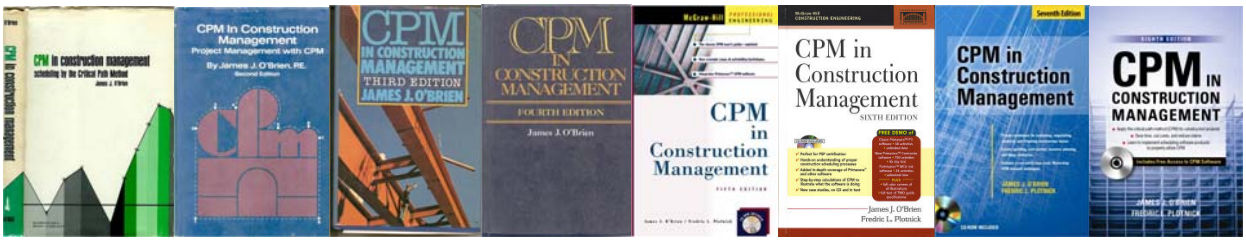
CPM in Construction Management – 8th Edition

James J. O'Brien, P.E. and Fredric L. Plotnick, Ph.D., Esq., P.E.

McGraw-Hill

FIGURES



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To provide further service to our readers, computer screen figures from the 8th Edition have been provided in this PDF file. This may be especially useful where the original is in color but only a black, white and grey-tone image is printed in the text. In addition, readers may zoom in on these various graphics. Professors may use graphics for course materials where using the text and with attribution.

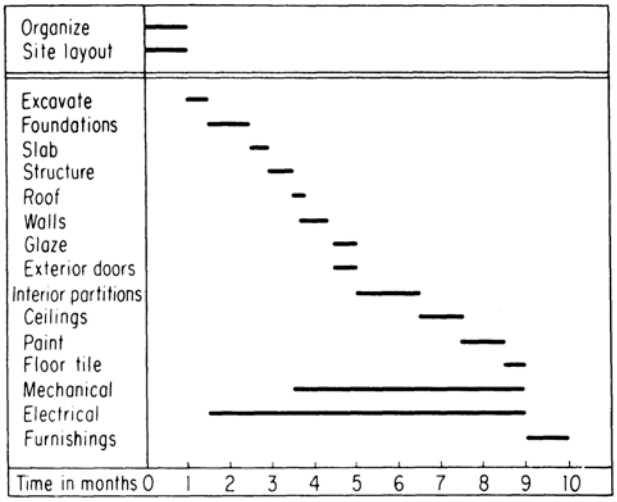


Figure 1.5.1 Bar chart for a one-story building.

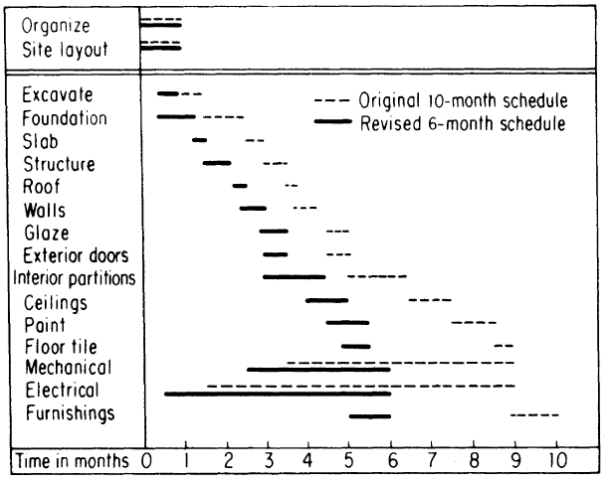


Figure 1.5.2 Revised bar chart for a one-story building.

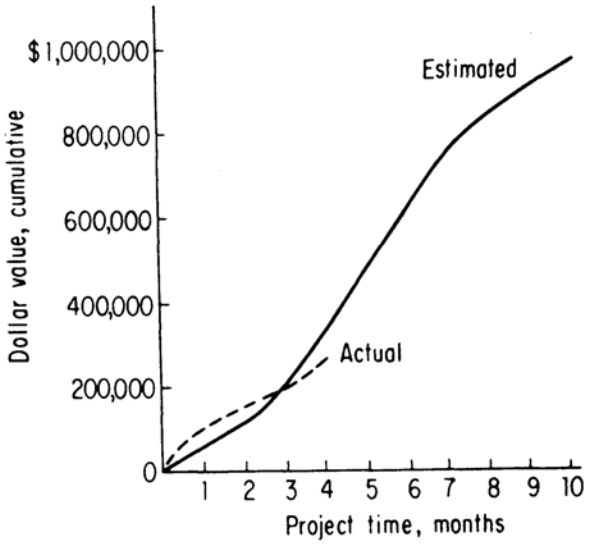
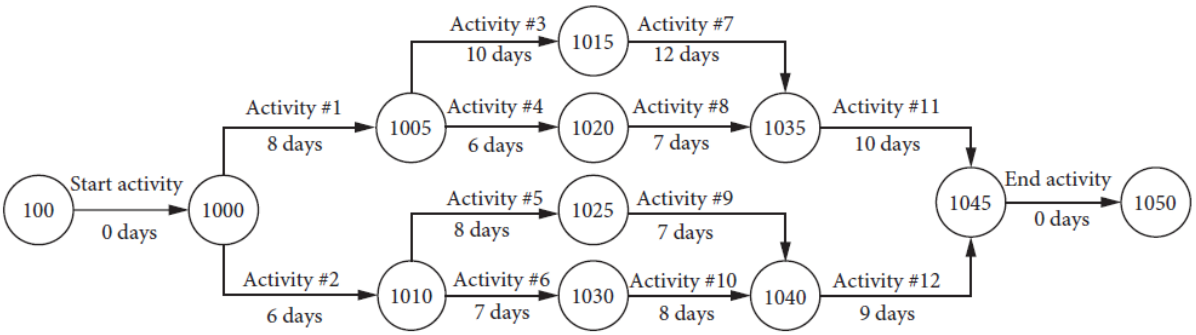


Figure 1.5.3 Typical S curve.



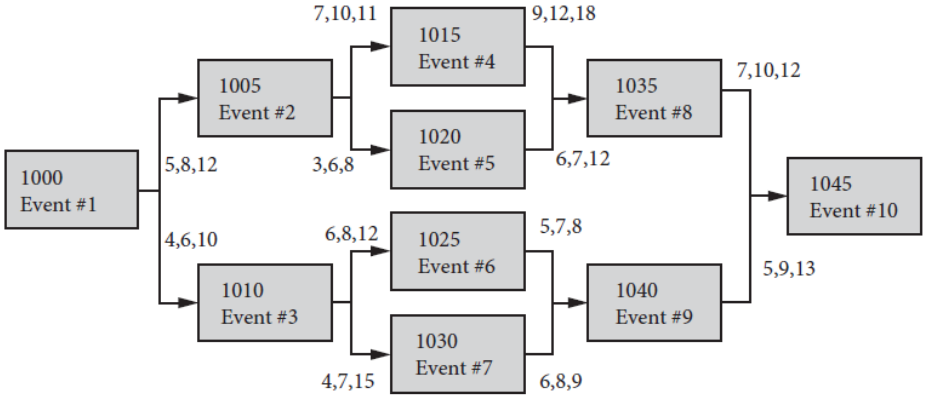


Figure 1.8.1 Comparison of ADM and PERT.

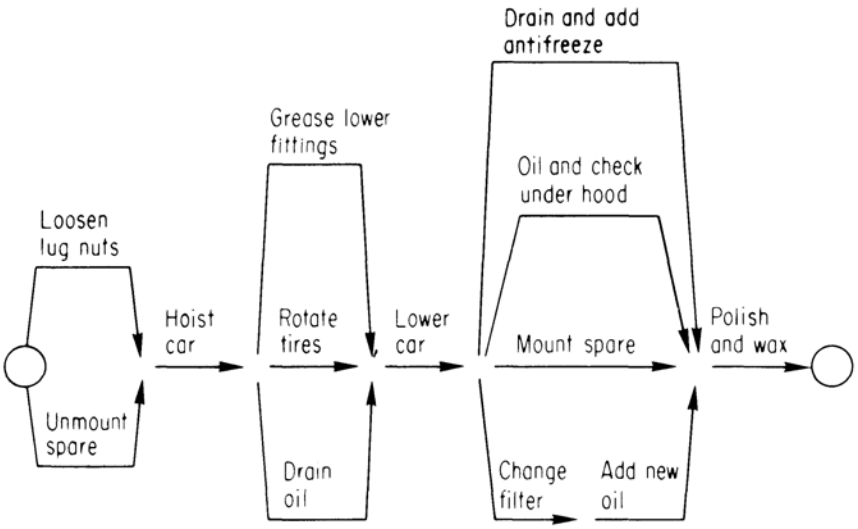


Figure 2.2.1 Arrow diagram, car checkup.

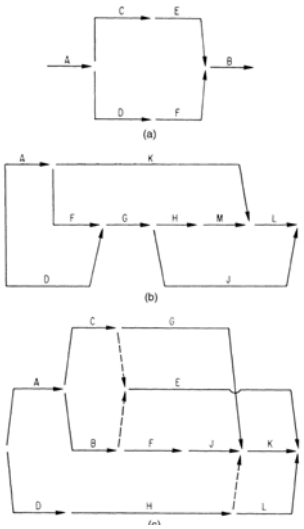


Figure 2.3.1 Logic network examples

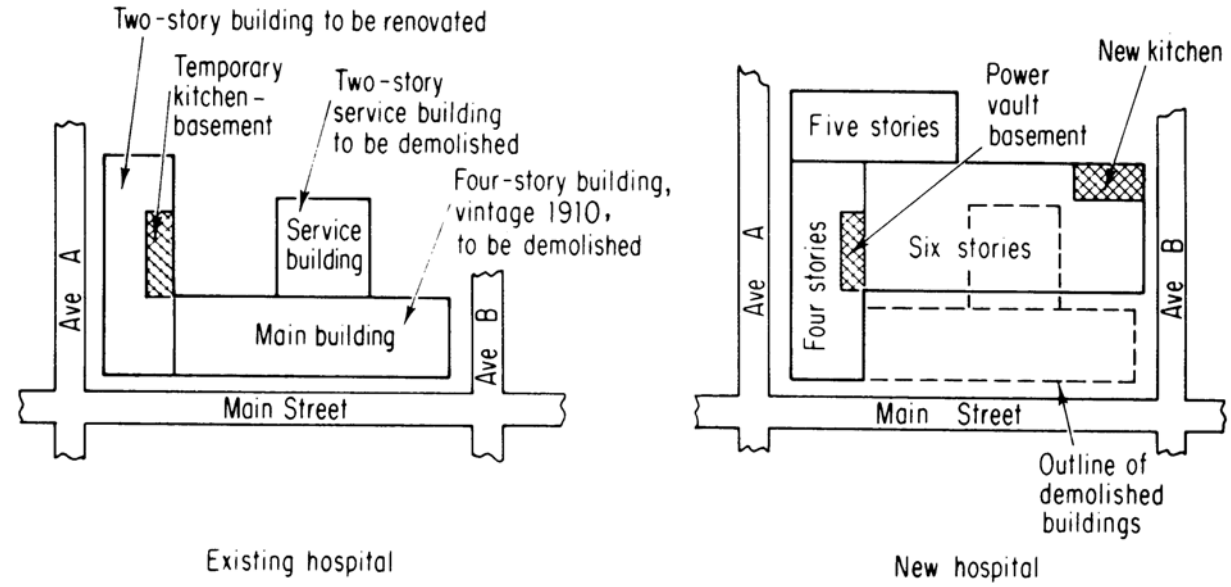
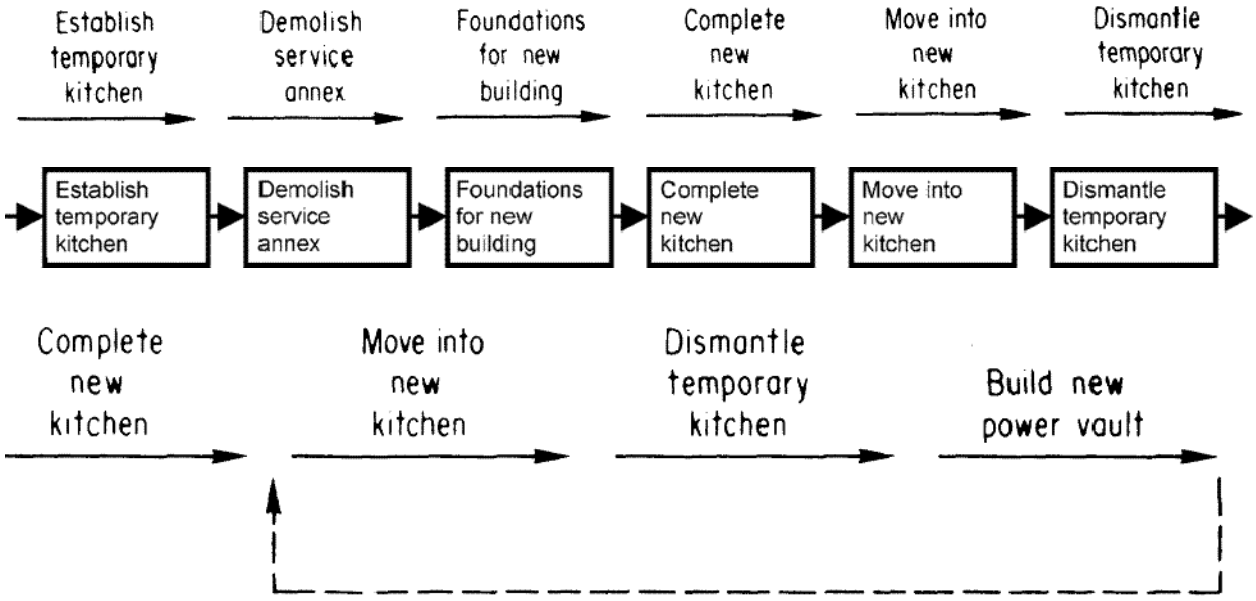


Figure 2.4.1 Hospital site layout.



