



Reviewing & Analyzing CPM Construction Schedules



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Module #2 Baseline / Initial Project Schedule (IPS) Review



IPS Importance



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The Initial Project Schedule or
Baseline Schedule is a critical tool:

- Original Baseline or As-planned Schedule
- Structure used to produce Schedule Updates for Progress Payments
- Time Impact / Delay Issues



IPS Development



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Fundamentals for success:

- Meets contract requirements *(but not just a response to)*
- Based on the contractor's Work Plan
- Time spent in development with right people
- Sound CPM Principles used
- Buy-in: Contractor Project Management, Superintendent, Foremen, Subcontractors & Client



IPS Development

General Worksheet for Contractors



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Initial Project Schedule (IPS) Development General Worksheet for Contractors

Contract Documents

1. Project Schedule Tech Spec 01 32 01.00 10
2. Solicitation, Offer & Award SF1442 (Total Contract Value & Bid Items/Clin, Project Duration, Scope, Contractual Dates)
3. Letters: NTP Acknowledgement Letter (NTP = Contractor Acknowledgement Date) & Project Completion Letter (CCD)

Contract Data needed for IPS development

1. Notice to Proceed (NTP), Contract Duration, Contract Completion Date (CCD)
2. Other Contractual Dates Defined (Interim or Phased Dates as specifically defined in the contract)
3. Contract Schedule of Values (SOV) \$ for Total Contract and by CLIN/Bid Item
4. Scope, Mandatory Tasks, Critical Dates etc.
5. Specific Submittal Review/Approval durations, Close Out As-built \$ requirements, Commissioning, Design etc.

Submission Requirements – Via Serial Letter

CDs (2 ea):

- Electronic Schedule File in Backup Format (XER or PRX), Unique File Names for every file
- Opened / Imported Successfully

Hard Copies (2 ea):

- Narrative Report (Description of Activities on the 2 most Critical Paths, Problem Areas or Delaying factors or Impacts & Corrective Action)
- Network Diagram / Schedule
- Activity Report (sorted by Activity ID)
- Logic Report (Predecessor & Successor Listing In ascending order by Activity ID)
- Total Float Report (Incomplete Activities Listed by TF in ascending order of ES)
- Earnings Report (Act ID, Activity Description, Original Budget \$, Qty to Date, %Complete based on cost, Earnings to Date)
- S-Curves (Projected early and late earnings and earnings to date)
- Subcontract Report (\$ Value by Subcontract)

General Review

1. Data Date = NTP and no Progress
2. NTP has Early Start (Start on or After) Constraint or Actual Date equal to the contract NTP.
3. CCD has Late Finish (Finish on or Before) Constraint equal to the contract CCD.
4. Other Contractual Dates – Only NTP & CCD constraints allowed unless interim dates defined in contract.
5. Mechanics - Retained Logic (not Progress Override), Remaining Duration & % Complete Not Linked
6. Critical Activities defined as Longest Path, passes common sense test, (rule of thumb appx. 20 to 30% of activities)
7. Logic - No Open Ends, No Out-of-Sequence Logic (Run Schedule Report!)
8. Mandatory Tasks (Design Pkgs, Permits, TAB, Commissioning, Testing, As-builts/LEED, O&Ms, Prefinal, Punchlist, Final Inspections)
9. Pre-construction Submittal & Review/Approval Activities (Health & Safety, Accident Prevention, Traffic Control, Environmental, Sampling & Analysis, SWPP, IPS, QC, Site, Temp Utilities)
10. Descriptions - Activity Descriptions are all Unique and adequately describe work scope detail
11. Level of Detail / Durations – Number of activities reasonable to define & control work, Durations reasonable length (<2% Durations> 20 Days), no excessive durations, common sense test, realistic to perform & progress work
12. Lags - No Excessive Lags, No Negative Lags
13. Materials - Activities (Long Lead, Procurement, Fab/Deliver, Stored Materials)
14. Calendars – realistic, use for seasonal restrictions, holidays (P8 users develop as "Project" Calendars not Global)
15. Standard Activity Coding – Use activity coding structure defined in the Standard Data Exchange Format (SDEF). (P8 users develop "Project" Activity Codes not Global)

WRKP	Workers Per Day	(Length = 3)	BIDI	Bid Item (CLIN)	(Length 6)
RESP	Responsible Party	(Length = 4)	PHAS	Phase of Work	(Length 2)
AREA	Area of Work	(Length = 4)	CATW	Category of Work	(Length 1)
MODF	Modification Number	(Length = 6)	FOW1	Feature of Work (FOW2, FOW2)	(Length 10 each)
16. Schedule of Values / Budgets – The Total Contract \$ & IPS \$ must match including each BIDI/Clin, Values reasonable, not too much scope on one activity, OH/markup equitably spread. Design \$/% reasonable Close Out Activities have \$ & contract req. Not front end loaded. (Summary Report by BIDI to check \$ match)

Note: This Worksheet is intended for general reference only and should be considered all inclusive of contract requirements.

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IPS Review Process



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Process:

- ↓ Contractor submits IPS / Baseline Schedule
- ↓ Owner conducts Technical Review
- ↓ Owner & Contractor Schedule Review Meeting
- ↓ Contractor resubmits IPS (if necessary)
- ↓ Owner accepts IPS / Baseline Schedule (buy-in)

Form:

IPS Development – Contractor Worksheet



IPS Review Owner Review



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Steps:

1. Pulls/Reviews Contract Documents
2. Compiles Contract Data
3. Checks Contractor Submission meets Requirements (Reports, CDs, etc.)
4. Reviews Schedule Mechanics
5. Performs General Schedule Review
(Critical Activities, Level of Detail, Logic, WBS, Activity Codes, Budgets, Descriptions, Resources, Calendars, Budgets, Durations, Constraints, Activity Types, etc.)



