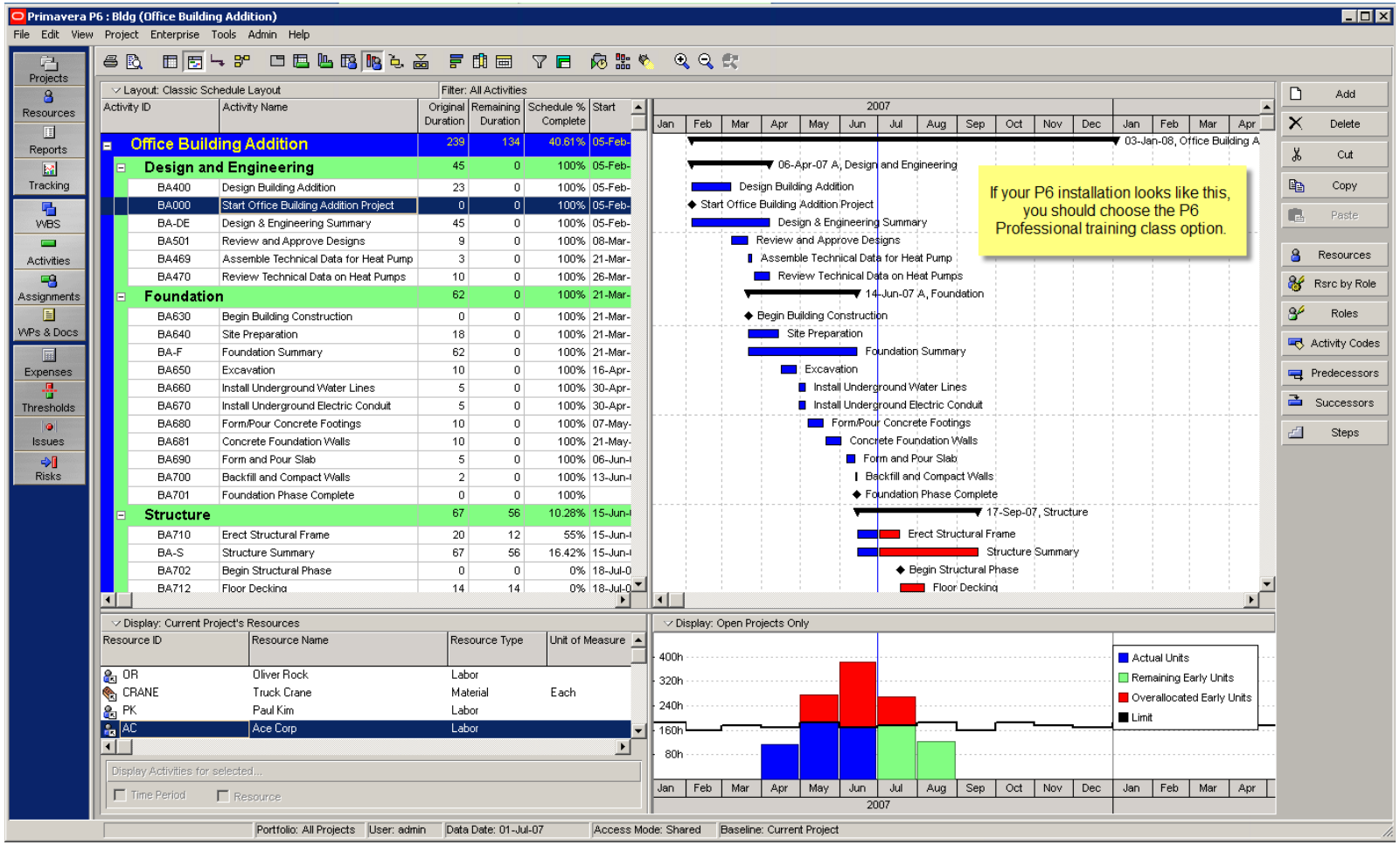
# CPM SCHEDULE TRAINING

## Module 1 | Abbreviated

# TRAINING GOAL

Provide a working knowledge of CPM Schedules



# INTRODUCTION TO CPM SCHEDULING

## CPM SCHEDULING DEFINED

- The **critical path method** (CPM) is a step-by-step project management technique for planning that defines **critical** and **non-critical** tasks with the goal of preventing delays to a project.

- CPM is commonly used with all forms of projects, including construction, aerospace and defense, software development, research projects, product development, engineering, and plant maintenance, among others.

- Any project with interdependent activities can apply this method of mathematical analysis.

# INTRODUCTION TO CPM SCHEDULING

## OBJECTIVE

- The objective of the CPM schedule is to provide a management tool for the proper and logical allocation and use of the resources needed to complete a project.

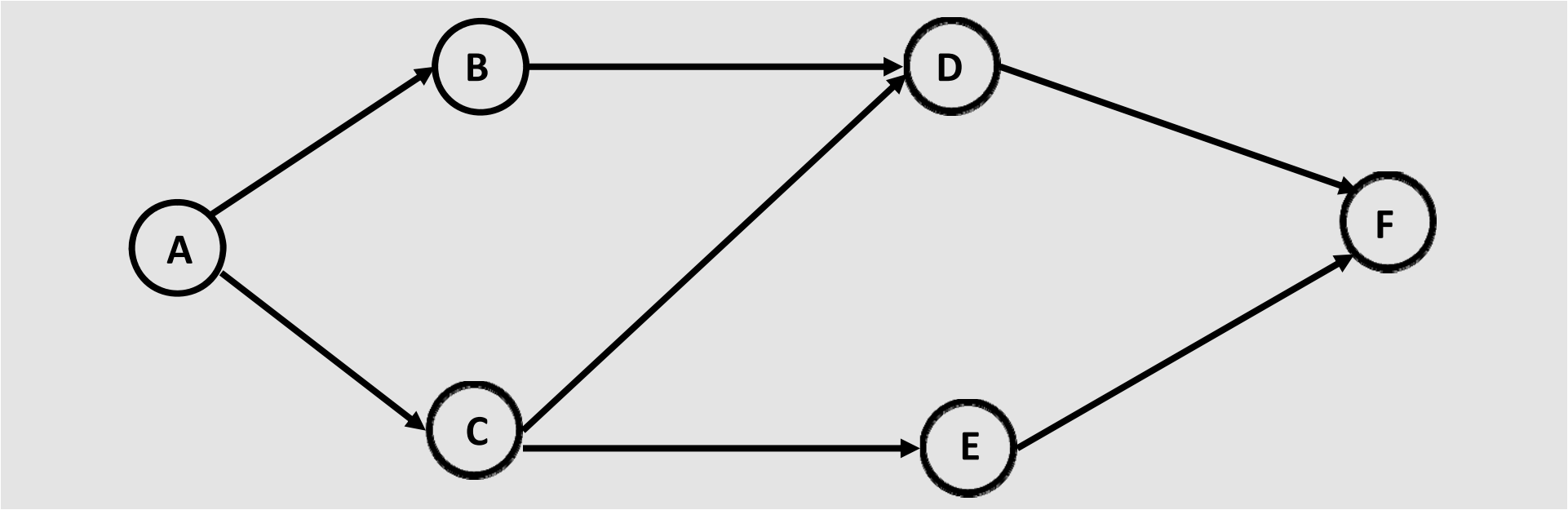
# INTRODUCTION TO CPM SCHEDULING

## ACTIVITY ON NODE (PRECEDENCE) METHOD

- Activity-on-node (Precedence) Method uses boxes to denote schedule activities.
- These boxes or “nodes” are connected with arrows to depict a logical progression of the dependencies between the schedule activities.
- Each node is coded with a letter or number that correlates to an activity on the project schedule.
- The Precedence method allows different type of relationships.

# INTRODUCTION TO CPM SCHEDULING

## Precedence Diagram Example



# CPM Terms

# INTRODUCTION TO CPM SCHEDULING

## TERMS

- Baseline Schedule
- Data Date
- Schedule Update
- Activity
- Types of Activities
- Relationship
- Types of Relationships
- Relationship Lag
- Calendar
- Original Duration
- Remaining Duration
- Percent Complete
- Total Float
- Free Float
- Critical Path (Longest Path)
- Controlling Work Item
- Resource
- Delay

# INTRODUCTION TO CPM SCHEDULING

## TERMS

- Fragnet
- Status, Statused or Statusing
- De-status
- Gantt Chart
- Sequestering Float
- Target

# INTRODUCTION TO CPM SCHEDULING

## BASELINE SCHEDULE

- A **Baseline Schedule** is an original schedule that has not been updated. A Baseline schedule is sometimes referred to as an **Initial Schedule**. In the FDOT Specifications, the Baseline Schedule is referred to as the **Contract Schedule**.

# INTRODUCTION TO CPM SCHEDULING

## DATA DATE

- The Data Date is the date through which a baseline schedule is updated.

# INTRODUCTION TO CPM SCHEDULING

## SCHEDULE UPDATE

- A Schedule Update is the result of recording actual start and finish dates for each activity on a Baseline Schedule through the data date of the update and estimating the remaining duration and percent complete for the activities.

- Schedule Updates should also include adjustments of the relationships to reflect changes in the plan.  These adjustments are called logic changes.

# INTRODUCTION TO CPM SCHEDULING

## ACTIVITY

- An activity is a unique unit of the project which can be described within prescribed limits of time – a task, function or decision that consumes time.

- Types of activities:
  - Tasks
  - Milestones (Start or Finish)
  - Level of Effort (Hammock)

# INTRODUCTION TO CPM SCHEDULING

## TASKS

- A task is the predominate type of activity in a CPM schedule and represents a specific element of the project that requires time to complete.

- Tasks include administrative and production type elements such as:
  - Shop drawing submittals and reviews
  - Material procurement and fabrication
  - Construction of project elements at the site
  - Inspection activities
  - Curing periods
  - Specified non-work periods

# INTRODUCTION TO CPM SCHEDULING

## MILESTONES

- Start Milestone – A Start Milestone has a start date and no finish date and is scheduled at the start of a time period.
- Examples of Start Milestones are Start Project, NTP, Start Phase 1.
- Finish Milestone - A Finish Milestone has a finish date, no start date and is scheduled at the end of a time period.
- Examples of Finish Milestones are Complete Project, Final Completion, Complete Phase 1.
- Milestones do not have any duration and do not add to the duration of the schedule, but can effect the end date of a schedule if not properly statused.

# INTRODUCTION TO CPM SCHEDULING

## LEVEL OF EFFORT (Hammock)

- A  Level of Effort (Hammock) Activity is best described as a summary activity.
- The duration of a Level of Effort Activity is determined by the dates of its predecessor(s) and successor(s).
- Level of Effort activities do not have a static duration and do not add to the overall duration of the schedule.

# INTRODUCTION TO CPM SCHEDULING

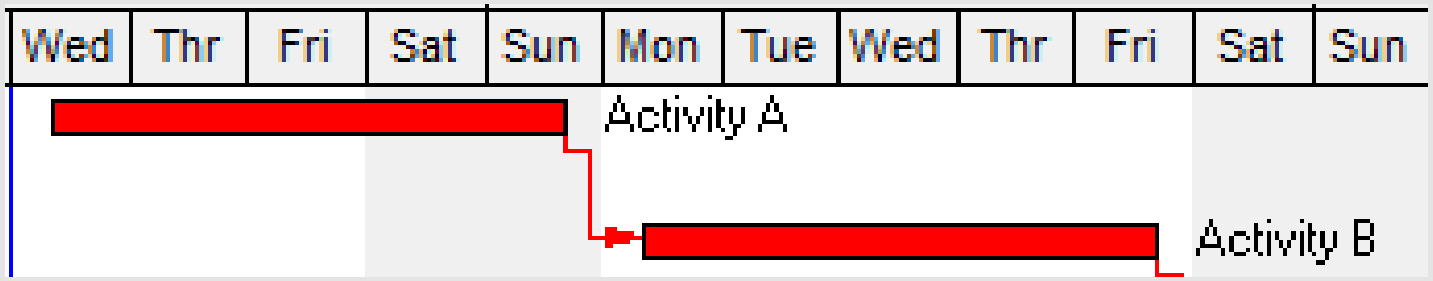
## RELATIONSHIP

- A relationship is the interaction between elements (activities) of the work.
- Types of relationships:
  - Finish-to-Start
  - Start-to-Start
  - Finish-to-Finish
  - Start-to-Finish

# INTRODUCTION TO CPM SCHEDULING

## TYPES OF RELATIONSHIPS

- Finish-to-Start - (FS) - Activity A must be completed before Activity B can begin.

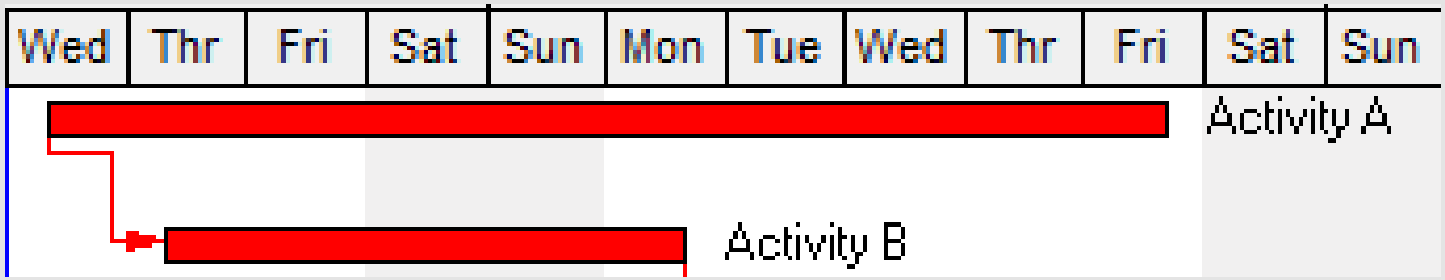



- Example – Piling must be complete before footing starts.

# INTRODUCTION TO CPM SCHEDULING

## TYPES OF RELATIONSHIPS

- Start-to-Start (SS) - Activity B can start after Activity A has started.

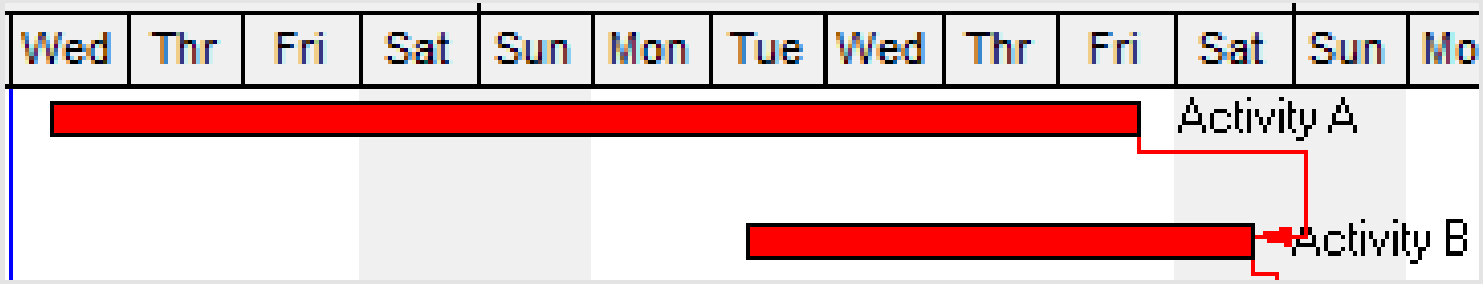



- Example – Sod can start 1 day after finish grading starts.

# INTRODUCTION TO CPM SCHEDULING

## TYPES OF RELATIONSHIPS

- Finish-to-Finish (FF) - Activity A must be complete before Activity B can finish.

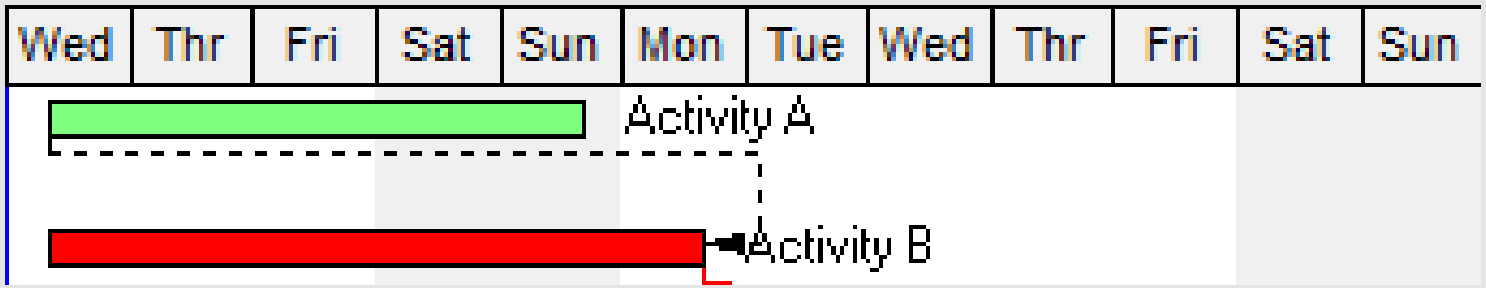



- Example – Base can finish 3 days after the subgrade finishes.

# INTRODUCTION TO CPM SCHEDULING

## TYPES OF RELATIONSHIPS

- Start-to-Finish (SF) - B can't finish before A starts.



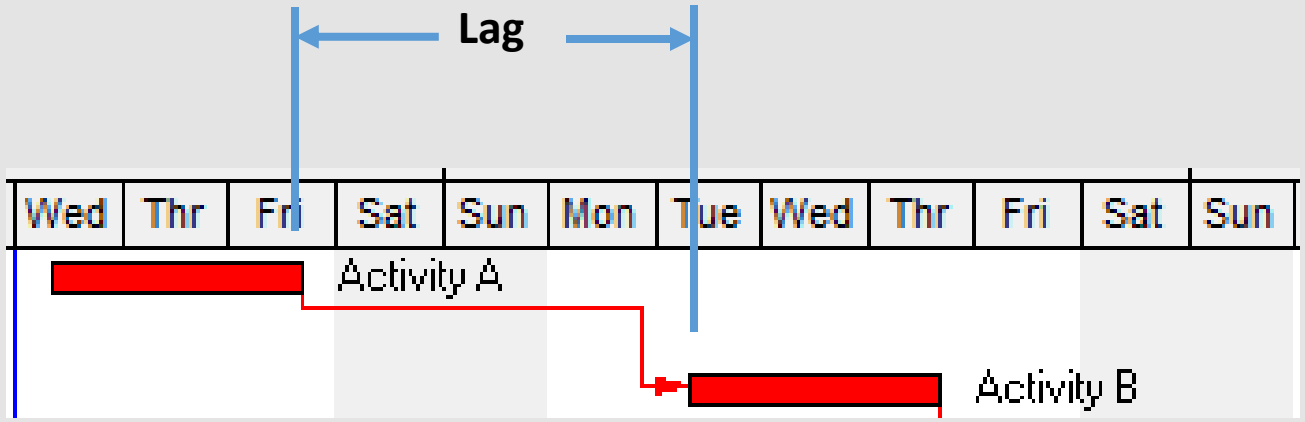

- Example – Maintenance period can’t finish until warranty period begins.

# INTRODUCTION TO CPM SCHEDULING

## RELATIONSHIP LAG

- A Lag is a duration that is applied to a relationship to make the successor start or finish earlier or later.

- Example of lag is flex-time start of construction after the notice to proceed.



# INTRODUCTION TO CPM SCHEDULING

## CALENDAR

- A Calendar establishes the days on which an activity can or will be worked on.
- Activities can have different calendars.
- Example – Submittals and reviews may be on a 7 days per week calendar while field production activities are on a 5 days per week calendar.
- It's very common to use many different calendars on more complex projects.
- P6 uses **Global** Calendars and **Project** Calendars.

# INTRODUCTION TO CPM SCHEDULING

## CALENDAR

- Global Calendars
  - Calendars that are “Global” to the P6 Program for all project schedules
  - Calendars are not specific to a project schedule
  - May create schedule calculation issues when project schedules are imported and exported between different computers
- Project Calendars
  - Calendars that are specific to a project schedule
  - Calendars “go with” the project schedule when imported and exported

# INTRODUCTION TO CPM SCHEDULING

## ORIGINAL DURATION

- The original duration is the amount of time it will take to complete an activity, from beginning to end.
- Milestones always have a duration of zero.
- The original duration of Level of Effort activities is calculated based on the start date of the predecessor and the finish date of the successor.

# INTRODUCTION TO CPM SCHEDULING

## REMAINING DURATION

- The Remaining Duration is the amount of time required to complete an activity from the data date until the end of the activity.

- On a baseline schedule, the Remaining Duration will always be the same as the Original Duration.

# INTRODUCTION TO CPM SCHEDULING

## PERCENT COMPLETE

- Percent Complete is a numerical representation of an activity's status. It is normally determined by the ratio of Remaining Duration to Original Duration.

***Percent Complete = 1 - RD/OD***

- For a baseline schedule, the Percent Complete is 0% for all activities.

- For a schedule update, the Percent Complete will range from 0% for activities that have not started to 100% for complete activities.

# INTRODUCTION TO CPM SCHEDULING

## TOTAL FLOAT

- Total Float (TF) is the maximum amount of time an activity can be delayed from its early start without delaying the entire project.

- Total Float is calculated as the difference between an activity's Late Finish Date and Early Finish Date. *(FDOT Specifications)*

***Total Float = Late Finish-Early Finish***

# INTRODUCTION TO CPM SCHEDULING

## FREE FLOAT

- Free Float (FF) is the maximum amount of time an activity can be delayed without delaying the early start of any of its succeeding activities.

***FF = Early Start of next activity –***
***Early Finish of current activity***

# INTRODUCTION TO CPM SCHEDULING

## CRITICAL PATH (LONGEST PATH)

- The Critical Path is the longest / most time-consuming path in a network of activities, following the network logic and using the planned remaining durations for the network activities.

- A critical activity is any activity on the longest path.

- A critical activity may or may not have zero total float.

# INTRODUCTION TO CPM SCHEDULING

## CONTROLLING WORK ITEM

- The activity or work item on the critical path having the least amount of total float. The controlling item of work will also be referred to as a Critical Activity. *(2015 FDOT Standard Specifications)*

# INTRODUCTION TO CPM SCHEDULING

## RESOURCE

- A resource is something of value that is needed in the production and prosecution of a project.  Resources include labor, equipment and materials.

- Resources are seldom unlimited in quantity and therefore, must be managed.

- The amount of resources available can directly impact the duration of a schedule activity and must be taken into account.

# INTRODUCTION TO CPM SCHEDULING

## DELAY

- Any unanticipated event, action, force or factor which extends the Contractor's time of performance of any controlling work item under the Contract. The term "delay" is intended to cover all such events, actions, forces or factors, whether styled "delay", "disruption", "interference", "impedance", "hindrance", or otherwise, which are beyond the control of and not caused by the Contractor, or the Contractor's subcontractors, materialmen, suppliers or other agents. This term does not include "extra work". *(FDOT Standard Specifications)*

# INTRODUCTION TO CPM SCHEDULING

## Fragnet

- A fragnet is a fragment of a schedule.  A fragnet is defined as the sequence of new activities that are proposed to be added to the existing schedule. The fragnet shall identify the predecessors to the new activities and demonstrate the impacts to successor activities. (Ohio DOT Specification 2008)

# INTRODUCTION TO CPM SCHEDULING

## Status, Statused or Statusing

- This is the process of providing actual starts, actual finishes and adjusting remaining durations and/or percent completes to a schedule, up to a specific data date.

# INTRODUCTION TO CPM SCHEDULING

## De-status

- This is the process of removing actual starts, actual finishes and adjusting remaining durations and/or percent completes, back to a specific data date in the past.

# INTRODUCTION TO CPM SCHEDULING

## Gantt Chart

- A Gantt chart, commonly used in project management, is one of the most popular and useful ways of showing activities (tasks or events) displayed against time. On the left of the chart is a list of the activities and along the top is a suitable time scale. Each activity is represented by a bar; the position and length of the bar reflects the start date, duration and end date of the activity. (Gantt.com)

# INTRODUCTION TO CPM SCHEDULING

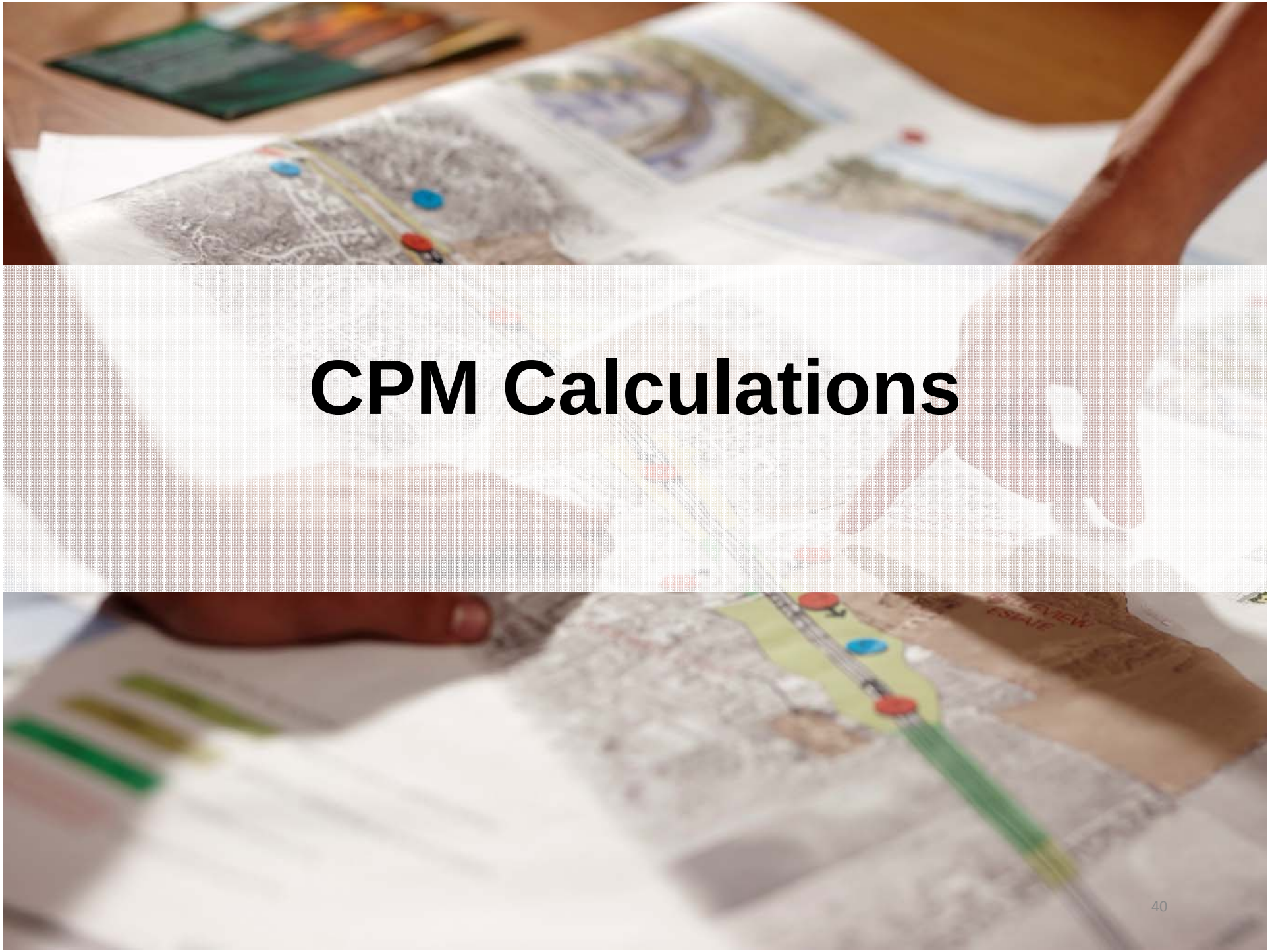
## Sequestering Float

- Taking up float through the use of lags and preferential logic and constraints.

# INTRODUCTION TO CPM SCHEDULING

## Target

- Term used when comparing two schedules. The target is normally the schedule that an update or an impacted schedule is being compared to. The target could be the baseline schedule or it could be an update. For example, if you were comparing the February update to the January update, the January update would be the Target.



# CPM Calculations

# INTRODUCTION TO CPM SCHEDULING

## CALCULATIONS

The primary calculations in the CPM process are:

- **Forward Pass** – process of determining the early start & finish dates
- **Backward Pass** – process of determining the late start & finish dates
- **Total Float** – difference between the early & late dates

# INTRODUCTION TO CPM SCHEDULING

## CALCULATIONS

The variables in the CPM calculations are:

- Data date
- Imposed finish date
- Remaining duration
- Logic (including constraints)
- Calendar(s)
- Retained Logic or Progress Override – methods for handling out-of-sequence progress

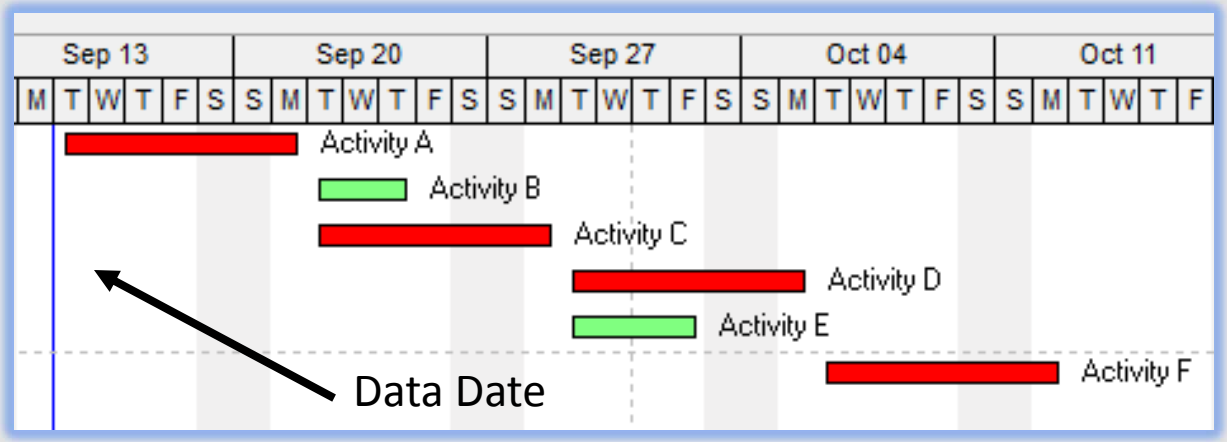
A change to any one of these variables can effect the calculated dates in the schedule.