Chapter 2.4 – Discovered loop in constructability review.

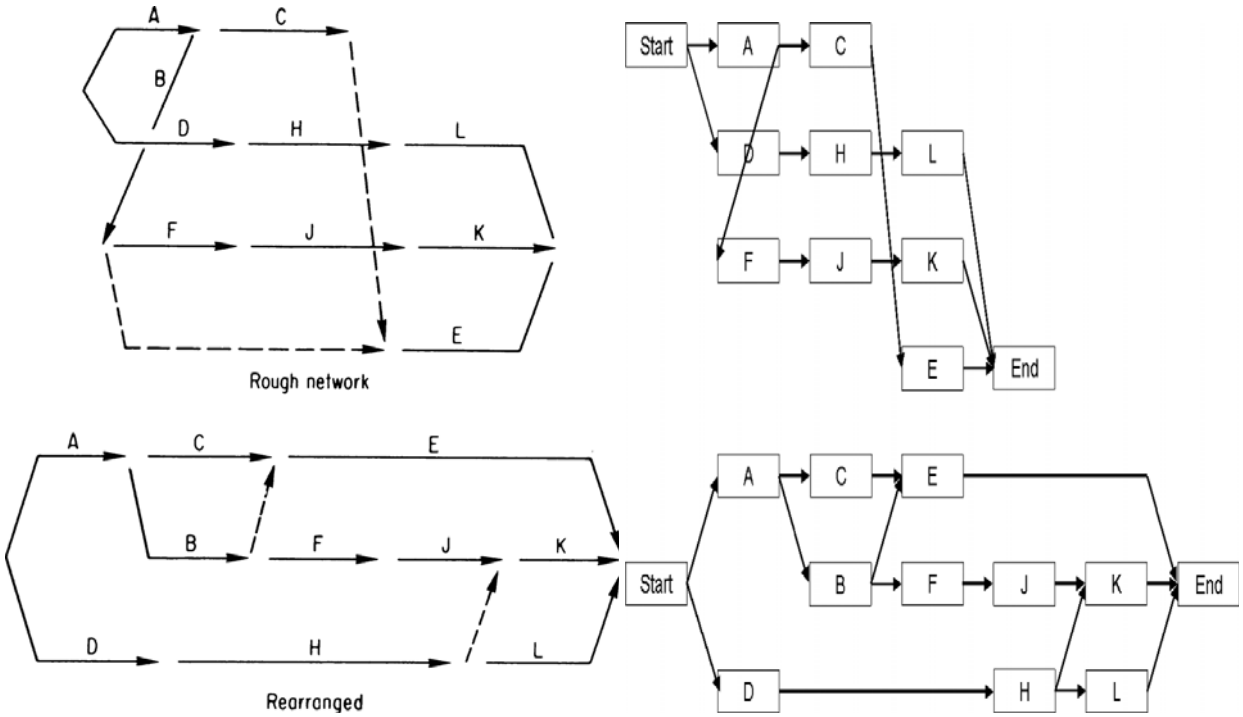


Figure 2.5.1 and 2.5.2 Rough and rearranged network activity on arrow depiction.

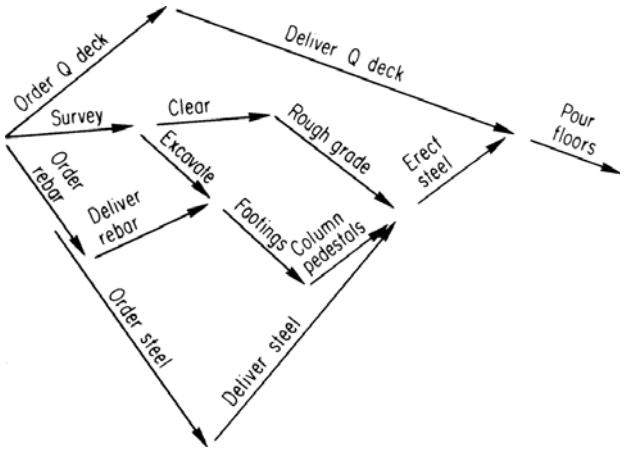


Figure 2.5.3 Random line example.

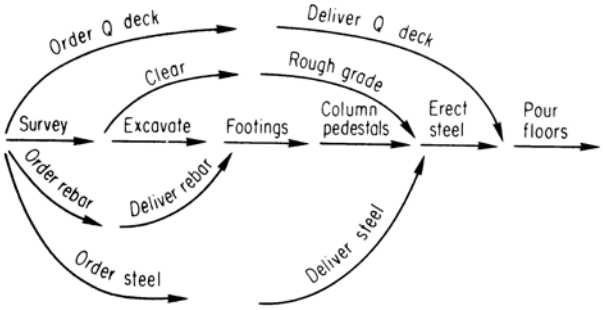


Figure 2.5.4 Sweeping curve example.

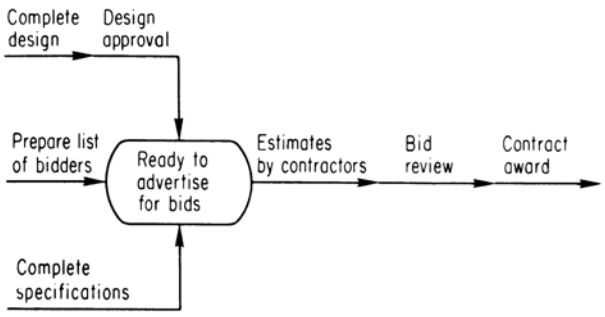
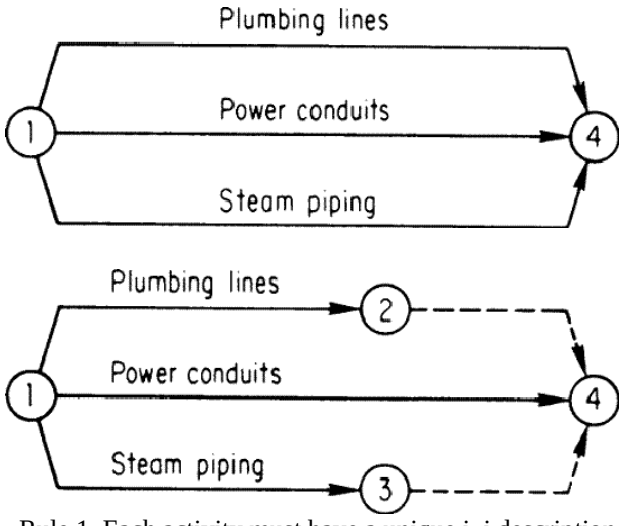


Figure 2.6.1 Example of milestone event in ADM



Rule 1. Each activity must have a unique i–j description

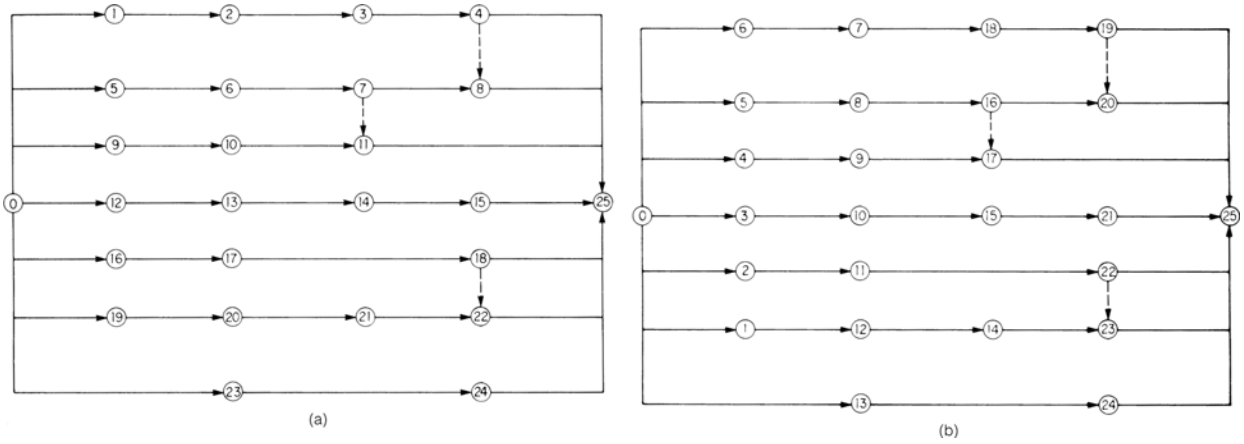


Figure 2.6.2 (a) Horizontal numbering and (b) vertical numbering.

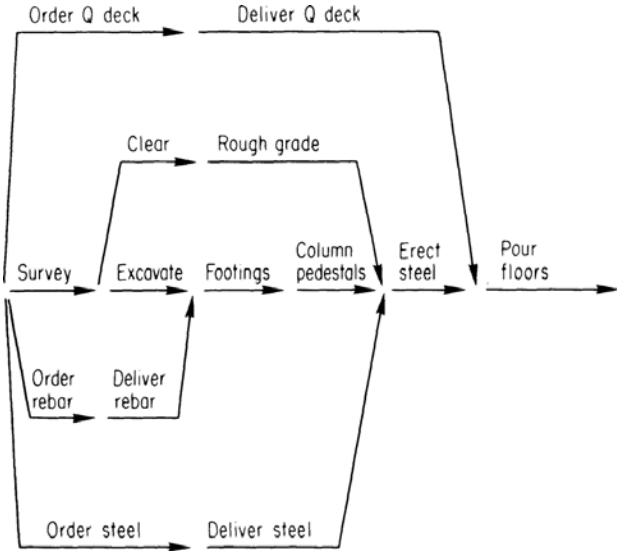


Figure 2.6.3 Horizontal format.

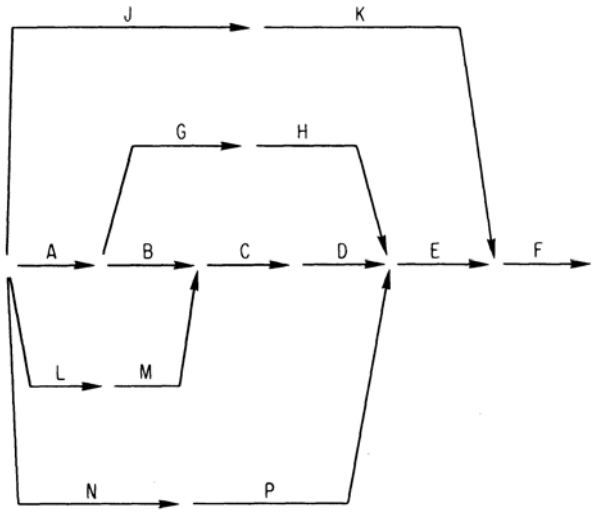


Figure 2.6.4 Untitled (coded) network.

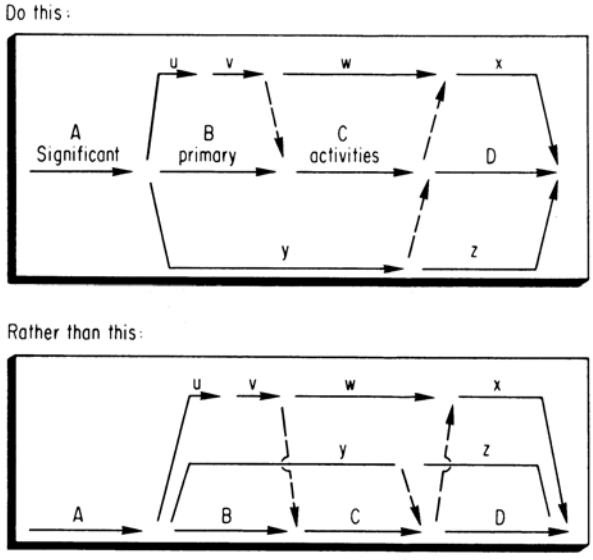


Figure 2.6.5 Significant primary activities.

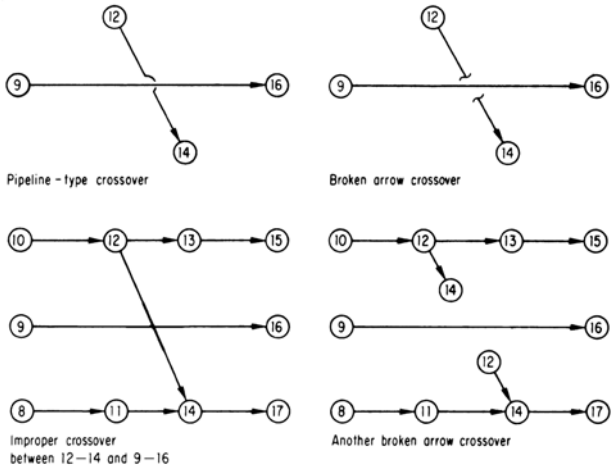


Figure 2.6.7 Arrow crossover techniques.

