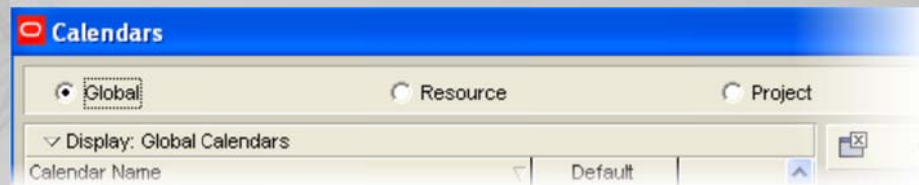
Develop Schedule Logic

- Dissolving activities
 - Edit, User Preferences, Calculations
 - Retain Lag

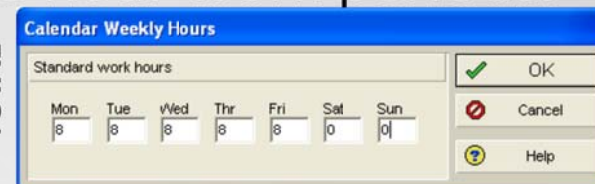


Estimate Durations

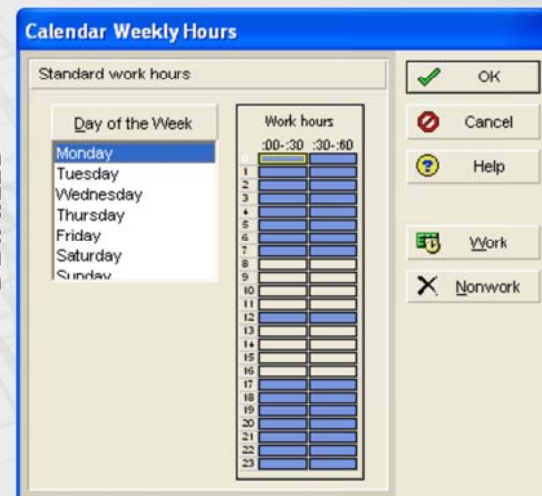
- Calendar Types (Enterprise menu, Calendars)
 - Global (database) – templates
 - Resource
 - Project (project specific)
- Work Periods - System calendars are set to 8 hour work periods.



TOTAL



DETAILED



Important – P

nute

Estimate Durations

- Preferences (Admin vs User) for calculating and displaying data:
 - TIME UNITS (Edit menu, User Preferences, Time Units tab)
 - Check Dates and Times (Start/Finish) (Edit menu, User Preferences, Dates tab)

The screenshot shows the 'User Preferences' dialog box with the 'Time Units' tab selected. The 'Units Format' section has 'Unit of Time' set to 'Day', 'Sub-unit' unchecked, and 'Decimals' set to '0'. The 'Show Unit label' checkbox is checked, and the 'Example' field contains '5d'. The 'Durations Format' section has 'Unit of Time' set to 'Day', 'Sub-unit' unchecked, and 'Decimals' set to '0'. The 'Show Duration label' checkbox is checked, and the 'Example' field contains '10d'.

The 'Time' section has three radio buttons: '12 hour (1:30 PM)' (selected), '24 hour (13:30)', and 'Do not show time'. The 'Show minutes' checkbox is checked. The 'Sample' section has a text field containing '29-Jun-10 12:00 AM'.

Once the calendar settings are in place, and activities and their durations added, caution should be taken when changing the calendar 'rules'!

Estimate Durations

- TIME PERIODS (Admin menu, Admin Preferences, Time Periods tab)
Version 7 and later allows workdays to be defined at calendar level
“Use assigned calendar to specify the number of work hours for each time period”

The screenshot shows the 'Admin Preferences' dialog box with the 'Time Periods' tab selected. The 'Hours per Time Period' section contains four input fields: 'Hours/Day' (8.0), 'Hours/Week' (40.0), 'Hours/Month' (172.0), and 'Hours/Year' (2000.0). A checkbox labeled 'Use assigned calendar to specify the number of work hours for each time period' is checked.

The screenshot shows the 'Hours per Time Period' dialog box. It contains the same four input fields as the previous screenshot: 'Hours/Day' (10.0), 'Hours/Week' (40.0), 'Hours/Month' (172.0), and 'Hours/Year' (2000.0). On the right side, there are three buttons: 'OK' (with a green checkmark icon), 'Cancel' (with a red 'X' icon), and 'Help' (with a yellow question mark icon).

Note: Issue with BL workdays, uses 8 hours regardless of Calendar. Oracle issue # [ID 906081.1]

Establish Schedule Requirements

- Contract time requirements regarding start/finish dates.
- Non-precedence Constraints (Activity Details, Status Tab)

- Primary
- Secondary

Constraints

Primary Secondary

Date Date

- Types

Start on or After	Finish on
Finish on or After	Mandatory Start
Start on or Before	Mandatory Finish
Finish on or Before	As Late as Possible
Start on	Must Finish by (Project Constraint)

P3 Users: there is no Zero Total Float option (now use Finish on or Before); there is no Zero Free Float option (now use As Late As Possible)

Allocate Resources

- Define Resource Breakdown Structure (RBS) and Cost Accounts – **GLOBAL**

Resources

Display: All Resources

Resource ID	Resource Name	Resource Type
COP_AK	ConocoPhillips - Alaska	Nonlabor
CPA_CPO	CPAI Capital Projects Organization	Nonlabor
CPA_PM	CPAI Project Management Group	Nonlabor
CPA_PMEN	CPAI Project Engineer	Labor
CPA_PMPL	CPAI Project Leader	Labor
PRGSPT	CPAI Program Support	Labor
CPA_CS	Construction Services Group	Nonlabor

Cost Accounts

Display: All Cost Accounts

Cost Account ID	Cost Account Name
00100	00100
00200	00200
00300	00300
00400	00400
00500	00500
00600	00600
00700	00700
00800	00800

Cost Account ID: 00100 Cost Account Name: 00100

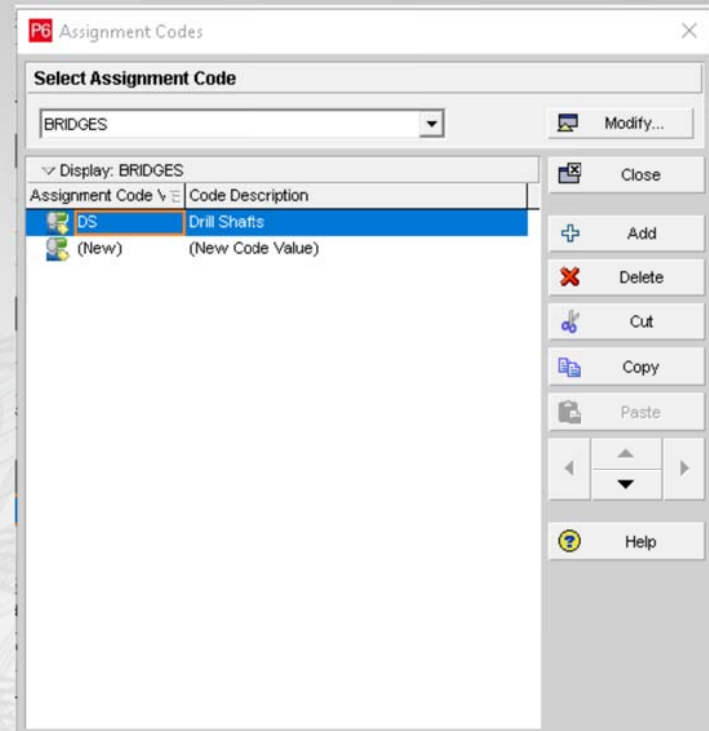
Cost Account Description

Modify Print Copy

- Identify Project Resources vs. Global Resources (Example: *Project ID* + Name) using hierarchical structure
- Resources can be Labor, Non Labor, and Material

Allocate Resources

- Define Resource Assignment Codes (Enterprise, Assignment Codes) – **GLOBAL (v.20X)**