# INTRODUCTION TO CPM SCHEDULING

## CALCULATIONS

Data Date

- The date on which the forward pass begins

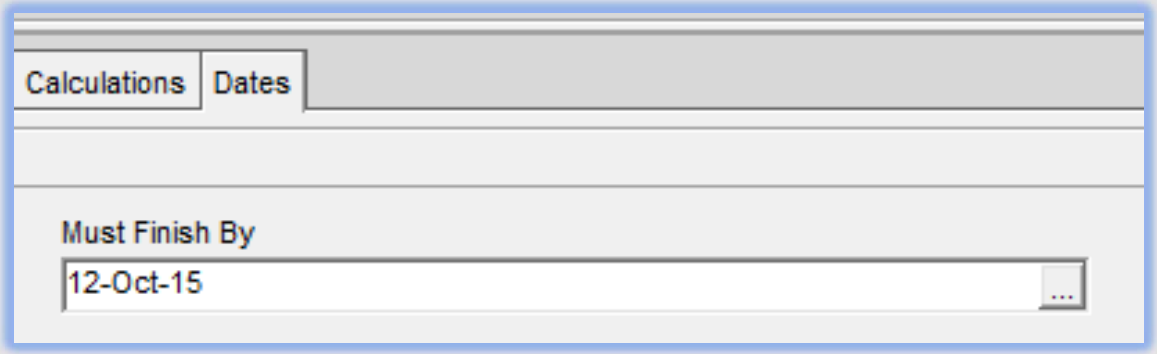


# INTRODUCTION TO CPM SCHEDULING

## CALCULATIONS

Imposed Finish Date

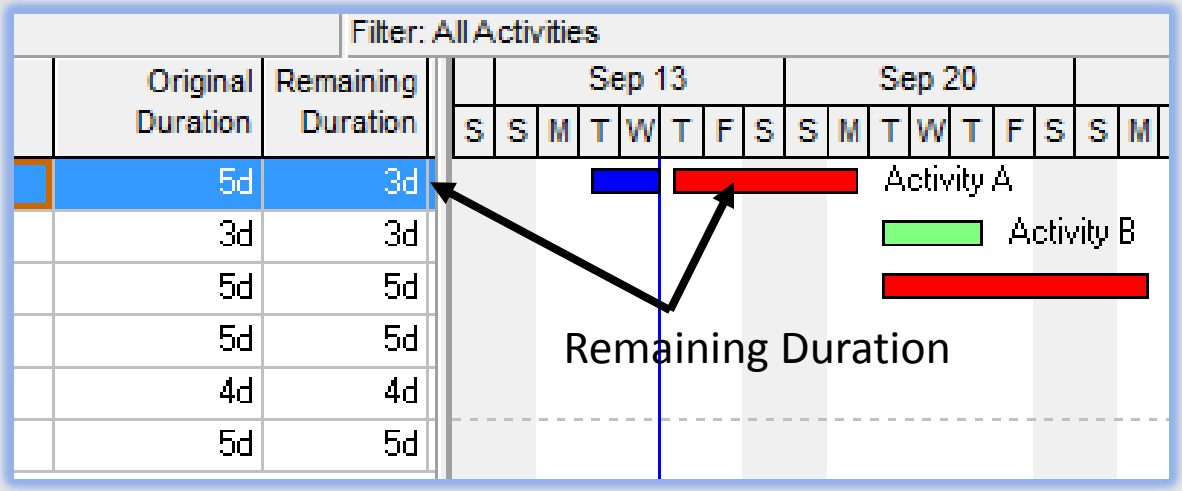
- The date on which the backward pass begins



# INTRODUCTION TO CPM SCHEDULING

## CALCULATIONS

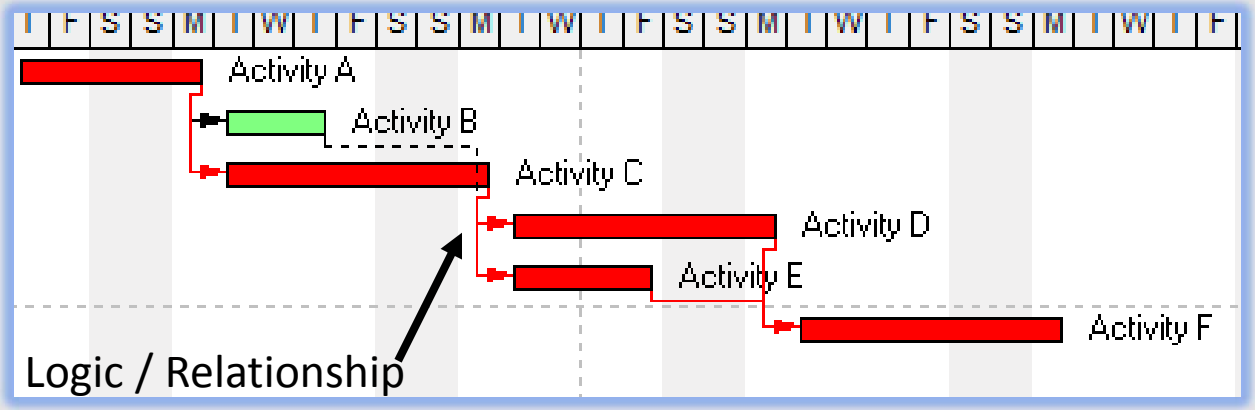
- Remaining duration



# INTRODUCTION TO CPM SCHEDULING

## CALCULATIONS

- Logic (including constraints)

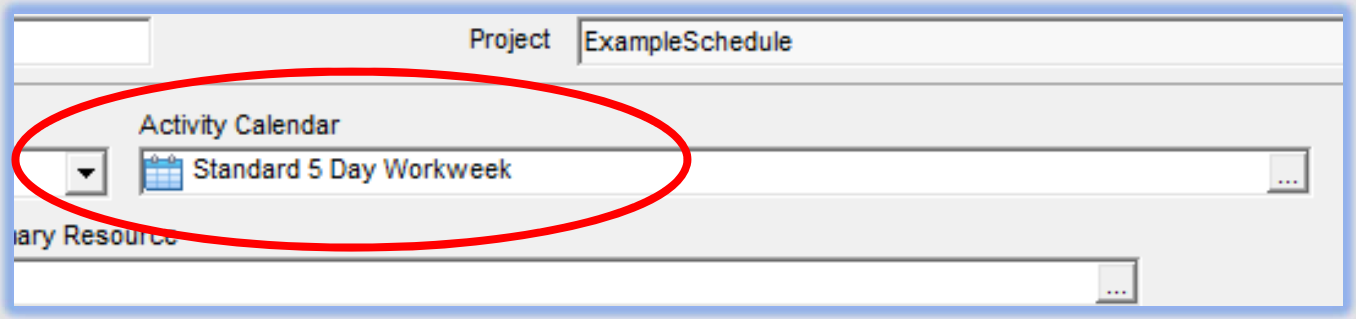



- Constraints are dates assigned to activities regardless of the logic
- Examples are “Start On”, “Start On or After”, “Finish On”, “Finish On or Before”

# INTRODUCTION TO CPM SCHEDULING

## CALCULATIONS

- Calendar(s)



# INTRODUCTION TO CPM SCHEDULING

## CALCULATIONS

- The mathematical calculations performed in the process of critical path method scheduling is one of the fundamental elements to understanding CPM schedules.

- One needs to understand the calculations P6 is performing in order to understand why activities have certain dates and total float.

- To have a basic understanding of the calculations, it is helpful to perform the calculations by hand on a simple schedule.

# INTRODUCTION TO CPM SCHEDULING

## CALCULATIONS

Process for manual calculations of a schedule

1. Develop a list of activities
2. Determine activity interdependence (the logic)
3. Determine the calendar for each activity
4. Determine the durations for each activity
5. Determine the **sequence step** for each activity
6. Draw the network
7. Run through the calculations

# INTRODUCTION TO CPM SCHEDULING

## SEQUENCE STEPS

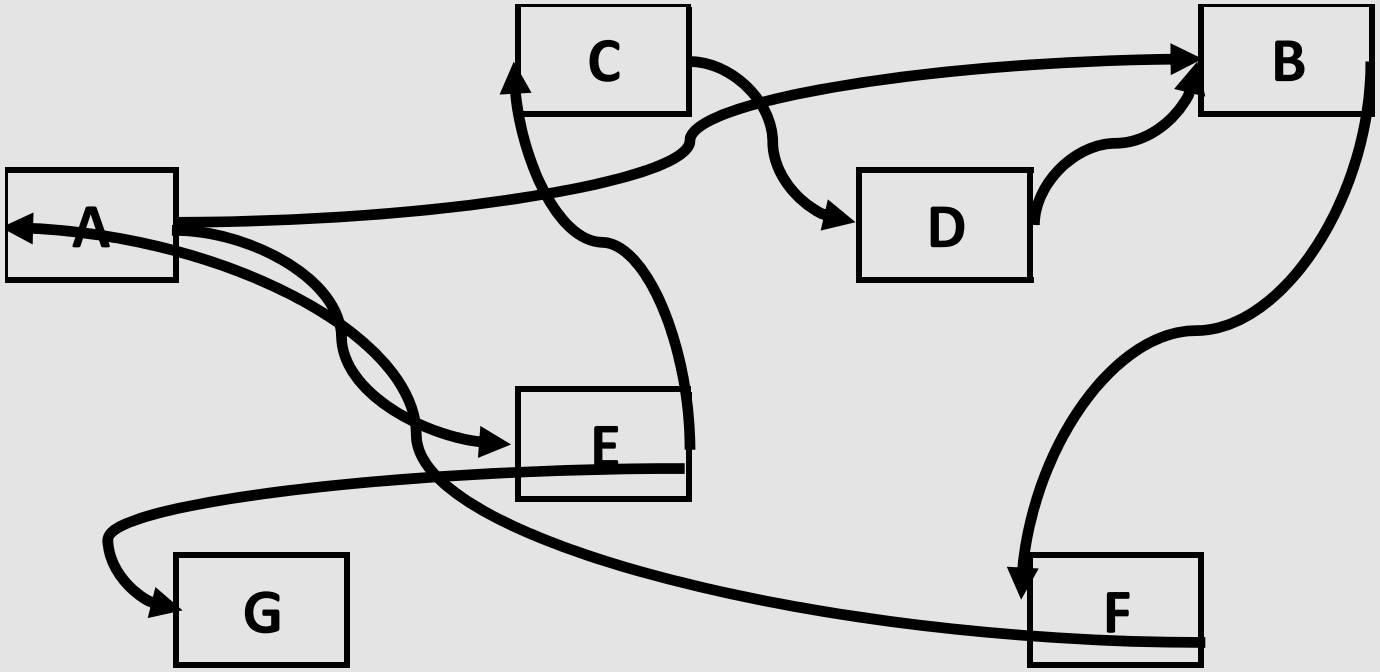
**What is a sequence step and why do we care about them?**

- A sequence step is the first logical position in a logic diagram that an activity can take, based on the position of its predecessor(s).
- Without determining the sequence steps, drawing a schedule network is guesswork.

# INTRODUCTION TO CPM SCHEDULING

## SEQUENCE STEPS

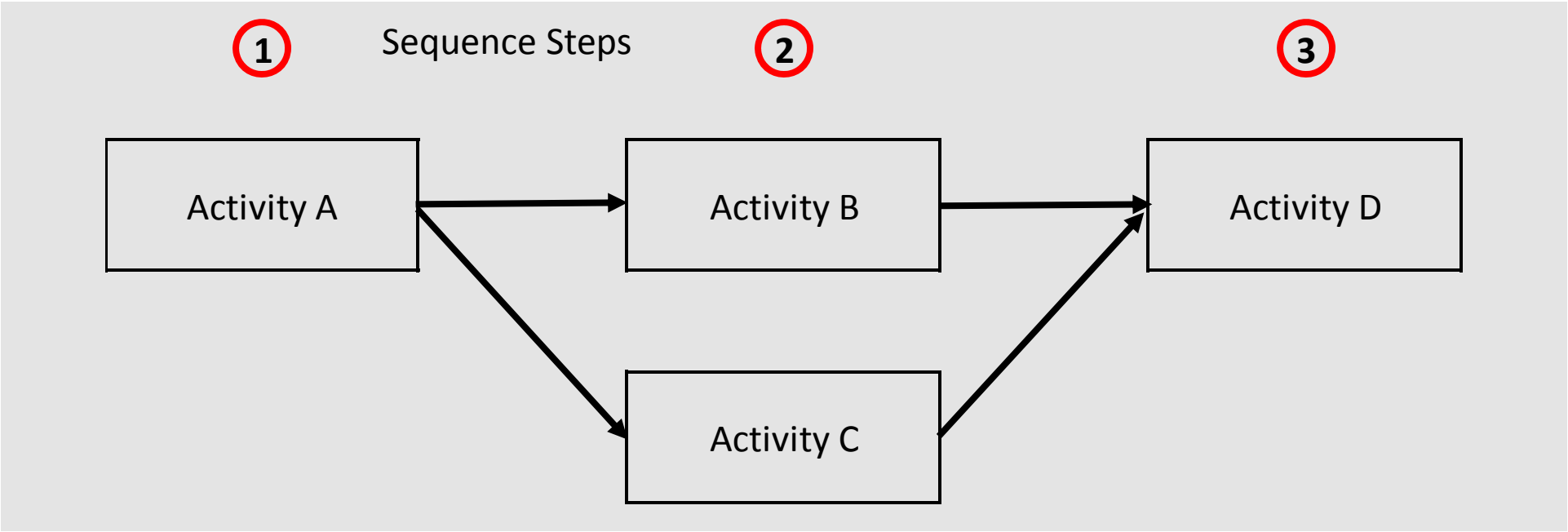
**A schedule network without sequence steps**



# INTRODUCTION TO CPM SCHEDULING

## SEQUENCE STEPS

- A schedule network drawn using sequence steps



# INTRODUCTION TO CPM SCHEDULING

## SEQUENCE STEPS

- The formula for determining a sequence step:

**Sequence Step (SS) = Greatest SS of predecessors + 1**

| Activity | Predecessor | Sequence Step |
|---|---|---|
| A | none | 1 |
| B | A | 2 |
| C | A | 2 |
| D | B, C | 3 |

# INTRODUCTION TO CPM SCHEDULING

## SEQUENCE STEPS – CLASS EXERCISE

**Sequence Step (SS) = Greatest SS of predecessors + 1**

| Activity ID | Predecessor | Sequence Step |
|---|---|---|
| A | none | |
| B | A | |
| C | A | |
| D | C | |
| E | D | |
| F | B | |
| G | D | |
| H | E, F | |
| I | H | |
| J | G | |
| K | I, J | |

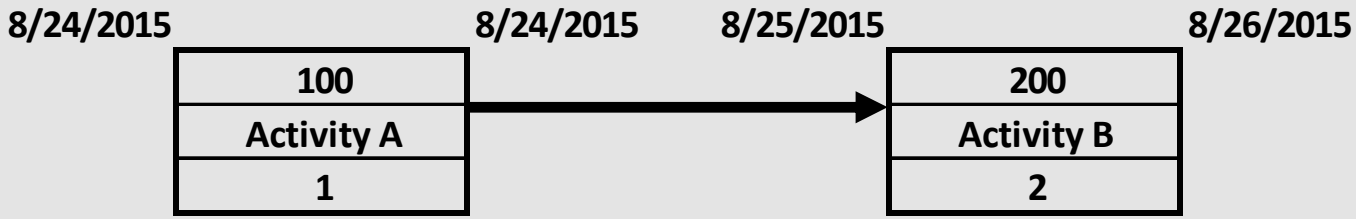
# INTRODUCTION TO CPM SCHEDULING

## FORWARD PASS

- A Forward Pass calculates early start and early finish dates, starting with the first activity within the network
- **Early Start** is the earliest time an activity can start
- Early Start = Early Finish (predecessor) + lag
- **Early Finish** is the earliest time an activity can finish
- Early Finish = Early Start + Duration

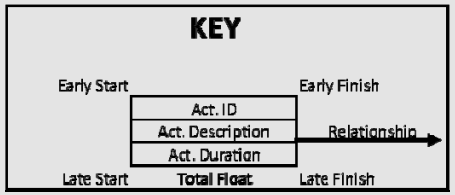
# INTRODUCTION TO CPM SCHEDULING

## FORWARD PASS




Early Start = Early Finish (predecessor) + lag

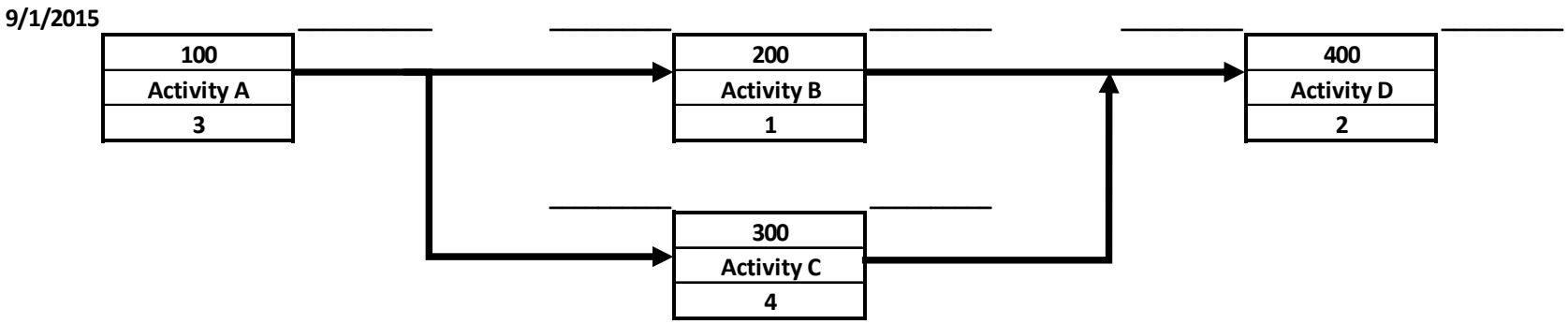
Early Finish = Early Start + Duration

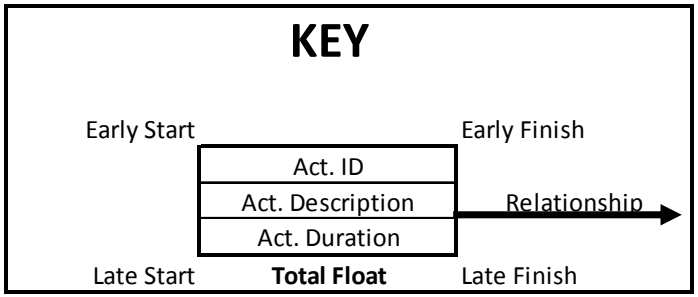



- In this example, Activity A starts at the beginning of the work shift and ends at the end of the work shift on the same day.

# INTRODUCTION TO CPM SCHEDULING

## FORWARD PASS – CLASS EXERCISE



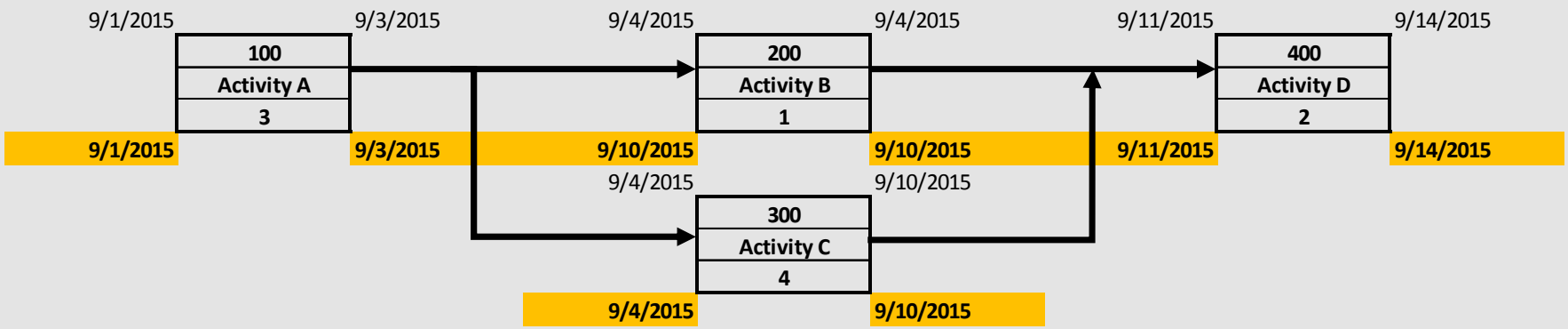
# INTRODUCTION TO CPM SCHEDULING

## BACKWARD PASS

- A Backward Pass calculates late finish and late start dates, starting with the last activity within the network
- **Late Finish** is the latest time an activity can finish
- Late Finish = Late Start (successor) - lag
- **Late Start** is the latest time an activity can start
- Late Start = Late Finish – Duration

# INTRODUCTION TO CPM SCHEDULING

## BACKWARD PASS



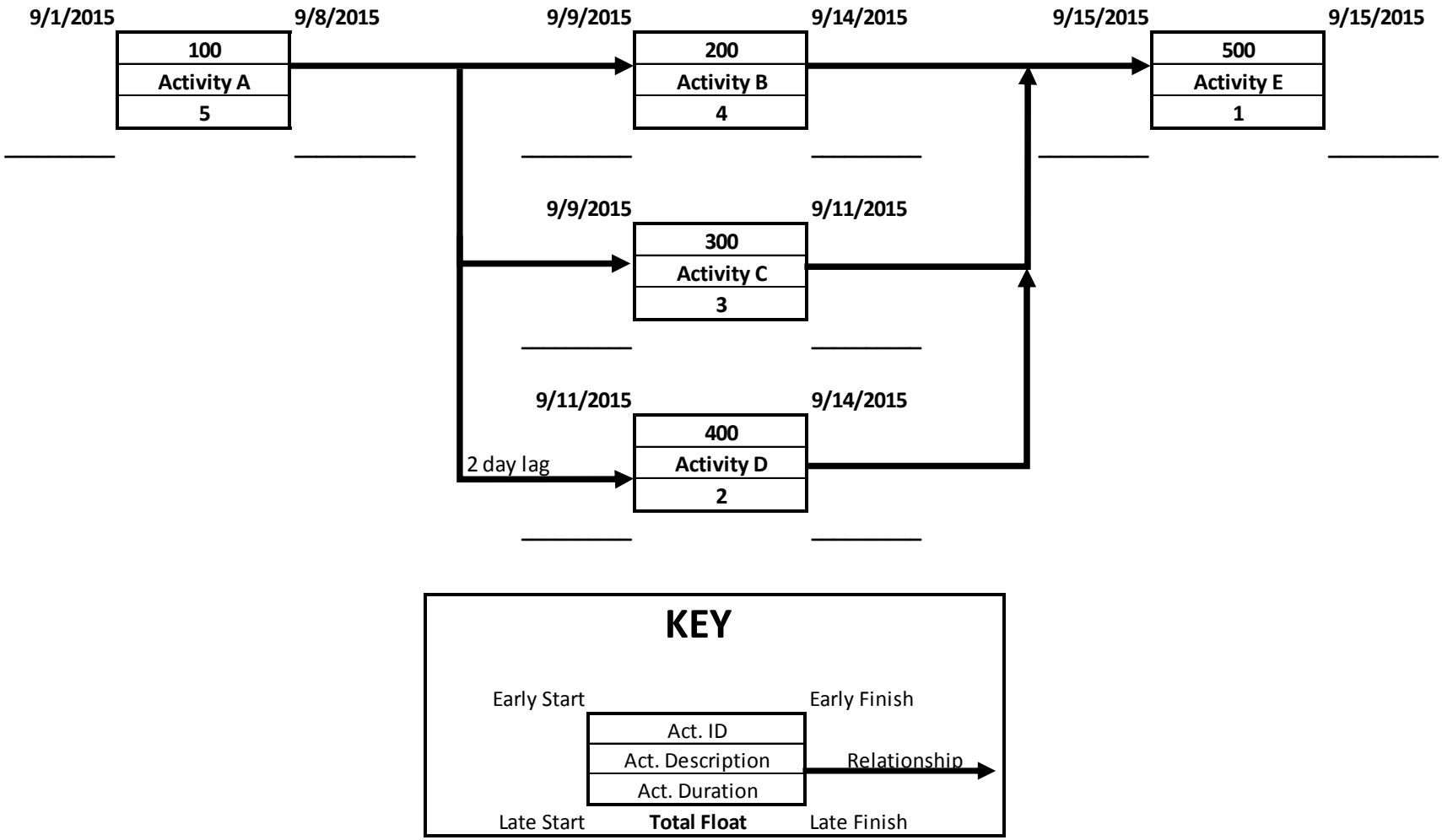

Late Finish = Late Start (successor) - lag

Late Start = Late Finish – Duration

- In this example, all activities are on a standard 5 day work week with holidays.

# INTRODUCTION TO CPM SCHEDULING

## BACKWARD PASS – CLASS EXERCISE



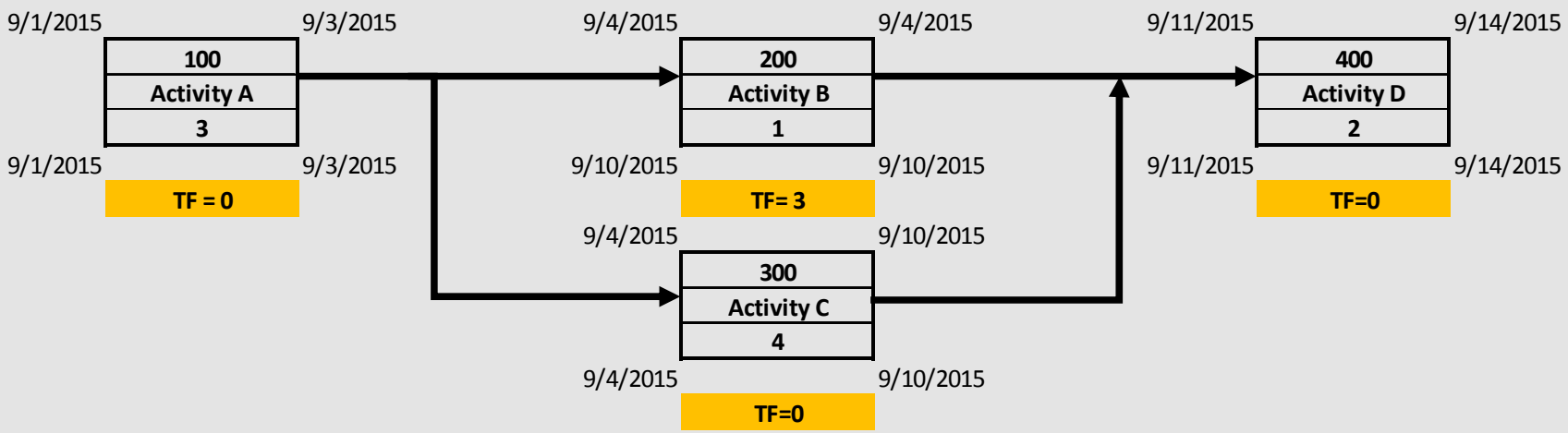
# INTRODUCTION TO CPM SCHEDULING

## TOTAL FLOAT

- Total Float (TF) = the maximum amount of time an activity can be delayed from its early start without delaying the entire project.
- Total Float is calculated by subtracting Early Finish from Late Finish
- Total Float = Late Finish Date – Early Finish Date

# INTRODUCTION TO CPM SCHEDULING

## TOTAL FLOAT

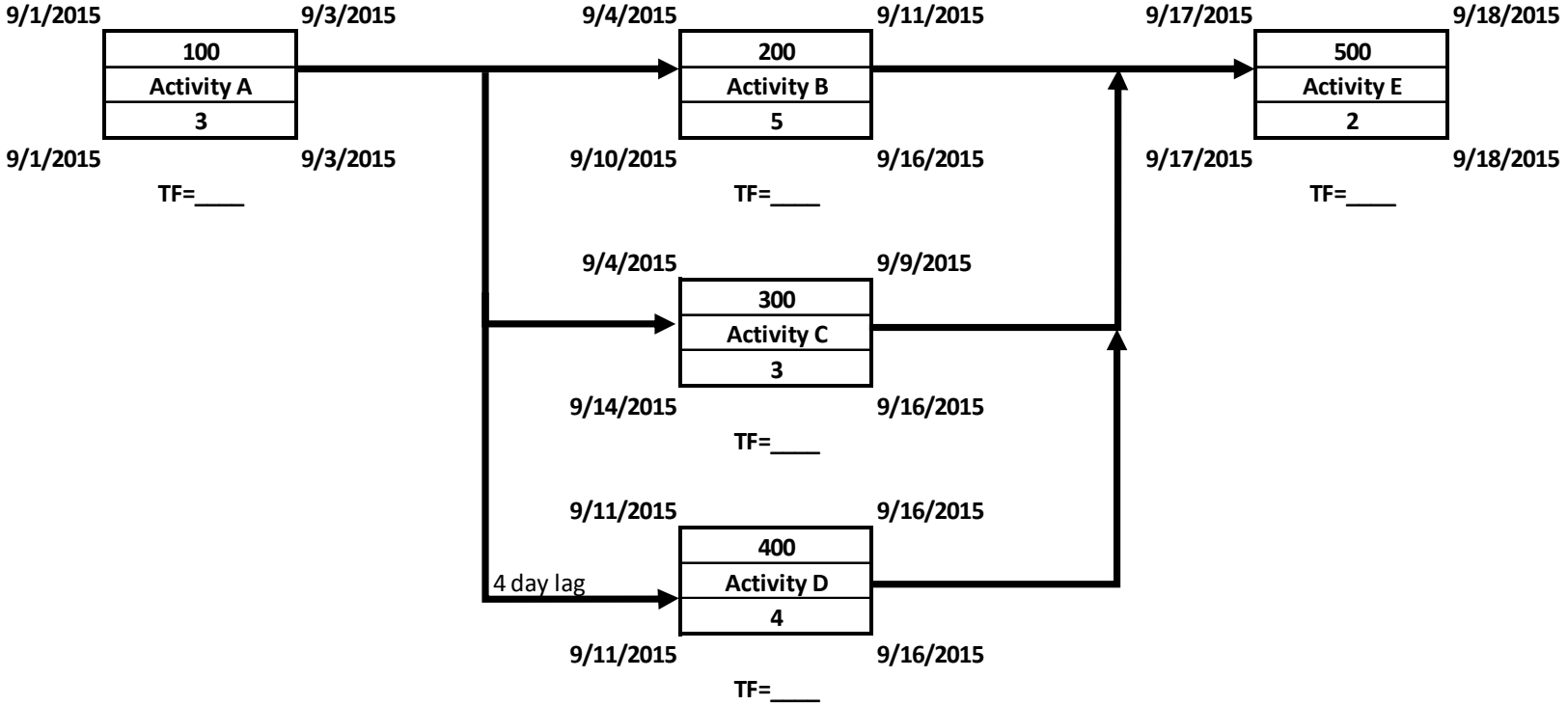


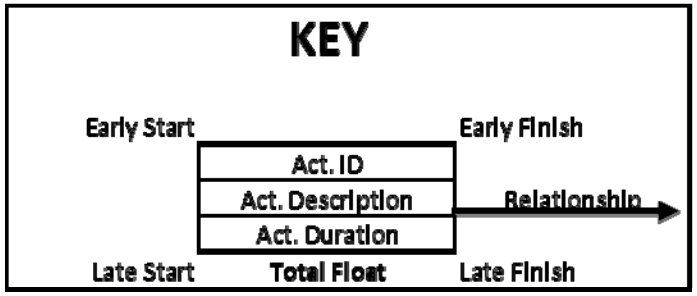

Total Float = Late Finish Date – Early Finish Date

- In this example, TF for Activity 200 is only 3 days because TF is expressed in work days, not calendar days.