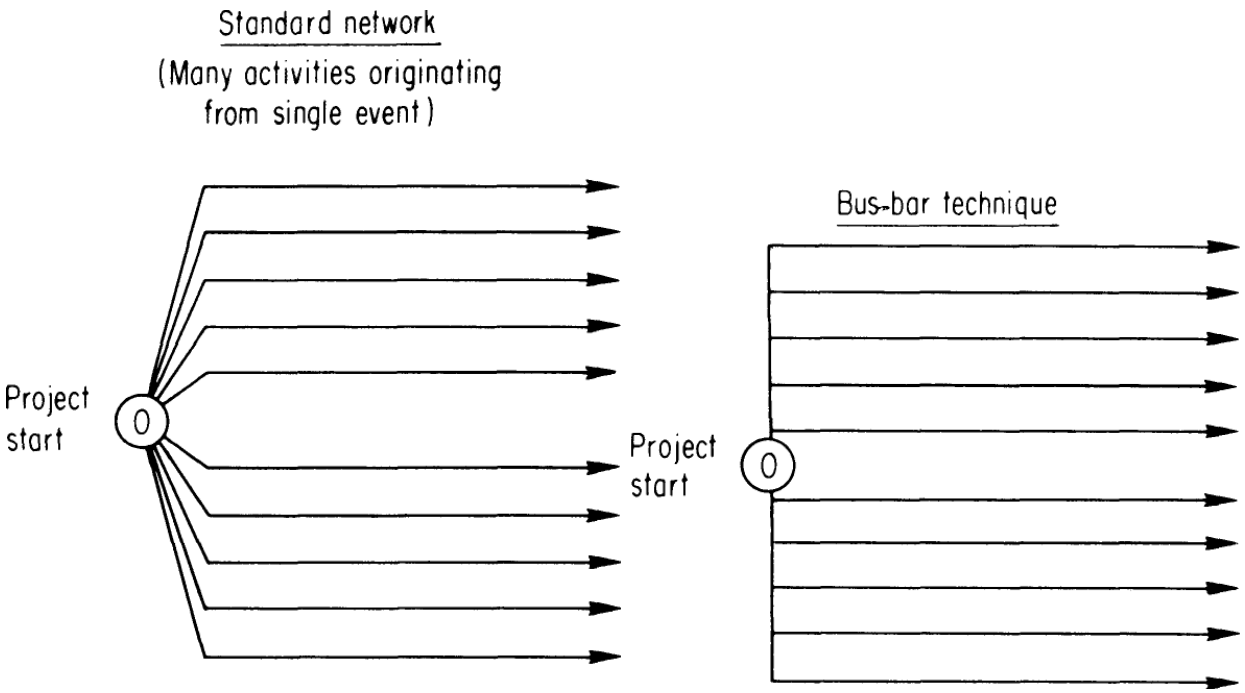
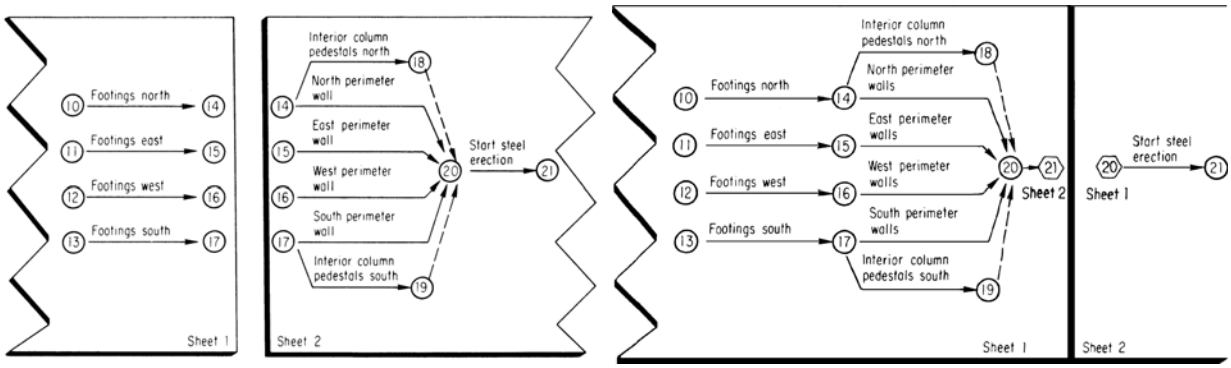


Figure 2.6.8 Standard versus bus bar technique.



2.7.2 and 2.7.3 Multi-sheet network example: poorly and properly split network.

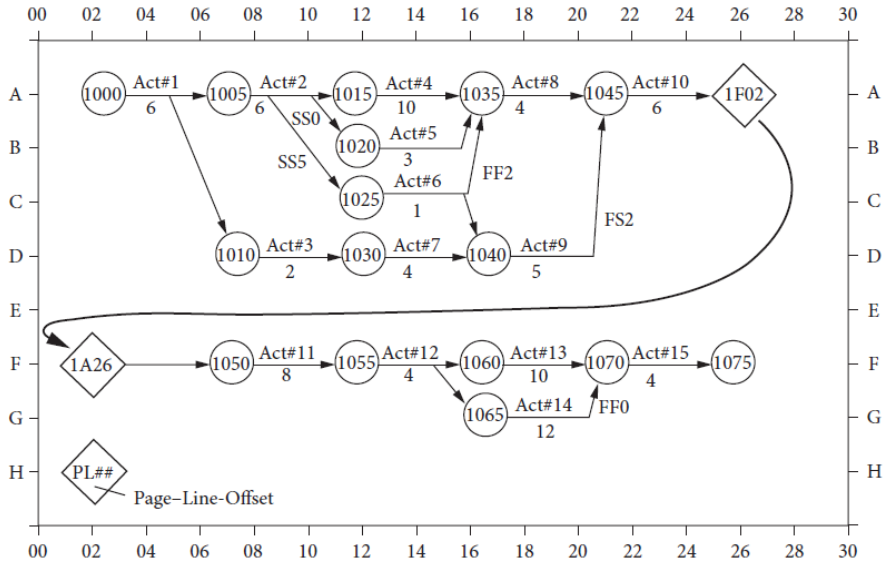


Figure 2.7.4 Page and grid method, shown for variant of PDM Network Logic.

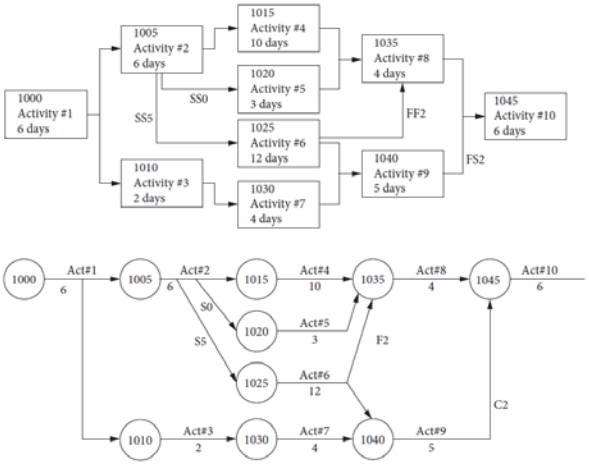


Figure 2.9.1 Alternate drafting conventions for PDM.

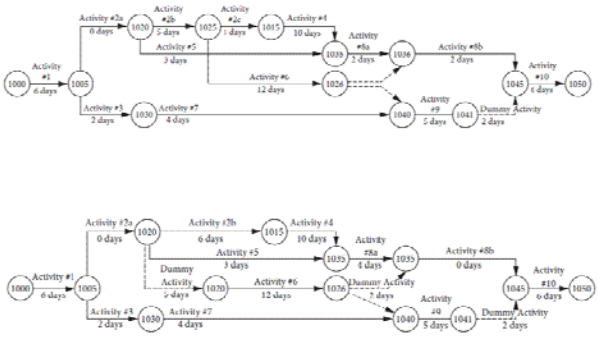


Figure 2.9.2 and 2.9.3 Alternate Interpretations in ADM

In Primavera P3 and P6 software, use one custom data code for quantity and a second for productivity rate. A standard activity code may also be reserved to note the units of quantity recorded. Enter the quantity (numeric) and create a Global Change to calculate the productivity rate for all non-zero duration activities (equal to quantity divided by original duration.)

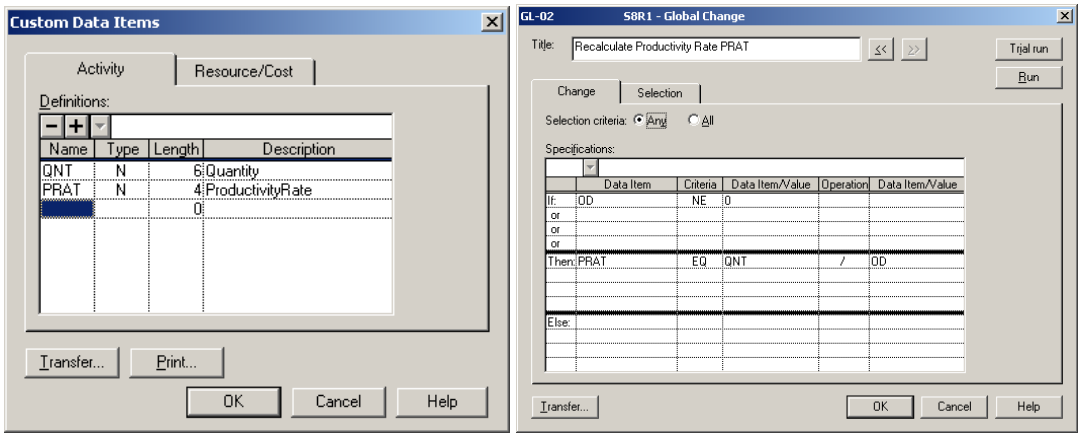


Figure 3.3.1 – Use of Custom Data Items and Global Change to Calculate Productivity Rates