- Ability to categorize individual resource assignments (ex: cost v revenue, OFCI v CFCI)

Allocate Resources

- Defining Resource Settings (should be initially defined)
 - Resource Details for Labor, Nonlabor, Material
 - Auto Compute Actuals
 - Calculate costs from units

Resources

Display: All Resources

Resource ID	Resource Name	Resource Type	Unit of Measure	Primary Role	Default Units / Time
CDP_AK	ConocoPhillips - Alaska	Nonlabor			8/d
CPA_CPO	CPAI Capital Projects Organization	Nonlabor			8/d
CPA_PM	CPAI Project Management Group	Nonlabor			8/d
CPA_PMEN	CPAI Project Engineer	Labor		Project Engineer	8/d
CPA_PMPL	CPAI Project Leader	Labor		Project Leader	8/d
PRGSPT	CPAI Program Support	Labor			8/d

General Codes Details Units & Prices Roles Notes

Resource Type: Labor Nonlabor Material

Unit of Measure: [Dropdown]

Currency and Overtime: Currency: US Dollar

Overtime Allowed: Overtime Factor: [Input]

Profile: Calendar: CPAI - 5 day, 08 hr/day, w/ Holidays

Default Units / Time: 8/d

Auto Compute Actuals
 Calculate costs from units

- Project and Activity Details
 - Override Resource Details settings – Calculate Costs from Units

Project Management 301 74 26-Aug-13 0 21:4

A61770 Define - Project Management 274 74 0% 26-Aug-13 0 21:4

General Status Resources Relationships Feedback

Activity: A61770 Define - Project Management

Resource ID Name	Auto Compute Actuals	Calculate costs from units
CPA_PMEN CPAI Project Engineer	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CPA_PMPL CPAI Project Leader	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Allocate Resources

- And at Project Level (Project Details, Calculations tab)
 - Link Actual and Actual This Period Units and Costs (when using Financial Periods for storing resource actuals per period)

Summary Resources Calculations Funding Codes Settings

Resource Assignments

When updating Actual Units or Cost

Add Actual to Remaining

Subtract Actual from At Completion

Recalculate Actual Units and Cost when duration % complete changes

Update units when costs change on resource assignments

Link Actual and Actual This Period Units and Cost

- Resources Drive activity dates by default for resource dependent activities with resource calendars (Project Details, Resources tab)

Summary Funding Codes Resources Settings Calculations

Assignment Defaults

Specify the default Rate Type for new assignments

Price / Unit

Drive activity dates by default

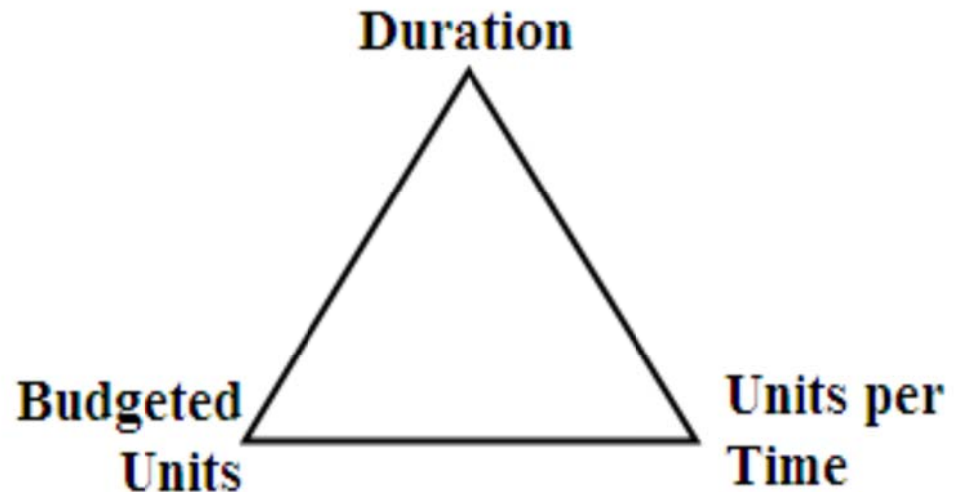
Resource Assignments

Resources can be assigned to the same activity more than once

Allocate Resources

Other Project level defaults to consider *prior to developing activity list* (can be set to specific activities)

- Duration Types
 - Fixed Duration and Units (**default**)
 - Fixed Duration and Units/Time
 - Fixed Units
 - Fixed Units/Time



Allocate Resources

- Percent Complete Types
 - Duration Percent Complete (**default**) – *calculated*
 - Physical Percent Complete – *manual entry*
 - Units Percent Complete – *calculated*

Activity
Percent
Complete
1.4.A.4.

4. Remaining durations for activities.
 - a. The remaining duration shall be the actual time in workdays to complete the activity.
 - b. Remaining duration shall not be automatically computed based on the percent complete of the activity.

- Default type defined at the Project Level (Projects Details, Defaults tab) but can be modified at the Activity Level (Activity Details, General Tab)
- Project Level defaults only apply to new activities.

Allocate Resources

- Financial Periods (Global) – used for storing and distributing past period resource actuals per defined period
- Periods are defined at Admin level for **ALL** projects in the database (Admin menu, Financial Periods)
- In v20.x: Admin menu, Financial Period Calendars: can create calendar for project specific financial periods

The screenshot displays two windows from the Primavera 6 (P6) software interface. The left window, titled "Financial Period Calendars", shows a table with two columns: "Financial Period Calendar" and "Default". The "Calendar" row is selected, and the "Default" checkbox is checked. The right window, titled "Financial Periods for: Calendar", shows the "Batch Create Financial Periods" configuration panel and a list of financial periods.

Batch Create Financial Periods Configuration:

- Last Period End Date: 31-Dec-30
- Batch Start Date: 01-Jan-31 (Wednesday)
- Batch End Date: 28-Jan-31 (Tuesday)
- Financial Period:
 - Every 4 Weeks
 - Every 3 Months
 - Every Year
- Period Ends On: Saturday
- Batch Create button

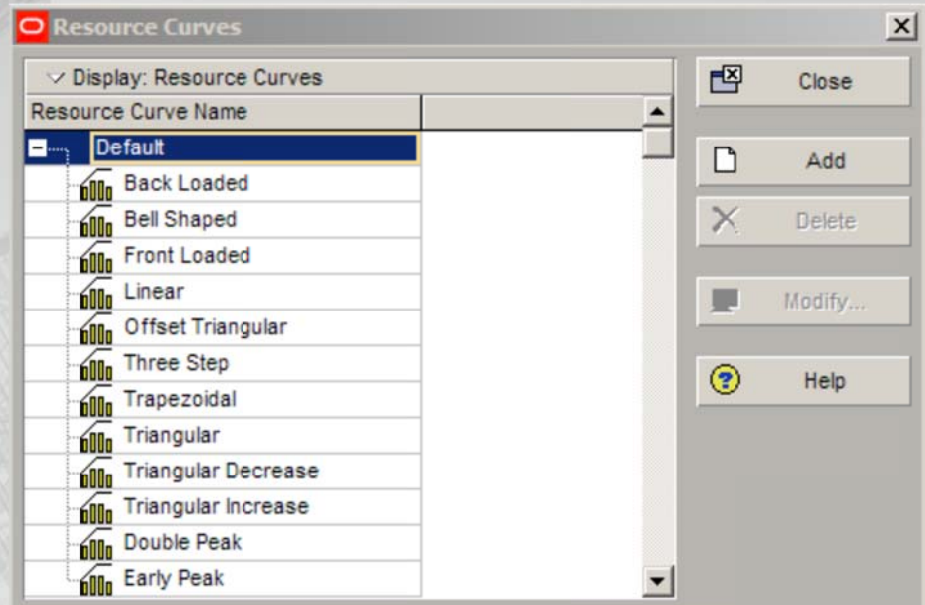
Financial Periods List:

Period Name	Start Date	End Date
2010-07-01	01-Jul-10	31-Jul-10
2010-08-01	01-Aug-10	31-Aug-10
2010-09-01	01-Sep-10	30-Sep-10
2010-10-01	01-Oct-10	31-Oct-10
2010-11-01	01-Nov-10	30-Nov-10
2010-12-01	01-Dec-10	31-Dec-10
2011-01-01	01-Jan-11	31-Jan-11
2011-02-01	01-Feb-11	28-Feb-11
2011-03-01	01-Mar-11	31-Mar-11
2011-04-01	01-Apr-11	30-Apr-11
2011-05-01	01-May-11	31-May-11
2011-06-01	01-Jun-11	30-Jun-11
2011-07-01	01-Jul-11	31-Jul-11
2011-08-01	01-Aug-11	31-Aug-11
2011-09-01	01-Sep-11	30-Sep-11
2011-10-01	01-Oct-11	31-Oct-11
2011-11-01	01-Nov-11	30-Nov-11

Allocate Resources

- Resource Distribution and Curves / Future Bucket Planning
- System Default and User – used for future redistributions from the standard linear resource spread;

Global (Enterprise menu, Resource Curves)



- Can add new curves by copying a default curve and modifying settings
- Assign at the activity level (Activity Details, Resources tab)

Optimize Schedule

- Schedule Options – project specific vs multiple schedules
 - Data date options – for multiple open files, per project or “group” data date
 - Project Forecast Start date option (Project Screen, add date column for Forecast Start date)
 - Log to file as txt or html
 - Overwrite existing log or append to existing
 - Save settings

Primavera P6 Professional 20



Scheduling settings have been changed for SWD_TEMPL*** - TEMPLATE w/ Proc**. Do you want to save the changes ?

Yes

No

Cancel

Schedule

Project(s) to schedule

1

All Projects use their own data date

Apply selected data date to all open projects

01-Jul-20

Project Forecast Start Date

Set Data Date and Planned Start to Project Forecast Start during scheduling

Log to file

As Html

Overwrite existing

Append to existing

Cancel

Schedule

View Log

Help

Options...

Optimize Schedule

- Schedule Options – project specific
 - General
 - Relationships to and from other projects
 - Open ends
 - Schedule Calculation options
 - Retained Logic
 - Progress Override
 - Actual Dates
 - Critical activity definition
 - Calculate SS lag – Early or Actual
 - Float definition
 - Calendar for scheduling relationship lag

Schedule Options

General | Advanced

Ignore relationships to and from other projects

Make open-ended activities critical

Use Expected Finish Dates

Schedule automatically when a change affects dates

Level resources during scheduling

Recalculate assignment costs after scheduling

When scheduling progressed activities use

Retained Logic Progress Override Actual Dates

Calculate start-to-start lag from

Early Start Actual Start

Define critical activities as

Total Float less than or equal to

Longest Path

Calculate float based on finish date of

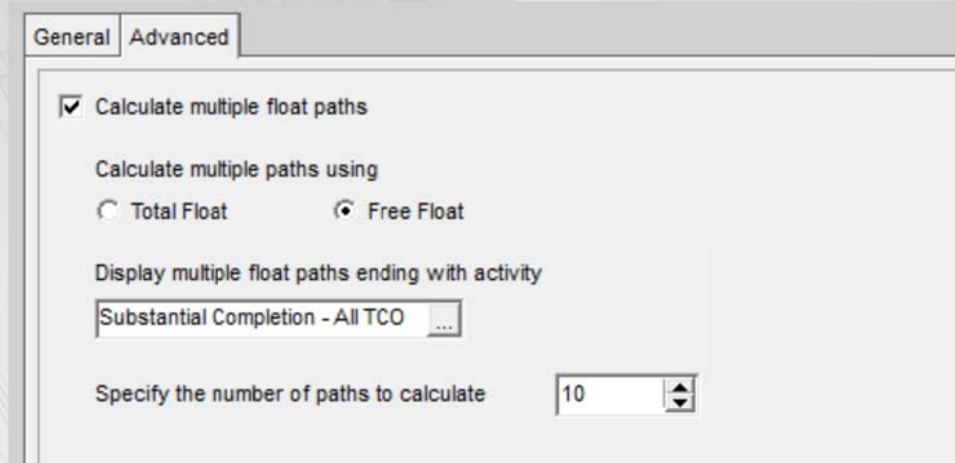
Each project Opened projects

Compute Total Float as

Calendar for scheduling Relationship Lag

Optimize Schedule

- Schedule Options
 - Advanced
 - Calculate multiple float paths by either Total Float or Free Float (Recommend using Free Float for Longest Path)



The screenshot shows a dialog box with two tabs: 'General' and 'Advanced'. The 'Advanced' tab is selected. The dialog contains the following options:

- Calculate multiple float paths
- Calculate multiple paths using
 - Total Float
 - Free Float
- Display multiple float paths ending with activity
 - Substantial Completion - All TCO ...
- Specify the number of paths to calculate: 10

For more information regarding multiple float paths read 'Longest Path to the Rescue' by Ron Winter.

Optimize Schedule

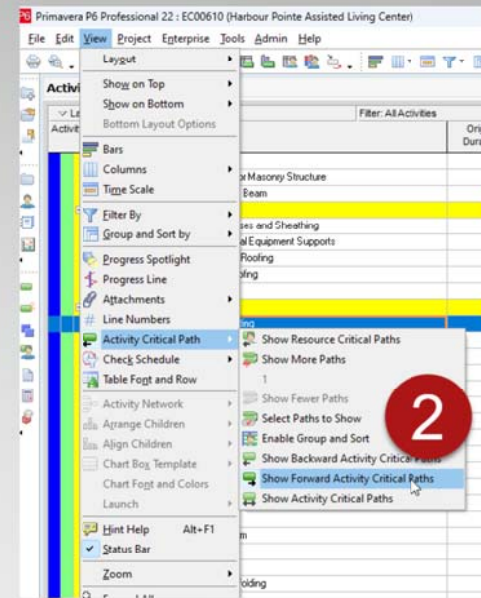
- Activity Critical Path (version 22x)
 - *'Similar'* to Float Path
 - Driving path to/from the selected activity OR the 'potential' to drive
 - Up to 30 activity-driven critical paths (including option for resource leveled critical path)
 - View menu, Activity Critical Path
 - Resource Critical Path – activities with leveled resource assignments
 - No of Paths (default is '1')
 - Enable Group and Sort (Group and Sort by default is off)
 - Direction (forward/backward/'both') through network to calculate

NOTE: FILTER is applied. To remove, View, Activity Critical Path and unselect the option.

Optimize Schedule

Activity Critical Path – Example of Forward Path

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Free Float	Total Float
EC1360	Mobilize Scaffolding	15	15	31-Aug-11 08 AM	21-Sep-11 05 PM	20	42
EC1410	Install Exterior Windows and Sliding Glass Doors Floor 1	14	24	22-Sep-11 08 AM	25-Oct-11 05 PM	0	0
EC1470	Install Exterior Windows and Sliding Glass Doors Floor 2	14	24	19-Oct-11 08 AM	21-Nov-11 05 PM	0	0
EC1490	Install Backing & Cauld Windows Floor1	12	12	20-Oct-11 08 AM	04-Nov-11 05 PM	7	22
EC1500	Install Exterior Windows and Sliding Glass Doors Floor 3	21	21	15-Nov-11 08 AM	14-Dec-11 05 PM	0	0
EC1510	Install Backing & Cauld Windows Floor 2	12	12	16-Nov-11 08 AM	02-Dec-11 05 PM	2	15
EC1520	Install Exterior Windows and Sliding Glass Doors Floor 4	27	27	08-Dec-11 08 AM	17-Jan-12 05 PM	0	0
EC1570	Install Backing & Cauld Windows Floor 3	9	9	09-Dec-11 08 AM	21-Dec-11 05 PM	13	13
EC1650	Install Backing & Cauld Windows Floor 4	12	12	12-Jan-12 08 AM	27-Jan-12 05 PM	0	0
EC1580	Stucco Bands	12	12	16-Jan-12 08 AM	31-Jan-12 05 PM	0	0
EC1660	Stucco Grey	24	24	01-Feb-12 08 AM	05-Mar-12 05 PM	0	0
EC1690	Stucco Finish Coat	30	30	06-Mar-12 08 AM	16-Apr-12 05 PM	0	0
EC1840	Caulk	12	12	17-Apr-12 08 AM	02-May-12 05 PM	0	0
EC1900	Stucco Band Trim	15	15	03-May-12 08 AM	23-May-12 05 PM	0	0
EC1980	Paint Exterior	15	15	01-Jun-12 08 AM	21-Jun-12 05 PM	0	0
EC1990	Install Railings	45	45	01-Jun-12 08 AM	03-Aug-12 05 PM	0	189
EC2110	Demobilize Scaffolding	15	15	22-Jun-12 08 AM	13-Jul-12 05 PM	0	0
EC2140	Shell Complete	0	0	03-Aug-12 05 PM	03-Aug-12 05 PM	14	189