# INTRODUCTION TO CPM SCHEDULING

## TOTAL FLOAT – CLASS EXERCISE



# INTRODUCTION TO CPM SCHEDULING

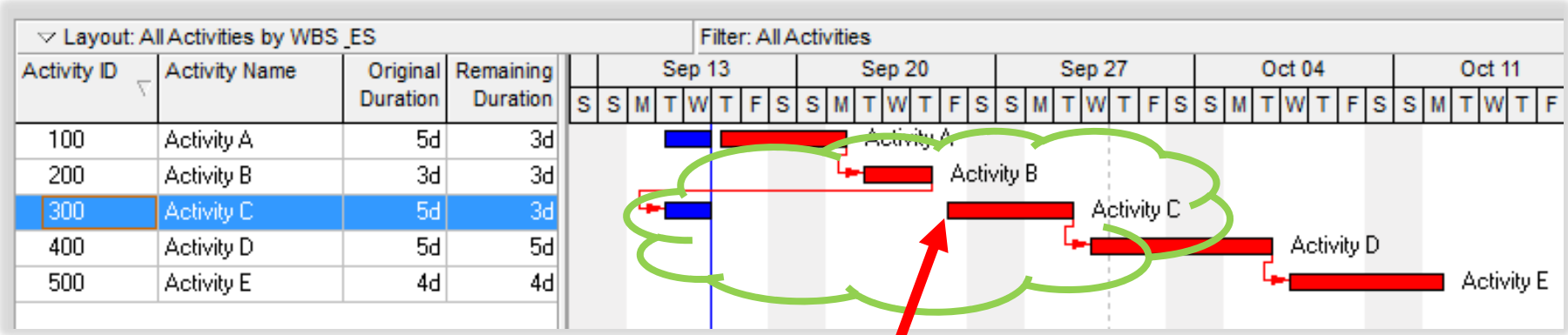
## RETAINED LOGIC

- Retained Logic calculation holds schedule logic constant during calculation of in-progress schedules, regardless of the status of predecessor activities.

- The Retained Logic calculation results in a **conservative representation** of the project status when there is significant out-of-sequence logic.

# INTRODUCTION TO CPM SCHEDULING

## RETAINED LOGIC




**Note the break in this activity**

# INTRODUCTION TO CPM SCHEDULING

## PROGRESS OVERRIDE

- Progress Override calculation ignores or overrides the predecessor activity relationships if the successor activity has started.

- The Progress Override calculation results in a **liberal representation** of the project status when there is significant out-of-sequence logic.

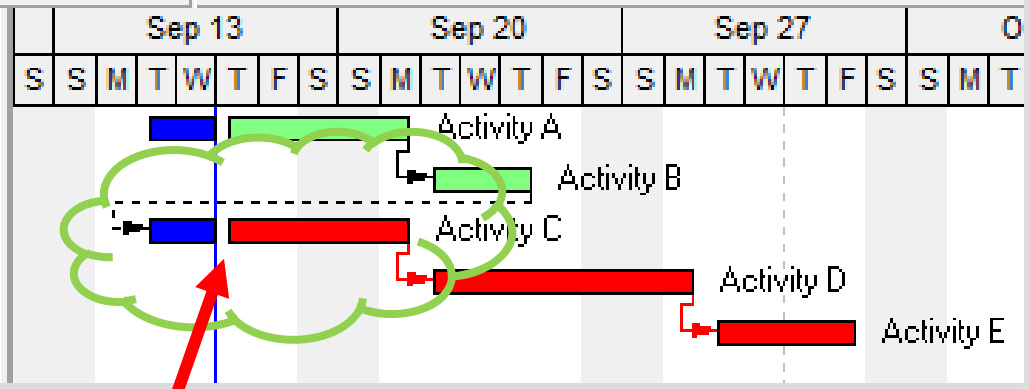
# INTRODUCTION TO CPM SCHEDULING

## PROGRESS OVERRIDE

Layout: All Activities by WBS _ES

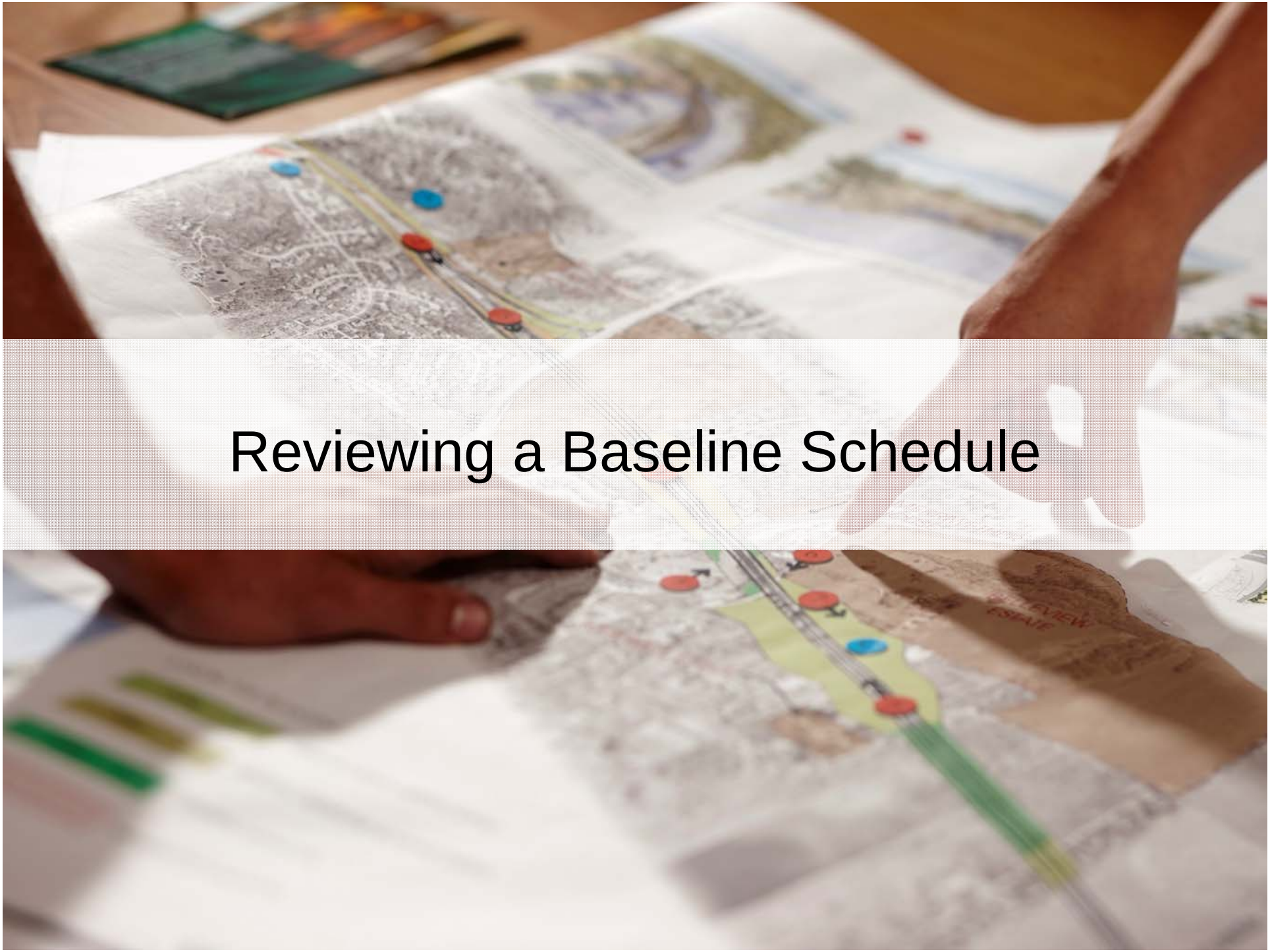
Filter: All Activities

| Activity ID | Activity Name | Original Duration | Remaining Duration |
|---|---|---|---|
| 100 | Activity A | 5d | 3d |
| 200 | Activity B | 3d | 3d |
| 300 | Activity C | 5d | 3d |
| 400 | Activity D | 5d | 5d |
| 500 | Activity E | 4d | 4d |




**Note there is no break in this activity**

**Also notice that activities A & B are no longer critical and the finish date for activity E is earlier.**



# Reviewing a Baseline Schedule

# REVIEWING A BASELINE SCHEDULE

## PURPOSE OF A REVIEW

- To understand the Contractor's plan
- To check the validity of the Contractor's plan
- To understand the impact of the Department's obligations on the Contractor's plan
- Because the Contract requires it!

# REVIEWING A BASELINE SCHEDULE

## FUNDAMENTALS OF A COMPREHENSIVE BASELINE REVIEW

Know the Contract Requirements

- **Schedule Specification**
- Plan Details
- Contractual Limitations of Operations
  - Coordination with 3rd Parties
  - Lane Closure Restrictions
  - Holidays and Special Events
- Contractual Deadlines
  - Contract Time
  - Interim Milestones
  - Bonus and I/D Dates/Timeframe
  - Utility Schedules

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

**PROSECUTION AND PROGRESS - SUBMISSION OF WORKING SCHEDULE. (REV 11-13-14) (FA 1-22-15) (7-15)**
SUBARTICLE 8-3.2 is deleted and the following substituted:
**8-3.2 General:** For this Contract submit the following schedules and reports.
**8-3.2.1 Contract Schedule:** Submit to the Engineer for acceptance a Critical Path Method (CPM) Contract Schedule for the project <u>within 30 calendar days after execution of the Contract or at the preconstruction conference</u>, whichever is earlier.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

The Contract Schedule shall include detailed schedule diagrams and schedule data as described below for the entire Contract Period. The Contract Schedule shall be consistent with the Contract Maintenance of Traffic plan, showing activities for each discrete Contract activity to be accomplished within each Maintenance of Traffic phase. Include activities for deliverables and reviews in the schedule. Sufficient liaison shall be conducted and information provided to indicate coordination with utility owners having facilities within the project limits. The schedule must reflect the utility adjustment schedules included in the Contract Documents, unless changed by mutual agreement of the utility company, the Contractor and the Department.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

The Contract Schedule may indicate a completion date in advance of the expiration of Contract Time. However, the Department will not be liable in any way for the Contractor's failure to complete the project prior to expiration of Contract Time. Any additional costs, including extended overhead incurred between the Contractor's scheduled completion date and the expiration of Contract Time, shall be the responsibility of the Contractor. The Contractor shall not be entitled to claim or recover any such costs from the Department.

The Engineer will withhold monthly payments due for failure of the Contractor to submit an acceptable schedule or monthly updates within the time frame described herein.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

**8-3.2.2 Schedule Submissions:** Develop the schedule in Precedence Diagram Method (PDM) format. All schedule submittals, shall have a copy of the schedule files on a Windows compatible CD or DVD attached. The files shall be in a Primavera format. Make sure to use “Back up” menu selection and ensure that the option “Remove access list during backup” is checked.

Each schedule submission and monthly update shall include a minimum of the following four items:

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

1. A Critical Path Method (CPM) Network Diagram in time-scale logic diagram, by week starting on Monday, grouped (banded) by phase and location and sorted by early start days. Prominently identify the critical path activities, defined as the longest continuous path of work activities. Submit the Network Diagram, printed in color on D size, 22 inches by 34 inches or E size, 34 inches by 44 inches paper. The network diagram shall contain, as a minimum, the following information for each schedule activity: identification, activity description, total duration, remaining duration, early start date, late finish date, and total float.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

2. A report with the following schedule activity information for each construction activity: identification, description, original duration, remaining duration, early start, early finish, total float, percent complete, and budgeted cost. The bar chart diagram shall not be included in this report. It will be submitted on 8.5 inches by 11 inches paper.

3. A schedule narrative report describing current project schedule status and identifying potential delays. This report will include a description of the progress made since the previous schedule submission and objectives for the upcoming 30 calendar days. It will be submitted on 8.5 inches by 11 inches paper. This report shall at a minimum include the following information:

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

a. This report shall indicate if the project is on schedule, ahead of schedule or behind schedule. If the project is ahead of schedule or behind schedule, the report shall include the specific number of calendar days. If the project is behind schedule, the report shall include a detailed recovery plan that will put the project back on schedule or include a properly supported request for Time Extension.

b. The report will describe the current critical path of the project and indicate if this has changed in the last 30 calendar days. Discuss current successes or problems that have affected either the critical path's length or have caused a shift in the critical path within the last 30 calendar days. Identify specific activities, progress, or events that may reasonably be anticipated to impact the critical path within the next 30 calendar days, either to affect its length or to shift it to an alternate path.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

c. List all schedule logic or duration changes that have been made to the schedule since the previous submission. For each change, describe the basis for the change and specifically identify the affected activities by identification number.

d. Identify any and all activities, either in progress or scheduled to occur within the following 30 days that require Department participation, review, approval, etc.

# REVIEWING A BASELINE SCHEDULE

## Narrative Checklist

| Requirement | Disposition |
|---|---|
| • Current project schedule status and identify potential delays | |
| • A description of the progress made since the previous schedule submission | N/A for Baseline |
| • Objectives for the upcoming 30 calendar days | |
| • Indicate if the project is on schedule, ahead of schedule or behind schedule | N/A for Baseline |
| o If ahead or behind schedule, indicate the specific number of calendar days | N/A for Baseline |
| o If behind schedule, include a detailed recovery plan that will put the schedule back on track or provide a properly supported request for Time Extension. | N/A for Baseline |
| • Describe the current critical path and indicate if the critical path has changed within the last 30 calendar days. | |
| • Discuss current successes or problems that have affected either the critical path's length or have caused a shift in the critical path in the last 30 calendar days. | N/A for Baseline |
| • Identify specific activities, progress, or events that may reasonably be anticipated to impact the critical path within the next 30 calendar days, either to affect its length or to shift it to an alternate path. | |
| • List all schedule logic or duration changes that have been made to the schedule since the previous submission. | |
| o For each change, describe the basis for the change and specifically identify the affected activities by identification number. | |
| • Identify any and all activities, either in progress or scheduled to occur within the following 30 days that require Department participation, review, approval, etc. | |

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

4. A copy of the schedule files on a Windows compatible CD or DVD in Primavera format.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

The Engineer will have 30 days to accept the Contract Schedule or to schedule a meeting, if needed, within that time, with the Contractor to resolve any problems that prevent acceptance of the schedule. Attend the meeting scheduled by the Engineer, and submit a corrected schedule to the Engineer within seven days after the meeting. The process will be continued until a Contract Schedule is accepted by the Engineer.

Upon the Engineer's acceptance of the Contract Schedule, submit monthly updates of the Contract Schedule reflecting progress through the monthly estimate cut-off date within 7 calendar days after the monthly estimate cut-off date.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

**8-3.2.3 Schedule Content:** All schedule submissions shall comply with the following content guidelines as appropriate to the specific submission:

Outline Schedule Diagrams and Data shall show the sequence, order, and interdependence of major construction milestones and activities. Include ordering and procurement of major materials and equipment, long-lead time items, and key milestones identified by the Contract. Identify planned work schedule(s) and include all non-workdays. Provide a description of each major construction activity or key milestone.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

Detailed Schedule Diagrams shall include activity number, description, early dates, float, and all relationships ( i.e. logic ties ), resources and costs. Show the sequence, order, and interdependence of activities in which the work is to be accomplished. Include allowance for Department oversight, acceptance and return of submittals, samples and shop drawings where Department acceptance is specifically required (in accordance with 5-1.4.6 of the standard specifications). In addition to construction activities, detailed network activities shall include the submittals, procurement, and Department or Utility activities impacting progress:

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

1. Submittal activities shall include oversight and acceptance of submittals. If the Department's action on any submittal is “Not Accepted” or “Revise and Resubmit”, a new series of submittal preparation activities shall be inserted into the schedule. Predecessor for the new submittal preparation activity will be the original acceptance activity and the successor of the new acceptance activity will be the fabrication/delivery activity for the equipment or material.

2. Procurement activities shall include all materials and equipment, receipt of materials with estimated procurement costs of major items for which payment of stockpiled materials will be requested in advance of installation, fabrication of special material and equipment, and their installation and testing.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

3. Show activities of the Department or Utilities that affect progress and contract-required dates for completion of all or parts of the work.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

1. All activities shall be assigned to a specific calendar within the software. Specific calendars will be defined within the software to include planned work days. These calendars will include both Contractor and Contract defined holidays and suspension days as non-workdays.

2. Each schedule activity shall be cost loaded. Activity cost loading shall be consistent with the bid breakdown. The sum total of the activity cost loading shall be equal to the current contract value, and should not include bid items.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

3. At a minimum, each schedule activity shall contain codes by:

a. Responsibility: including, but not be limited to, Department, Utility, Contractor/Subcontractor, Supplier/Vendor, Consultant, etc.

b. Phasing: identify the appropriate Maintenance of Traffic phase or subphase.

4. Key milestones as identified by contract. At a minimum, the start and finish of each Maintenance of Traffic phase or subphase shall be represented by a milestone activity.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

5. All non-procurement activities must be less than or equal to 20 workdays unless approved by the Engineer to be greater by the Engineer.

6. Detailed description of each activity. In each activity, give quantity and unit of measure so that the amount of work the activity involves is clearly communicated.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

7. Only two open-ended activities (the first and the last) are allowed.

8. Constraints shall only be used for “Project Start,” and “Project Completion.” Constraints cannot override logic. The use of any other imposed constraints is not allowed without specific approval by the Engineer. Any other desired constraints must be submitted to the Engineer with the rationale for the use of each desired additional constraint. If allowed by the Engineer, the rationale should be recorded in the activity's log field. Mandatory constraints (start and finish) violate network logic and shall not be used.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

9. Out of sequence progress, if applicable, shall be handled through Retained Logic. Use of the Progress Override option is not appropriate for this project and will not be allowed.

10. Progress shall be calculated based on percent complete.

11. All changes to activities shall be recorded with a note in the activity log field. The log shall include, as a minimum, the date and reason for the change, as well as reference to a document wherein the Engineer acknowledges and accepts the change.

12. The use of resource leveling, either manual or automatic, is prohibited.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

**8-3.2.4 Weekly Meetings:** Attend weekly meetings scheduled by the Engineer to discuss Contract progress, near term scheduled activities, including utility relocations, problems and their proposed solutions. Submit a Two-Week “Look Ahead” Planning Schedule at each weekly meeting, showing the items of work planned for the next two weeks. Develop the schedule in Bar Chart format, identifying current and planned activities and related Contract Schedule work activities, including subcontractor work. Designate all activities that are controlling work items as determined by the currently accepted Contract Schedule. A report shall be submitted at each weekly meeting identifying schedule activity progress including actual start or finish dates achieved for any activities.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

**8-3.2.5 Float:** Float is defined as the amount of time the finish of an activity can be delayed. Two kinds of float are possible: Total float is how much an activity can be delayed without affecting the finish date of the project or an intermediate deadline (constraint); it is the difference between the late finish date and the early finish date. Free float is how much an activity can be delayed without affecting its earliest successor.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

Float is not for the exclusive use or benefit of either the Department or the Contractor.

Use of float suppression techniques, such as preferential sequencing (arranging critical path through activities more susceptible to Department caused delay), special lead/lag logic restraints, zero total or free float constraints, extended activity times, or imposing constraint dates other than as required by the contract, shall be cause for rejection of the project schedule or its updates. The use of Resource Leveling (or similar software features) used for the purpose of artificially adjusting activity durations to consume float and influence the critical path is expressly prohibited.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

Negative float shall not be a basis for requesting time extensions. Any extension of time shall be addressed in accordance with 8-3.2.6 Time Extensions. Scheduled completion date(s) that extend beyond the contract completion date (evidenced by negative float) may be used in computations for assessment of payment withholdings. The use of this computation is not to be construed as a means of acceleration.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

**8-3.2.6 Time Extensions:** The Contractor is responsible for submitting a request for Contract Time extension in accordance with 8-7.3.2 of the standard specifications. An extension of time for performance shall be considered only to the extent that a delay to an activity or activities exceeds the total float along the project critical paths within the current approved schedule.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

As a minimum, time extension requests shall contain:

1. A descriptive summary of the changes
2. An analysis of project impact
3. A fragnet that shows the impacted activities before the change
4. A fragnet that shows the impacted activities after the change

Time extensions shall not be considered for proposals that do not include full documentation for the schedule change. Once a change has been approved by the Engineer, the specific activities and the overall schedule must be updated.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

**8-3.2.7 Performance of Work:** By submitting a schedule the Contractor is making a positive assertion that the project will be constructed in the order indicated on the schedule. Prosecute the work in accordance with the latest accepted Working Schedule. Any costs associated with meeting milestones and completing the project within the authorized Contract Time will be borne solely by the Contractor.

# REVIEWING A BASELINE SCHEDULE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

**8-3.2.8 As-Built Schedule:** As a condition for Final Acceptance of the project, submittal of an as-built schedule which describes the actual order and start and stop times for all activities by the Contractor is required.

# REVIEWING A BASELINE SCHEDULE

## DEVELOP A REVIEW CHECKLIST FOR THE PROJECT

- General items for all schedules
- Project specific items

# REVIEWING A BASELINE SCHEDULE

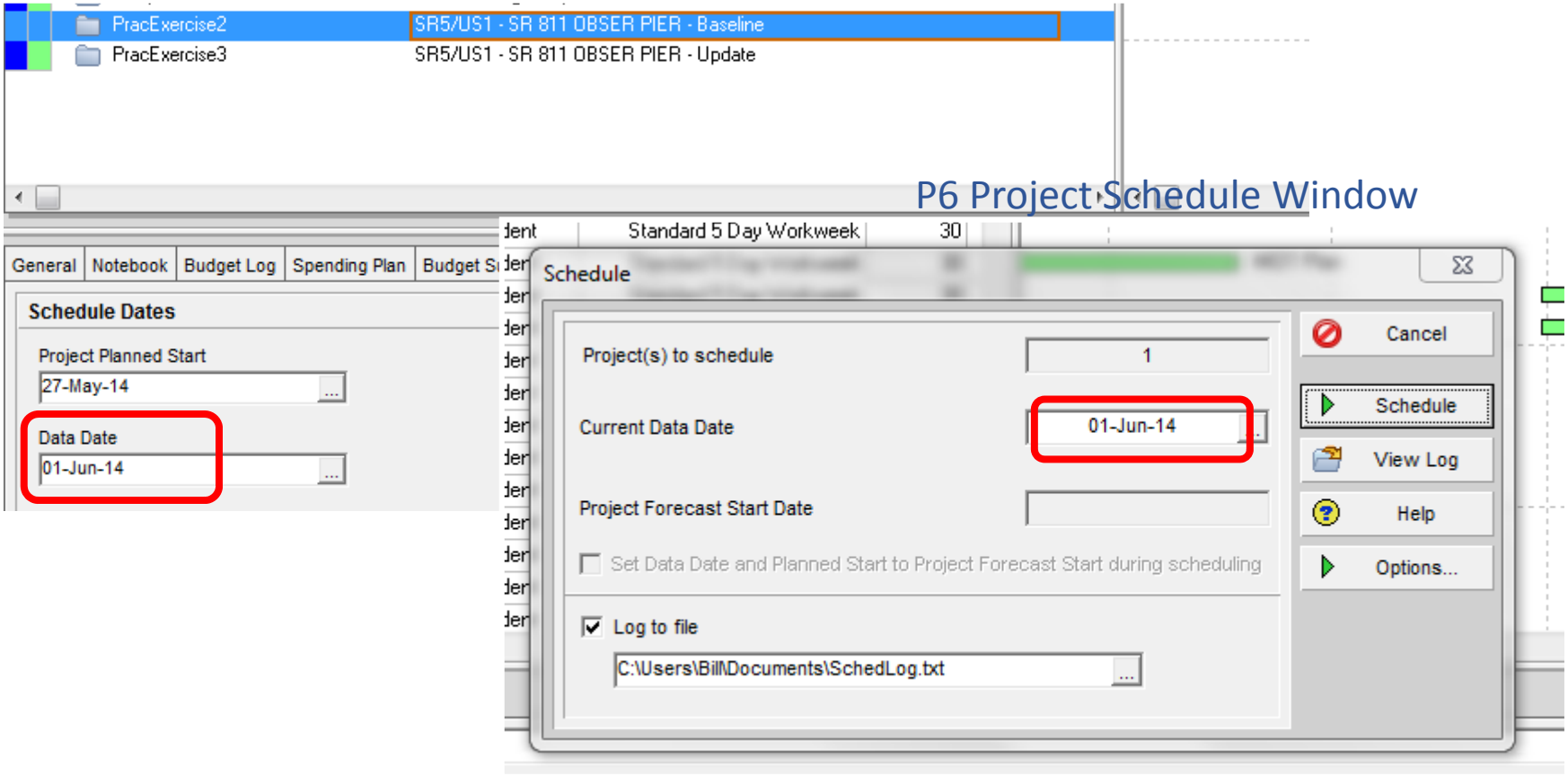
## GENERAL ITEMS FOR ALL SCHEDULES

| Type | Checklist Item | How to Check |
|---|---|---|
| Date | Is the data date correct? | P6 Projects Dates Screen |
| Activities | Are owner and third party activities included in the schedule? | Detailed Review |
| Calculation | Verify the total float calculation method. (Should be Finish Float) | P6 Calculation Sub-screen |
| Calculation | Verify the critical activity determination method. (Should be Longest Path) | P6 Calculation Sub-screen |
| Calculation | Calculate the schedule and review the output file to verify there are no logic loops or out-of-sequence progress. | P6 Schedule Log text file |
| Calculation | Is the critical path clearly shown? | P6 Schedule Log text file |
| Calculation | Is there more than one critical path? | Detailed review |
| Calendars | Check to see what calendars have been set up for the schedule – are there project calendars or global calendars? (Project Calendars are best) | P6 View Calendars Column |
| Calendars | Verify if holidays and other non-work periods are shown on the calendars used for the schedule. | P6 Calendars Sub-screen |
| Constraint | Check for schedule completion constraints. (Not allowed by Specification) | P6 Projects Dates Screen |
| Constraint | Check for constraints on any activities. (Only allow for Project Start & Project Completion) (Mandatory Start & Finish constraints are not allowed) | P6 Activity Detail Window |
| Durations | Verify that activity durations are not excessive or inadequate. | Detailed Review |
| Logic | Is there only one activity with no predecessor? | P6 Schedule Log text file |
| Logic | Is there only one activity with no successor? | P6 Schedule Log text file |
| Logic | Verify all relationship lags to make sure float has not be sequestered? | P6 Activity Detail Window |
| Logic | Verify that Milestones only have “Start on or After” or “Finish on or Before”. | P6 Activity Detail Window |
| Logic | Verify that “Level of Effort” activities have start-to-start predecessors with 0 lag and finish-to-finish successors with 0 lag. | P6 Activity Detail Window |
| Status | Verify the schedule does not include any statused activities. | Detailed Review |
| Submittal | Verify that the submittal includes the required components – most importantly the electronic files and the narrative. | Submittal Package |
| Submittal | Verify that the narrative includes all of the required information | Narrative |
| Submittal | Verify that there are adequate submittal/review & approval/fabrication & manufacturing activities. | Detailed Review |