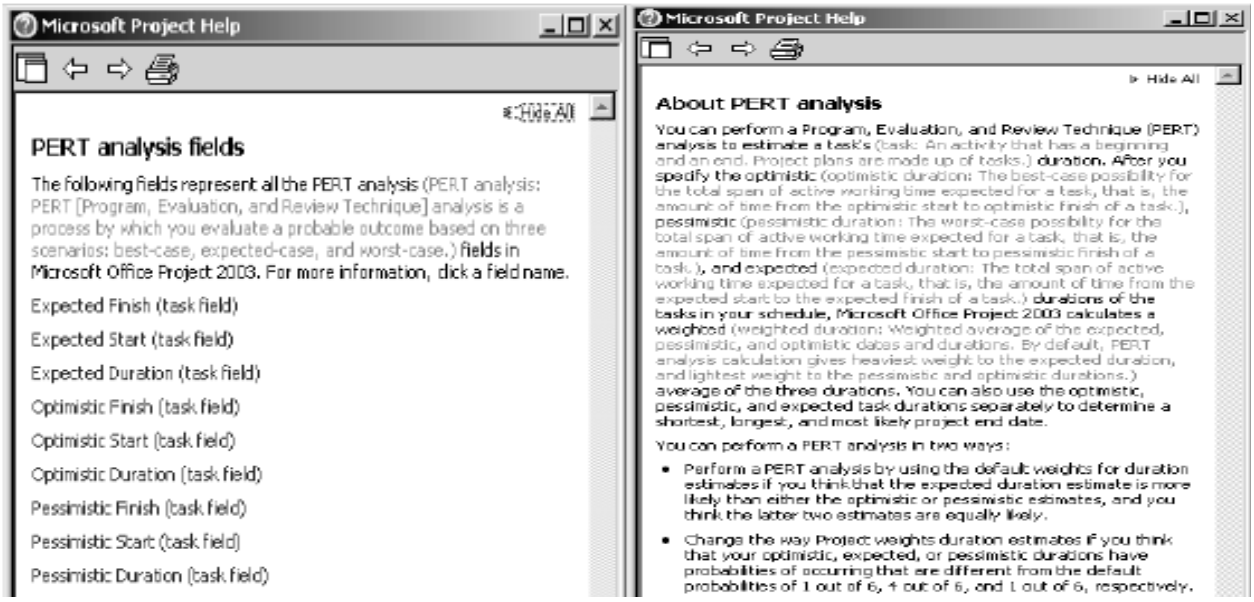
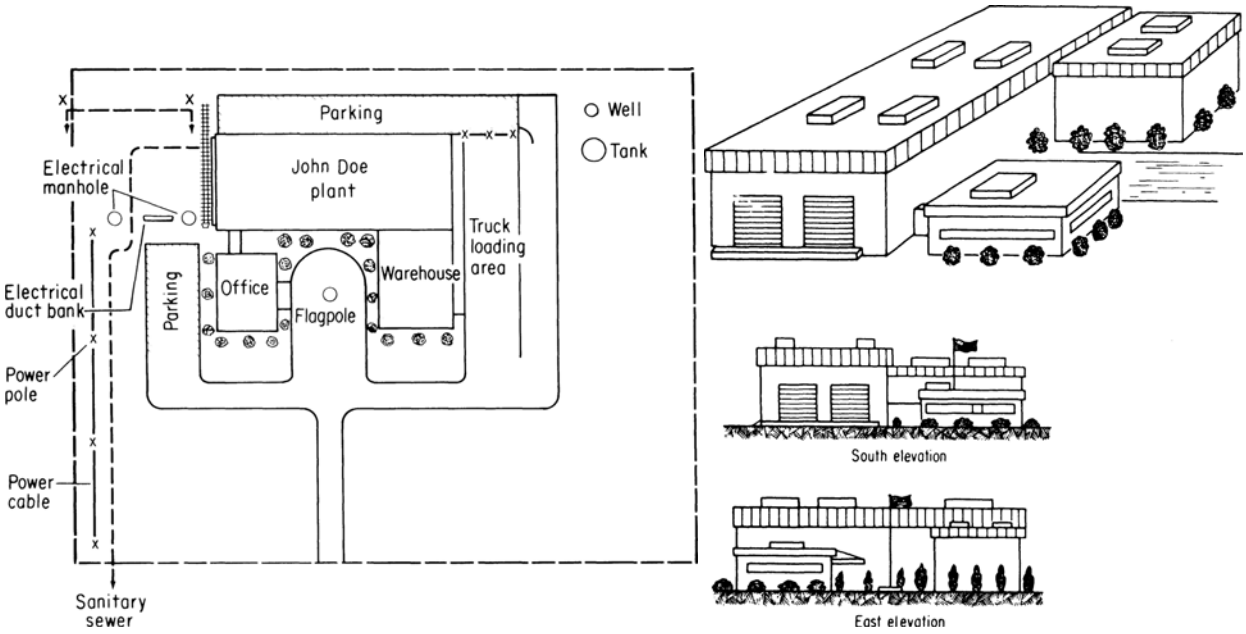
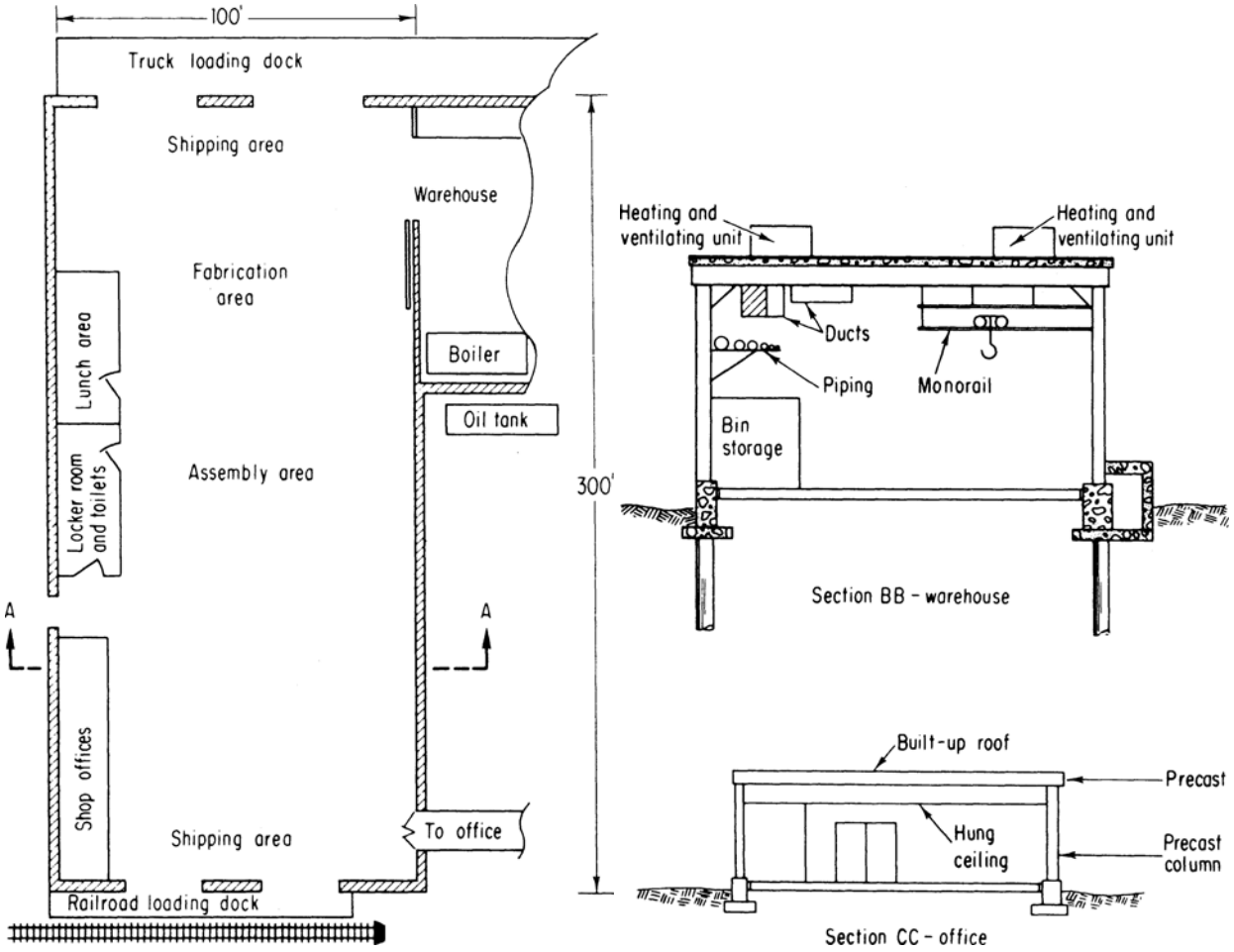


Figure 3.4.1 Microsoft Project permits the user to provide PERT style durations


Parking
John Doe plant
Well
Tank
Electrical manhole
Truck loading area
Warehouse
Office
Flagpole
Parking
Electrical duct bank
Power pole
Power cable
Sanitary sewer
South elevation
East elevation


100'
Truck loading dock
Shipping area
Warehouse
Fabrication area
Lunch area
Boiler
Oil tank
Locker room and toilets
Assembly area
300'
A
A
Shop offices
Shipping area
To office
Railroad loading dock
Heating and ventilating unit
Heating and ventilating unit
Ducts
Piping
Monorail
Bin storage
Section BB - warehouse
Built-up roof
Precast
Hung ceiling
Precast column
Section CC - office

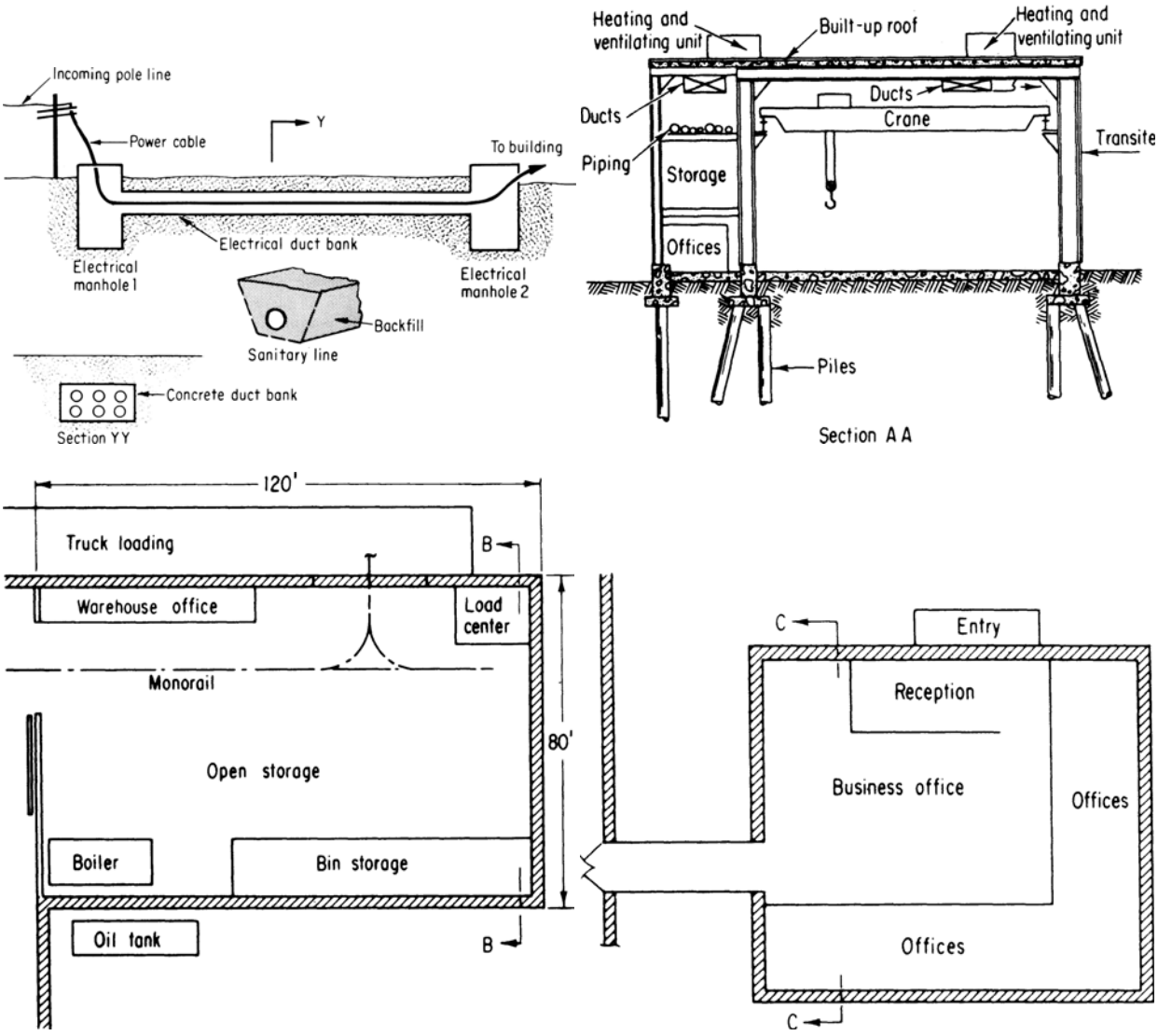


Figure 4.3.1 through .8 John Doe project.

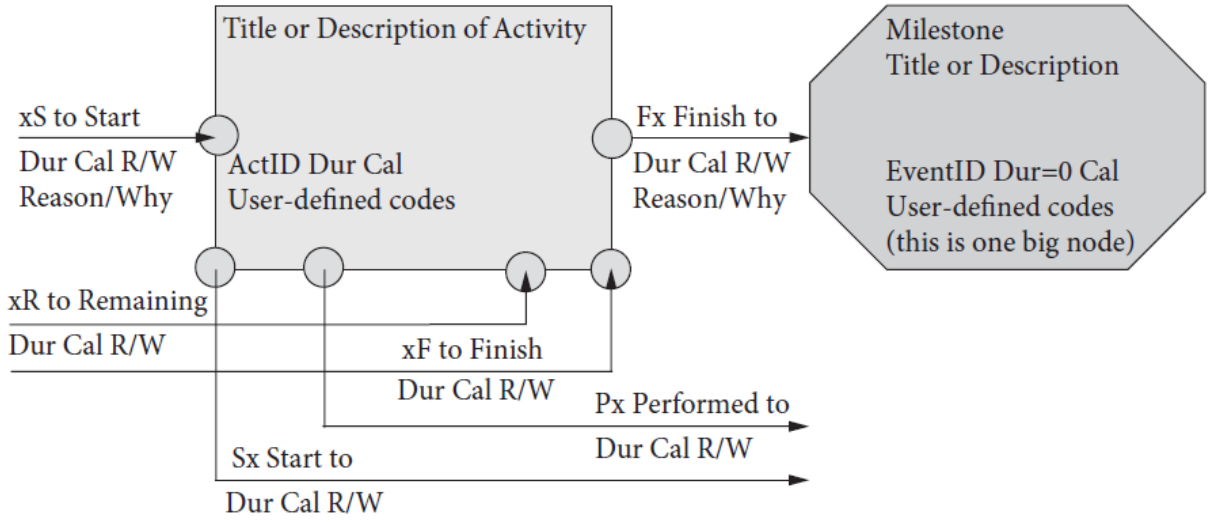


Figure 4.5.1 Format of pure logic diagram used in text.