- 'Closest' Driving Tie (when selecting '1' path)
- Filter applied that must be unselected

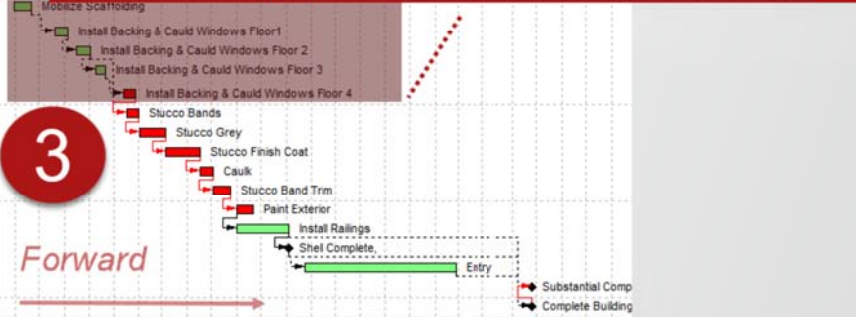
Potential Driving Ties



Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish	Free Float	Total Float
EC1360	Mobilize Scaffolding	15	15	31-Aug-11 08 AM	21-Sep-11 05 PM	20	42
EC1490	Install Backing & Cauld Windows Floor1	12	12	20-Oct-11 08 AM	04-Nov-11 05 PM	7	22
EC1510	Install Backing & Cauld Windows Floor 2	12	12	16-Nov-11 08 AM	02-Dec-11 05 PM	2	15
EC1570	Install Backing & Cauld Windows Floor 3	9	9	09-Dec-11 08 AM	21-Dec-11 05 PM	13	13
EC1650	Install Backing & Cauld Windows Floor 4	12	12	12-Jan-12 08 AM	27-Jan-12 05 PM	0	0
EC1580	Stucco Bands	12	12	16-Jan-12 08 AM	31-Jan-12 05 PM	0	0
EC1660	Stucco Grey	24	24	01-Feb-12 08 AM	05-Mar-12 05 PM	0	0
EC1690	Stucco Finish Coat	30	30	06-Mar-12 08 AM	16-Apr-12 05 PM	0	0
EC1840	Caulk	12	12	17-Apr-12 08 AM	02-May-12 05 PM	0	0
EC1900	Stucco Band Trim	15	15	03-May-12 08 AM	23-May-12 05 PM	0	0
EC1980	Paint Exterior	15	15	01-Jun-12 08 AM	21-Jun-12 05 PM	0	0
EC1990	Install Railings	45	45	01-Jun-12 08 AM	03-Aug-12 05 PM	0	189
EC2140	Shell Complete	0	0	03-Aug-12 05 PM	03-Aug-12 05 PM	14	189
EC2260	Entry Feature/Sign Wall	129	129	24-Aug-12 08 AM	26-Feb-13 05 PM	406	406
EC2430	Substantial Completion - All TCO	0	0	24-Sep-14 05 PM	24-Sep-14 05 PM	0	0
EC2440	Complete Building 1	0	0	24-Sep-14 05 PM	24-Sep-14 05 PM	0	0

3

Forward

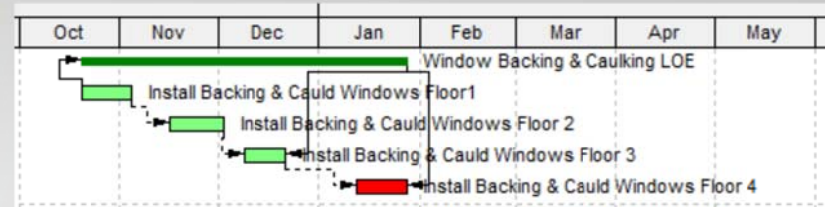
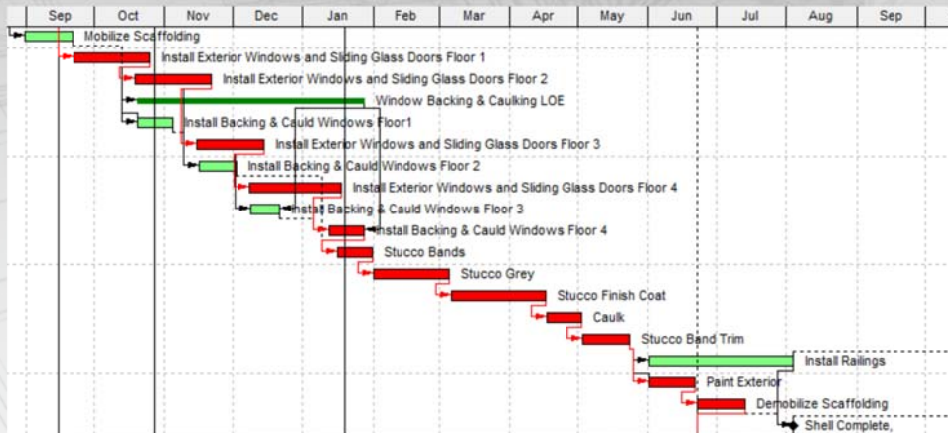


Optimize Schedule

- Activity Critical Path
 - Applies a FILTER of specified driving activity path. This FILTER is maintained until the option is unselected (View menu, Activity Critical Path).
 - Oracle documentation says the following activities are not included in the Activity Critical Path:
 - Activities with the Activity Status, 'Completed'
 - Activities with Activity Type, 'WBS Summary'
 - **ISSUE:** If the driving path of activities contains an activity with the Activity Type, 'Level of Effort' (hammock), the path contains the Level of Effort (LOE), the 'direct' LOE predecessor(s), the 'direct' LOE successor(s), BUT NO intermediary activities

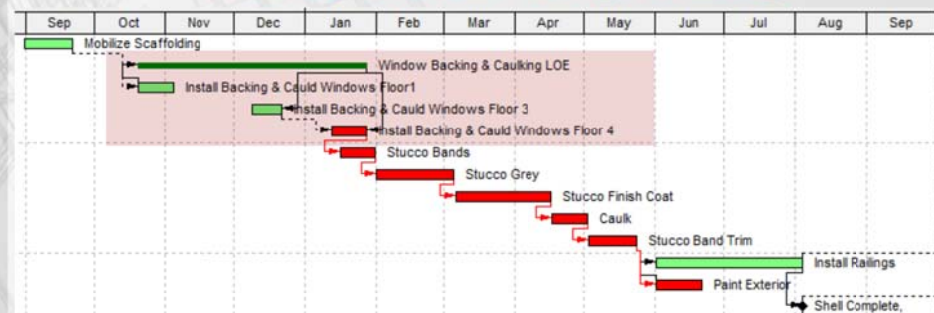
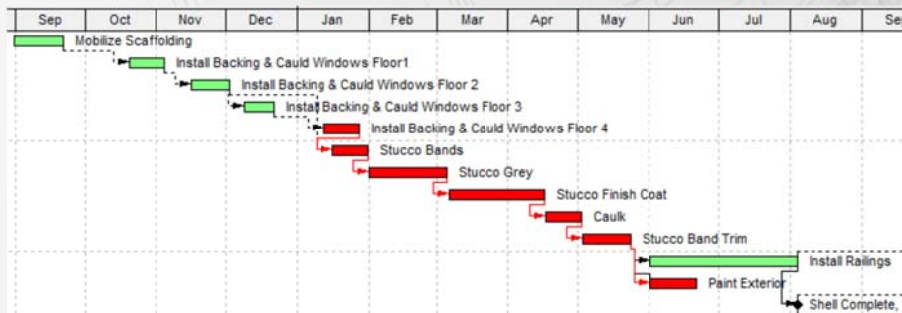
Optimize Schedule