# REVIEWING A BASELINE SCHEDULE

## Is the data date correct?

P6 Projects List – Dates Tab Screen

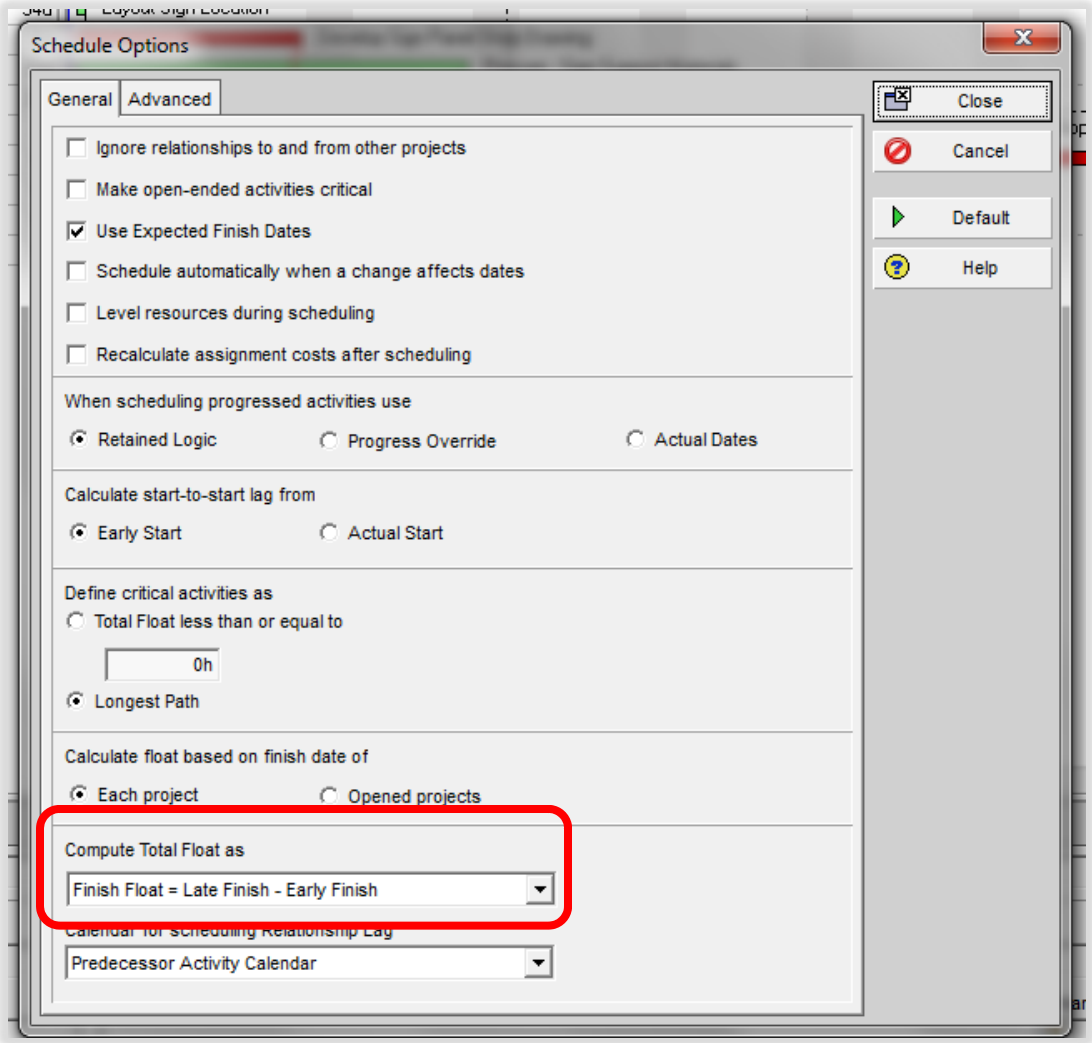



P6 Project Schedule Window

# REVIEWING A BASELINE SCHEDULE

## Verify the total float calculation method

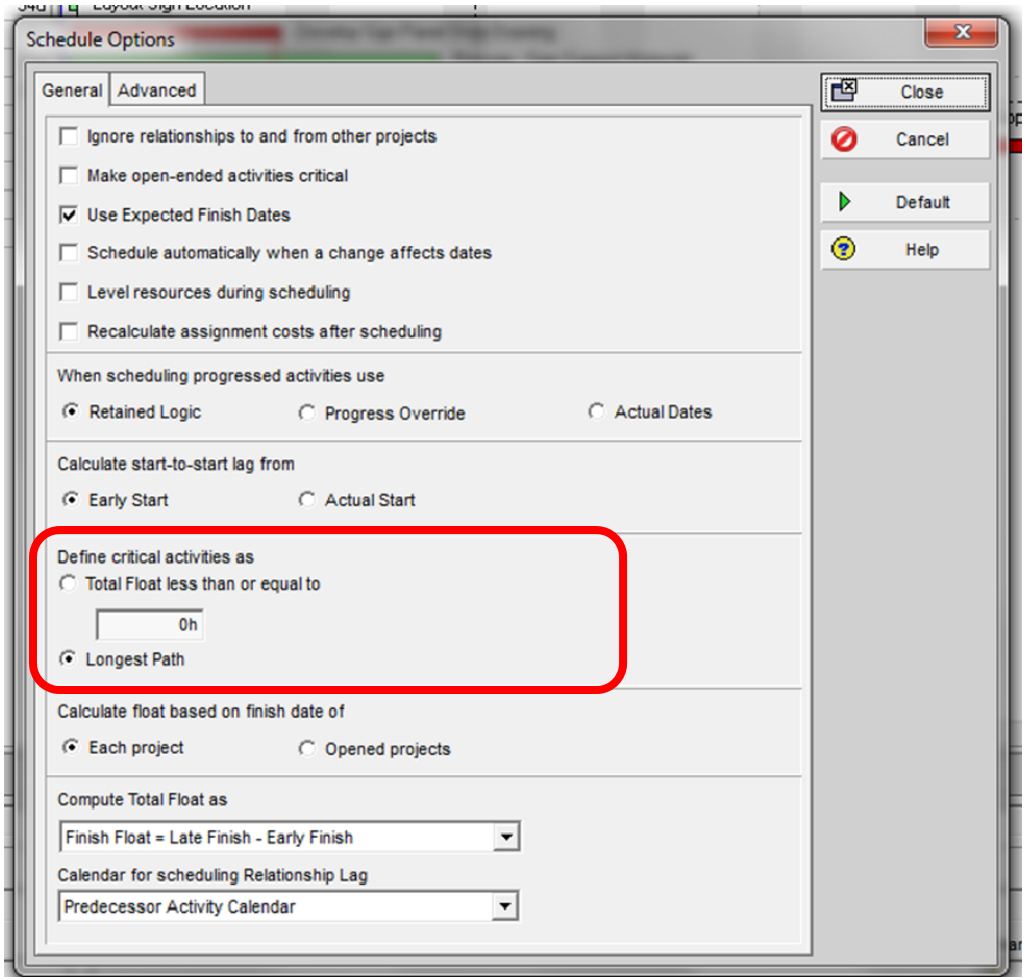
Project Schedule
Calculation Sub-screen



# REVIEWING A BASELINE SCHEDULE

## Verify the critical activity determination method

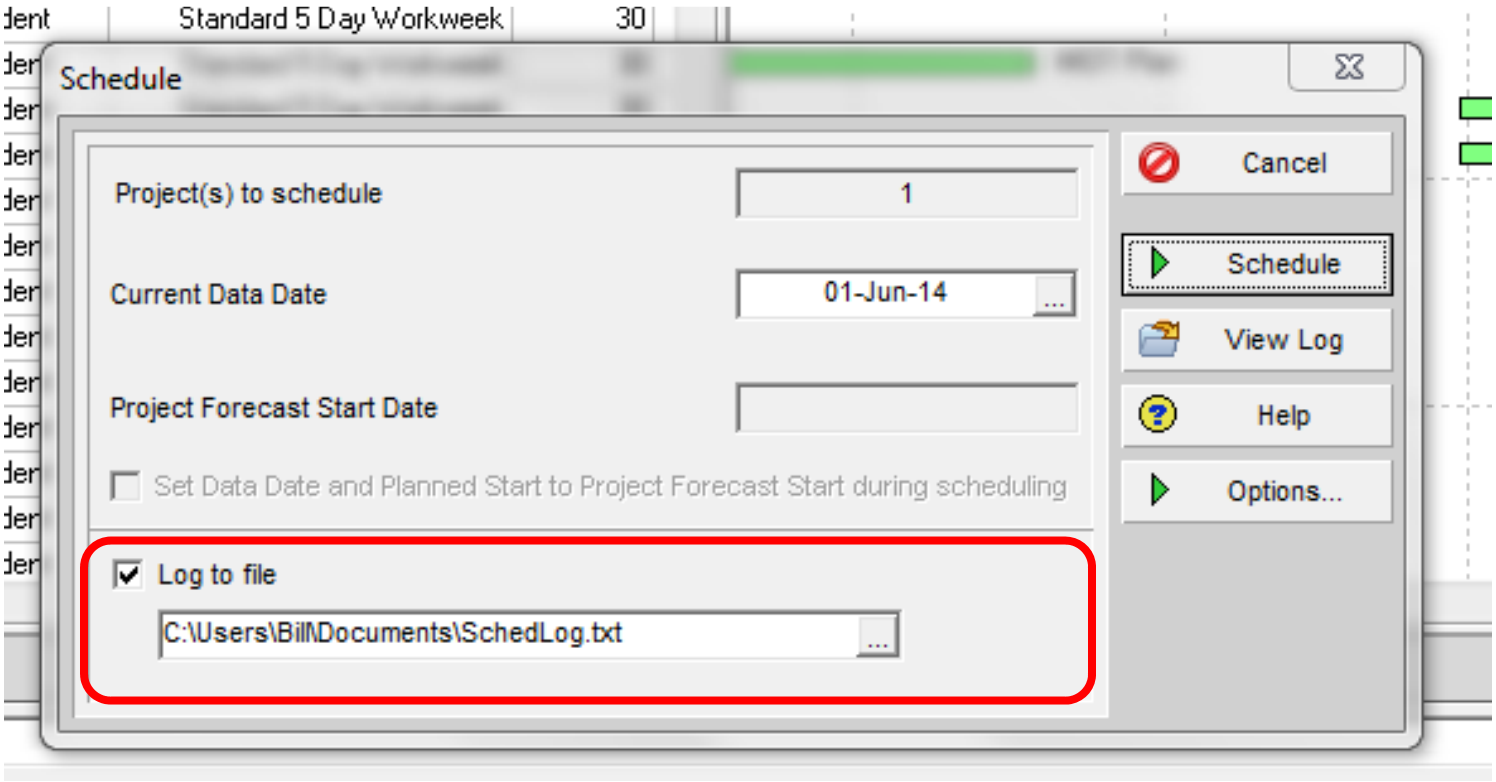
Project Schedule
Calculation Sub-screen



# REVIEWING A BASELINE SCHEDULE

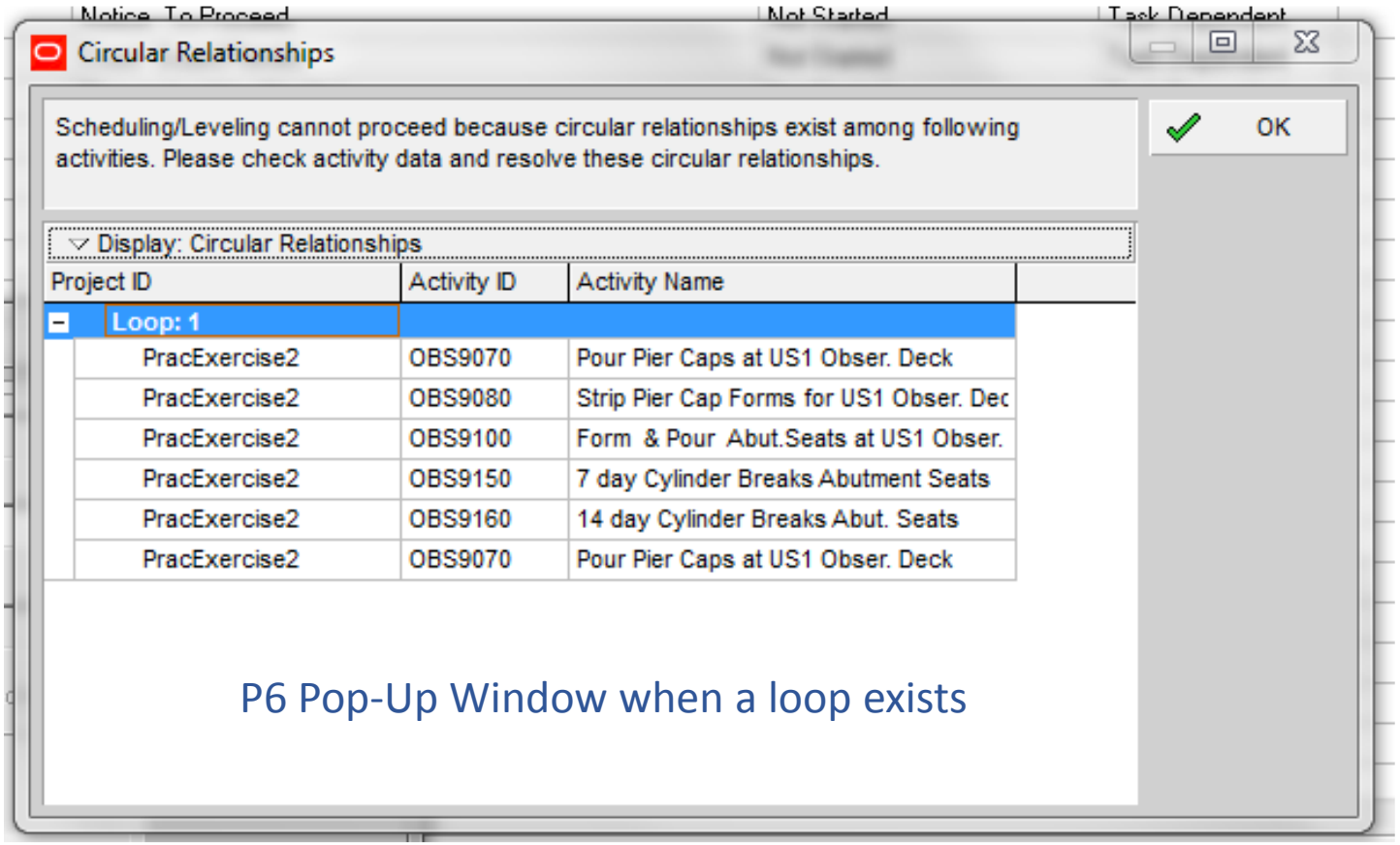
Calculate the schedule and review the output file to verify there are no logic loops or out-of-sequence progress

P6 Project Schedule Window



# REVIEWING A BASELINE SCHEDULE

Calculate the schedule and review the output file to verify there are <u>no logic loops</u> or out-of-sequence progress




P6 Pop-Up Window when a loop exists

# REVIEWING A BASELINE SCHEDULE

Calculate the schedule and review the output file to verify there are no logic loops or <u>out-of-sequence progress</u>

```
Errors:
-------
Warnings:
---------
        Activities without predecessors.................................1
                Project:        BusStop Activity:       MS100   Start Project

        Activities without successors...................................1
                Project:        BusStop Activity:       MS200   End project

        Out-of-sequence activities......................................1
                Project:        BusStop Activity:       SD200   Develop submittal - timber beam

        Activities with Actual Dates > Data Date........................1
                Project:        BusStop Activity:       SD200   Develop submittal - timber beam
```

P6 Schedule Text File

# REVIEWING A BASELINE SCHEDULE

Is the critical path clearly shown?

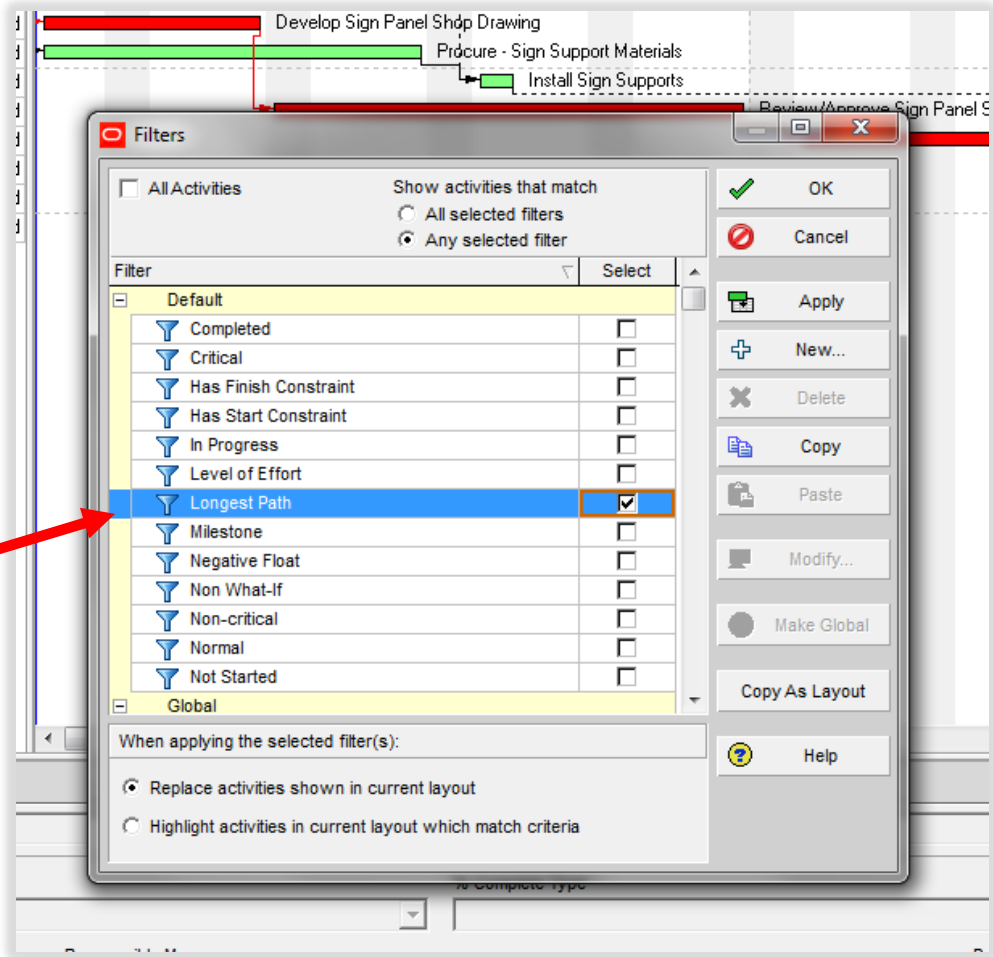
```
Critical Activities.............................................10
        Project:        BusStop Activity:       AD100   Execute contract
        Project:        BusStop Activity:       AD200   Notice to proceed
        Project:        BusStop Activity:       CN350   Install timber beam
        Project:        BusStop Activity:       CN400   Install roof panels
        Project:        BusStop Activity:       CN750   Punch-list & final clean-up
        Project:        BusStop Activity:       MS100   Start Project
        Project:        BusStop Activity:       MS200   End project
        Project:        BusStop Activity:       PC200   Procure - timber beam
        Project:        BusStop Activity:       RV200   Review/approve - timber beam
        Project:        BusStop Activity:       SD200   Develop submittal - timber beam
```

P6 Schedule Text File

# REVIEWING A BASELINE SCHEDULE

## Is the critical path clearly shown?

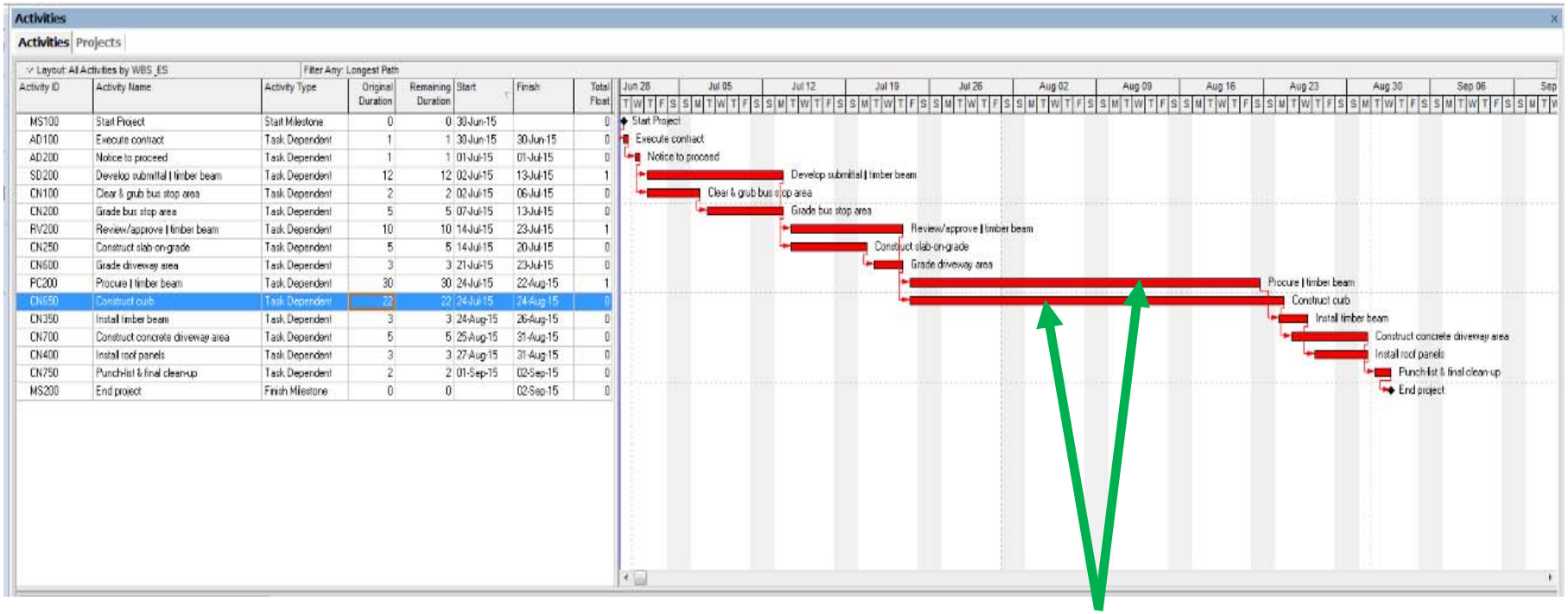
P6 Activity Filter Screen




**Filter for the longest path to view in bar chart format**

# REVIEWING A BASELINE SCHEDULE

Is there more than one critical path?

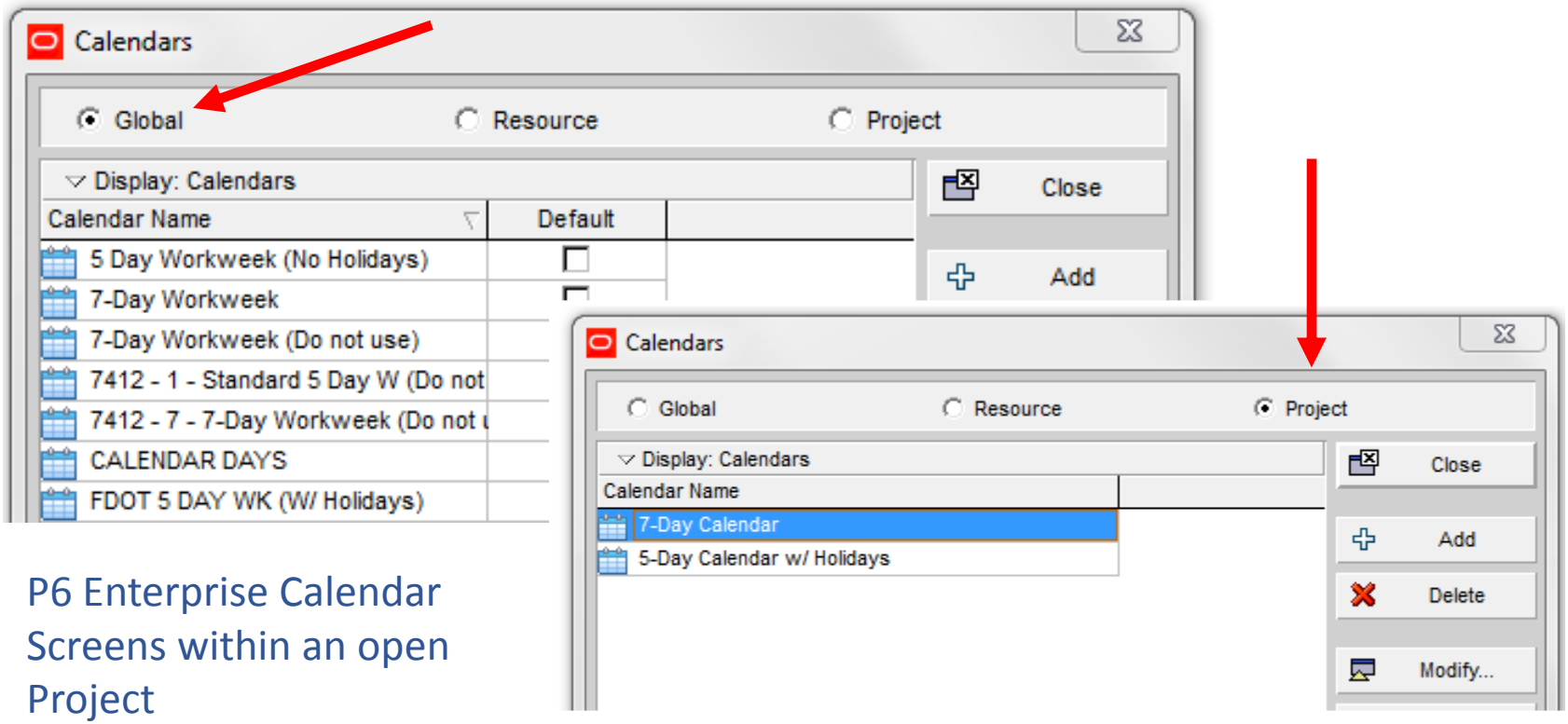



P6 Activity Bar Chart Screen

**These bars show concurrent activities that do not have a logic tie, indicating two critical paths.**

# REVIEWING A BASELINE SCHEDULE

Check to see what calendars have been set up for the schedule – are there <u>global calendars</u> or <u>project calendars</u>?




P6 Enterprise Calendar Screens within an open Project

# REVIEWING A BASELINE SCHEDULE

Check to see what calendars have been set up for the schedule – are there <u>global calendars</u> or <u>project calendars</u>?