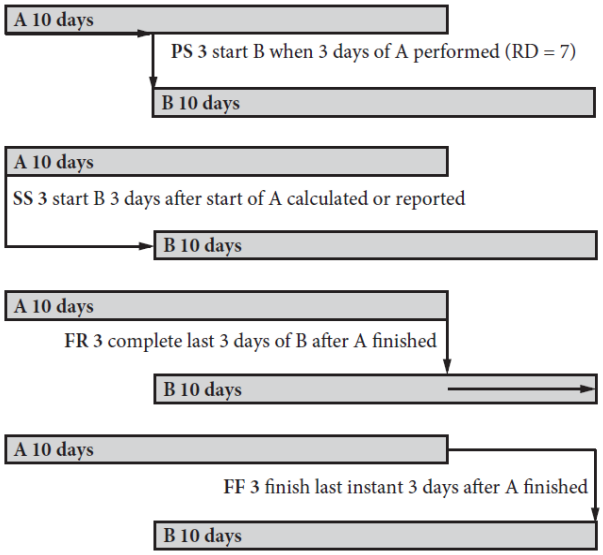


Figure 4.5.2 Comparison of PS to SS, FR to FF restraints

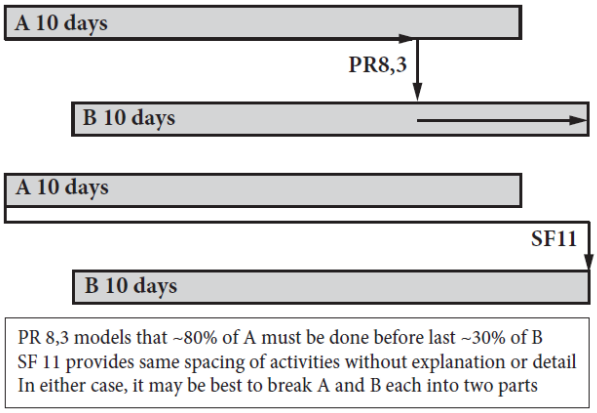
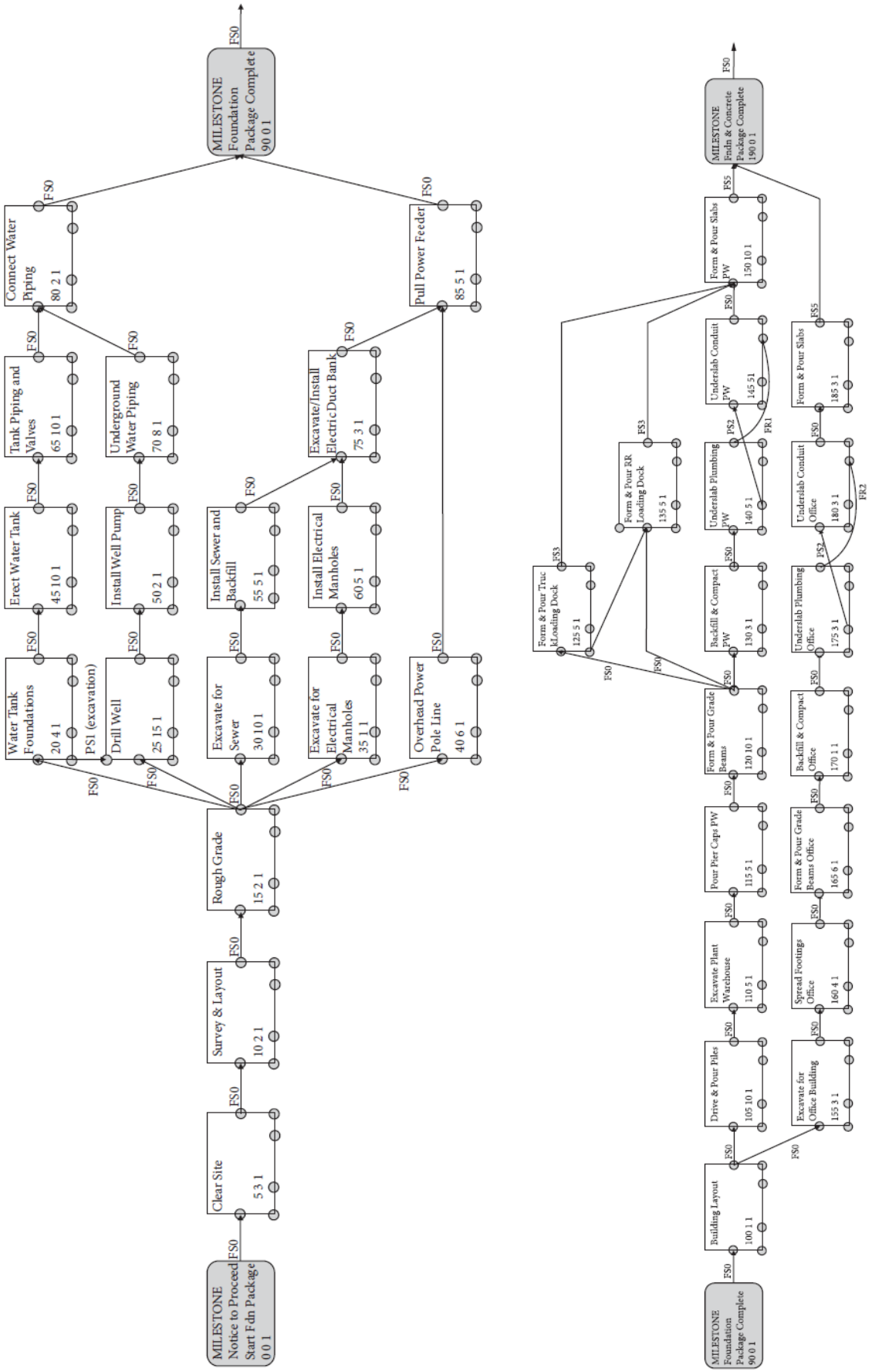
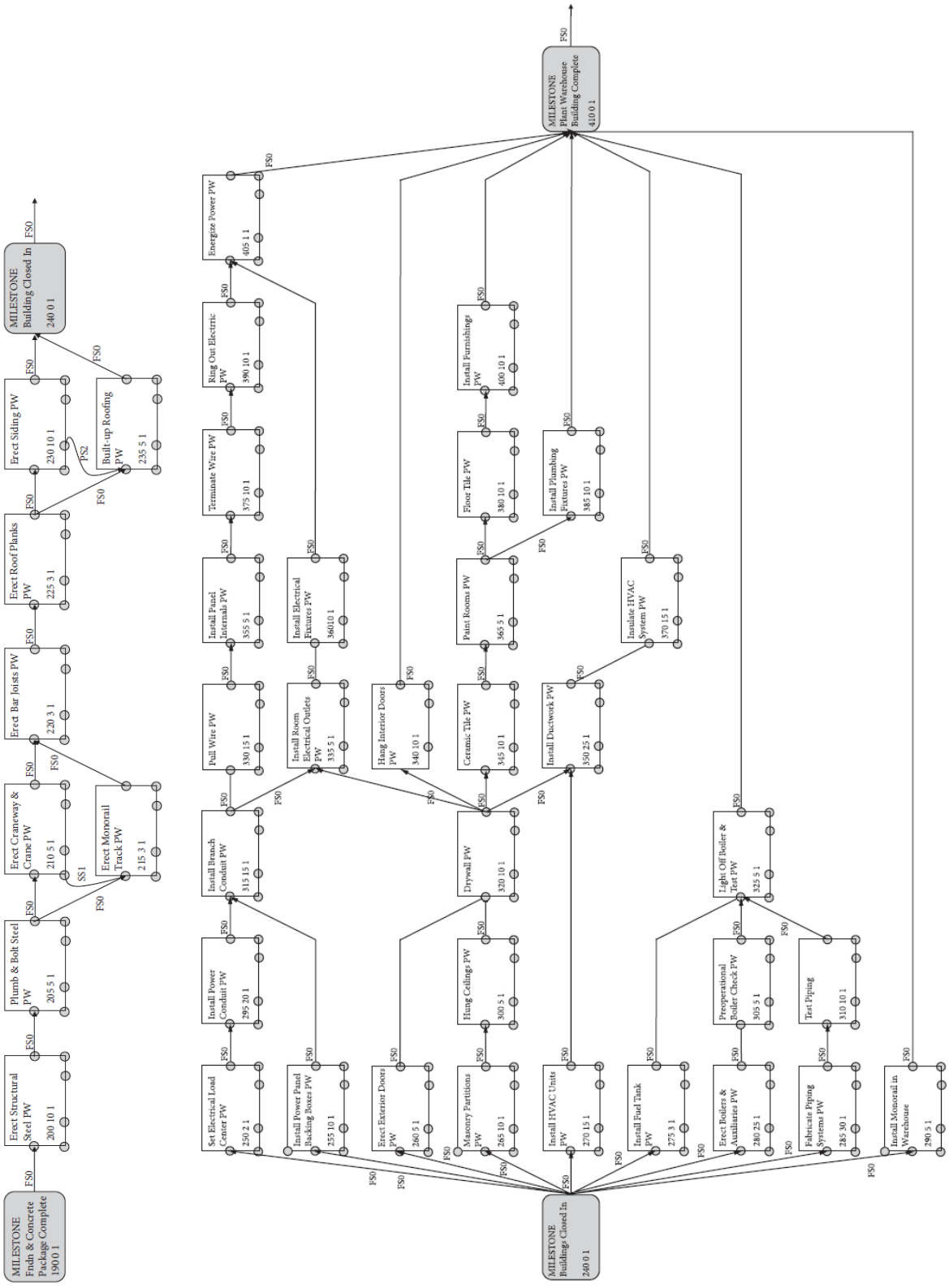


Figure 4.5.3 Comparison of PR to SF restraints.



Figures 4.6.1 and 4.6.2 Logic network of John Doe site prep and foundation contracts



Figures 4.6.3 and 4.6.4 Logic network of John Doe structural and interior work for plant and warehouse

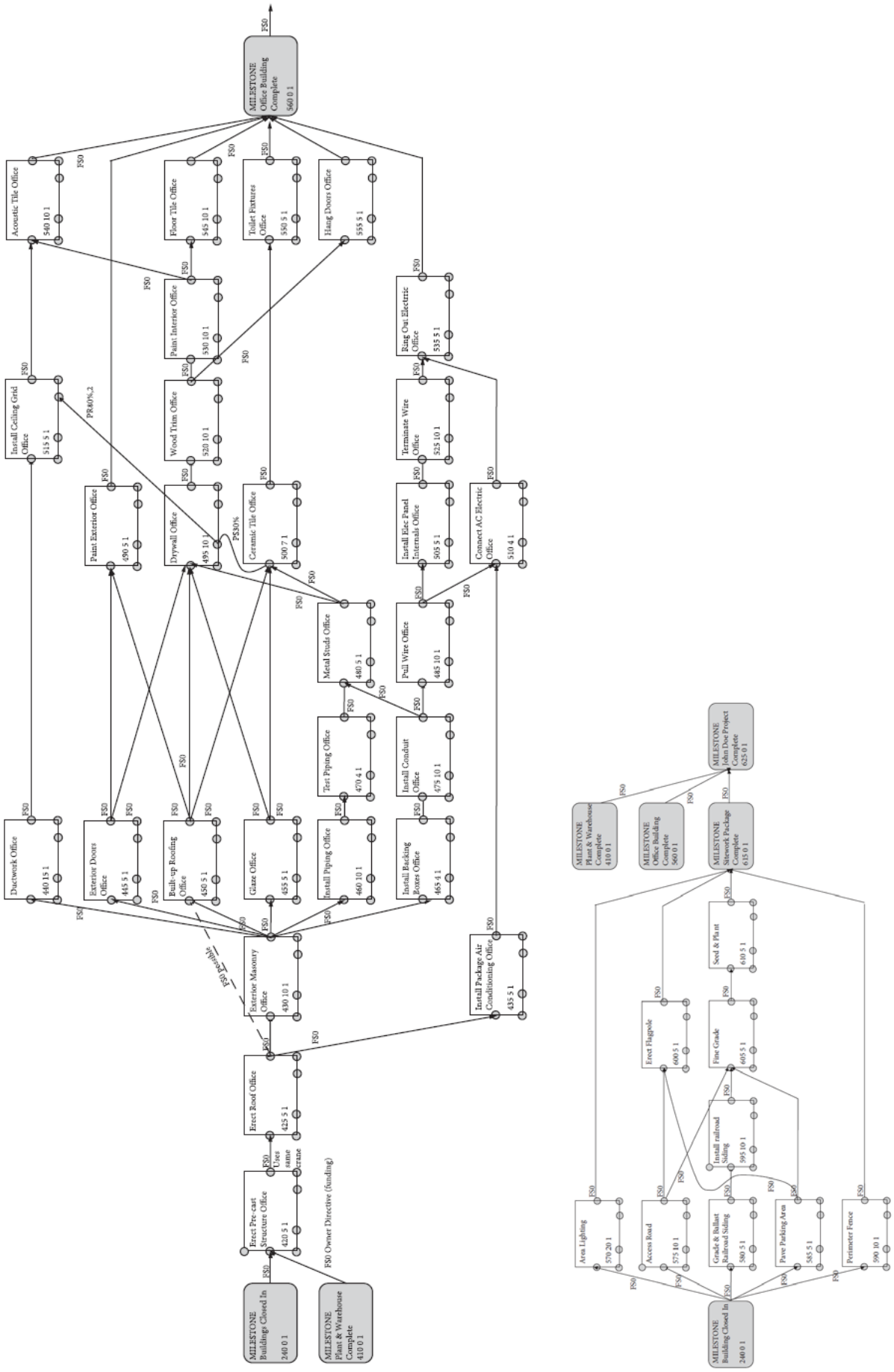


Figure 4.6.5 and 4.6.4 Logic network of John Doe office building and site landscape works