- Activity Critical Path Issue with a Level of Effort (hammock)
- Work Around – Use Float Path – *only does Backward Path*



Activity Critical Path (no LOE)

Activity Critical Path (incl LOE)



Optimize Schedule – Reports

Review Logic reports / Layouts and Changes made

Schedule Log

Claim Digger

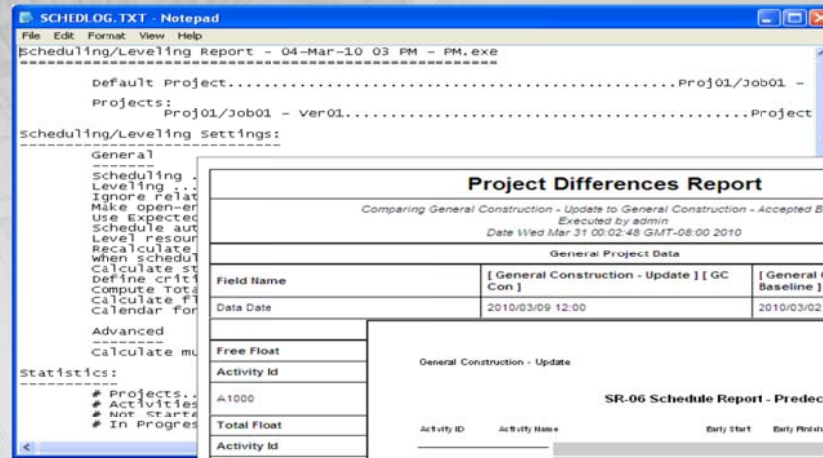
Schedule Comparison

in Visualizer

Tabular Reports

Check Schedule (version 22)

3rd Party Schedule Comparison tools: Schedule Analyzer for the Enterprise (SAe), Acumen Fuse, Schedule Validator, etc.



Project Differences Report		
Comparing General Construction - Update to General Construction - Accepted Baseline		
Executed by admin Date Wed Mar 31 00:02:48 GMT-08:00 2010		
General Project Data		
Field Name	[General Construction - Update] [GC Con]	[General Construction - Accepted Baseline] [GC Con - B1]
Data Date	2010/03/09 12:00	2010/03/02 12:00

SR-06 Schedule Report - Predecessors Successors									
Activity ID	Activity Name	Early Start	Early Finish	Late	Late	Total	Predecessors	Successors	
General Construction - Update									
Project Start 02-Mar-10 Project Finish 20-Aug-10 Data Date 09-Mar-10									
Check Schedule Report 12-Jan-24 PM.EXE									
▼ Projects Checked									
Project ID	Project Name	Data Date	Total Activities	Complete Activities	Internal Relationships	External Relationships			
		03-Feb-22	621	0	1108	0			
▼ Project checked to have links to the following closed projects									
Closed Project ID	Closed Project Name	Data Date	Links to from the closed project						
▼ Check Summary									
Check	Description	Target	Percent	Found	Total				
Logic	Activities missing predecessors or successors	< 5.00 %	1.70 %	23	621				
Negative Lags	Relationships with a lag duration of less than 0	< -1.00 %	0.00 %	0	1108				
Positive Lags	Relationships with a positive lag duration	< 5.00 %	0.00 %	262	1108				
Long Lags	Relationships with a lag duration greater than 20 hours	< 5.00 %	0.00 %	258	1108				
Relationship Type	The majority of relationships should be Finish to Start	> -90.00 %	0.00 %	861	1108				
Hard Constraints	Constraints that prevent activities being moved	< 1.00 %	0.16 %	1	614				
Soft Constraints	Constraints that do not prevent activities being moved	< 5.00 %	0.00 %	0	614				
Large Float	Activities with total float greater than 400 hours	< 1.00 %	0.00 %	414	614				
Negative Float	Activities with a total float less than 0	< 1.00 %	0.00 %	0	614				
Large Durations	Activities that have a remaining duration greater than 160 hours	< 5.00 %	0.00 %	283	596				
	Complete activities before the data date	< 5.00 %	0.00 %	0	614				

Optimize Schedule – Review & Analyze

Review and Verify data input (Scheduler self-check)

- Open Ends (activities with no Predecessors and / or Successors)
- Dangling Relationship ties (Start to Start and/or Finish to Finish ties without a Predecessor and/or Successor)
- Incorrect and non-overlapping lag ties that result in gaps in sequencing
 - Start to Start lag that exceeds the activity duration
 - Finish to Finish lag that exceeds the successor duration
 - Finish to Start lag
- Actual dates in the future
- Incorrect times
- Calendars
- Activities on the data date (verify predecessor logic)
- Excessive float values
- Negative float
- Critical Path and Near Critical Path
- Constructability issues
- Stacking of trades

Optimize Schedule – Review & Analyze

• Check Schedule (v22)

Minimum/maximum levels:

- Activity relationships based on completion of work (i.e., Finish to Start)
- Lags and Leads (or negative lags) – appropriate use of lags (+/-) versus identifying driving work or process (concrete cure)
- Level of activity detail – general (long duration activities can be difficult to accurately progress and demonstrate ‘true’ schedule logic)
- Total float (excessive) – schedule network logic issues
- Total float less than zero – critical path delay
- Manually constrained activity dates (hard/soft constraints) – user-imposed restriction (w/o restriction identification)
- Activity with invalid progress – erroneous activity progress based on the schedule’s current Data Date
- Resource / cost assignments – activities w/o resource assignments
- Late activities – activity progress comparison with the Project Baseline
- Baseline Execution Index (BEI) – overall, schedule progress comparison (no. of activities) with the Project Baseline.

NOTE: Calculations are based on duration **HOURS** (352 hours = 44 days with 8hr/day).

Optimize Schedule – Review & Analyze

- Check Schedule (v22) – settings (Tools menu, Check Schedule Report)

Check Schedule ✕

Use Check Schedule Parameters from EC00610-3 - LOE PRED/SUCC - Harbour Pointe A ▾ **Target**

<input checked="" type="checkbox"/> Logic - Activities missing predecessors or successors.	<	<input type="text" value="5"/>	%
<input checked="" type="checkbox"/> Negative lags - Relationships with a lag duration of less than 0	<	<input type="text" value="1"/>	%
<input checked="" type="checkbox"/> Positive Lags - Relationships with a positive lag duration	<	<input type="text" value="5"/>	%
<input checked="" type="checkbox"/> Long Lags - Relationships with a lag duration greater than <input type="text" value="352"/> h	<	<input type="text" value="5"/>	%
<input checked="" type="checkbox"/> Relationship Types - The majority of the relationships should be Finish to Start	>	<input type="text" value="90"/>	%
<input checked="" type="checkbox"/> Hard Constraints - Constraints that prevent activities from being moved	<	<input type="text" value="1"/>	%
<input checked="" type="checkbox"/> Soft Constraints - Constraints that do not prevent activities from being moved	<	<input type="text" value="5"/>	%
<input checked="" type="checkbox"/> Large Float - Activities with total float greater than <input type="text" value="352"/> h	<	<input type="text" value="1"/>	%
<input checked="" type="checkbox"/> Negative Float - Activities with a total float less than 0	<	<input type="text" value="1"/>	%
<input checked="" type="checkbox"/> Large Durations - Activities that have a remaining duration greater than <input type="text" value="352"/> h	<	<input type="text" value="5"/>	%
<input checked="" type="checkbox"/> Activities with Invalid progress dates	<	<input type="text" value="1"/>	%
<input checked="" type="checkbox"/> Resources / Cost - Activities that do not have an expense or resource assigned	<	<input type="text" value="1"/>	%
<input checked="" type="checkbox"/> Late Activities - Activities scheduled to finish later than the project baseline	<	<input type="text" value="5"/>	%
<input checked="" type="checkbox"/> BEI - Baseline Execution Index	>	<input type="text" value="0.95"/>	