P6 Activity List Screen with Calendar Column Selected

**Activities**

Projects **Activities**

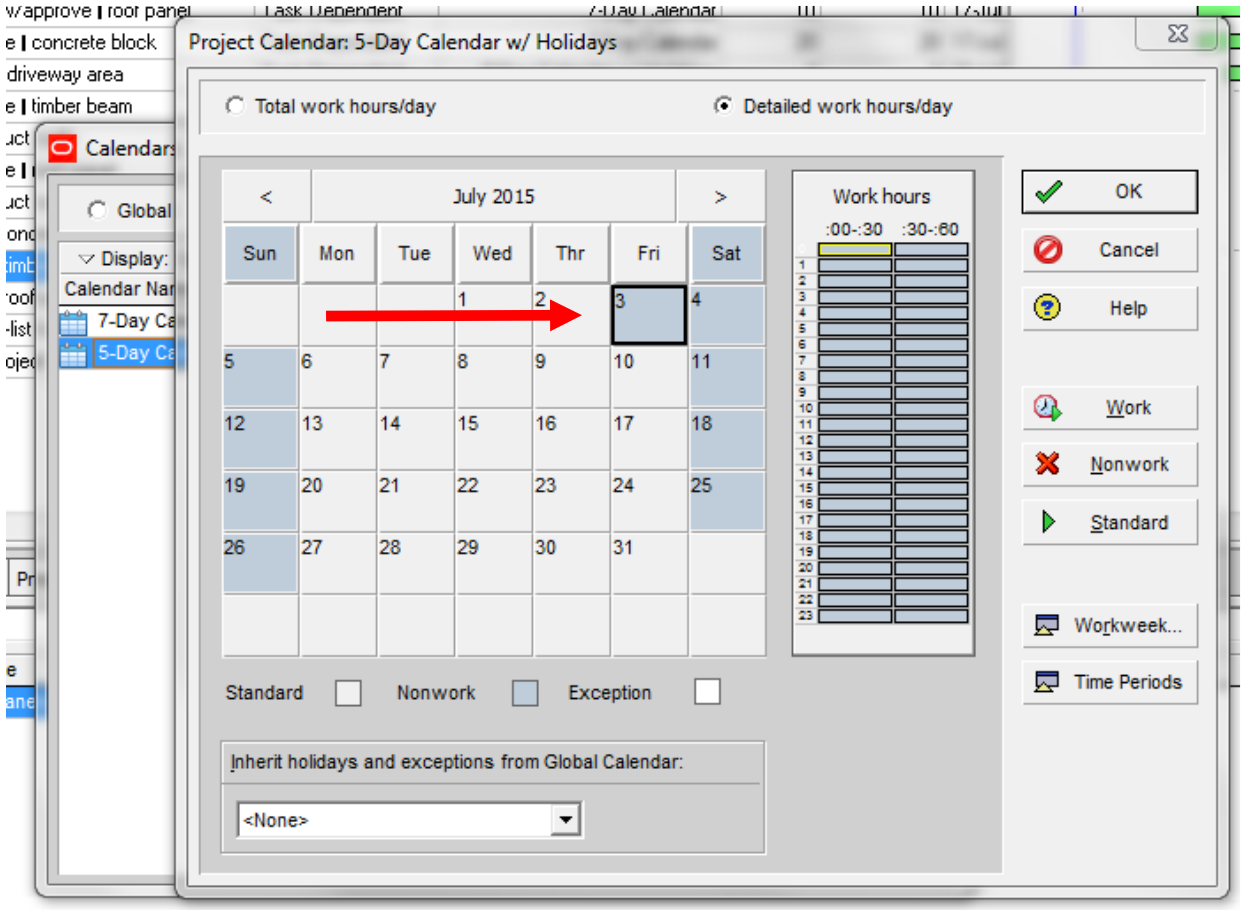
Layout: All Activities by WBS _ES | Filter: All Activities

| Activity ID | Activity Name | Activity Type | Calendar | Ori Dur |
|---|---|---|---|---|
| MS100 | Start Project | Start Milestone | 7-Day Calendar | |
| AD100 | Execute contract | Task Dependent | 7-Day Calendar | |
| AD200 | Notice to proceed | Task Dependent | 7-Day Calendar | |
| SD100 | Develop submittal \| concrete block | Task Dependent | 7-Day Calendar | |
| SD200 | Develop submittal \| timber beam | Task Dependent | 7-Day Calendar | |
| SD300 | Develop submittal \| roof panel | Task Dependent | 7-Day Calendar | |
| CN100 | Clear & grub bus stop area | Task Dependent | 5-Day Calendar w/ Holidays | |
| CN150 | Remove curb & gutter | Task Dependent | 5-Day Calendar w/ Holidays | |
| RV100 | Review/approve \| concrete block | Task Dependent | 7-Day Calendar | |
| CN200 | Grade bus stop area | Task Dependent | 5-Day Calendar w/ Holidays | |
| RV200 | Review/approve \| timber beam | Task Dependent | 7-Day Calendar | |
| CN250 | Construct slab-on-grade | Task Dependent | 5-Day Calendar w/ Holidays | |
| RV300 | Review/approve \| roof panel | Task Dependent | 7-Day Calendar | |
| PC100 | Procure \| concrete block | Task Dependent | 7-Day Calendar | |

# REVIEWING A BASELINE SCHEDULE

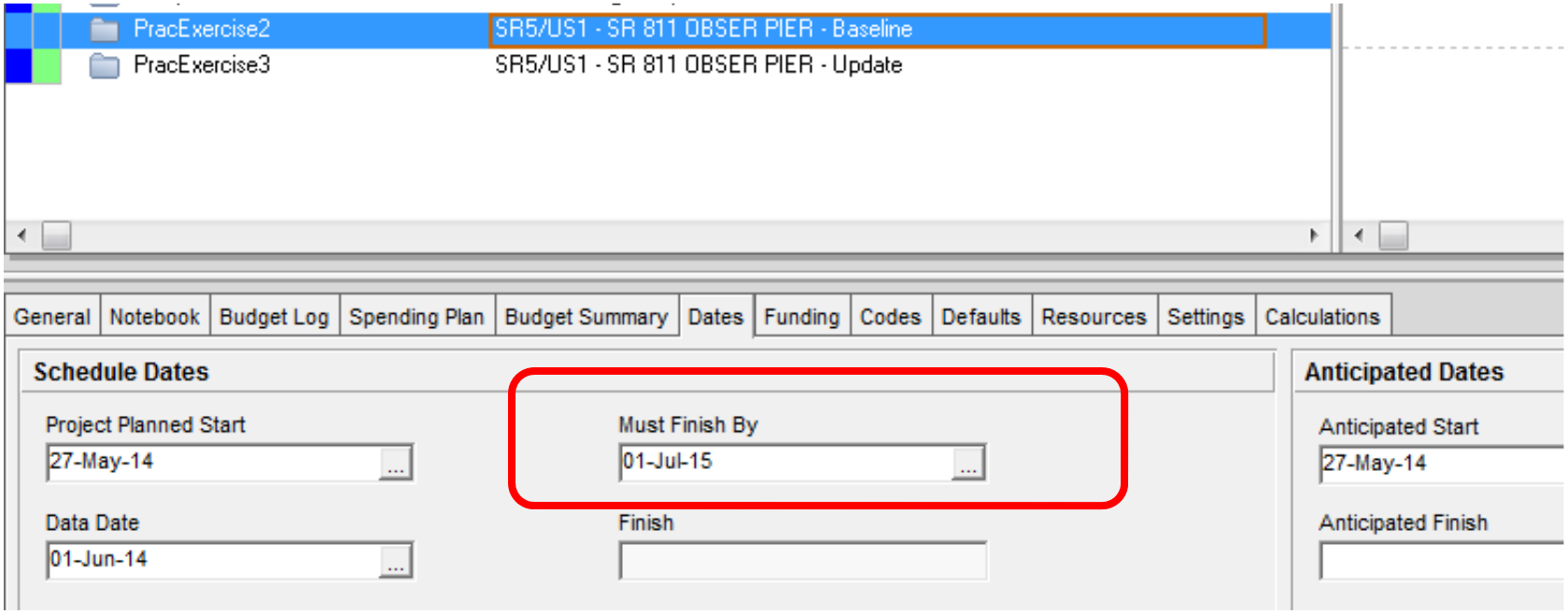
Verify if holidays and other non-work periods are shown on the calendars used for the schedule.

P6 Calendar Detail Screen in Enterprise Calendars within an Open Project



# REVIEWING A BASELINE SCHEDULE

Check for schedule completion constraints.




P6 Projects List – Dates Tab Screen

# REVIEWING A BASELINE SCHEDULE

Check for constraints on any activities.

| | | | | | |
|---|---|---|---|---|---|
| r w/ Holidays | 5 | 5 | 21-Jul-15 | 25-Jul-15 | 20 |
| Day Calendar | 30 | 30 | 24-Jul-15 | 22-Aug-15 | 1 |
| r w/ Holidays | 2 | 2 | 24-Jul-15 | 27-Jul-15 | 20 |
| Day Calendar | 25 | 25 | 27-Jul-15 | 20-Aug-15 | 6 |
| r w/ Holidays | 5 | 5 | 28-Jul-15 | 03-Aug-15 | 20 |
| r w/ Holidays | 5 | 5 | 06-Aug-15 | 12-Aug-15 | 7 |
| r w/ Holidays | 3 | 3 | 24-Aug-15 | 26-Aug-15* | 0 |
| r w/ Holidays | 3 | 3 | 27-Aug-15 | 31-Aug-15 | 0 |
| r w/ Holidays | 2 | 2 | 01-Sep-15 | 02-Sep-15 | 0 |
| Day Calendar | 0 | 0 | | 02-Sep-15 | 0 |

P6 Activity List Screen with Dates Columns Selected

**An asterisk indicates that the activity is constrained**

# REVIEWING A BASELINE SCHEDULE

Is there only one activity with no predecessor?

```
Errors:
-------
Warnings:
---------
        Activities without predecessors.................................1
                Project:        BusStop Activity:       MS100   Start Project

        Activities without successors...................................1
                Project:        BusStop Activity:       MS200   End project

        Out-of-sequence activities......................................1
                Project:        BusStop Activity:       SD200   Develop submittal - timber beam

        Activities with Actual Dates > Data Date........................1
                Project:        BusStop Activity:       SD200   Develop submittal - timber beam
```

P6 Schedule Text File

# REVIEWING A BASELINE SCHEDULE

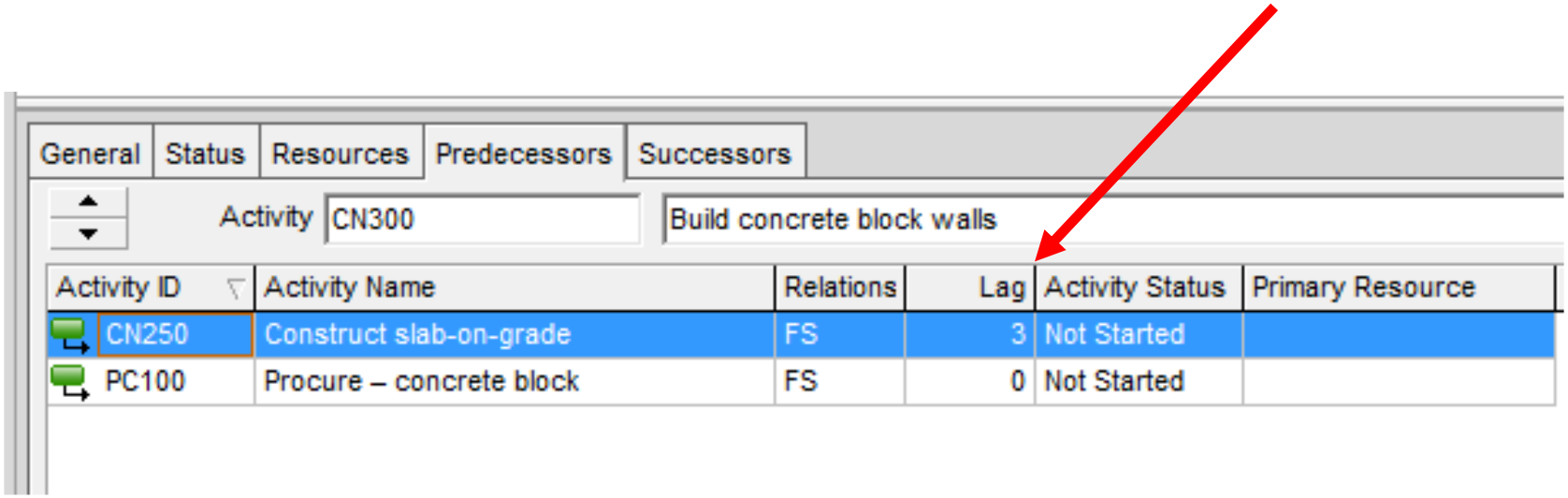
Is there only one activity with no successor?

```
Errors:
-------
Warnings:
---------
        Activities without predecessors.................................1
                Project:        BusStop Activity:       MS100   Start Project

        Activities without successors...................................1
                Project:        BusStop Activity:       MS200   End project

        Out-of-sequence activities......................................1
                Project:        BusStop Activity:       SD200   Develop submittal - timber beam

        Activities with Actual Dates > Data Date........................1
                Project:        BusStop Activity:       SD200   Develop submittal - timber beam
```

P6 Schedule Text File

# REVIEWING A BASELINE SCHEDULE

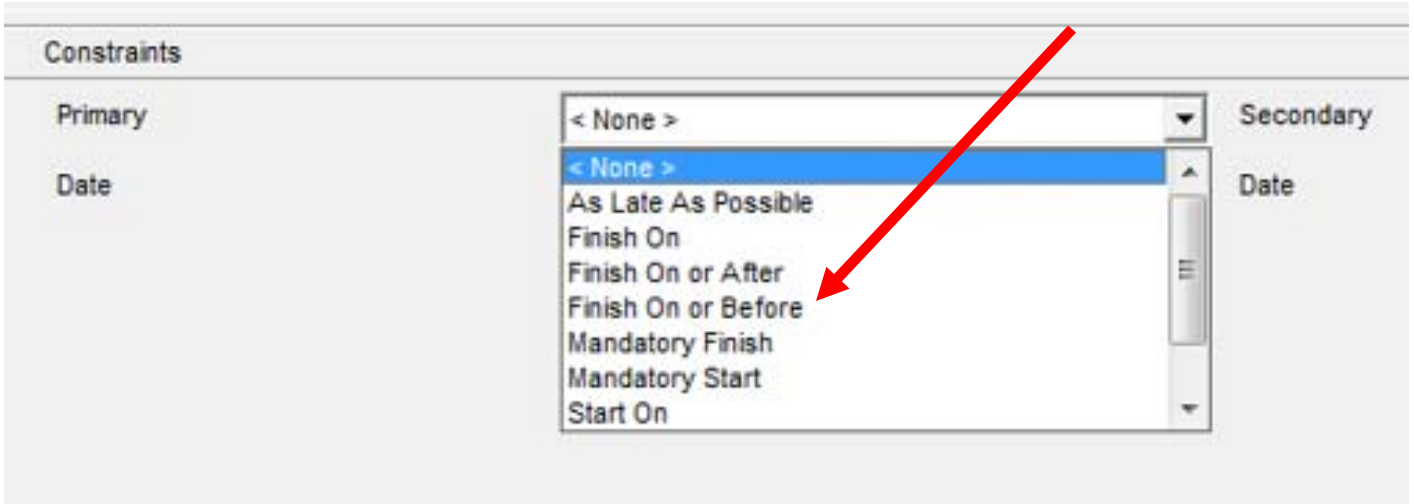
Verify all relationship lags to make sure float has not been sequestered?




P6 Activities Detail Screen with Predecessors Tab Selected

# REVIEWING A BASELINE SCHEDULE

Verify that Milestones only have “Start on or After” or “Finish on or Before”.




P6 Activities Detail Screen with Status Tab Selected

# REVIEWING A BASELINE SCHEDULE

Verify the schedule does not include any statused activities.

| | | | | | |
|---|---|---|---|---|---|
| 7-Day Calendar | 1 | 1 | 01-Jul-15 | 01-Jul-15 | |
| 7-Day Calendar | 5 | 5 | 02-Jul-15 | 06-Jul-15 | 1 |
| 7-Day Calendar | 12 | 12 | 02-Jul-15 A | 13-Jul-15 | |
| 7-Day Calendar | 15 | 15 | 02-Jul-15 | 16-Jul-15 | |
| Calendar w/ Holidays | 2 | 2 | 02-Jul-15 | 06-Jul-15 | 1 |
| Calendar w/ Holidays | 2 | 2 | 02-Jul-15 | 06-Jul-15 | 3 |
| 7-Day Calendar | 10 | 10 | 07-Jul-15 | 16-Jul-15 | 1 |
| Calendar w/ Holidays | 5 | 5 | 07-Jul-15 | 13-Jul-15 | 1 |
| 7-Day Calendar | 10 | 10 | 14-Jul-15 | 23-Jul-15 | |

P6 Activity List Screen with
Dates Columns Selected

An “A” next to a date indicates that the activity has been statused (given an actual date).

# REVIEWING A BASELINE SCHEDULE

## PROJECT SPECIFIC CHECKLIST ITEMS

| Type | Checklist Item | How to Check |
|---|---|---|
| Activities | Develop a list of project specific work elements in the Work Breakdown Structure used by the Contractor. Verify that all of the work elements are included in an activity on the schedule. | Detailed Review |
| Activities | Develop a list of project specific milestones and check to see that the milestones are included in the schedule. | Detailed Review |
| Calendars | Develop a list of project specific limitations on operations and verify that these limitations are represented in the schedule calendars. | P6 Calendars Subscreen |
| Calendars | Verify that calendars in the schedule are properly assigned to the correct activities. | P6 View Calendars Column |
| Costs | Verify that the cost loading of the activities is reasonable and consistent with the contract schedule of values. | Detailed Review |
| Logic | Verify that the schedule logic is physically logical and reasonable based on the project requirements. | Detailed Review |
| Logic | Verify that delivery activities are logically tied to the appropriate installation activities. | Detailed Review |
| Durations | Verify that production activities include adequate time for testing. | Detailed Review |
| Logic | Verify that any specified logic or constraints are represented in the schedule. | Detailed Review |
| WBS | Verify that the MOT phases are represented in the schedule and that activities are broken out by phase. | Detailed Review |
| Logic | Verify that the MOT phases are in the correct sequence according to the contract. | Detailed Review |
| Activities | Verify that utility work is properly shown in the schedule with the correct durations, sequence and logic. | Detailed Review |
| Durations | Verify that activity durations are reasonable and contractual. | Detailed Review |

# REVIEWING A BASELINE SCHEDULE

Develop a list of project specific work elements in the Work Breakdown Structure used by the Contractor. Verify that all of the work elements are included in an activity on the schedule.

- This check requires a detailed review of the plans and specifications.
- It is very important to make sure the schedule includes all of the elements of the work.
- This is one of the first indications of the Contractor's understanding of the project scope and specific requirements.

# REVIEWING A BASELINE SCHEDULE

Develop a list of project specific milestones and check to see that the milestones are included in the schedule.

- At a minimum, there should be Start Project and Finish Project milestones.
- There should also be milestones to represent the start and finish of each Maintenance of Traffic phase.
- Other milestones should include significant elements of the work, third party coordination dates, bonus dates and incentive/disincentive dates.

# REVIEWING A BASELINE SCHEDULE

Develop a list of project specific milestones and check to see that the milestones are included in the schedule.

Activities

Projects | Activities

Layout: All Activities by WBS _ES | Filter: All Activities

| Activity ID | Activity Name | Activity Type | Calendar | Ori Dur |
|---|---|---|---|---|
| MS100 | Start Project | Start Milestone | 7-Day Calendar | |
| AD100 | Execute contract | Task Dependent | 7-Day Calendar | |
| AD200 | Notice to proceed | Task Dependent | 7-Day Calendar | |
| SD100 | Develop submittal \| concrete block | Task Dependent | 7-Day Calendar | |
| SD200 | Develop submittal \| timber beam | Task Dependent | 7-Day Calendar | |
| SD300 | Develop submittal \| roof panel | Task Dependent | 7-Day Calendar | |
| CN100 | Clear & grub bus stop area | Task Dependent | 5-Day Calendar w/ Holidays | |
| CN150 | Remove curb & gutter | Task Dependent | 5-Day Calendar w/ Holidays | |
| RV100 | Review/approve \| concrete block | Task Dependent | 7-Day Calendar | |
| CN200 | Grade bus stop area | Task Dependent | 5-Day Calendar w/ Holidays | |
| RV200 | Review/approve \| timber beam | Task Dependent | 7-Day Calendar | |
| CN250 | Construct slab-on-grade | Task Dependent | 5-Day Calendar w/ Holidays | |
| RV300 | Review/approve \| roof panel | Task Dependent | 7-Day Calendar | |
| PC100 | Procure \| concrete block | Task Dependent | 7-Day Calendar | |

P6 Activity List Screen with Activity Type Column Selected

# REVIEWING A BASELINE SCHEDULE

Develop a list of project specific limitations on operations and verify that these limitations are represented in the schedule calendars.

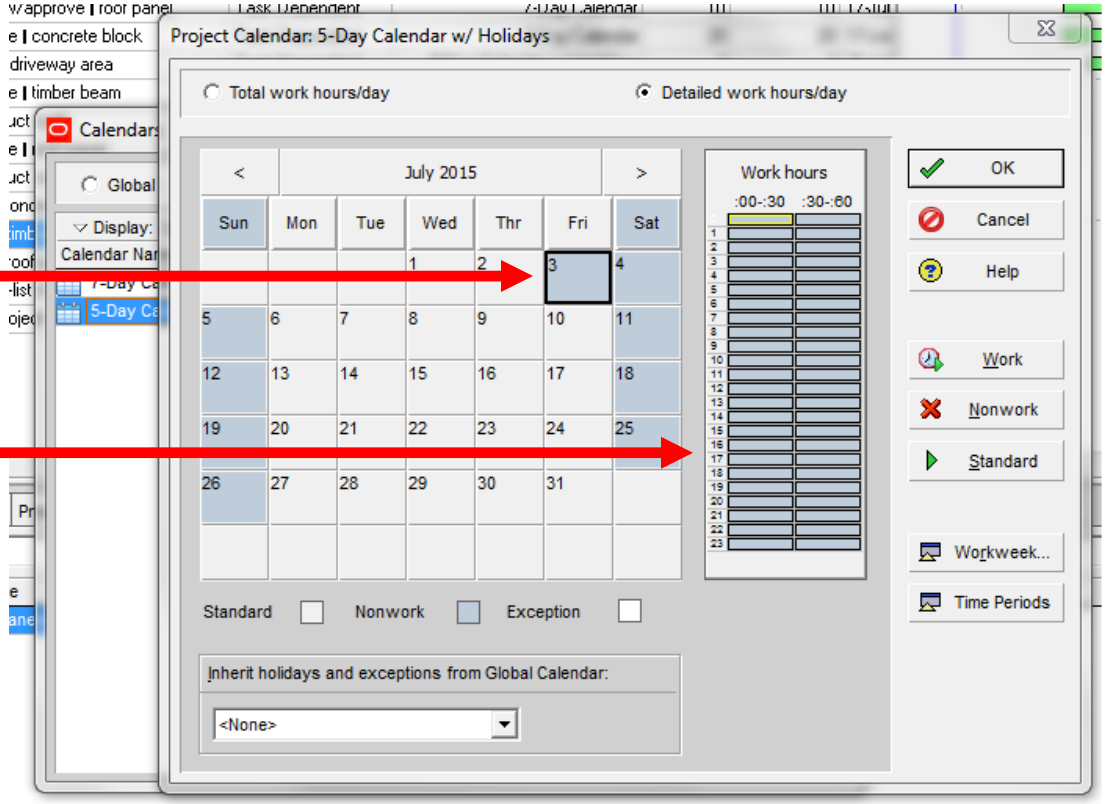
- Any limitations on operations – such as “no-work” dates should be shown in the calendar.
- Holidays should be shown in the calendars.
- Work hours should be identified in the calendars and verified. The work hours should match the Contractor’s shifts.
- Work hours should be checked against work hour limitations. ***For example, lane closure time frames.***

# REVIEWING A BASELINE SCHEDULE

Develop a list of project specific limitations on operations and verify that these limitations are represented in the schedule calendars.

**Holiday shown as non-work day**

**Work hours are shown here**




P6 Calendar Detail Screen in Enterprise Calendars within an Open Project

# REVIEWING A BASELINE SCHEDULE

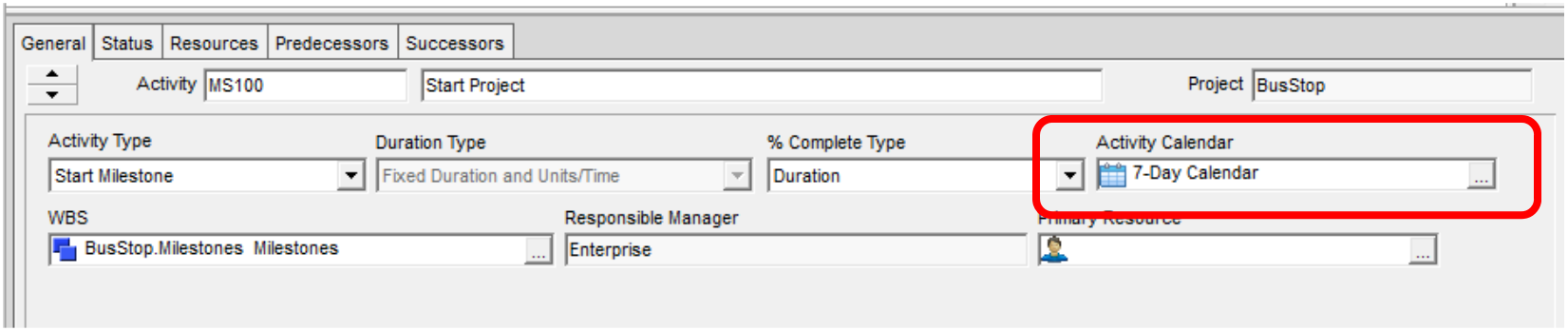
## Verify that calendars in the schedule are properly assigned to the correct activities.

- Each activity in the schedule has a correct calendar, based on the specific project requirements.
- You must review the calendar assignment for each activity to determine if the assignment is correct.
- Incorrect calendar assignments will effect the start and finish dates of activities.
- Incorrect calendar assignments can effect total float calculations and the completion date of the project.

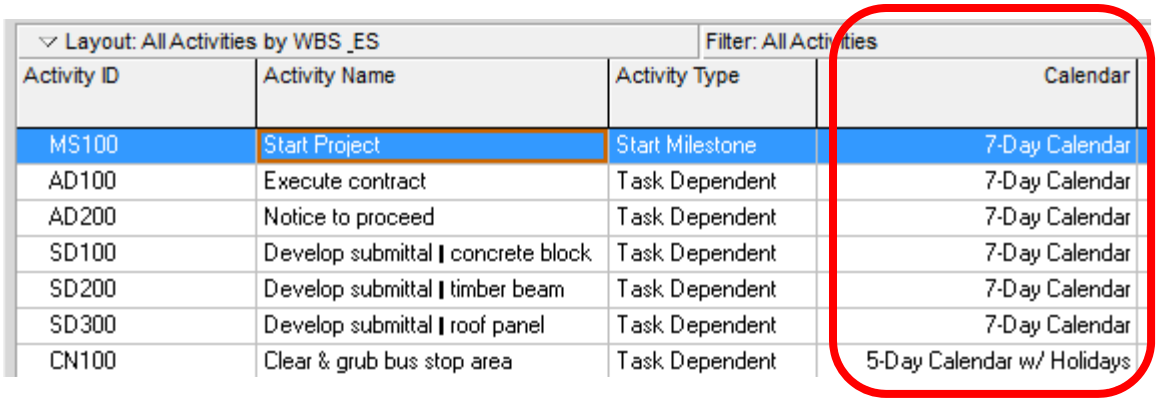
# REVIEWING A BASELINE SCHEDULE

Verify that calendars in the schedule are properly assigned to the correct activities.

P6 Activities Detail Screen with General Tab Selected




P6 Activity List Screen with Calendar Column Selected




| Activity ID | Activity Name | Activity Type | Calendar |
|---|---|---|---|
| MS100 | Start Project | Start Milestone | 7-Day Calendar |
| AD100 | Execute contract | Task Dependent | 7-Day Calendar |
| AD200 | Notice to proceed | Task Dependent | 7-Day Calendar |
| SD100 | Develop submittal \| concrete block | Task Dependent | 7-Day Calendar |
| SD200 | Develop submittal \| timber beam | Task Dependent | 7-Day Calendar |
| SD300 | Develop submittal \| roof panel | Task Dependent | 7-Day Calendar |
| CN100 | Clear & grub bus stop area | Task Dependent | 5-Day Calendar w/ Holidays |

# REVIEWING A BASELINE SCHEDULE

Verify that the cost loading of the activities is reasonable and consistent with the contract schedule of values.

- Review the quantity of work associated with the activity.
- Compare the unit cost assigned to the activity work to the unit cost assigned in the schedule of values for the contract.
- Roll up (summarize) groups of activities to verify total amounts for the groups.

# REVIEWING A BASELINE SCHEDULE

Verify that the cost loading of the activities is reasonable and consistent with the contract schedule of values.

Layout: All Activities by WBS _ES | Filter: All Activities

| Activity ID | Activity Name | Original Duration | Remaining Duration | Start | Finish | Total Float | Budgeted Expense Cost |
|---|---|---|---|---|---|---|---|
| AD200 | Notice to proceed | 1 | 1 | 01-Jul-15 | 01-Jul-15 | 1 | $0.00 |
| SD100 | Develop submittal \| concrete block | 5 | 5 | 02-Jul-15 | 06-Jul-15 | 11 | $0.00 |
| SD200 | Develop submittal \| timber beam | 12 | 12 | 02-Jul-15 A | 13-Jul-15 | 1 | $0.00 |
| SD300 | Develop submittal \| roof panel | 15 | 15 | 02-Jul-15 | 16-Jul-15 | 6 | $0.00 |
| CN100 | Clear & grub bus stop area | 2 | 2 | 02-Jul-15 | 06-Jul-15 | 16 | $5,000.00 |
| CN150 | Remove curb & gutter | 2 | 2 | 02-Jul-15 | 06-Jul-15 | 33 | $0.00 |
| RV100 | Review/approve \| concrete block | 10 | 10 | 07-Jul-15 | 16-Jul-15 | 11 | $0.00 |
| CN200 | Grade bus stop area | 5 | 5 | 07-Jul-15 | 13-Jul-15 | 16 | $0.00 |
| RV200 | Review/approve \| timber beam | 10 | 10 | 14-Jul-15 | 23-Jul-15 | 1 | $0.00 |

General | Status | Resources | Predecessors | Successors | Expenses

Activity: CN100 — Clear & grub bus stop area

| Expense Item | Expense Category | Accrual Type | Budgeted Units | Price / Unit | Budgeted Cost | Actual Cost | Remaining Cost |
|---|---|---|---|---|---|---|---|
| Revenue | | Uniform over Activit | 1.000 | $5,000.00 | $5,000.00 | $0.00 | $5,000.00 |

P6 Activity List Screen with Expense Column Selected & Activity Detail with Expense Tab Selected

# REVIEWING A BASELINE SCHEDULE

Verify that the cost loading of the activities is reasonable and consistent with the contract schedule of values.