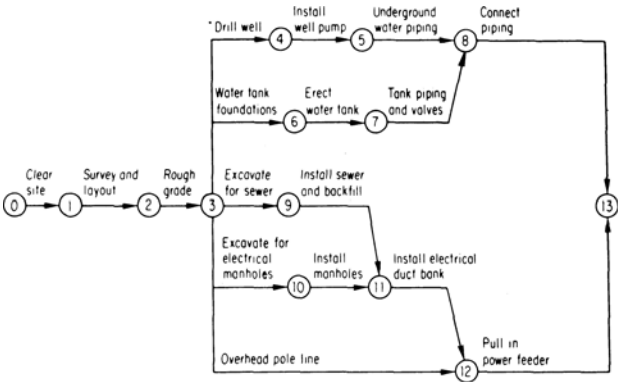


Figure 4.7.1 ADM version of Figure 4.6.1

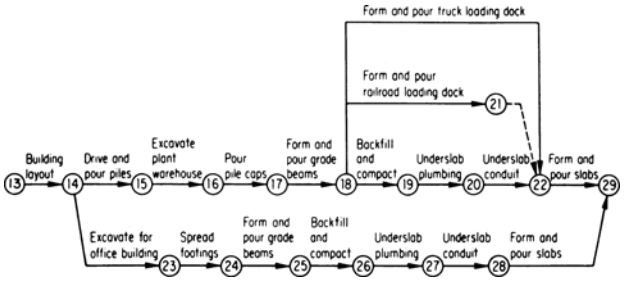


Figure 4.7.2 ADM version of Figure 4.6.2

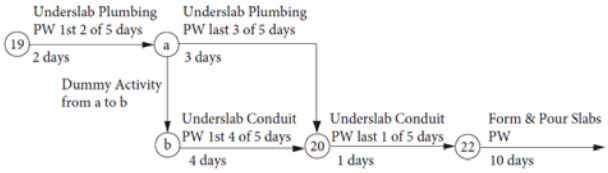


Figure 4.7.3 Overlap of plumbing and conduit in ADM

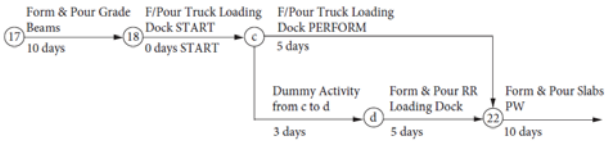


Figure 4.7.4 Delay start of railroad loading dock in ADM

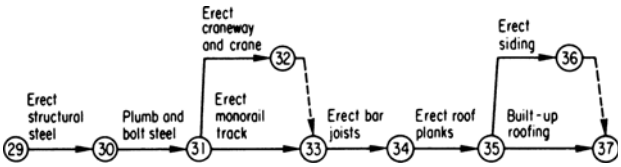
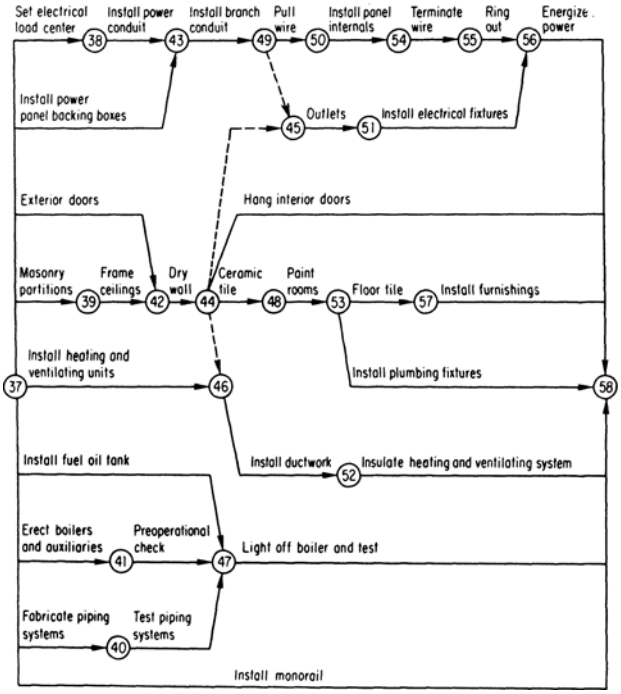


Figure 4.7.5 CPM network: close-in, plant, and warehouse.



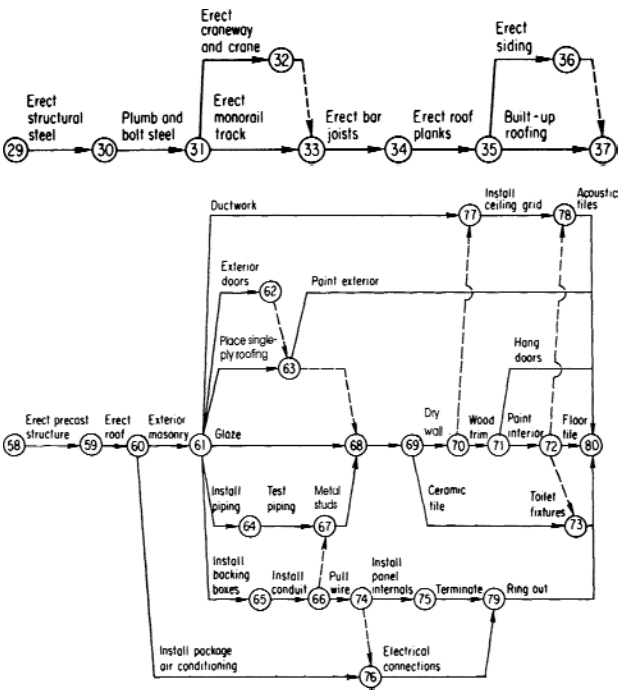


Figure 4.7.5-6-7 CPM network: close-in and interior work of plant and warehouse, complete office building

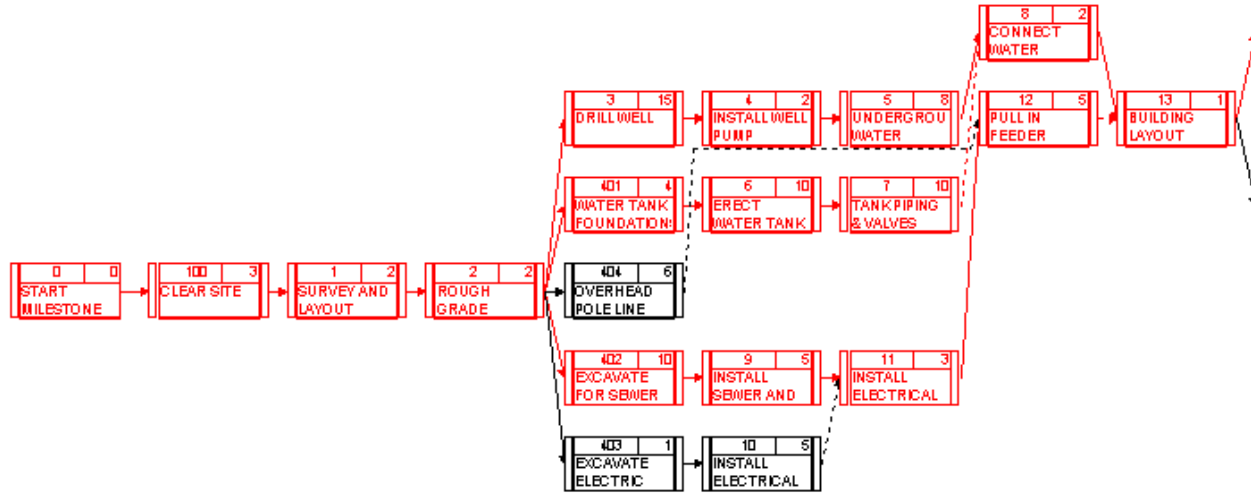


Figure 4.8.1 John Doe in PDM initial site work.

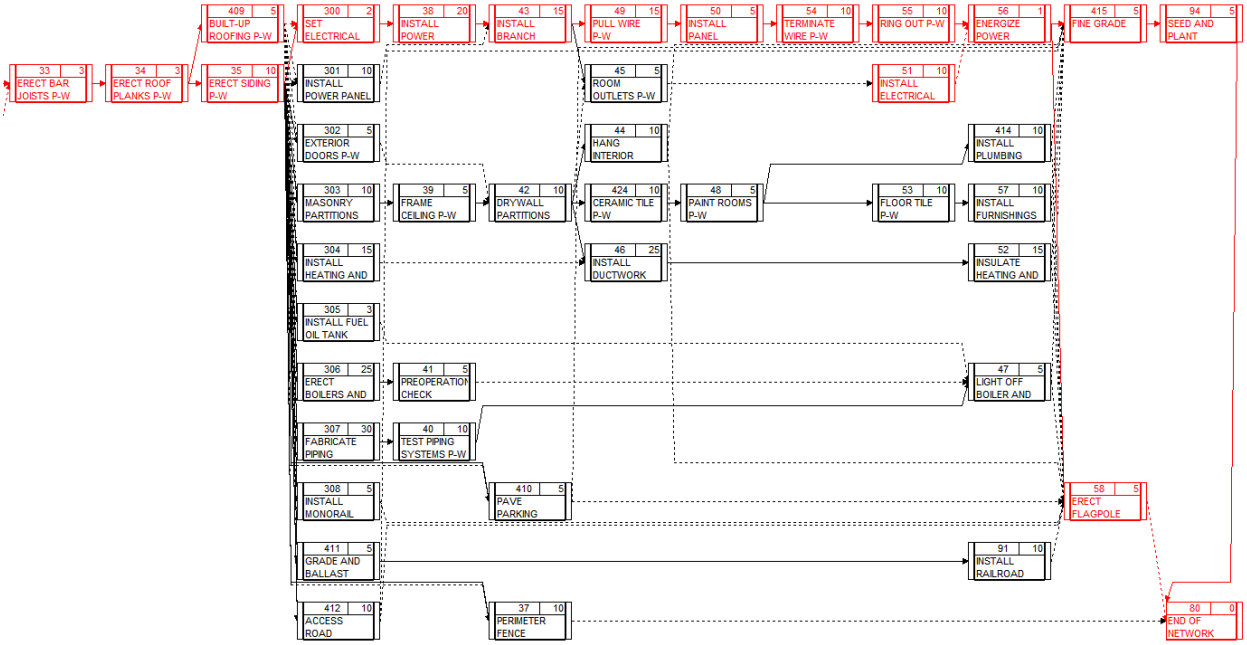


Figure 4.8.2 John Doe in PDM Plant-Warehouse

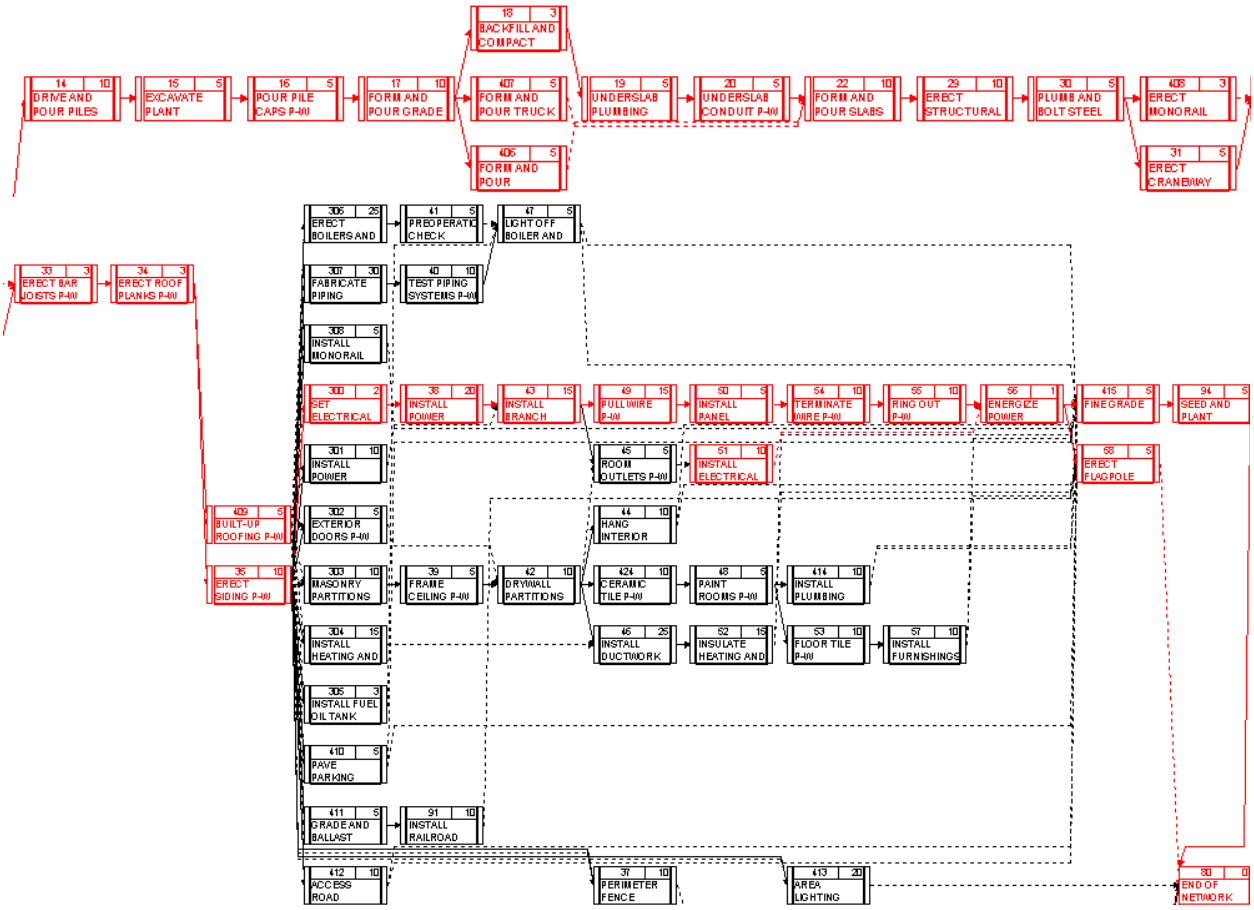


Figure 4.8.2 John Doe in PDM Warehouse – alternate view (not in text)