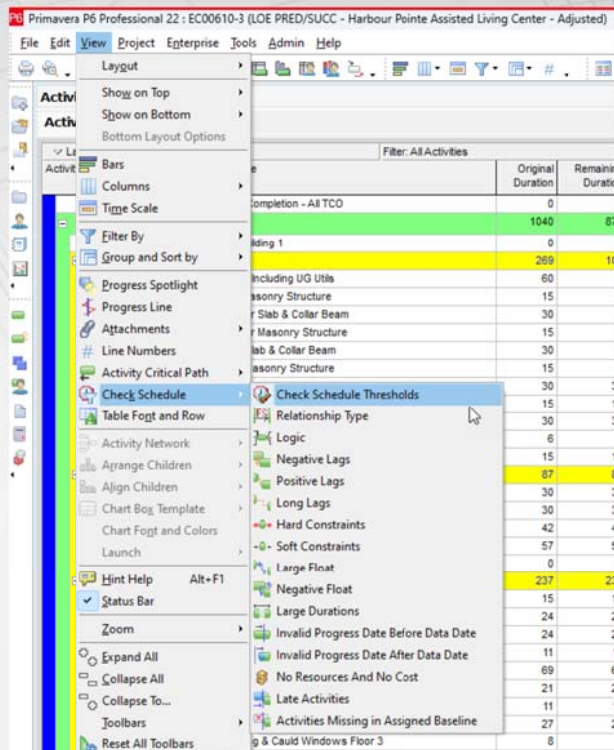
Save Report To ...

Overwrite Existing

⊞ Cancel
💾 Save
▶ Check Schedule
▶ Default
? Help

Optimize Schedule – Review & Analyze

- Check Schedule (v22)
 - View Report OR Filter Using Toolbar (View menu, Check Schedule) Drill-down to activities

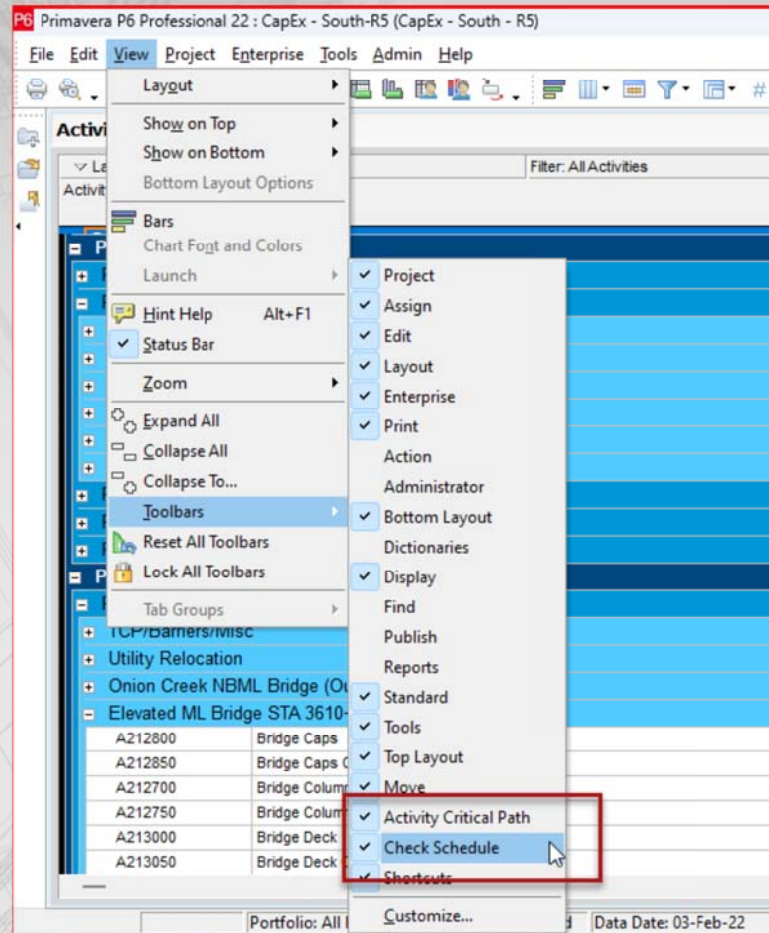


OR

Check Schedule Report						
12-Jan-24						
PM EXE						
▼ Projects Checked						
Project ID	Project Name	Data Date	Total Activities	Complete Activities	Internal Relationships	External Relationships
		01-Feb-22	621	0	1108	0
▼ Project checked to have links to the following closed projects						
Closed Project ID	Closed Project Name	Data Date	Links to/from the closed project			
▼ Check Summary						
Check	Description	Target	Percent	Found	Total	
Logic	Activities missing predecessors or successors	< 5.00 %	1.00 %	23	621	
Negative Lags	Relationships with a lag duration of less than 0	< 1.00 %	0.00 %	0	1108	
Positive Lags	Relationships with a positive lag duration	< 5.00 %	27.61 %	262	1108	
Long Lags	Relationships with a lag duration greater than 20 hours	< 5.00 %	27.61 %	258	1108	
Relationship Type	The majority of relationships should be Finish to Start	> 90.00 %	97.66 %	861	1108	
Hard Constraints	Constraints that prevent activities being moved	< 1.00 %	0.00 %	1	614	
Soft Constraints	Constraints that do not prevent activities being moved	< 5.00 %	0.00 %	0	614	
Large Float	Activities with total float greater than 400 hours	< 1.00 %	0.00 %	414	614	
Negative Float	Activities with a total float less than 0	< 1.00 %	0.00 %	0	614	
Large Durations	Activities that have a remaining duration greater than 160 hours	< 5.00 %	0.00 %	283	596	
Invalid Progress Before Data Date	Incomplete activities before the data date	< 1.00 %	0.00 %	0	614	
Invalid Progress After Data Date	Activities with actual dates after the data date	< 1.00 %	0.00 %	0	614	
Resources Cost	Activities that do not have an expense or a resource assigned	< 1.00 %	0.00 %	596	596	
Late Activities	Activities scheduled to finish later than the project baseline	< 5.00 %	0.00 %	0	596	
Check	Description	Target	BEI Ratio	Project Activities	Baseline Activities	
BEI	Baseline Execution Index	> 0.95	0.99 %	-	-	
▼ Logic: Activities missing predecessors or successors						
Project ID	Activity ID	Activity Name	Predecessor	Successor		
	A010000	Let Date	No	Yes		
	A014600	Contract Working Days	Yes	No		
	A015000	Begin Pvs Phase 1	Yes	No		
	A015100	Begin Phase 1 Step 1	Yes	No		
	A015200	Begin Phase 1 Step 1A	Yes	No		
	A015300	Begin Phase 1 Step 1B	Yes	No		
		Begin Phase 1 Step 1C	Yes	No		