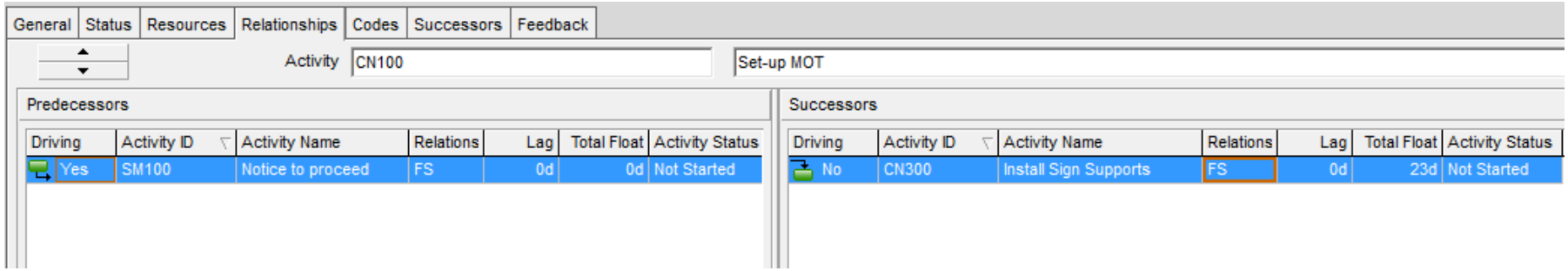
P6 Activity List Screen with Expense Column Selected, Utilizing the WBS to Roll Up the Costs

Layout: All Activities by WBS _ES | Filter: All Activities

| Activity ID | Activity Name | Original Duration | Remaining Duration | Start | Finish | Total Float | Budgeted Expense Cost |
|---|---|---|---|---|---|---|---|
| **Bus Stop Sample Schedule** | | 47 | 47 | 30-Jun-15 A | 02-Sep-15 | 0 | $5,250.00 |
| **Construction Activities** | | 44 | 44 | 02-Jul-15 | 02-Sep-15 | 0 | $5,000.00 |
| CN100 | Clear & grub bus stop area | 2 | 2 | 02-Jul-15 | 06-Jul-15 | 16 | $5,000.00 |
| CN150 | Remove curb & gutter | 2 | 2 | 02-Jul-15 | 06-Jul-15 | 33 | $0.00 |
| CN200 | Grade bus stop area | 5 | 5 | 07-Jul-15 | 13-Jul-15 | 16 | $0.00 |
| CN250 | Construct slab-on-grade | 5 | 5 | 14-Jul-15 | 20-Jul-15 | 16 | $0.00 |
| CN600 | Grade driveway area | 3 | 3 | 21-Jul-15 | 23-Jul-15 | 20 | $0.00 |
| CN650 | Construct curb | 2 | 2 | 24-Jul-15 | 27-Jul-15 | 20 | $0.00 |
| CN700 | Construct concrete driveway area | 5 | 5 | 28-Jul-15 | 03-Aug-15 | 20 | $0.00 |
| CN300 | Build concrete block walls | 5 | 5 | 06-Aug-15 | 12-Aug-15 | 7 | $0.00 |
| CN350 | Install timber beam | 3 | 3 | 24-Aug-15 | 26-Aug-15* | 0 | $0.00 |
| CN400 | Install roof panels | 3 | 3 | 27-Aug-15 | 31-Aug-15 | 0 | $0.00 |
| CN750 | Punch-list & final clean-up | 2 | 2 | 01-Sep-15 | 02-Sep-15 | 0 | $0.00 |
| **Contract Administration Activities** | | 54 | 54 | 30-Jun-15 A | 22-Aug-15 | 4 | $250.00 |
| AD100 | Execute contract | 1 | 1 | 30-Jun-15 | 30-Jun-15 | 1 | $0.00 |
| AD200 | Notice to proceed | 1 | 1 | 01-Jul-15 | 01-Jul-15 | 1 | $0.00 |
| SD100 | Develop submittal \| concrete block | 5 | 5 | 02-Jul-15 | 06-Jul-15 | 11 | $0.00 |
| SD200 | Develop submittal \| timber beam | 12 | 12 | 02-Jul-15 A | 13-Jul-15 | 1 | $0.00 |
| SD300 | Develop submittal \| roof panel | 15 | 15 | 02-Jul-15 | 16-Jul-15 | 6 | $0.00 |
| RV100 | Review/approve \| concrete block | 10 | 10 | 07-Jul-15 | 16-Jul-15 | 11 | $0.00 |
| RV200 | Review/approve \| timber beam | 10 | 10 | 14-Jul-15 | 23-Jul-15 | 1 | $0.00 |
| RV300 | Review/approve \| roof panel | 10 | 10 | 17-Jul-15 | 26-Jul-15 | 6 | $0.00 |
| PC100 | Procure \| concrete block | 20 | 20 | 17-Jul-15 | 05-Aug-15 | 11 | $0.00 |
| PC200 | Procure \| timber beam | 30 | 30 | 24-Jul-15 | 22-Aug-15 | 1 | $250.00 |
| PC300 | Procure \| roof panel | 25 | 25 | 27-Jul-15 | 20-Aug-15 | 6 | $0.00 |
| **Milestones** | | 65 | 65 | 30-Jun-15 | 02-Sep-15 | 0 | $0.00 |
| MS100 | Start Project | 0 | 0 | 30-Jun-15* | | 1 | $0.00 |

# REVIEWING A BASELINE SCHEDULE

Verify that the schedule logic is physically logical and reasonable based on the project requirements.




P6 Activities Detail Screen with Relationships Tab Selected

# REVIEWING A BASELINE SCHEDULE

Verify that delivery activities are logically tied to the appropriate installation activities.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CN700 | Construct concrete driveway area | 5 | 5 | 28-Jul-15 | 03-Aug-15 | 20 | $0.0 |
| CN300 | Build concrete block walls | 5 | 5 | 06-Aug-15 | 12-Aug-15 | 7 | $0.0 |
| CN350 | Install timber beam | 3 | 3 | 24-Aug-15 | 26-Aug-15* | 0 | $0.0 |
| CN400 | Install roof panels | 3 | 3 | 27-Aug-15 | 31-Aug-15 | 0 | $0.0 |
| CN750 | Punch-list & final clean-up | 2 | 2 | 01-Sep-15 | 02-Sep-15 | 0 | $0.0 |
| **Contract Administration Activities** | | 54 | 54 | 30-Jun-15 A | 22-Aug-15 | 4 | $250.0 |
| AD100 | Execute contract | 1 | 1 | 30-Jun-15 | 30-Jun-15 | 1 | $0.0 |
| AD200 | Notice to proceed | 1 | 1 | 01-Jul-15 | 01-Jul-15 | 1 | $0.0 |
| SD100 | Develop submittal \| concrete block | 5 | 5 | 02-Jul-15 | 06-Jul-15 | 11 | $0.0 |
| SD200 | Develop submittal \| timber beam | 12 | 12 | 02-Jul-15 A | 13-Jul-15 | 1 | $0.0 |
| SD300 | Develop submittal \| roof panel | 15 | 15 | 02-Jul-15 | 16-Jul-15 | 6 | $0.0 |

General | Status | Resources | Predecessors | Successors | Expenses

Activity CN350 Install timber beam

| Activity ID | Activity Name | Relations | Lag | Activity Status | Primary Resource |
|---|---|---|---|---|---|
| CN300 | Build concrete block walls | FS | 0 | Not Started | |
| PC200 | Procure – timber beam | FS | 0 | Not Started | |

P6 Activities Detail Screen with Predecessors Tab Selected

# REVIEWING A BASELINE SCHEDULE

## Verify that production activities include adequate time for testing.

- Unless a separate activity is included and logically tied to the production activity, the duration for the production activity should include adequate time for testing & acceptance.

  ***Example: Stabilized Sub-grade that requires 3-4 days for LBR testing.***

# REVIEWING A BASELINE SCHEDULE

Verify that any specified logic or constraints are represented in the schedule.

- Activities should be included to represent the constraining element.
- The constraining element should be a predecessor to the constrained work activity.

***Example: Work in a channel that cannot proceed without a Coast Guard permit.***

# REVIEWING A BASELINE SCHEDULE

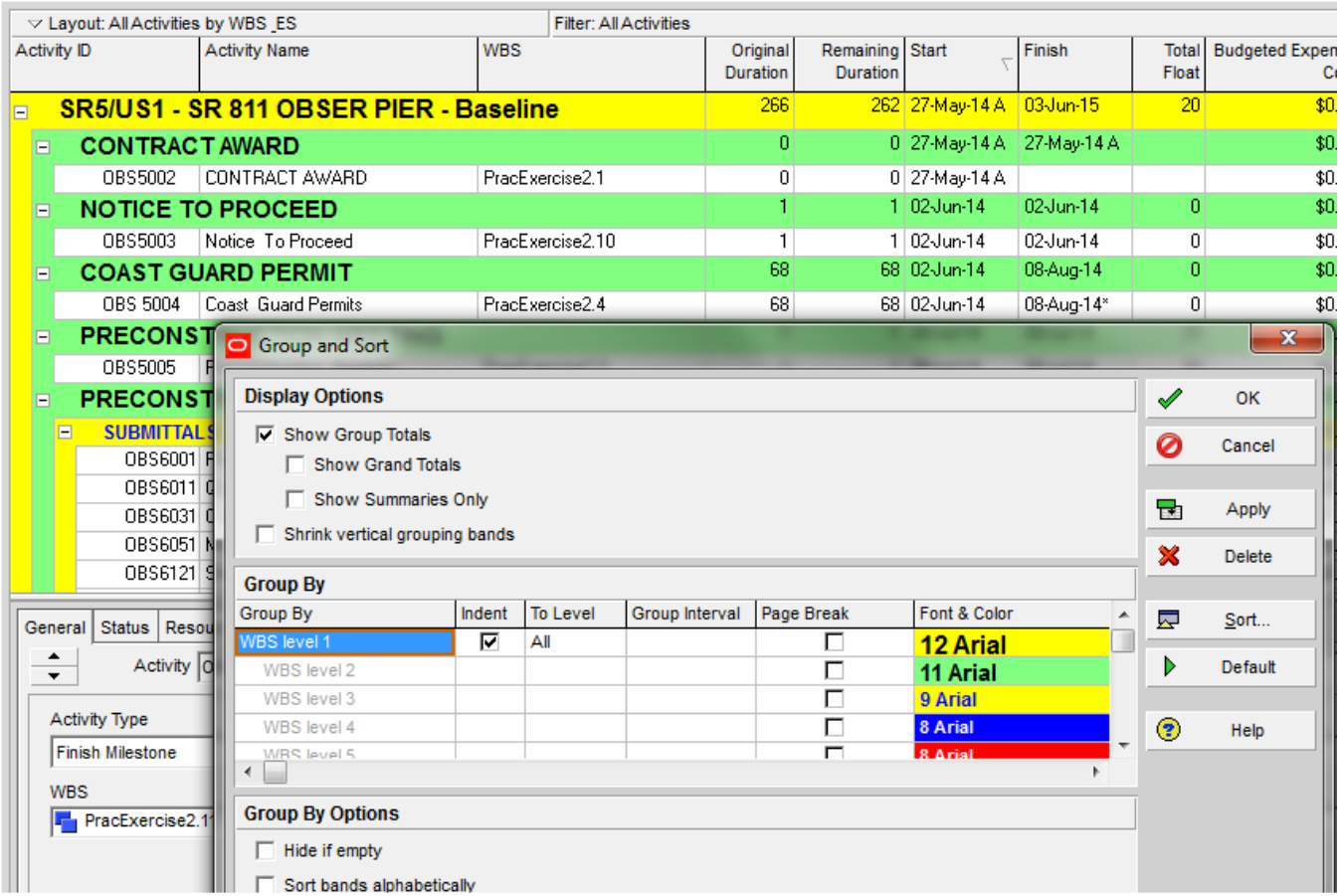
Verify that the MOT phases are represented in the schedule and that activities are broken out by phase.

- This requirement can be accomplished by the use of the WBS (Work Breakdown Structure) or by Activity Codes.
- Grouping the schedule view by WBS is a way to see the structure.

# REVIEWING A BASELINE SCHEDULE

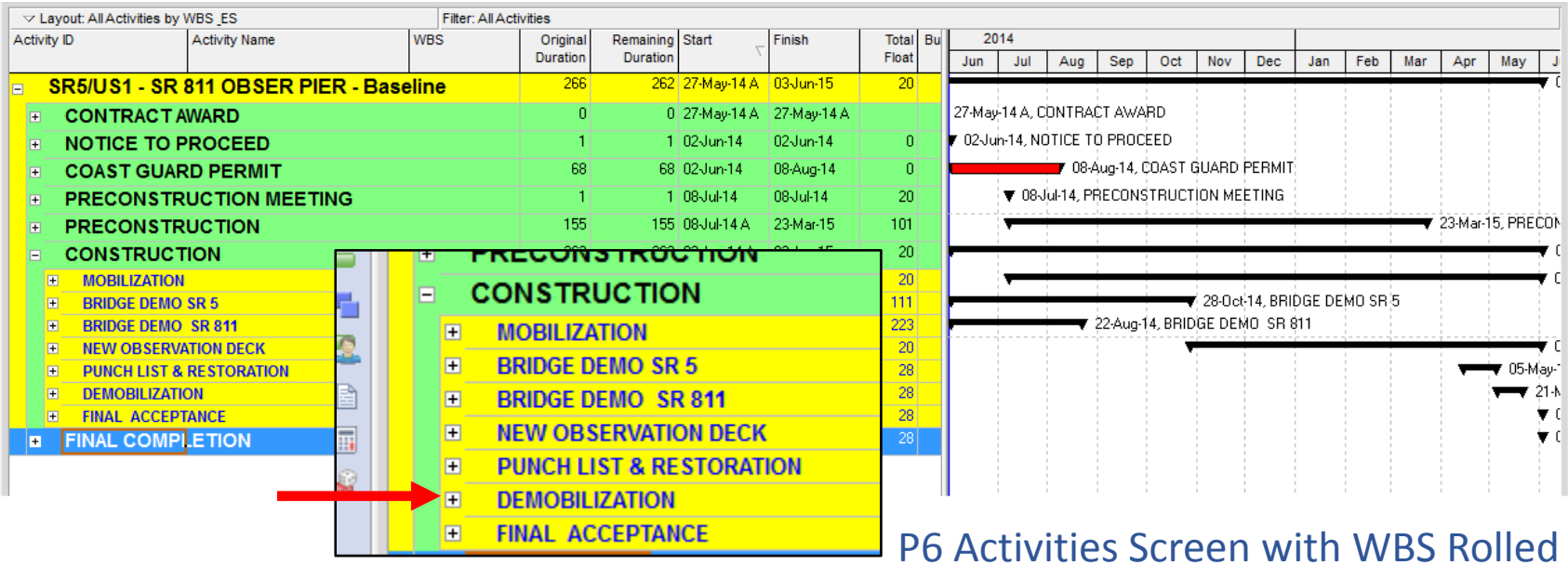
Verify that the MOT phases are represented in the schedule and that activities are broken out by phase.

P6 Activities Screen with Group and Sort Sub-Screen Selected



# REVIEWING A BASELINE SCHEDULE

Verify that the MOT phases are in the correct sequence according to the contract.




P6 Activities Screen with WBS Rolled Up

**By rolling up (collapsing) WBS groups you can view the sequence of the groups in time. If the WBS includes MOT phases, then you can verify the sequencing of the phases is correct.**

# REVIEWING A BASELINE SCHEDULE

Verify that utility work is properly shown in the schedule with the correct durations, sequence and logic.

- The schedule should includes activities representing the line items listed in the utility relocation agreements.
- The logic, durations and calendars should be consistent with the utility relocation agreements.

| UTILITY FACILITIES BY STATUS/ TYPE/SIZE/MATERIAL/OFFSET TO BASELINE FROM STA TO STA | DESCRIPTION OF UTILITY WORK | DEPENDENT ACTIVITIES | M.O.T. PHASE NUMBER | CONSECUTIVE CALENDAR DAYS |
|---|---|---|---|---|
| G2. STA 558+90 RT – ONE MANHOLE RING AND COVER, PARALLEL TO R/W, 47' FROM C/L | TO BE ADJUSTED, IF NECESSARY | PRIOR TO FINAL GRADE | PHASE 1 | 1 |
| G3. STA 560+68 RT – 6-4" PVC WITH FIBER AND COPPER CABLE, PARALLEL TO R/W, 39' FROM C/L | TO BE SUPPORTED, IF NECESSARY | WORKING WITH STATES CONTRACTOR DURING PLACEMENT OF 42" STORM PIPE | PHASE 1 | 2 |

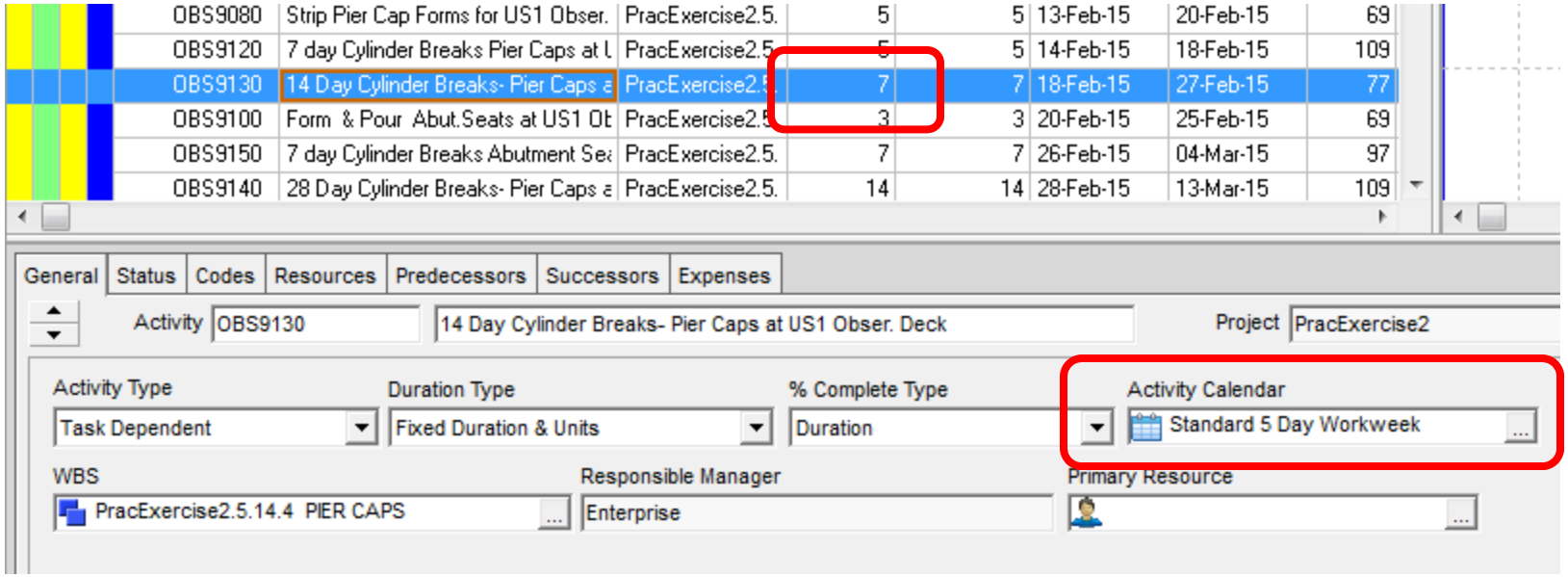
# REVIEWING A BASELINE SCHEDULE

## Verify that activity durations are reasonable and contractual.

- Check durations of production activities for reasonableness, based on the quantity of work.  Give wide latitude unless limited resources are specified.
- Check owner and 3rd party activity durations to confirm consistency with contract requirements.
- Durations are based on working days as determined by the assigned calendar.

# REVIEWING A BASELINE SCHEDULE

Verify that activity durations are reasonable and contractual.




P6 Activities Detail Screen with General Tab Selected

# Reviewing a Monthly Update Schedule

# REVIEWING A MONTHLY UPDATE

## FUNDAMENTALS OF A COMPREHENSIVE UPDATE REVIEW

- Know the Contract Requirements
  - **Schedule Specification**
  - Plan Details
  - Having accurate historical project data

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

The Contract Schedule may indicate a completion date in advance of the expiration of Contract Time. However, the Department will not be liable in any way for the Contractor's failure to complete the project prior to expiration of Contract Time. Any additional costs, including extended overhead incurred between the Contractor's scheduled completion date and the expiration of Contract Time, shall be the responsibility of the Contractor. The Contractor shall not be entitled to claim or recover any such costs from the Department.

The Engineer <u>will</u> withhold monthly payments due for failure of the Contractor to submit an acceptable schedule or <u>monthly updates</u> within the time frame described herein.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

**8-3.2.2 Schedule Submissions:** Develop the schedule in Precedence Diagram Method (PDM) format. All schedule submittals, shall have a copy of the schedule files on a Windows compatible CD or DVD attached. The files shall be in a Primavera format. Make sure to use "Back up" menu selection and ensure that the option "Remove access list during backup" is checked.

Each schedule submission and monthly update shall include a minimum of the following four items:

# REVIEWING A MONTHLY UPDATE

## PRECEDENCE DIAGRAM METHOD (PDM) *REFRESHER*

- Precedence Diagram Method (PDM) uses boxes to denote schedule activities.
- These boxes or “nodes” are connected with arrows to depict a logical progression of the dependencies between the schedule activities.
- Each node is coded with a letter or number that correlates to an activity on the project schedule.
- The Precedence method allows different type of relationships.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

1. A Critical Path Method (CPM) Network Diagram in time-scale logic diagram, by week starting on Monday, grouped (banded) by phase and location and sorted by early start days. Prominently identify the critical path activities, defined as the longest continuous path of work activities. Submit the Network Diagram, printed in color on D size, 22 inches by 34 inches or E size, 34 inches by 44 inches paper. The network diagram shall contain, as a minimum, the following information for each schedule activity: identification, activity description, total duration, remaining duration, early start date, late finish date, and total float.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

2. A report with the following schedule activity information for each construction activity: identification, description, original duration, remaining duration, early start, early finish, total float, percent complete, and budgeted cost. The bar chart diagram shall not be included in this report. It will be submitted on 8.5 inches by 11 inches paper.

3. **A schedule narrative report** describing current project schedule status and identifying potential delays. This report will include a description of the progress made since the previous schedule submission and objectives for the upcoming 30 calendar days. It will be submitted on 8.5 inches by 11 inches paper. This report shall at a minimum include the following information:

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

a. This report shall indicate if the project is on schedule, ahead of schedule or behind schedule. If the project is ahead of schedule or behind schedule, the report shall include the specific number of calendar days. If the project is behind schedule, the report shall include a detailed recovery plan that will put the project back on schedule or include a properly supported request for Time Extension.

b. The report will describe the current critical path of the project and indicate if this has changed in the last 30 calendar days. Discuss current successes or problems that have affected either the critical path's length or have caused a shift in the critical path within the last 30 calendar days. Identify specific activities, progress, or events that may reasonably be anticipated to impact the critical path within the next 30 calendar days, either to affect its length or to shift it to an alternate path.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

c. List all schedule logic or duration changes that have been made to the schedule since the previous submission. For each change, describe the basis for the change and specifically identify the affected activities by identification number.

d. Identify any and all activities, either in progress or scheduled to occur within the following 30 days that require Department participation, review, approval, etc.

# REVIEWING A MONTHLY UPDATE

## Narrative Checklist

| Requirement | Disposition |
|---|---|
| • Current project schedule status and identify potential delays | |
| • A description of the progress made since the previous schedule submission | |
| • Objectives for the upcoming 30 calendar days | |
| • Indicate if the project is on schedule, ahead of schedule or behind schedule | |
| o If ahead or behind schedule, indicate the specific number of calendar days | |
| o If behind schedule, include a detailed recovery plan that will put the schedule back on track or provide a properly supported request for Time Extension. | |
| • Describe the current critical path and indicate if the critical path has changed within the last 30 calendar days. | |
| • Discuss current successes or problems that have affected either the critical path's length or have caused a shift in the critical path in the last 30 calendar days. | |
| • Identify specific activities, progress, or events that may reasonably be anticipated to impact the critical path within the next 30 calendar days, either to affect its length or to shift it to an alternate path. | |
| • List all schedule logic or duration changes that have been made to the schedule since the previous submission. | |
| o For each change, describe the basis for the change and specifically identify the affected activities by identification number. | |
| • Identify any and all activities, either in progress or scheduled to occur within the following 30 days that require Department participation, review, approval, etc. | |

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

4. A copy of the schedule files on a Windows compatible CD or DVD in Primavera format.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

The Engineer will have 30 days to accept the Contract Schedule or to schedule a meeting, if needed, within that time, with the Contractor to resolve any problems that prevent acceptance of the schedule. Attend the meeting scheduled by the Engineer, and submit a corrected schedule to the Engineer within seven days after the meeting. The process will be continued until a Contract Schedule is accepted by the Engineer.

Upon the Engineer's acceptance of the Contract Schedule, submit monthly updates of the Contract Schedule reflecting progress through the monthly estimate cut-off date within 7 calendar days after the monthly estimate cut-off date.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

**8-3.2.3 Schedule Content:** All schedule submissions shall comply with the following content guidelines as appropriate to the specific submission:

Outline Schedule Diagrams and Data shall show the sequence, order, and interdependence of major construction milestones and activities. Include ordering and procurement of major materials and equipment, long-lead time items, and key milestones identified by the Contract. Identify planned work schedule(s) and include all non-workdays. Provide a description of each major construction activity or key milestone.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

Detailed Schedule Diagrams shall include activity number, description, early dates, float, and all relationships ( i.e. logic ties ), resources and costs. Show the sequence, order, and interdependence of activities in which the work is to be accomplished. Include allowance for Department oversight, acceptance and return of submittals, samples and shop drawings where Department acceptance is specifically required (in accordance with 5-1.4.6 of the standard specifications). In addition to construction activities, detailed network activities shall include the submittals, procurement, and Department or Utility activities impacting progress:

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

1. Submittal activities shall include oversight and acceptance of submittals. If the Department's action on any submittal is “Not Accepted” or “Revise and Resubmit”, a new series of submittal preparation activities shall be inserted into the schedule. Predecessor for the new submittal preparation activity will be the original acceptance activity and the successor of the new acceptance activity will be the fabrication/delivery activity for the equipment or material.

2. Procurement activities shall include all materials and equipment, receipt of materials with estimated procurement costs of major items for which payment of stockpiled materials will be requested in advance of installation, fabrication of special material and equipment, and their installation and testing.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

3. Show activities of the Department or Utilities that affect progress and contract-required dates for completion of all or parts of the work.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

1. All activities shall be assigned to a specific calendar within the software. Specific calendars will be defined within the software to include planned work days. These calendars will include both Contractor and Contract defined holidays and suspension days as non-workdays.

2. Each schedule activity shall be cost loaded. Activity cost loading shall be consistent with the bid breakdown. The sum total of the activity cost loading shall be equal to the current contract value, and should not include bid items.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

3. At a minimum, each schedule activity shall contain codes by:

a. Responsibility: including, but not be limited to, Department, Utility, Contractor/Subcontractor, Supplier/Vendor, Consultant, etc.

b. Phasing: identify the appropriate Maintenance of Traffic phase or subphase.

4. Key milestones as identified by contract. At a minimum, the start and finish of each Maintenance of Traffic phase or subphase shall be represented by a milestone activity.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

5. All non-procurement activities must be less than or equal to 20 workdays unless approved by the Engineer to be greater by the Engineer.

6. Detailed description of each activity. In each activity, give quantity and unit of measure so that the amount of work the activity involves is clearly communicated.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

7. Only two open-ended activities (the first and the last) are allowed.

8. Constraints shall only be used for “Project Start,” and “Project Completion.” Constraints cannot override logic. The use of any other imposed constraints is not allowed without specific approval by the Engineer. Any other desired constraints must be submitted to the Engineer with the rationale for the use of each desired additional constraint. If allowed by the Engineer, the rationale should be recorded in the activity's log field. Mandatory constraints (start and finish) violate network logic and shall not be used.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

9. Out of sequence progress, if applicable, shall be handled through Retained Logic. Use of the Progress Override option is not appropriate for this project and will not be allowed.

10. Progress shall be calculated based on percent complete.

11. All changes to activities shall be recorded with a note in the activity log field. The log shall include, as a minimum, the date and reason for the change, as well as reference to a document wherein the Engineer acknowledges and accepts the change.

12. The use of resource leveling, either manual or automatic, is prohibited.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

**8-3.2.4 Weekly Meetings:** Attend weekly meetings scheduled by the Engineer to discuss Contract progress, near term scheduled activities, including utility relocations, problems and their proposed solutions. Submit a Two-Week "Look Ahead" Planning Schedule at each weekly meeting, showing the items of work planned for the next two weeks. Develop the schedule in Bar Chart format, identifying current and planned activities and related Contract Schedule work activities, including subcontractor work. Designate all activities that are controlling work items as determined by the currently accepted Contract Schedule. A report shall be submitted at each weekly meeting identifying schedule activity progress including actual start or finish dates achieved for any activities.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

Float is not for the exclusive use or benefit of either the Department or the Contractor.

Use of float suppression techniques, such as preferential sequencing (**arranging critical path through activities more susceptible to Department caused delay**), special lead/lag logic restraints, zero total or free float constraints, extended activity times, or imposing constraint dates other than as required by the contract, shall be cause for rejection of the project schedule or its updates. The use of Resource Leveling (or similar software features) used for the purpose of artificially adjusting activity durations to consume float and influence the critical path is expressly prohibited.

**Examples of activities more susceptible to Department cause delay would be Submittal Reviews or Permitting.**

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

**8-3.2.7 Performance of Work:** By submitting a schedule the Contractor is making a positive assertion that the project will be constructed in the order indicated on the schedule. Prosecute the work in accordance with the latest accepted Working Schedule. Any costs associated with meeting milestones and completing the project within the authorized Contract Time will be borne solely by the Contractor.

# REVIEWING A MONTHLY UPDATE

## SCHEDULE SPECIFICATION – SECTION 8-3.2

**8-3.2.8 As-Built Schedule:** As a condition for Final Acceptance of the project, submittal of an as-built schedule which describes the actual order and start and stop times for all activities by the Contractor is required.