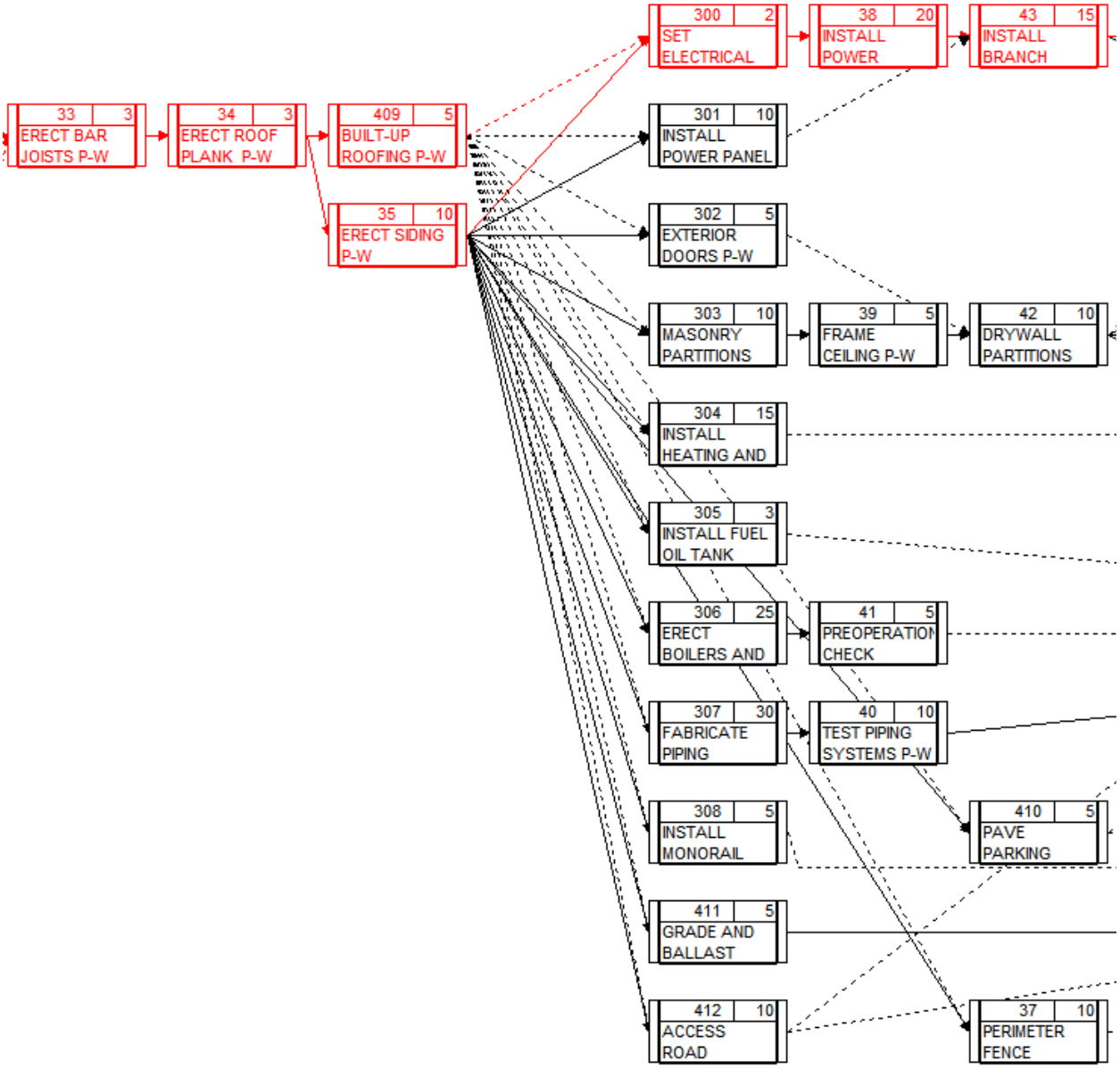


Figure 4.8.3 Detail of John Doe 4.8.2 Confluence at Building Watertight milestone event

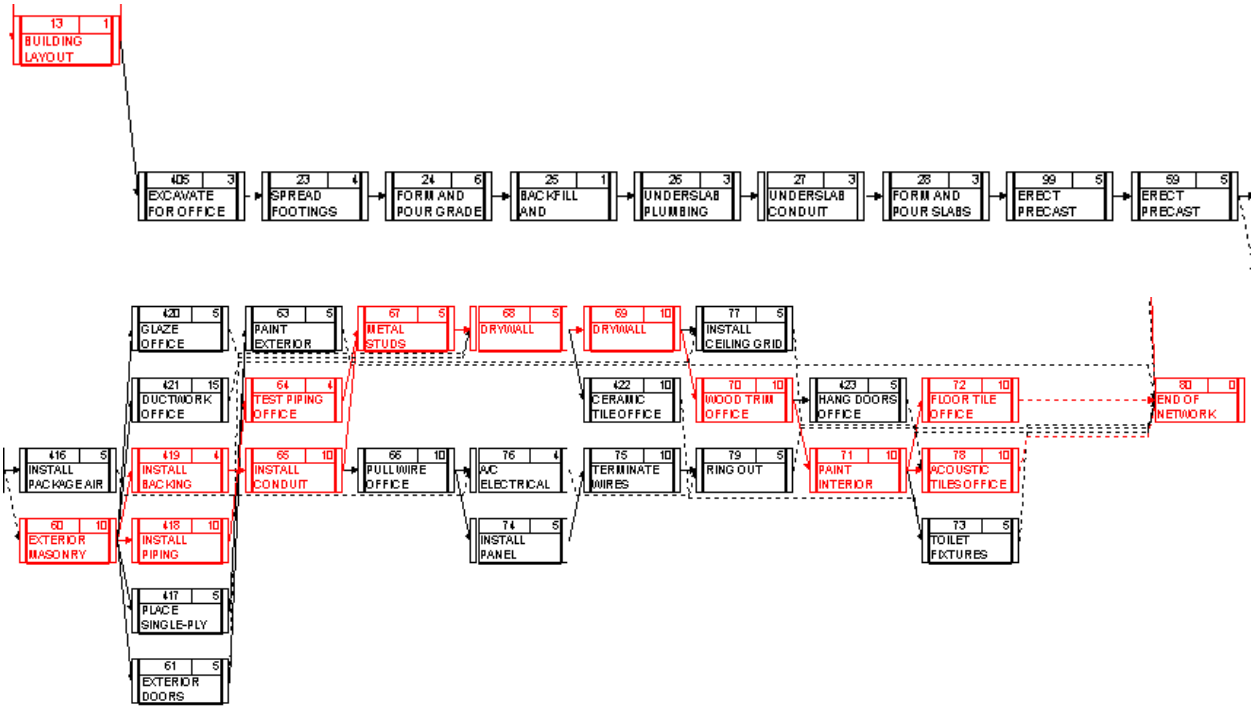


Figure 4.8.4 John Doe in PDM Office

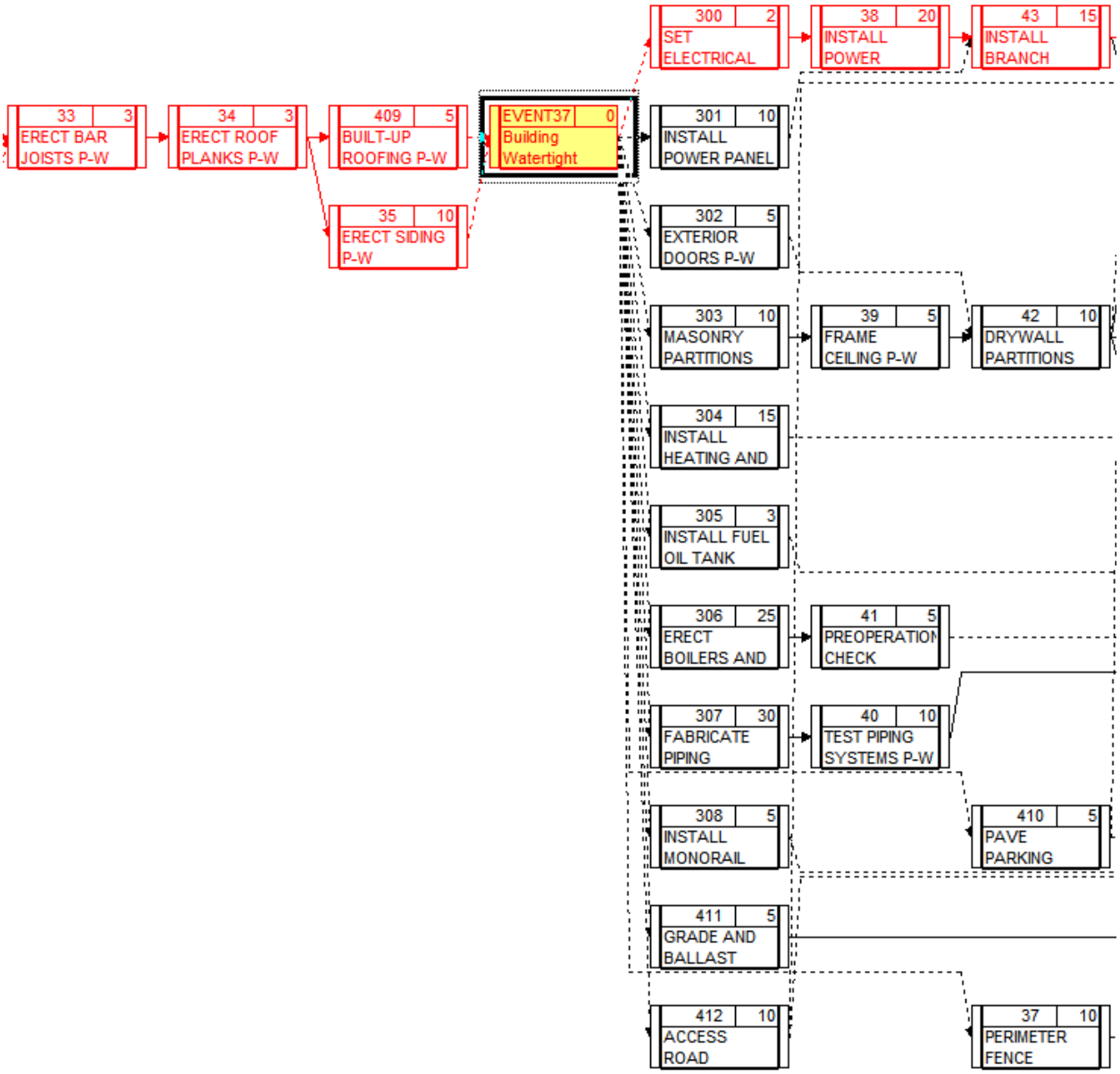


Figure 4.8.5 Detail of John Doe 4.8.2 Confluence shown with Milestone (ADM node 37)