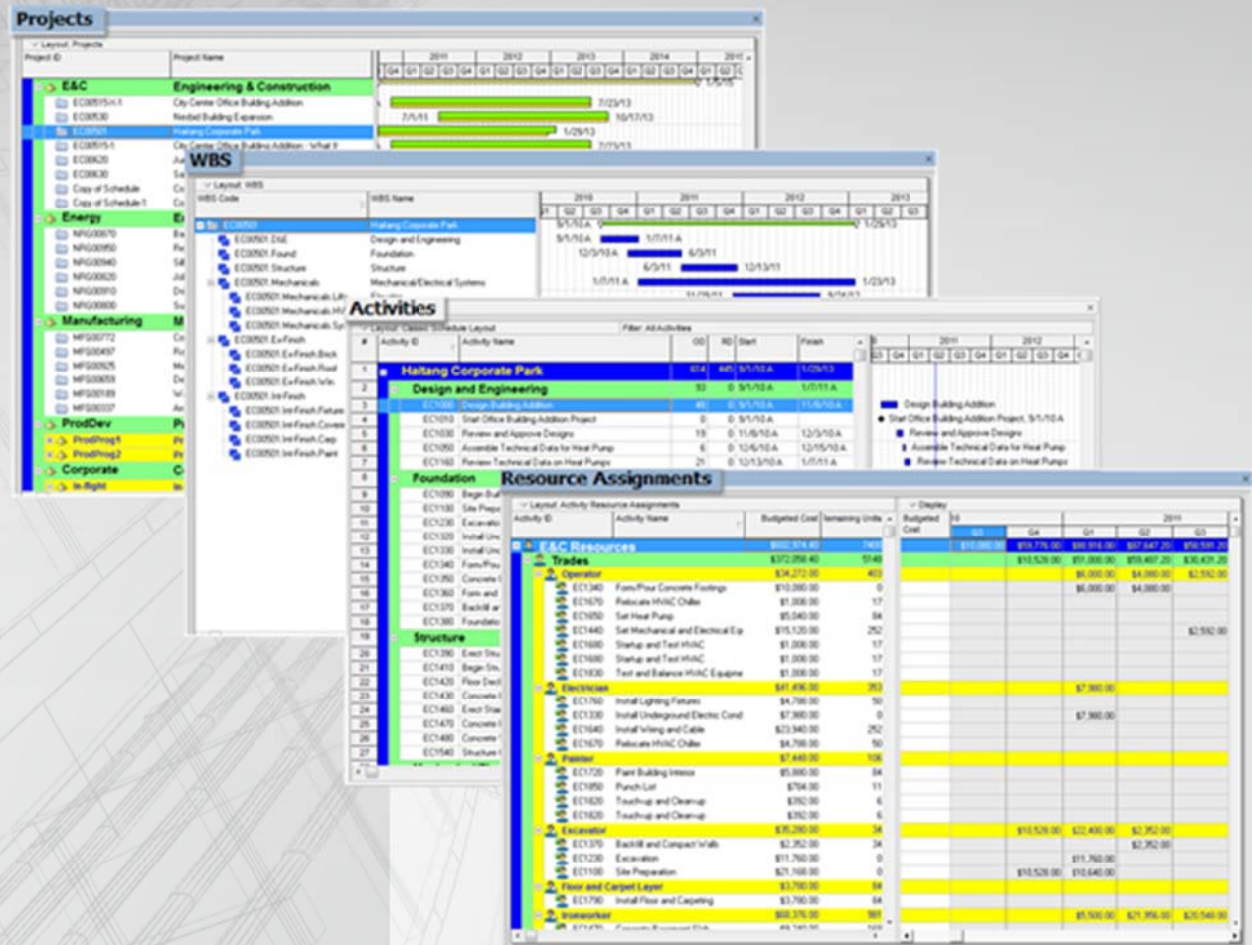
Optimize Schedule – Review & Analyze

- Check Schedule (v22) – *Utilizing Toolbars (incl. Activity Critical Path)*



Optimize Schedule – Graphic Reports

- Layouts are developed by modifying data within Primavera P6™ windows



Optimize Schedule – Layout Types

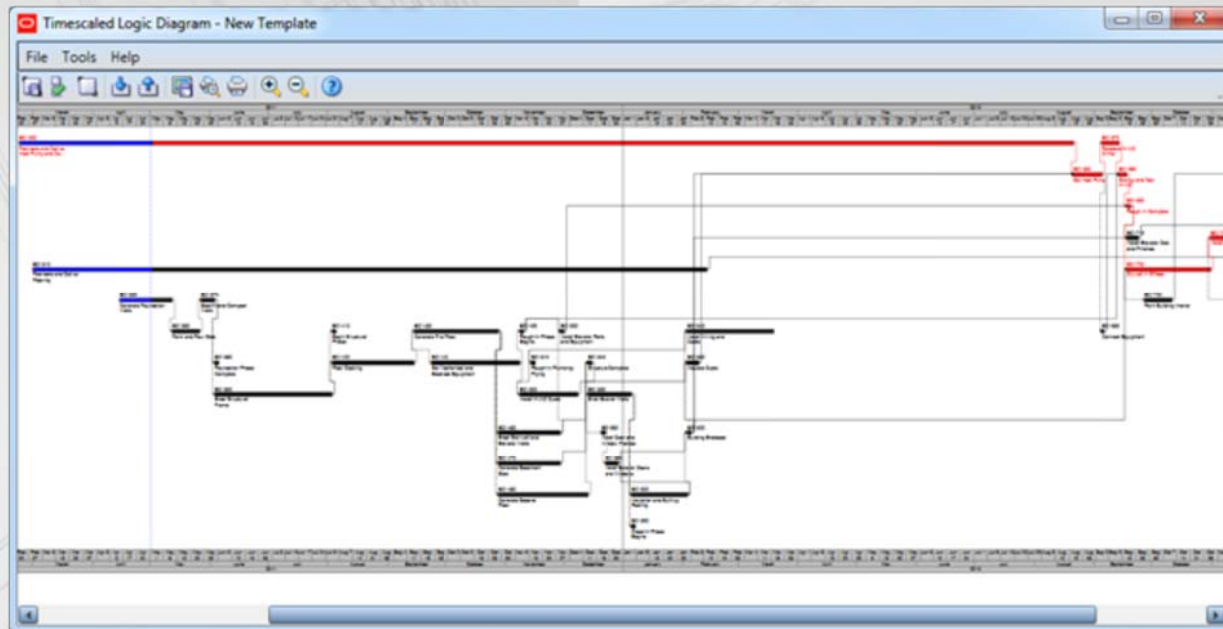
- Layout Types:
 - User
 - Available to a single user, for all accessible projects in the database
 - Global
 - Available to all users, for all projects in the database
 - Project
 - ‘Linked’ to a single project, for project specific reporting requirements
 - Can export the layout with project file when using XML export option
 - Visualizer (later versions)

Optimize Schedule – Layout Types

- Layout Types:
 - User
 - Available to a single user, for all accessible projects in the database
 - Global
 - Available to all users, for all projects in the database
 - Project
 - ‘Linked’ to a single project, for project specific reporting requirements
 - Can export the layout with project file when using XML export option
 - Visualizer (later versions)

Optimize – Time-scaled Logic OR Visualizer

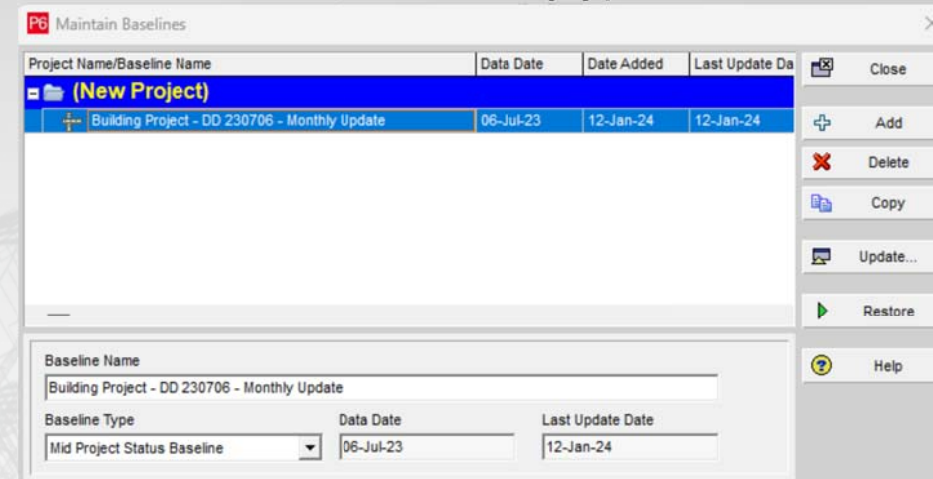
- Time scaled Logic Diagram or Visualizer
 - Available in Primavera P6™ version 7 through version 8.2
 - Replaced by Oracle® Primavera Visualizer in version 8.3 and later