# REVIEWING A MONTHLY UPDATE

## DEVELOPING AS-BUILT DATA TO SUPPORT THE UPDATE REVIEW

- Project Logs
- Inspector Daily Reports
- Material Testing Reports
- Inspection Records
- Lane Closure & Detour Requests

# REVIEWING A MONTHLY UPDATE

## PROJECT LOGS

- RFI/RFM/RFC Logs

| RFI | Subject | Question | Date Rec. | Date to Reviewer | Date from Reviewer | Date Responded | Elapsed Time |
|---|---|---|---|---|---|---|---|
| 001 | Clarify "Design Life" | RFP Page 31 of 47 states: "The Design Build Firm shall verify that all existing cross drains and storm sewers that are to remain have adequate hydraulic capacity and design life." Please clarify "design life." | 12/8/14 | 12/8/14 | 12/8/14 | 12/8/14 | 0 |
| 002 | Signal Components | P1.) The RFP states on page 43 of 48, "A 4-section head, with flashing yellow right -arrow, centered over right-turn lane shall be provided. When a right-turn lane is present at a signalized intersection, plans shall show right-turn overlap in the SOP." However, we understand that Pasco Co.'s signal system cannot currently accommodate 4-section heads for right-turn movements and 5-section heads are required for full signal operation. Therefore, this RFP requirement cannot currently be provided if full signal operation is to be met. Pleaes consult with Pasco Co. & advise. P2.) In addition, RFP states on pg 43 of 48, "Future protected/permissive 4-section signal heads shall be accounted when desigining signal structures for single left-turn lanes w/ permissive only mode in the proposed condition." This RFP requirement accounts fo rfuture signal heads ONLY for protected/ permissive single left-turn lanes. The RFP does not identify for the accommodation of future signal heads outside of this requirement. Pleaes provide direction whether or not to include this in the design. Any change from the RFP may require a price adjustment. | 12/17/14 | 12/18/14 | 12/19/14 | 12/22/14 | 5 |

# REVIEWING A MONTHLY UPDATE

## PROJECT LOGS

- Submittal Logs

| Date Rvd | Submittal Type | Contractor Sub # | Trans. # | JAA File | Delivered Via | Description | Reviewer | Response Required By(Date) | To Reviewer(s) | | To DB Firm |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Sent | Ret'd | |
| 12/18/14 | Shop Dw g/ Material | S-015 | T-032 | 3501.0 | Email | Conduit | FDOT | **01/20/15** | N/A | N/A | 12/22/14 |
| 1/9/15 | Shop Dw g/ Material | S-015.1 | T-032 | 3501.1 | Email | Conduit - Resubmittal | FDOT | **01/30/15** | 01/28/15 | 02/06/15 | 02/06/15 |
| 3/13/15 | Shop Dw g/ Material | | T-42 | 3503.0 | Email | Drainage Structure SD per Dgn Std 425 | FDOT | **04/03/15** | 03/13/15 | 03/18/15 | 03/19/15 |

# REVIEWING A MONTHLY UPDATE

## PROJECT LOGS

- Supplemental Agreement/Work Order Log

| SATS CODE | WO TO CONTRACTOR | WO SIGNED BY CONTRACTOR | WO RETURNED BY CONTRACTOR | DATE WO EXECUTED |
|---|---|---|---|---|
| | | | | |
| 0NN | 1/8/15 | 1/9/15 | 2/9/15 | 2/6/15 |
| 0NN | 3/30/15 | 3/31/15 | 4/9/15 | 4/15/15 |
| 2NN | 4/24/15 | 4/28/15 | 5/4/15 | 5/7/15 |
| 2NN | 5/28/15 | 6/1/15 | 6/9/15 | 6/12/15 |

# REVIEWING A MONTHLY UPDATE

## PROJECT LOGS

- Weather/Holiday Log

| | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| L | Date | Contract Day # | Allowable Days | Pursuit of Work Possible | Non Conform Days | Holiday | Weather | Recovery | SA/WO | Adjusted Allowable Contract Days | Constr Days |
| 0 | Tuesday, December 23, 2014 | 72 | N/A | N/A | | | | | | 456 | |
| 1 | Wednesday, December 24, 2014 | 73 | N/A | N/A | | 1 | | | | 457 | |
| 2 | Thursday, December 25, 2014 | 74 | N/A | N/A | | 1 | | | | 458 | |
| 3 | Friday, December 26, 2014 | 75 | N/A | N/A | | 1 | | | | 459 | |
| 4 | Saturday, December 27, 2014 | 76 | N/A | N/A | | 1 | | | | 460 | |
| 5 | Sunday, December 28, 2014 | 77 | N/A | N/A | | 1 | | | | 461 | |
| 6 | Monday, December 29, 2014 | 78 | N/A | N/A | | 1 | | | | 462 | |
| 7 | Tuesday, December 30, 2014 | 79 | N/A | N/A | | 1 | | | | 463 | |
| 8 | Wednesday, December 31, 2014 | 80 | N/A | N/A | | 1 | | | | 464 | |
| 9 | **Through December:** | | **0** | **0** | **0** | **8** | **0** | **0** | **0** | | |
| 0 | **Total to Date:** | | **0** | **0** | **0** | **14** | **0** | **0** | **0** | | |

# REVIEWING A MONTHLY UPDATE

## INSPECTOR DAILY REPORTS

- Track work by Activity ID
  - Makes reviewing actual dates much easier
  - Helps identify work without a schedule activity

```
Harris  6 Laborers   7AM-5PM       ACT- 1EB500200- Const 147
LF of 18" pipe from S-318 to S-319    Monitored trench
excavation. Comtractor laid 30 LF of 18" RCP from S-318 to
S-319 and set S-319 as per spec.425-2.2 and 425-6.5 and
125-4.4    ACT1EB500201 Const. 147' of 18" pipe from S-319
to S-320    Monitored trench excavation. Comtractor laid 147
LF of 18" RCP from S-319 to S-320 and set S-320 as per
spec.425-2.2 and 425-6.5 and 125-4.4    Contractor then
```

- Pay Item Activity

# REVIEWING A MONTHLY UPDATE

## MATERIAL TESTING REPORTS

- Concrete Test Reports

1300136002

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

FORM 675-050-04
MATERIALS - 06/01

PROJECT NO. 25841515201
PAY ITEM NO. 1 521 8 20
MATERIAL NO. 160F - STD Spec 346
SAMPLE NO. CCA40701Q
DATE SAMPLED 9/26/13 12:00 am
STA FROM 804+10
STA TO 804+39
SAMP FROM TRUCK
RDWAY SIDE R
OFFSET DISTANCE 009
OFFSET DIRECTION R
MAINLINE N
REFERENCE LINE BL
PLANT OR PIT NO. 10-007
QUANTITY REP 5.00
Unit of Measure: CY
INTENDED USE OR PART OF STRUCTURE PLACED MOMENT SLAB WALL10

ROAD NO. 400
DISTRICT NO. 07
COUNTY 10 Hillsborough
SECTION 190
CONTRACT T7209
SAMPLED BY A65207885-000
MATERIAL DESCRIPTION Concrete-Structural
SOURCE (PLACE FROM WHICH SHIPMENT WAS MADE)
MANUFACTURER OR PRODUCER:
LOT NO. 701
SUBLOT:
BATCH NO.: 32798657
DESIGN MIX NO. 07-0968
LIMS SAMPLE ID : 1300136002
LAB NO. I07013
QPL PRODUCT ID

# REVIEWING A MONTHLY UPDATE

## MATERIAL TESTING REPORTS

- Density Log Book

| LOT No. | Date | TIN | Gauge Serial No. | STD. Dns./Mst. Count | Max. Dens. / Sample No. | Test No. | Station | Offset of ℄ | Lift No. | Test Depth |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Embankment | | | | |
| 1-146 | 10-2-15 | 6,2310268 | 69508 | 2425<br>720 | 109.0<br>E0048 | 1 | 1914<br>+96 | 23'LT | 1/1 | 12" |
| | | | | | | Stabilized Subgrade Roadway | | | | |
| S1-146 | 10-2-15 | 6,2310268 | 69508 | 2425<br>720 | 114.0<br>S0368 | 2 | 1913<br>+24 | 27'LT | 1/1 | 12" |

# REVIEWING A MONTHLY UPDATE

## MATERIAL TESTING REPORTS

- LBR Test Reports

1500113551

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

FORM 675-050-04
MATERIALS - 06/01

PROJECT NO. [illegible]
PAY ITEM NO. 250 2
MATERIAL NO. 020L - STD Spec 160
SAMPLE NO. L028V
DATE SAMPLED 8/12/15 12:00 am
STA FROM 1930+80
STA TO 1920+80
SAMP FROM 1923+20
RDWAY SIDE L
OFFSET DISTANCE 028
OFFSET DIRECTION L
MAINLINE Y
REFERENCE LINE CLCONSTRUCT
PLANT OR PIT NO.
QUANTITY REP 1,000.00
Unit of Measure: LF
INTENDED USE OR PART OF STRUCTURE PLACED STABILIZED SUBGRADE

ROAD NO. SR 54
DISTRICT NO. 07
COUNTY 14 Pasco
SECTION 571
CONTRACT E7146
SAMPLED BY C62310268-000
MATERIAL DESCRIPTION STAB SUBGRADE & SHOULDERS
SOURCE (PLACE FROM WHICH SHIPMENT WAS MADE)
MANUFACTURER OR PRODUCER: Pepper
LOT NO. 48-54
SUBLOT:
BATCH NO.:
DESIGN MIX NO.
LIMS SAMPLE ID : 1500113551
LAB NO. I07002
QPL PRODUCT ID

# REVIEWING A MONTHLY UPDATE

## INSPECTION RECORDS

- Asphalt Records

Constant Width Areas — Gmm: 2.480

| # | Date Paved | Day or Night | Crew ID | Sub Lot | Truck Load #'s | Intended Use | Density ? | Lane | Desc. | Lift # | of # | Start Paving at Station | End Paving at Station |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 9/1/2015 | Night | 1 | 1 | 19-21 | SP TL-C | Y | R1 | WIDENING | 3 | 3 | 1890+75.00 | 1896+70.00 |
| | 9/1/2015 | Night | 1 | 1 | 21 | SP TL-C | Y | R1 | MAINLINE | 1 | 1 | 1896+70.00 | 1896+85.00 |
| | 9/1/2015 | Night | 1 | 1 | 21 | SP TL-C | N | IR | LTL TAPER | 3 | 3 | 1896+70.00 | 1897+20.00 |
| | 9/1/2015 | Night | 1 | 1 | 21-23 | SP TL-C | N | IR | GORE AREA | 3 | 3 | 1897+20.00 | 1902+50.00 |
| | 9/1/2015 | Night | 1 | 1 | 23-25 | SP TL-C | N | IR | LTL | 3 | 3 | 1897+20.00 | 1901+25.00 |
| → | 09/01/2015 DAILY TOTALS: 151.73 Total Tons 0.00 Tons Not in Lot 151.73 net tons (57.00 tons Require Density 94.73 tons N | | | | | | | | | | | | |

# REVIEWING A MONTHLY UPDATE

## INSPECTION RECORDS

- Asphalt Records
- Pile Driving Records
- Drilled Shaft Logs
- Post-tensioning & Grouting Records
- Bolting Records

# REVIEWING A MONTHLY UPDATE

## LANE CLOSURE & DETOUR REQUESTS

- Lane Closure Notices
- Detour Requests

# REVIEWING A MONTHLY UPDATE

## DEVELOPING A CHECKLIST

| Type | Checklist Item | How to Check |
|---|---|---|
| Activities | Have there been any activities deleted in the update? If so, why? | Claim Digger |
| Activities | Have the descriptions been changed for any of the activities? If so, why? | Claim Digger |
| Activities | Have there been any activities added in the update? If so, why? | Claim Digger |
| Activities | Were any activity types change in the update? If so why? | Detailed review |
| Activities | Have there been any Notebook entries? If so, what do they say and are they valid? | Claim Digger |
| Calcualtion | Did the total float change for any activities in an amount greater than the update period? If so, why? Most likely there have been logic changes. | Claim Digger |
| Calculation | Verify the total float calculation method. It should be Finish Float. | Claim Digger & Schedule Log txt file |
| Calculation | Verify the critical activity determination method. It should be Longest Path. | Claim Digger & Schedule Log txt file |
| Calculation | Calculate the schedule and review the output file to verify there are no logic loops or out-of-sequence progress. | P6 Pop-up or Schedule Log text file |
| Calculation | Is the critical path clearly shown? If not, why? | Schedule Log text file |
| Calculation | Is there more than one critical path? If so, does it make sense or has a path been made critical to support a delay issue? | Detailed review |
| Calendars | Were the calendars changed for any activities in the update? If so, why and is the change consistent with operations in the field? | Claim Digger |
| Constraint | Check for schedule completion constraints. If there, are they consistent with the Contract dates? | Projects Dates Screen & Claim Digger |
| Constraint | Check for new constraints on any activities. If there, have they been approved by the Engineer? | Activity Detail Window, Claim Digger & Schedule Log txt file |
| Date | Is the data date correct? Should be the Estimate cut-off date. | Projects Dates Screen, Schedule Calculation Window, Claim Digger & Schedule Log txt file |
| Date | Were actual start or finish dates added for any activities and if so, were the actual dates reported accurately? | Claim Digger & detailed review |

# REVIEWING A MONTHLY UPDATE

## DEVELOPING A CHECKLIST

| Type | Checklist Item | How to Check |
|---|---|---|
| Date | Are there any actual dates reported after the data date? If so, they need to be removed. | Schedule Log txt file & Detailed review |
| Date | Were any previously reported actual dates modified in the update and if so, why? | Claim Digger |
| Date | Were there any activities that could have started during the update period, but did not? If so, why? | Detailed review |
| Date | Were there any activities that could have finished during the update period, but did not? If so, why? | Detailed review |
| Date | Were there any activities that finish later that expected during the update period? If so, why? | Detailed review |
| Date | Were there variances to any milestones? If so, why? | Claim Digger & Detailed review |
| Durations | Were the original durations of any activities changed in the update? If so, why? | Claim Digger & detailed review |
| Durations | Verify that new activity durations are not excessive or inadequate. Limit is 20 workdays. | Detailed Review |
| Logic | Were there any logic changes made in the schedule? If so, why? | Claim Digger & detailed review |
| Logic | Is there only one activity with no predecessor? If there are more, it must be corrected. | Schedule Log text file |
| Logic | Is there only one activity with no successor? If there are more, it must be corrected. | Schedule Log text file |
| Logic | Verify all relationship lags to make sure float has not be sequestered? If Finish-to-Start lags exist, they need to be properly explained. | Activity Detail Window & Claim Digger |
| Logic | Verify that the lag cell has a number for all relationships. If there is a lag cell that is blank, it needs to be filled in with a number. Blank cells will be treated as 0 days by P6. | Activity Detail Window & Claim Digger |
| Logic | Verify that “Level of Effort” activities have start-to-start predecessors with 0 lag and finish-to-finish successors with 0 lag. | Activity Detail Window |
| Percent | Was the percent complete calulation changed for any activities in the update? | Detailed review |
| Percent | Was the percent complete changed for any ativities and if so, is the new percent complete accurate? | Claim Digger |
| Percent | Were there any active activities with no progress reported during the update period (no change in percent complete)? | Detailed review |
| Percent | Were there any active activities with no progress (0% complete) in the update? | Detailed review |
| Submittal | Verify that the submittal includes the required components – most importantly the electronic files and the narrative. | Detailed review |
| Submittal | Verify that the narrative includes all of the required information. | Detailed review |
| Submittal | Verify that there are adequate submittal/review & approval/fabrication & manufacturing activities. | Detailed Review |

# REVIEWING A MONTHLY UPDATE

Have there been any activities deleted in the update?

**Activities Added/Deleted**

**The following Activities have been deleted from the project**

| Activity Id | Activity Name |
|---|---|
| OBS6001 | Project CPM Schedule |
| OBS7042 | Install Containment System |

*This information can be found in a Claim Digger report.*

If activities have been deleted, it is important to know why and to make sure as-built activities are not deleted.

# REVIEWING A MONTHLY UPDATE

Have the descriptions been changed for any of the activities?

| Activity Name | | | |
|---|---|---|---|
| **Activity Id** | **Activity Name** | **New Activity Name** | **Old Activity Name** |
| 400 | Activity D Modified | Activity D Modified | Activity D |

*This information can be found in a Claim Digger report.*

**If descriptions have been changed, it is important to understand why and make sure that descriptions are not changed for as-built activities.**

# REVIEWING A MONTHLY UPDATE

Have there been any activities added in the update?

**Activities Added/Deleted**

**The following Activities have been added to the project**

| Activity Id | Activity Name |
|---|---|
| OBS6191 | Additional Fencing |
| OBS6181 | Reef Plan 2 |
| Issue1 | Issue 1 |

*This information can be found in a Claim Digger report.*

If activities have been added, it is important to understand why and verify that the new activities meet the specification requirements.

# REVIEWING A MONTHLY UPDATE

## Were there any activity types changed in the update?

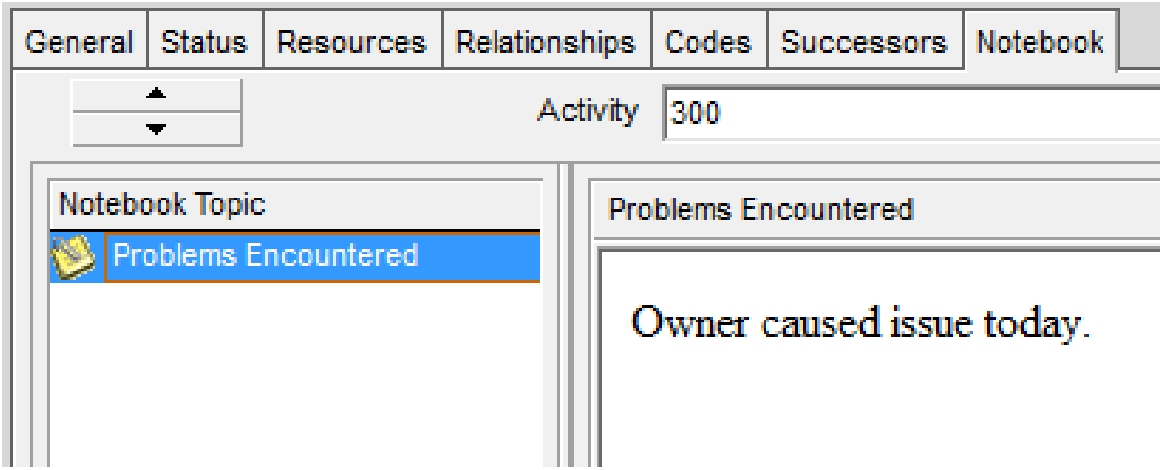
- Claim Digger will not perform this comparison.
- For the target (Baseline or previous update) and update schedules, include a column for Activity Type in the view and sort all of the activities by Activity ID and then copy and paste the activities to an Excel spreadsheet.
- Perform a side by side comparison of the activity types to determine if changes have been made.

**If any activity types are changed, it is important to understand why and verify that the new type is appropriate for what the activity represents.**

# REVIEWING A MONTHLY UPDATE

Have there been any Notebook entries?

| The following Activity Notes have been added to the project | |
|---|---|
| **Notebook Id** | **Notebook Topic Name** |
| 29 | Problems Encountered |




*Claim Digger will provide basic information and will indicate if a detailed review in P6 is warranted.*

# REVIEWING A MONTHLY UPDATE

Did the total float change for any activities in an amount greater than the update period?

**Total Float**

| Activity Id | Activity Name | New Total Float | Old Total Float |
|---|---|---|---|
| OBS6051 | MOT Plan | *Value not specified in the database* | 1808.0 |
| OBS6111 | Bearing Pads | 71.0 | 191.0 |
| OBS6011 | Quality Control Plan | *Value not specified in the database* | 1808.0 |
| OBS9310 | Secure Grating w/ Clips & bolts for US1 Obser. Deck | 271.0 | 431.0 |
| OBS9000 | Build & Set Pile Templates for US1 Obser. Deck | 0.0 | 888.0 |

*This information can be found in a Claim Digger report. Note that the data reported by Claim Digger is in HOURS, not days.*

# REVIEWING A MONTHLY UPDATE

Verify the total float calculation method.

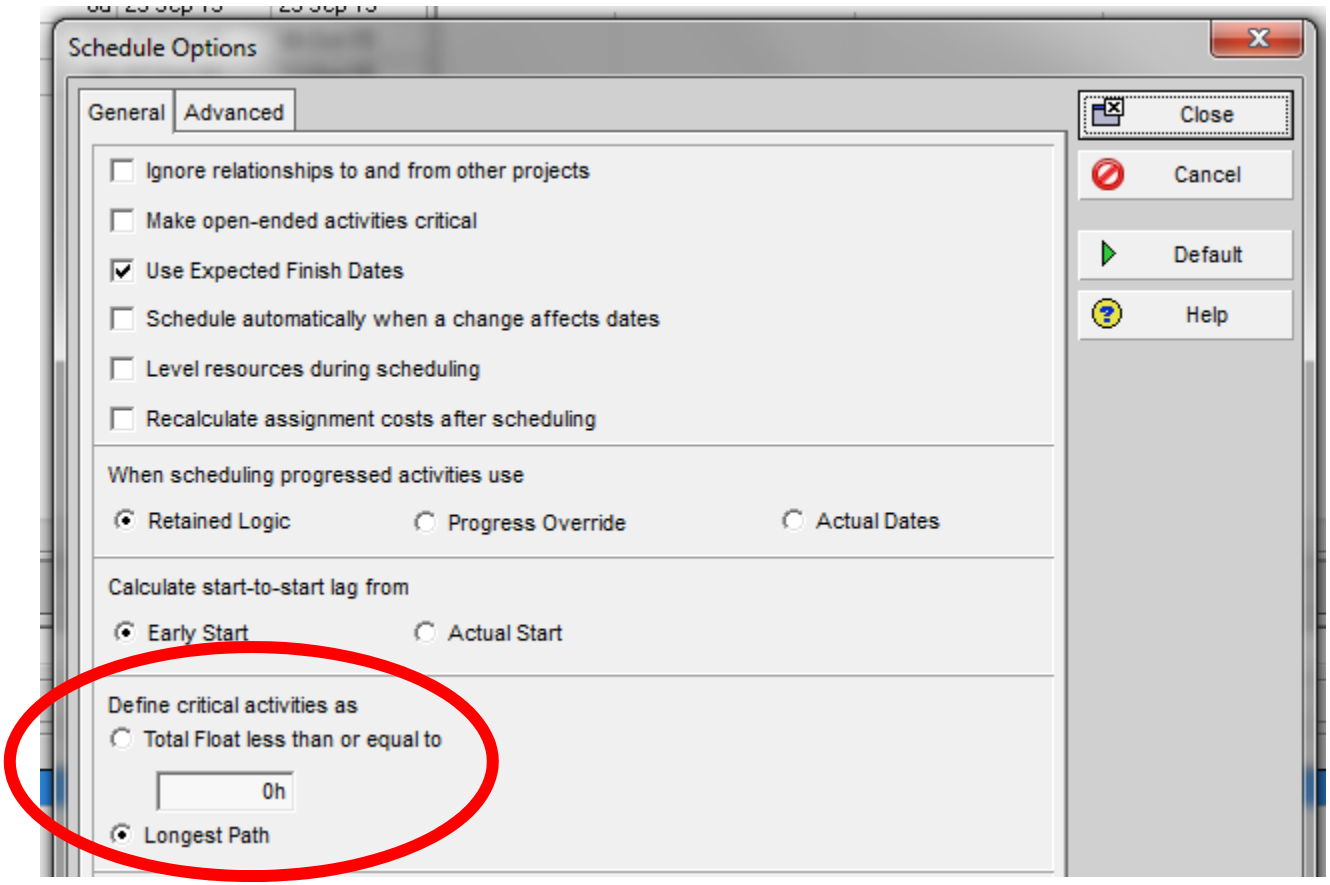
| Project Differences Report | | |
|---|---|---|
| *Comparing SR5/US1 - SR 811 OBSER PIER - Update to SR5/US1 - SR 811 OBSER PIER - Baseline*<br>*Executed by admin*<br>*Date Wed Jul 01 10:06:58 GMT-05:00 2015* | | |
| **General Project Data** | | |
| **Field Name** | **[ SR5/US1 - SR 811 OBSER PIER - Update ] [ PracExercise3 ]** | **[ SR5/US1 - SR 811 OBSER PIER - Baseline ] [ PracExercise2 ]** |
| Must Finish By Date | *Value not specified in the database* | 2015/07/01 12:00 |
| Data Date | 2014/09/30 12:00 | 2014/06/01 12:00 |
| **Project Scheduling Options** | | |
| **Field Name** | **[ PracExercise3 ]** | **[ PracExercise2 ]** |
| Compute Total Float Type | Start Float = Late Start - Early Start | Finish Float = Late Finish - Early Finish |
| Ignore Other Project Relationships | true | false |
| Out Of Sequence Schedule Type | Retained Logic | Progress Override |

*This information can be found in a Claim Digger report.*

The correct option is “Finish Float”.

# REVIEWING A MONTHLY UPDATE

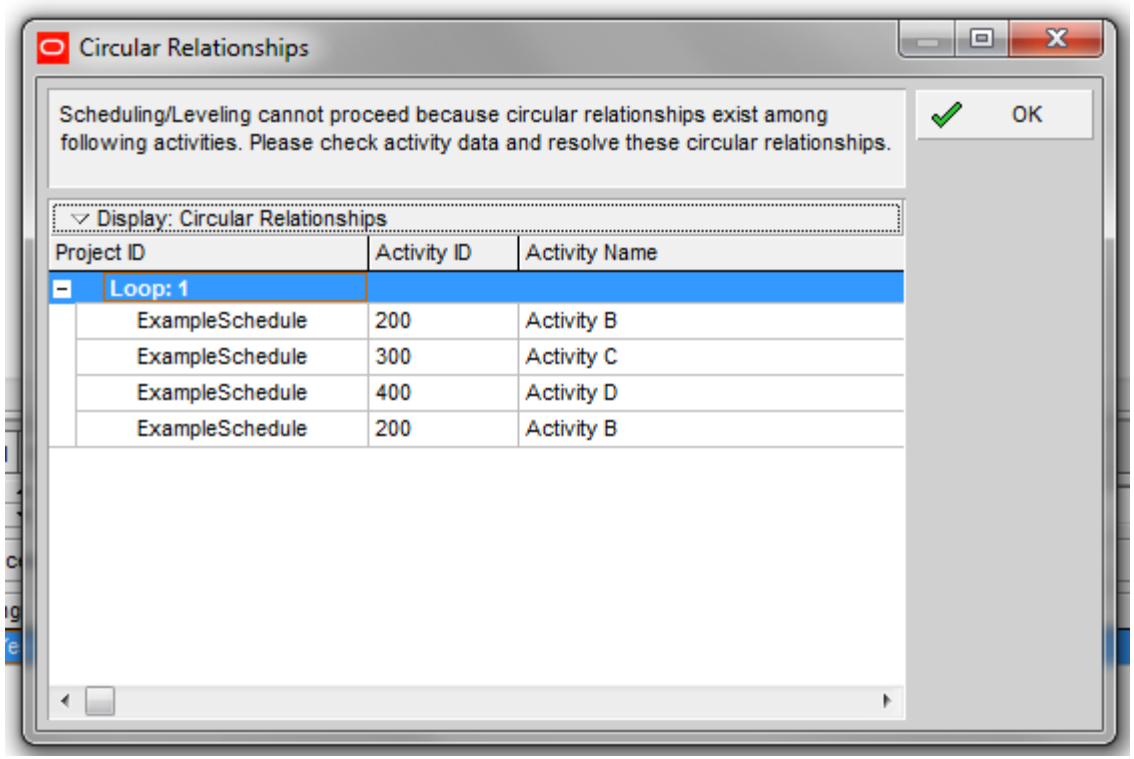
Verify the critical activity determination method.




The correct option is “Longest Path”.

# REVIEWING A MONTHLY UPDATE

Calculate the schedule and review the output file to verify there are <u>no logic loops</u> or out-of-sequence progress.




*This window will pop up if a logic loop exists when the schedule calculation is performed.*

# REVIEWING A MONTHLY UPDATE

Calculate the schedule and review the output file to verify there are no logic loops or <u>out-of-sequence progress</u>.

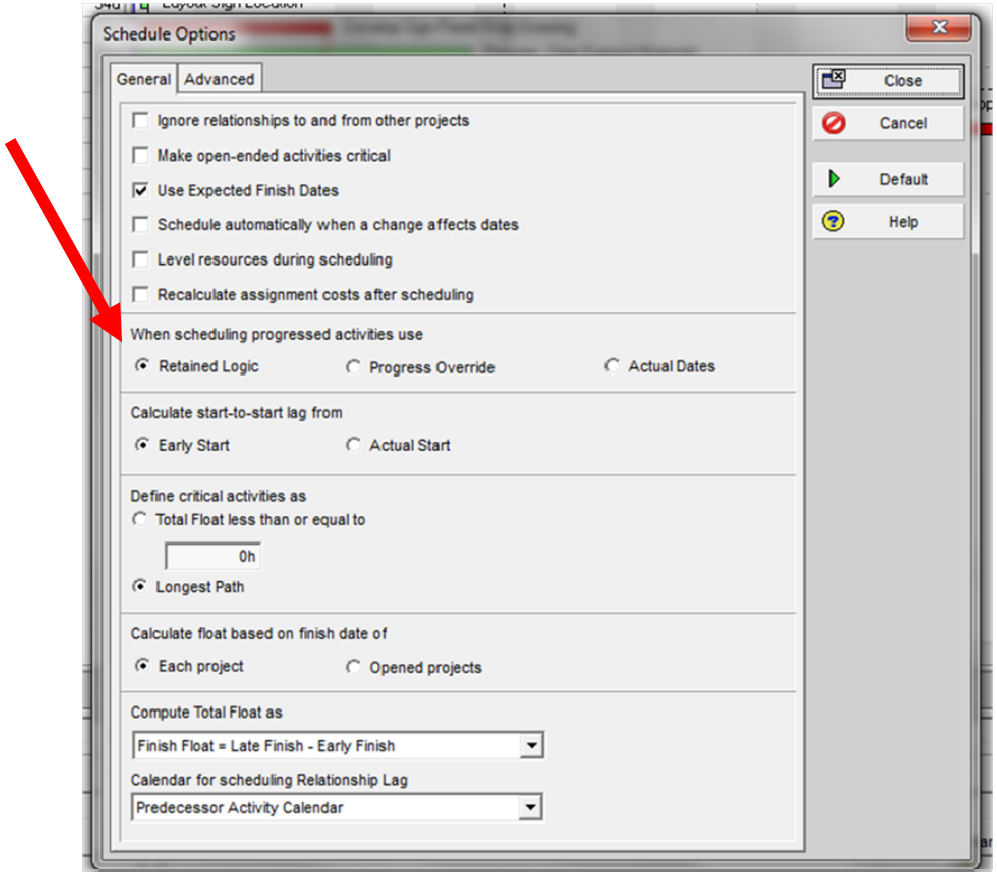
```
Activities without predecessors.....................................1
        Project:        ExampleSchedule Activity:       100     Activity A

Activities without successors.......................................1
        Project:        ExampleSchedule Activity:       500     Activity E

Out-of-sequence activities..........................................1
        Project:        ExampleSchedule Activity:       300     Activity C

Activities with Actual Dates > Data Date.........................0
```

*This information can be found in the schedule report text file.*

Out of sequence progress should be addressed by modifying the logic.