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Step 1: Pulls & Reviews Contract Docs

- Award Documents – Scope, Dates, Total Contract value & by Bid Item
- Drawings
- Project Schedule Specification – defines schedule requirements
- NTP Acknowledgement Letter or other correspondence.



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Step 2: Compiles Contract Data

Critical Contractual Schedule Dates:

- Project Start Date or NTP - Start Milestone, Early Start Constraint
- Interim Completion Dates - Finish Milestone, Late Finish Constraint (aka Project must finish on or Before Constraint)
- Contract Required Completion Date (CCD) - Finish Milestone, Late Finish Constraint



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Contract Documents



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Step 2: Compiles Contract Data (continued)

Contract Required Activities (also Durations & \$)

- Critical Milestones: NTP, CCD etc.
- Design Packages
- Preconstruction Submittals/Plans
- Owner Review & Acceptance Activities
- Commissioning Activities
- Inspections & Punchlists
- Close Out Activities - O&M Manual & Asbuilt Drawings, LEED



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Step 3: Checks Contractor met Submission Requirements

- Reports
- Network Diagram – the Schedule
- Electronic Schedule File (CD)



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Step 4 : Reviews Schedule Mechanics

Defaults (Review in detail in Mod #3)

- Retained Logic
- Remaining Duration & % Complete not Linked
- Critical Path defined as "Longest Path"

Data Date

Should equal the first activity in the schedule usually Notice to Proceed (no progress).



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Step 4 : Reviews Schedule Mechanics

(continued):

- Logic - no Open Ends or out-of-sequence
- Constraints – contractual only
- Calendars – match work plan, holidays addressed, used for weather restrictions



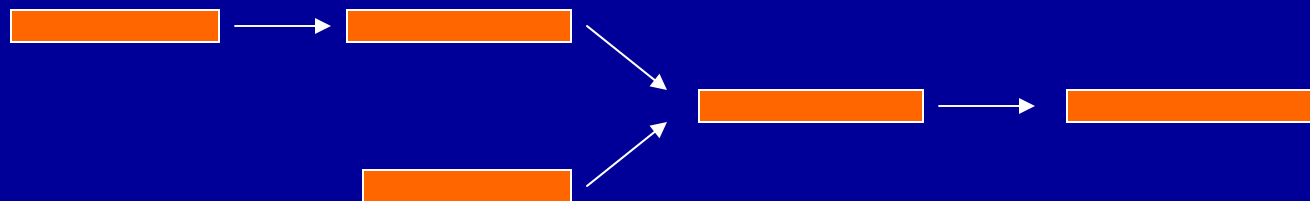
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Step 4 : Schedule Mechanics *(continued)*:

Logic - No **Open Ends** except start and finish activities



Where are the Open Ends?



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How to Check Mechanics



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Primavera Schedule Report: Tools, Schedule

The screenshot shows the Primavera Project Planner interface. The main window title is "Primavera Project Planner - [DWC1]". The menu bar includes File, Edit, View, Insert, Format, Tools, Data, Window, and Help. The toolbar contains various icons for file operations, editing, and scheduling. A "Schedule" dialog box is open, displaying the following options:

- Data date:** 03MAY04
- Scheduling report:** (empty field)
- Constraints
- Open ends
- Activities with out-of-sequence progress
- Run report series:** A

Buttons on the right side of the dialog include "Schedule Now", "Cancel", "Help", and "Options...". The left pane of the dialog shows a list of activity IDs:

Activity ID
LF03-0025
LF03-1011
LF03-8003
LF03-9415
LF23-0010
LF23-1010
LF02-1035
LF03-1035
LF02-4700



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Step 5: Performs General Schedule
Review

Electronically

In Software provided (P3 or P6)

Schedule Analyst Owner Review

Owner Team Review



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Step 5: General Schedule Review (continued)

Activity Check:

- Mandatory Tasks
- Precon & Owner Reviews Activities
- Required Milestones
- Critical Path Activities - Reasonable #
- Activity Type



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Step 5: General Schedule Review (continued)

Constraints:

- Match contract dates
- No additional constraints are added
- Correct "Constraint Types" were used



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Step 5: General Schedule Review (continued)

Level of Detail:

- Number of Activities reasonable for scope & managing work plan
- Activity Names/Descriptions unique
- Sufficient Activity detail to progress



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Step 5: General Schedule Review (continued)

Durations:

- Original Durations appear realistic
- Activity Names/Descriptions clear
- Activity detail sufficient to progress
- No excessive Durations
- No excessive Lags or negative Lags



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Step 5: General Schedule Review (continued)

Logic:

- Sequence of Activities passes common sense test
- Total Float value is not negative (can complete the Project on time)
- No Open Ends
- General Work Plan makes sense (look for "stacking" of Trades, etc.)



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Step 5: General Schedule Review (continued)

Calendars:

- Work Days
 - Weather Restrictions
 - Holidays
 - P6 Software: "Project" not "Global"
- (All match the work plan and make sense)



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Step 5: General Schedule Review (continued)

Activity Codes:

- Developed and match Contract Requirements
- Assigned to Activities
- Owner creates Summary Reports by Area, Feature of Work, Responsibility and Bid Item etc.



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Step 5: General Schedule Review (continued)

Schedule of Values / Cost Loading \$:

- Owner Responsibility to check cost loading is reasonable including: Spread of Overhead, Subcontractor values, Feature of Work, Design etc.
- Schedule Total \$ = Total Contract \$
- Schedule Activity Code "BIDI" = Contract Bid Item \$
- Activity Level of Detail is reasonable for work scope



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Review IPS / Baseline Schedule in
P6 software