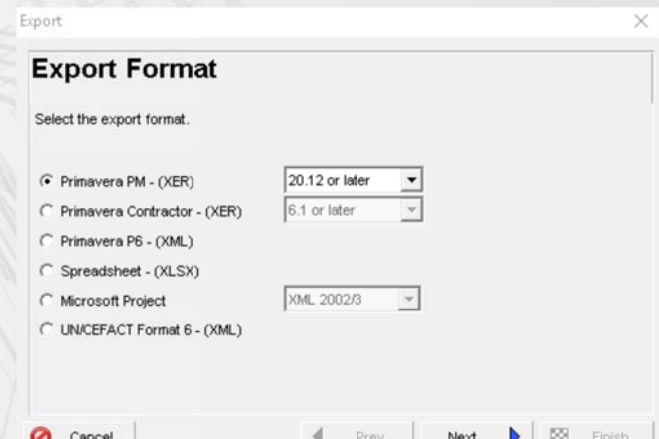
Optimize Schedule – Finalize, Save and Export

Once the entire team has reviewed and approved the draft, finalize and **Maintain Baseline**

- Maintain Baseline (Project, Maintain Baseline, Save Copy)
 - New Columns – Version 22



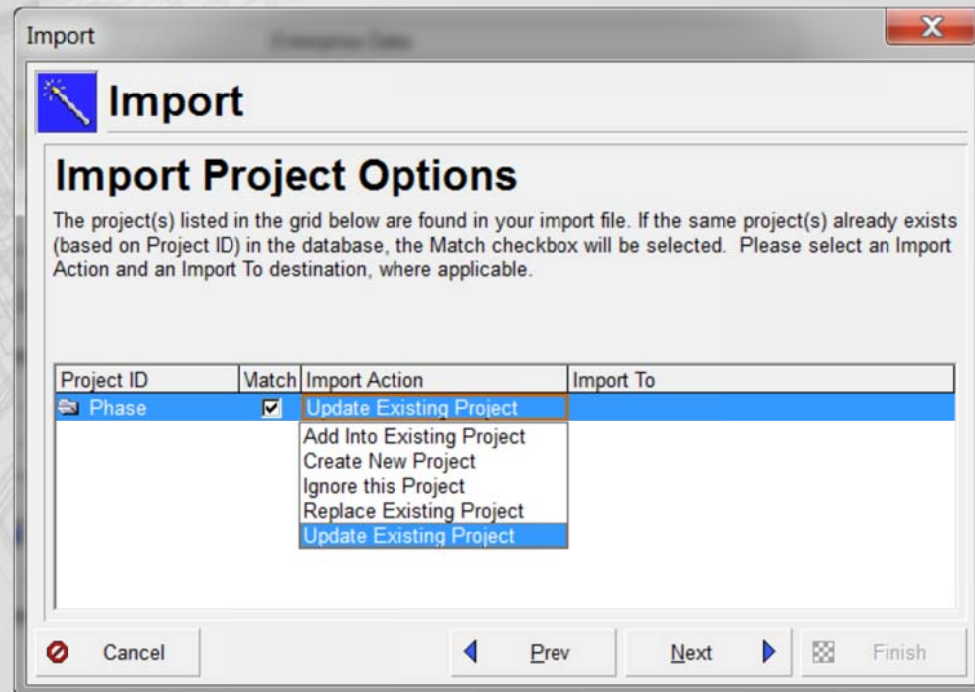
- Export - backup to safe location(s)



Data Transfer

- Importing Project Data depends on XER or XML
 - Add into Existing Project
 - Create New Project
 - Ignore this Project
 - Replace Existing Project
 - Update Existing Project

Note: To import past period actual data you must select 'Create New Project'.



Data Transfer

- Import Configuration utility – how to handle duplicate data.
 - Do Not Import
 - Insert New
 - Keep Existing
 - Update Existing
 - Delete

A* = Same ID but modified data

Do Not Import		Insert New		Keep Existing		Update Existing	
Existing	New	Existing	New	Existing	New	Existing	New
A	A*, B	A	A*, B	A	A*, B	A	A*, B
A <i>(after import)</i>		A, A*, B <i>(after import)</i>		A, B <i>(after import)</i>		A*, B <i>(after import)</i>	

Calendar Export / Import Issue

- Oracle Knowledgebase Issue (Doc ID 2869022.1): Calendar Exceptions and Notebook Descriptions Do Not Import / Export using XER format
 - Applies to:
 - Primavera P6 Professional Project Management - Version 19.12.19.0 to 21.12.4.0 [Release 19.12 to 21.12]
 - Primavera P6 Enterprise Project Portfolio Management Cloud Service - Version 19.12.19.0 to 21.12.4.0 [Release 19.12 to 21.12]
- Issue: Import XER from older P6 releases does not bring in full Calendar Exceptions and Notebook Descriptions when the data exceeds 4096 characters
- Solution: This issue has been resolved and the fix has been included in Remaster Patch Sets 19.12.20.0, 20.12.14.0 and Patch Set 21.12.5.0. All subsequent Patch Sets for this release version will also include the fix.

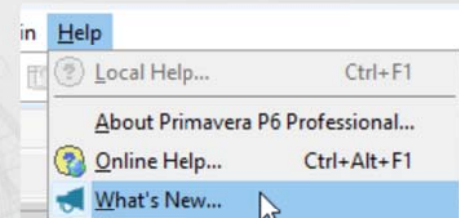
Conclusion

- Start with a Plan
- Setup Structures (EPS, WBS, Codes)
- Maintain Consistency (IDs, Calendars, Activity Names)
- Verify Start/Finish Times to Avoid Calendar Errors
- Use Caution in Modifying or Applying Global/Enterprise/Admin to a *project* schedule
- Set Resources options/defaults correctly from the start
- Understand Schedule Calculation options
- Use the Tools provided to optimize the schedule (i.e. Schedule Log, Layouts, Reports, etc.)

*For Primavera New Features Comparison, see

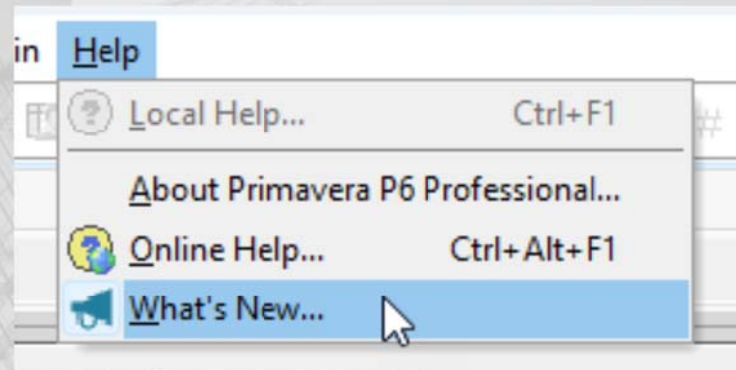
https://docs.oracle.com/cd/E64687_01/EPPM/EPPM_CFO.html

Or select the 'What's New' in the



Conclusion

- *For Primavera New Features Comparison, see https://docs.oracle.com/cd/E64687_01/EPPM/EPPM_CFO.html
- Or select the 'What's New' in the Help menu
- To see what version you are using, select the About Primavera P6 Professional...



Contact Information

- We hope that you can use these implementation and execution lessons learned outlined in this presentation to develop schedules more efficiently using Primavera P6™
- Please contact us if you have questions regarding Primavera P6 implementation, concepts, or general use

Questions?

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