# REVIEWING A MONTHLY UPDATE

Was Retained Logic or Progress Override Used?




Retained Logic is required by the Specifications.

# REVIEWING A MONTHLY UPDATE

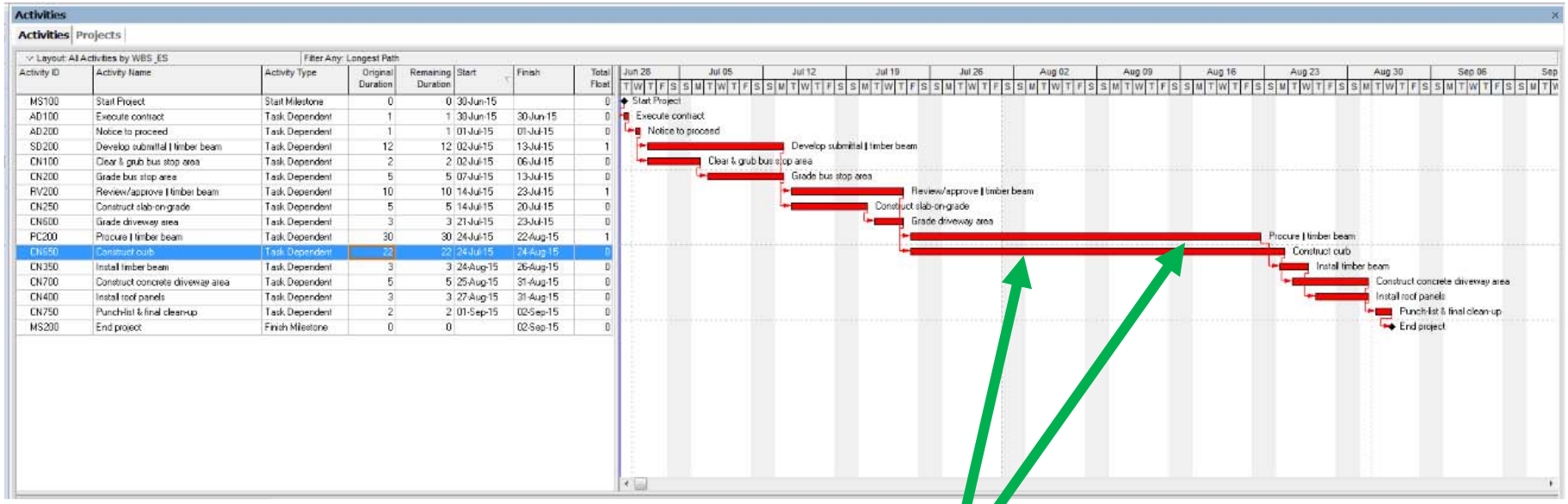
Is the critical path clearly shown?

```
Scheduling/Leveling Results:
----------------------------
        # Projects Scheduled/Leveled.....................................1
        # Activities Scheduled/Leveled....................................24
        # Relationships with other projects...............................0
        Data Date.......................................................30-Jun-15
        Earliest Early Start Date.......................................30-Jun-15
        Latest Early Finish Date........................................02-Sep-15
Exceptions:
-----------
        Critical Activities.............................................10
                Project:        BusStop Activity:       AD100   Execute contract
                Project:        BusStop Activity:       AD200   Notice to proceed
                Project:        BusStop Activity:       CN350   Install timber beam
                Project:        BusStop Activity:       CN400   Install roof panels
                Project:        BusStop Activity:       CN750   Punch-list & final clean-up
                Project:        BusStop Activity:       MS100   Start Project
                Project:        BusStop Activity:       MS200   End project
                Project:        BusStop Activity:       PC200   Procure - timber beam
                Project:        BusStop Activity:       RV200   Review/approve - timber beam
                Project:        BusStop Activity:       SD200   Develop submittal - timber beam
```

*This information can be found in the schedule report text file.*

# REVIEWING A MONTHLY UPDATE

Is there more than one critical path?




*This can be determined by carefully reviewing the longest path.*

If there is more than one longest path, the logic and durations of each path should be reviewed carefully.

# REVIEWING A MONTHLY UPDATE

Were the calendars changed for any activities in the update?

| Calendar Name | | | |
|---|---|---|---|
| **Activity Id** | **Activity Name** | **New Calendar Name** | **Old Calendar Name** |
| 200 | Activity B | 5 Day Project Calendar | Standard 5 Day Workweek |

*This information can be found in a Claim Digger report.*

If the calendar was changed for any activity, a reason should be provided and the new calendar should be consistent with the project's work week and shifts.

# REVIEWING A MONTHLY UPDATE

Check for schedule completion constraints.

| Project Differences Report | | |
|---|---|---|
| *Comparing SR5/US1 - SR 811 OBSER PIER - Update to SR5/US1 - SR 811 OBSER PIER - Baseline*<br>*Executed by admin*<br>*Date Wed Jul 01 10:06:58 GMT-05:00 2015* | | |
| **General Project Data** | | |
| **Field Name** | **[ SR5/US1 - SR 811 OBSER PIER - Update ] [ PracExercise3 ]** | **[ SR5/US1 - SR 811 OBSER PIER - Baseline ] [ PracExercise2 ]** |
| Must Finish By Date | *Value not specified in the database* | 2015/07/01 12:00 |
| Data Date | 2014/09/30 12:00 | 2014/06/01 12:00 |
| **Project Scheduling Options** | | |
| **Field Name** | **[ PracExercise3 ]** | **[ PracExercise2 ]** |
| Compute Total Float Type | Start Float = Late Start - Early Start | Finish Float = Late Finish - Early Finish |
| Ignore Other Project Relationships | true | false |
| Out Of Sequence Schedule Type | Retained Logic | Progress Override |

*This information can be found in a Claim Digger report.*

# REVIEWING A MONTHLY UPDATE

Check for new constraints on any activities.

| Constraints | | | |
|---|---|---|---|
| **Primary Constraint Type** | | | |
| **Activity Id** | **Activity Name** | **New Primary Constraint Type** | **Old Primary Constraint Type** |
| OBS 5004 | Coast Guard Permits | *Value not specified in the database* | Finish On or Before |
| **Primary Constraint Date** | | | |
| **Activity Id** | **Activity Name** | **New Primary Constraint Date** | **Old Primary Constraint Date** |
| OBS 5004 | Coast Guard Permits | *Value not specified in the database* | 2014/08/08 04:00 |

*This information can be found in a Claim Digger report.*

Most constraints are not allowed without approval.

# REVIEWING A MONTHLY UPDATE

Is the data date correct? The data date must be correct for an update.

| Project Differences Report | | |
|---|---|---|
| *Comparing SR5/US1 - SR 811 OBSER PIER - Update to SR5/US1 - SR 811 OBSER PIER - Baseline*<br>*Executed by admin*<br>*Date Wed Jul 01 10:06:58 GMT-05:00 2015* | | |
| **General Project Data** | | |
| **Field Name** | **[ SR5/US1 - SR 811 OBSER PIER - Update ] [ PracExercise3 ]** | **[ SR5/US1 - SR 811 OBSER PIER - Baseline ] [ PracExercise2 ]** |
| Must Finish By Date | *Value not specified in the database* | 2015/07/01 12:00 |
| Data Date | 2014/09/30 12:00 | 2014/06/01 12:00 |
| **Project Scheduling Options** | | |
| **Field Name** | **[ PracExercise3 ]** | **[ PracExercise2 ]** |
| Compute Total Float Type | Start Float = Late Start - Early Start | Finish Float = Late Finish - Early Finish |
| Ignore Other Project Relationships | true | false |
| Out Of Sequence Schedule Type | Retained Logic | Progress Override |

*This information can be found in a Claim Digger report.*

# REVIEWING A MONTHLY UPDATE

Were actual start or finish dates added for any activities and if so, were the actual dates reported accurately?

| Actual Start Date | | | |
|---|---|---|---|
| **Activity Id** | **Activity Name** | **New Actual Start Date** | **Old Actual Start Date** |
| OBS6051 | MOT Plan | 2014/07/08 08:00 | *Value not specified in the database* |
| OBS6011 | Quality Control Plan | 2014/07/08 08:00 | *Value not specified in the database* |

| Actual Finish Date | | | |
|---|---|---|---|
| **Activity Id** | **Activity Name** | **New Actual Finish Date** | **Old Actual Finish Date** |
| OBS6051 | MOT Plan | 2014/07/14 12:00 | *Value not specified in the database* |
| OBS6011 | Quality Control Plan | 2014/07/18 12:00 | *Value not specified in the database* |
| OBS8100 | Install New Railing at SR811 Fish Pier Abutment | 2014/10/07 12:00 | *Value not specified in the database* |

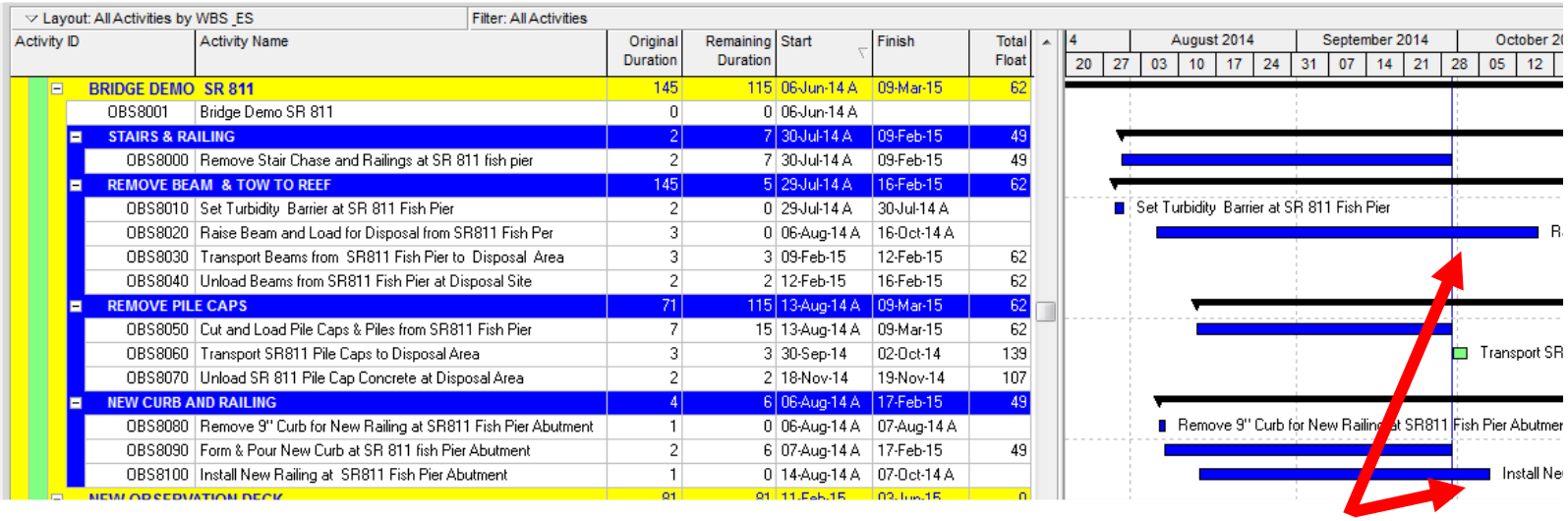
*This information can be found in a Claim Digger report.*

# REVIEWING A MONTHLY UPDATE

## Are there any actual dates reported after the data date?

```
Activities with Actual Dates > Data Date.........................1
        Project:        ExampleSchedule-1        Activity:        200      Activity B
```

*This information can be found in the schedule report text file.*



Layout: All Activities by WBS _ES | Filter: All Activities

| Activity ID | Activity Name | Original Duration | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|---|
| BRIDGE DEMO SR 811 | | 145 | 115 | 06-Jun-14 A | 09-Mar-15 | 62 |
| OBS8001 | Bridge Demo SR 811 | 0 | 0 | 06-Jun-14 A | | |
| STAIRS & RAILING | | 2 | 7 | 30-Jul-14 A | 09-Feb-15 | 49 |
| OBS8000 | Remove Stair Chase and Railings at SR 811 fish pier | 2 | 7 | 30-Jul-14 A | 09-Feb-15 | 49 |
| REMOVE BEAM & TOW TO REEF | | 145 | 5 | 29-Jul-14 A | 16-Feb-15 | 62 |
| OBS8010 | Set Turbidity Barrier at SR 811 Fish Pier | 2 | 0 | 29-Jul-14 A | 30-Jul-14 A | |
| OBS8020 | Raise Beam and Load for Disposal from SR811 Fish Per | 3 | 0 | 06-Aug-14 A | 16-Oct-14 A | |
| OBS8030 | Transport Beams from SR811 Fish Pier to Disposal Area | 3 | 3 | 09-Feb-15 | 12-Feb-15 | 62 |
| OBS8040 | Unload Beams from SR811 Fish Pier at Disposal Site | 2 | 2 | 12-Feb-15 | 16-Feb-15 | 62 |
| REMOVE PILE CAPS | | 71 | 115 | 13-Aug-14 A | 09-Mar-15 | 62 |
| OBS8050 | Cut and Load Pile Caps & Piles from SR811 Fish Pier | 7 | 15 | 13-Aug-14 A | 09-Mar-15 | 62 |
| OBS8060 | Transport SR811 Pile Caps to Disposal Area | 3 | 3 | 30-Sep-14 | 02-Oct-14 | 139 |
| OBS8070 | Unload SR 811 Pile Cap Concrete at Disposal Area | 2 | 2 | 18-Nov-14 | 19-Nov-14 | 107 |
| NEW CURB AND RAILING | | 4 | 6 | 06-Aug-14 A | 17-Feb-15 | 49 |
| OBS8080 | Remove 9" Curb for New Railing at SR811 Fish Pier Abutment | 1 | 0 | 06-Aug-14 A | 07-Aug-14 A | |
| OBS8090 | Form & Pour New Curb at SR 811 fish Pier Abutment | 2 | 6 | 07-Aug-14 A | 17-Feb-15 | 49 |
| OBS8100 | Install New Railing at SR811 Fish Pier Abutment | 1 | 0 | 14-Aug-14 A | 07-Oct-14 A | |



*Any progress bars to the right of the data date line are a graphical "give away" for actual dates after the data date.*

## Actual dates after the data date need to be removed.

# REVIEWING A MONTHLY UPDATE

Were any previously reported actual dates modified in the update and if so, why?

| Actual Start Date | | | |
|---|---|---|---|
| **Activity Id** | **Activity Name** | **New Actual Start Date** | **Old Actual Start Date** |
| OBS6051 | MOT Plan | 2014/07/08 08:00 | *Value not specified in the database* |
| OBS6011 | Quality Control Plan | 2014/07/08 08:00 | *Value not specified in the database* |

| Actual Finish Date | | | |
|---|---|---|---|
| **Activity Id** | **Activity Name** | **New Actual Finish Date** | **Old Actual Finish Date** |
| OBS6051 | MOT Plan | 2014/07/14 12:00 | *Value not specified in the database* |
| OBS6011 | Quality Control Plan | 2014/07/18 12:00 | *Value not specified in the database* |
| OBS8100 | Install New Railing at SR811 Fish Pier Abutment | 2014/10/07 12:00 | *Value not specified in the database* |

*This information can be found in a Claim Digger report.*

# REVIEWING A MONTHLY UPDATE

Were there any activities that could have started during the update period, but did not?

Were there any activities that could have finished during the update period, but did not?

Were there any activities that finished later than expected during the update period?

*Determining the answer to these questions requires a detailed review and comparison of the planned activities from the target to the activities statused in the update.*

# REVIEWING A MONTHLY UPDATE

Were there variances to any milestones? If so, why?

**Activities**

Projects **Activities**

Layout: All Activities by WBS _ES | Filter: All Activities

| Activity ID | Activity Name | Activity Type | Original Duration | Remaining Duration | Start | Finish | Total Float |
|---|---|---|---|---|---|---|---|
| OBS9900 | FINAL ACCEPTANCE | Finish Milestone | 0 | 0 | | 04-Jun-15 | 0 |
| OBS5001 | Final completion | Finish Milestone | 0 | 0 | | 04-Jun-15 | 0 |
| Issue1 | Issue 1 | Finish Milestone | 0 | 0 | | 30-Sep-14 A | |
| OBS4040 | MOT | Level of Effort | 330 | 247 | 08-Jul-14 A | 03-Jun-15 | -84 |
| OBS1000 | Bridge Demo SR5 | Start Milestone | 0 | 0 | 19-Dec-14 | | 54 |
| OBS8001 | Bridge Demo SR 811 | Start Milestone | 0 | 0 | 06-Jun-14 A | | |
| OBS9002 | New Observation Deck | Start Milestone | 0 | 0 | 05-Mar-15 | | 0 |
| OBS5002 | CONTRACT AWARD | Start Milestone | 0 | 0 | 27-May-14 A | | |

*You must do a detailed review of the target schedule's dates and the update's dates.*

# REVIEWING A MONTHLY UPDATE

Were the original durations of any activities changed in the update?

**Original Duration**

| Activity Id | Activity Name | New Original Duration | Old Original Duration |
|---|---|---|---|
| OBS7150 | Hammer Footings and Columns at SR5/US1 Bridge | 16.0 | 24.0 |

*This information can be found in a claim digger report.*

***Verify that new activity durations are not excessive or inadequate.***

# REVIEWING A MONTHLY UPDATE

Were there any logic changes made in the schedule?

| General Relationship Differences | | | | | | |
|---|---|---|---|---|---|---|
| Predecessor Activity Id | | | | | | |
| Activity Id | Activity Name | Relationship Type | Predecessor Activity Id | Predecessor Activity Name | New Predecessor Activity Id | Old Predecessor Activity Id |
| OBS8020 | Raise Beam and Load for Disposal from SR811 Fish Per | Finish to Start | OBS8000 | Remove Stair Chase and Railings at SR 811 fish pier | OBS8000 | OBS8010 |
| OBS9001 | Install Rip Rap at New Obser. Deck | Finish to Start | OBS7160 | Transport & Unload SR5/US1 Bridge Broken Concrete to Disposal Area | OBS7160 | OBS6161 |
| OBS8090 | Form & Pour New Curb at SR 811 fish Pier Abutment | Finish to Start | OBS8080 | Remove 9" Curb for New Railing at SR811 Fish Pier Abutment | OBS8080 | OBS6091 |

*This information can be found in a claim digger report.*

The reasons for any logic changes needs to be provided.

# REVIEWING A MONTHLY UPDATE

Is there only one activity with no predecessor?

Is there only one activity with no successor?

```
Errors:
-------
Warnings:
---------
        Activities without predecessors.................................4
                Project:        PracExercise3   Activity:       Issue1  Iss
                Project:        PracExercise3   Activity:       OBS5002 CON
                Project:        PracExercise3   Activity:       OBS6181 Ree
                Project:        PracExercise3   Activity:       OBS8060 Tra

        Activities without successors...................................4
                Project:        PracExercise3   Activity:       Issue1  Iss
                Project:        PracExercise3   Activity:       OBS5001 Fin
                Project:        PracExercise3   Activity:       OBS6151 Deb
                Project:        PracExercise3   Activity:       OBS8050 Cut
```

*This information can be found in the schedule report text file.*

*If so, the logic must be corrected.*

# REVIEWING A MONTHLY UPDATE

Verify all relationship lags to make sure float has not be sequestered?

| General Relationship Differences | | | | | | |
|---|---|---|---|---|---|---|
| **Relationship Lag** | | | | | | |
| **Activity Id** | **Activity Name** | **Relationship Type** | **Predecessor Activity Id** | **Predecessor Activity Name** | **New Relationship Lag** | **Old Relationship Lag** |
| 300 | Activity C | Finish to Start | 200 | Activity B | *Value not specified in the database* | 0.0 |

*This information can be found in a claim digger report.*

Note that a report of "Value not Specified" means the lag field is blank and needs a value. P6 treats a blank field as a zero for calculations.

# REVIEWING A MONTHLY UPDATE

Was the percent complete changed for any activities and if so, is the new percent complete accurate?

| Activity Percent Complete | | | |
|---|---|---|---|
| Duration Percent Complete | | | |
| Activity Id | Activity Name | New Duration Percent Complete | Old Duration Percent Complete |
| OBS6051 | MOT Plan | 1.0 | 0.0 |
| OBS6011 | Quality Control Plan | 1.0 | 0.0 |
| OBS8100 | Install New Railing at SR811 Fish Pier Abutment | 1.0 | 0.0 |
| OBS 5004 | Coast Guard Permits | 0.8529411764705882 | 0.0 |
| OBS7012 | Set Turbidity Barrier | 1.0 | 0.0 |

*This information can be found in a claim digger report.*

# REVIEWING A MONTHLY UPDATE

## Were there any active activities with no progress or 0% complete reported during the update period (no change in percent complete)?

- Review a list of all active activities (activities with an actual start date) and determine from the Claim Digger report whether or not the percent complete changed for each of these activities.

- No change in percent complete indicates that there may be an issue holding up the work or the activity was overlooked in the update reporting.

# REVIEWING A MONTHLY UPDATE

Verify that the submittal includes the required components – most importantly the electronic files and the narrative.

- Electronic file is a must!
- Description of changes and explanations for changes is critically important.

# REVIEWING A MONTHLY UPDATE

Verify that there are adequate submittal/review & approval/fabrication & manufacturing activities.

- Check the submittal / review / manufacturing activities against the submittal log.
- Verify that resubmittal / review activities have been included.

# REVIEWING A MONTHLY UPDATE

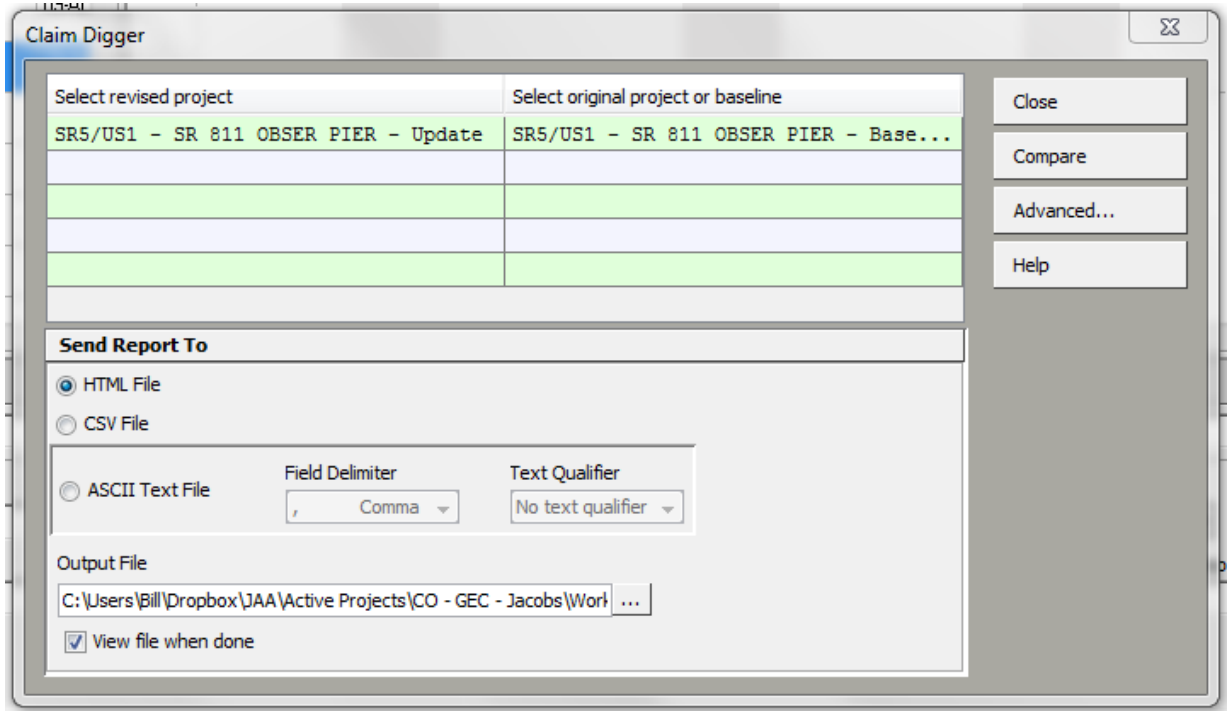
## SOFTWARE

- Claim Digger

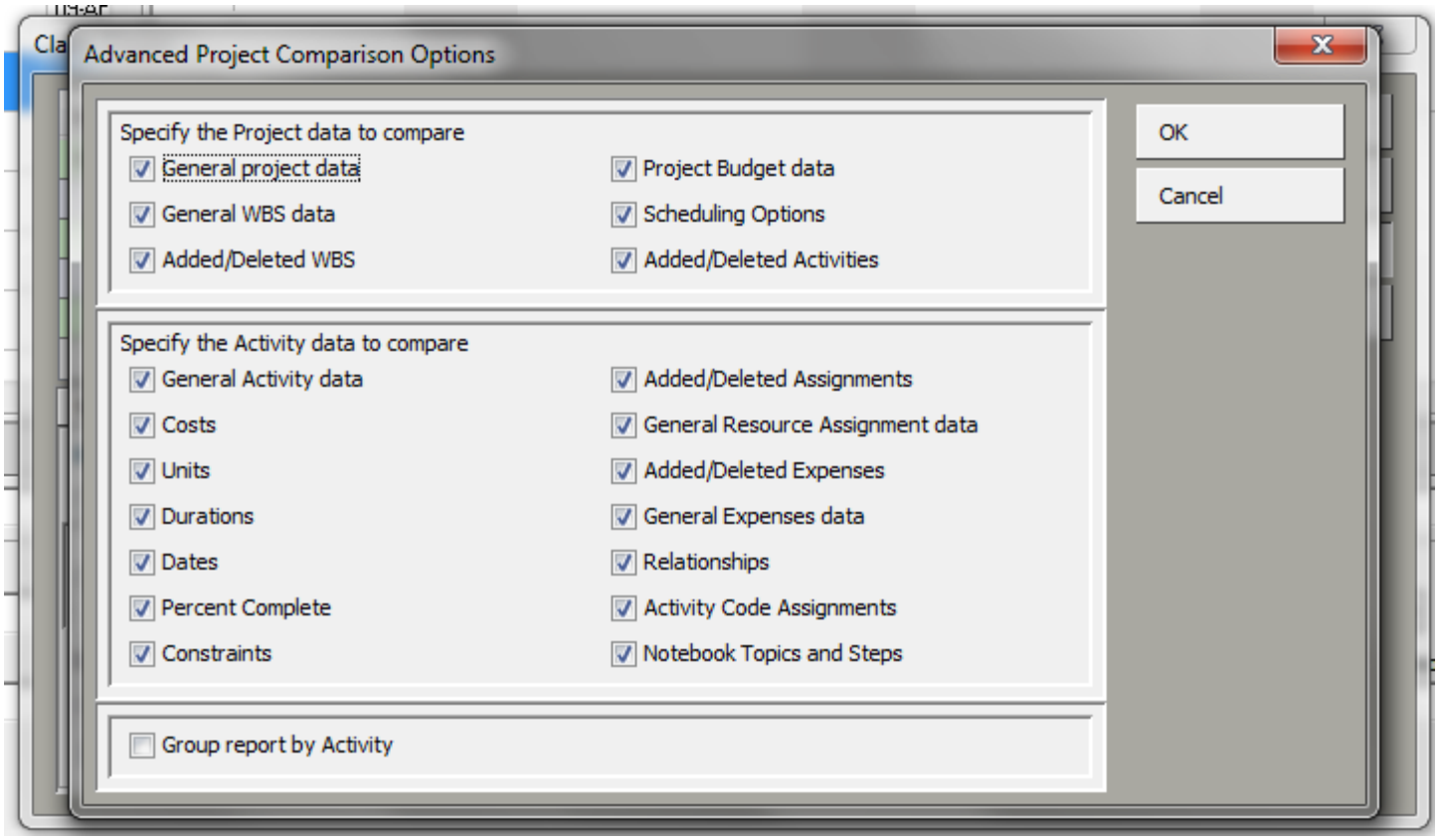
# REVIEWING A MONTHLY UPDATE

## CLAIM DIGGER

- Built-in to P6.  Very effective tool for comparing two schedules
- Need to understand that output is in hours and must be converted to days based on project calendars and hours per shift



# REVIEWING A MONTHLY UPDATE

## CLAIM DIGGER

- Compares many elements of the schedules