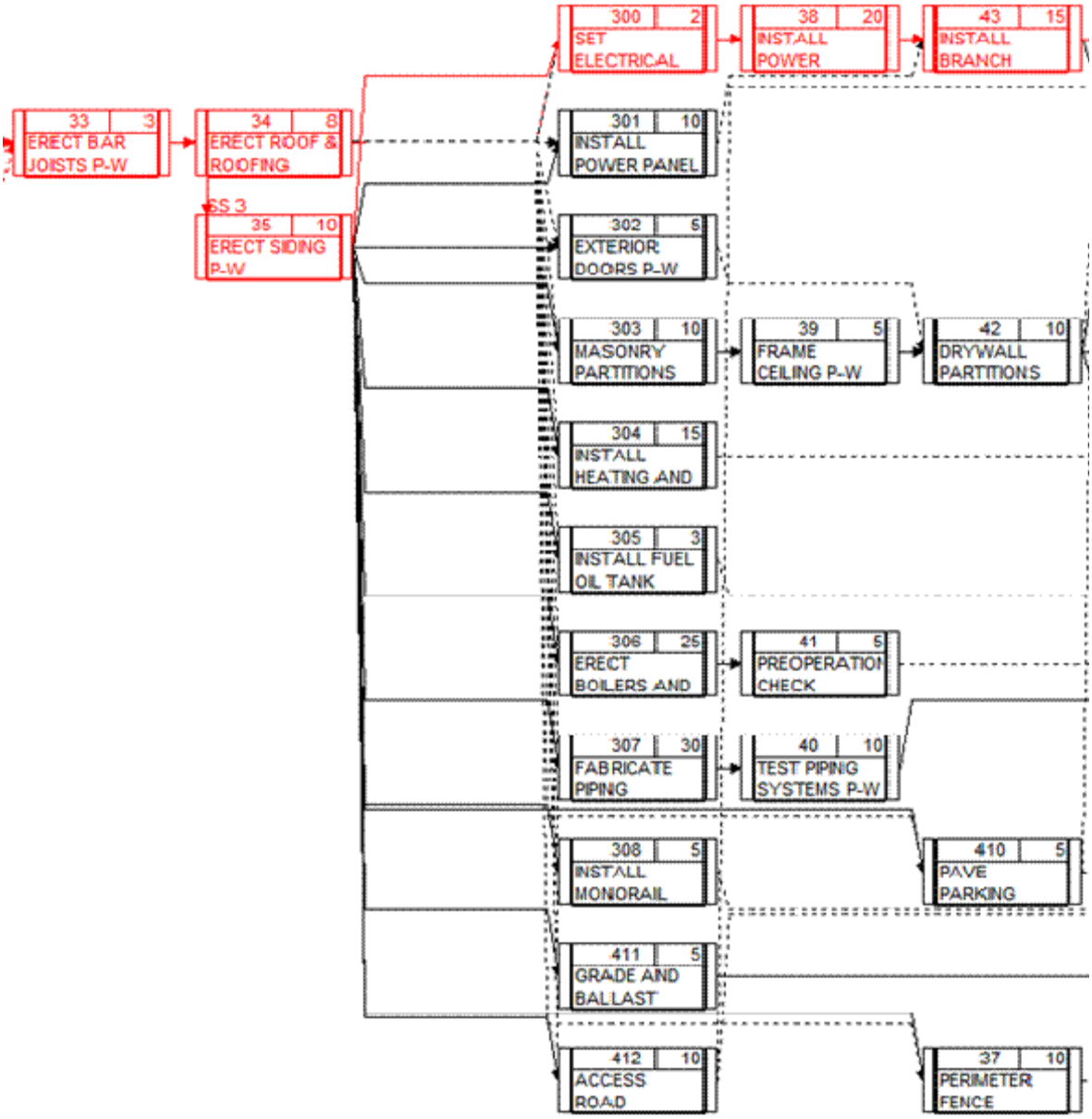


Figure 4.8.6 Detail combining activities 35 and 409 in PDM

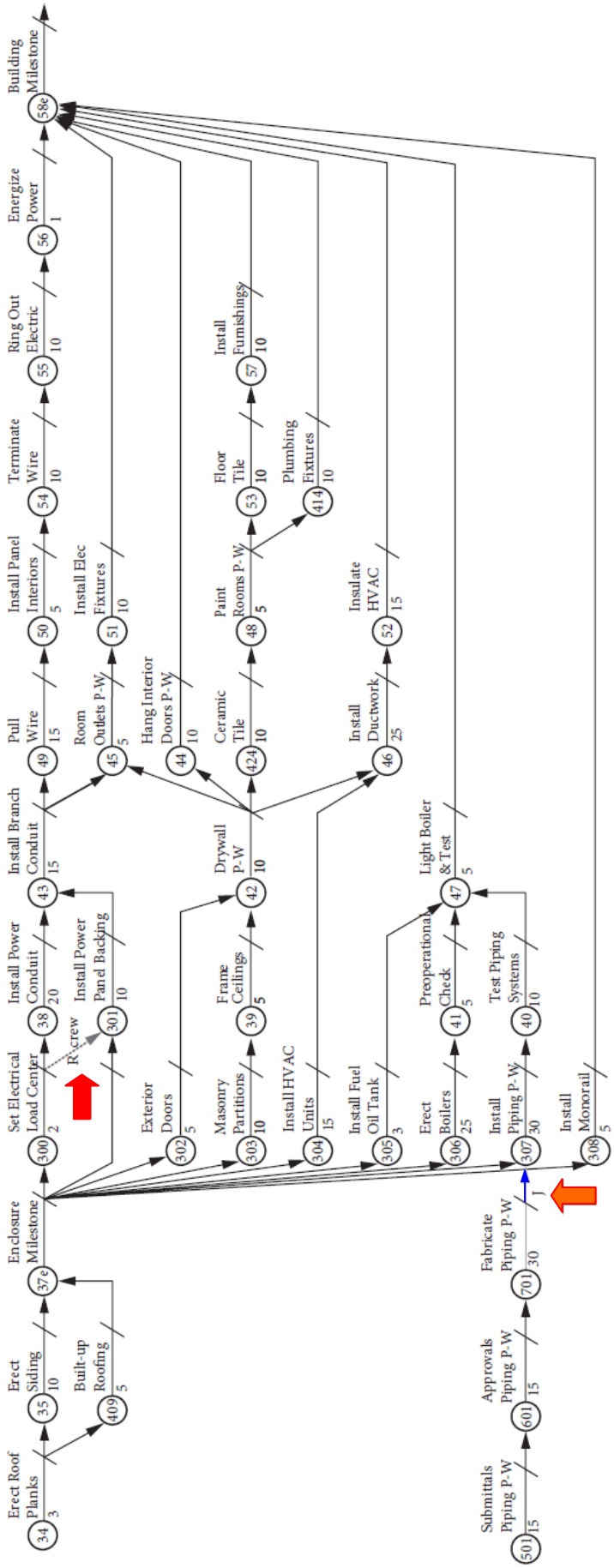


Figure 4.9.1 John Doe project in RDM format.

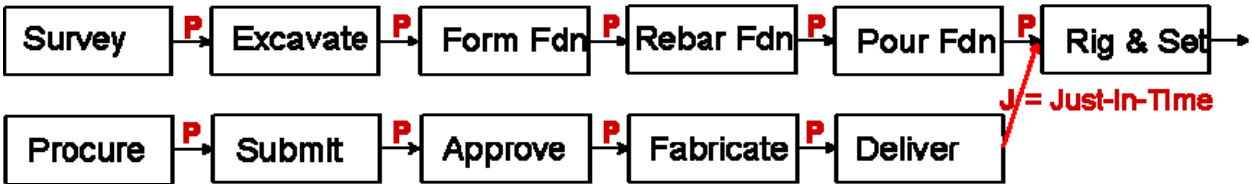
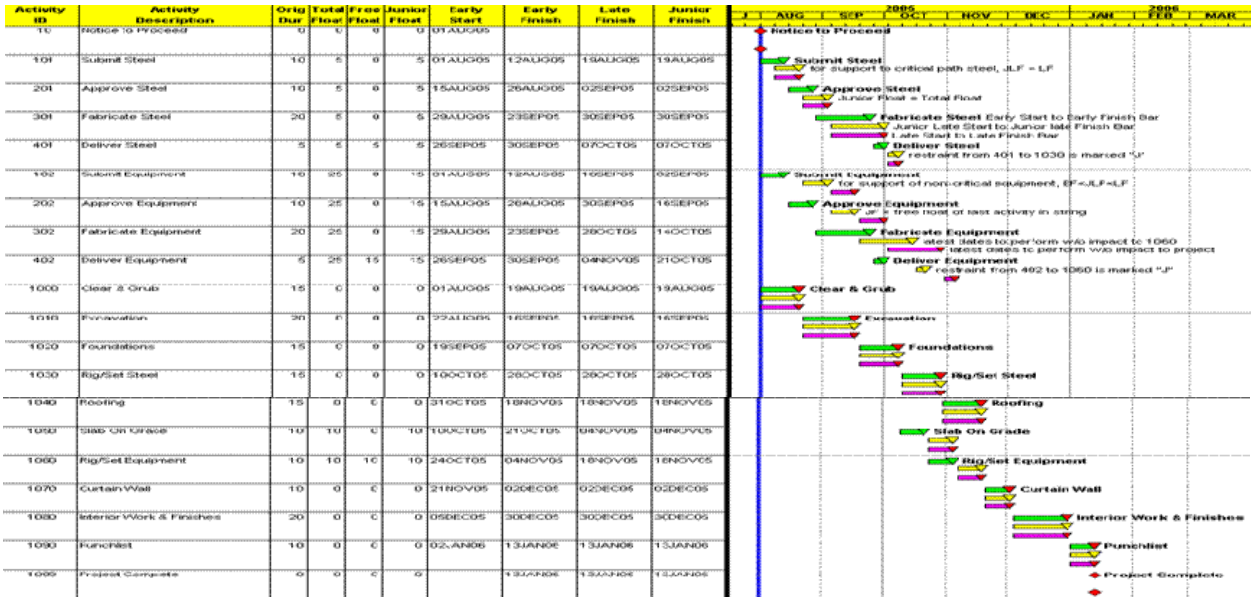
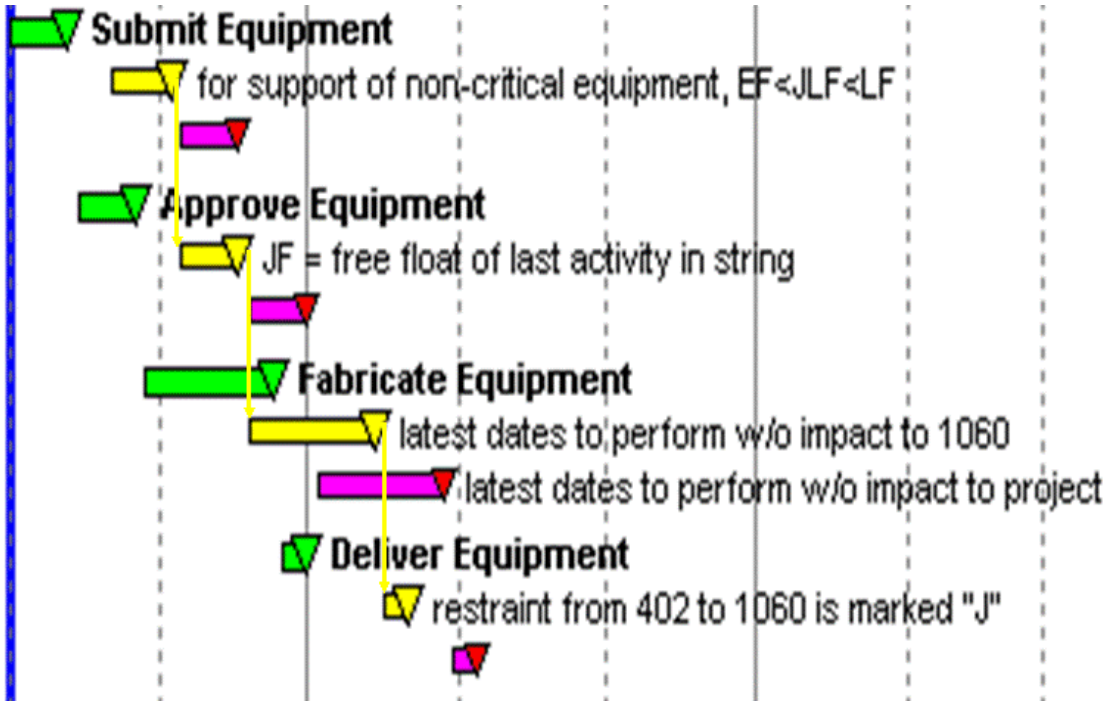


Figure 5.6.1 Just-in-Time restraint indicates delivery is to be expedited to support the earliest date for rig and set.



Activity ID	Activity Description	Orig Dur	Total Float	Free Float	Junior Float	Early Start	Early Finish	Late Finish	Junior Finish
10	Notice to Proceed	0	0	0	0	01AUG05			
101	Submit Steel	10	5	0	5	01AUG05	12AUG05	19AUG05	19AUG05
201	Approve Steel	10	5	0	5	15AUG05	26AUG05	02SEP05	02SEP05
301	Fabricate Steel	20	5	0	5	29AUG05	23SEP05	30SEP05	30SEP05
401	Deliver Steel	5	5	5	5	26SEP05	30SEP05	07OCT05	07OCT05
102	Submit Equipment	10	25	0	15	01AUG05	12AUG05	16SEP05	02SEP05
202	Approve Equipment	10	25	0	15	15AUG05	26AUG05	30SEP05	16SEP05
302	Fabricate Equipment	20	25	0	15	29AUG05	23SEP05	28OCT05	14OCT05
402	Deliver Equipment	5	25	15	15	26SEP05	30SEP05	04NOV05	21OCT05
1000	Clear & Grub	15	0	0	0	01AUG05	19AUG05	19AUG05	19AUG05
1010	Excavation	30	0	0	0	22AUG05	16SEP05	16SEP05	16SEP05
1020	Foundations	15	0	0	0	19SEP05	07OCT05	07OCT05	07OCT05
1030	Rig/Set Steel	15	0	0	0	10OCT05	28OCT05	28OCT05	28OCT05
1040	Roofing	15	0	0	0	31OCT05	18NOV05	18NOV05	18NOV05
1050	Slab On Grade	10	10	0	10	10OCT05	21OCT05	04NOV05	04NOV05
1060	Rig/Set Equipment	10	10	10	10	24OCT05	04NOV05	18NOV05	18NOV05
1070	Curtain Wall	10	0	0	0	21NOV05	02DEC05	02DEC05	02DEC05
1080	Interior Work & Finishes	20	0	0	0	05DEC05	30DEC05	30DEC05	30DEC05
1090	Punchlist	10	0	0	0	02JAN06	13JAN06	13JAN06	13JAN06
1099	Project Complete	0	0	0	0		13JAN06	13JAN06	13JAN06

Legend – Top Line (Green) is Early Date, Middle Line (Yellow) is Junior Date, Bottom Line (Purple) is Late Date
Figure 5.6.2 Example of early, Just-in-Time, and late dates.



Legend – Top Line (Green) is Early Date, Middle Line (Yellow) is Junior Date, Bottom Line (Purple) is Late Date
Figure 5.6.3 Detail of Figure 5.6.2 illustrating the early, Just-in-Time, and late bars calculated.

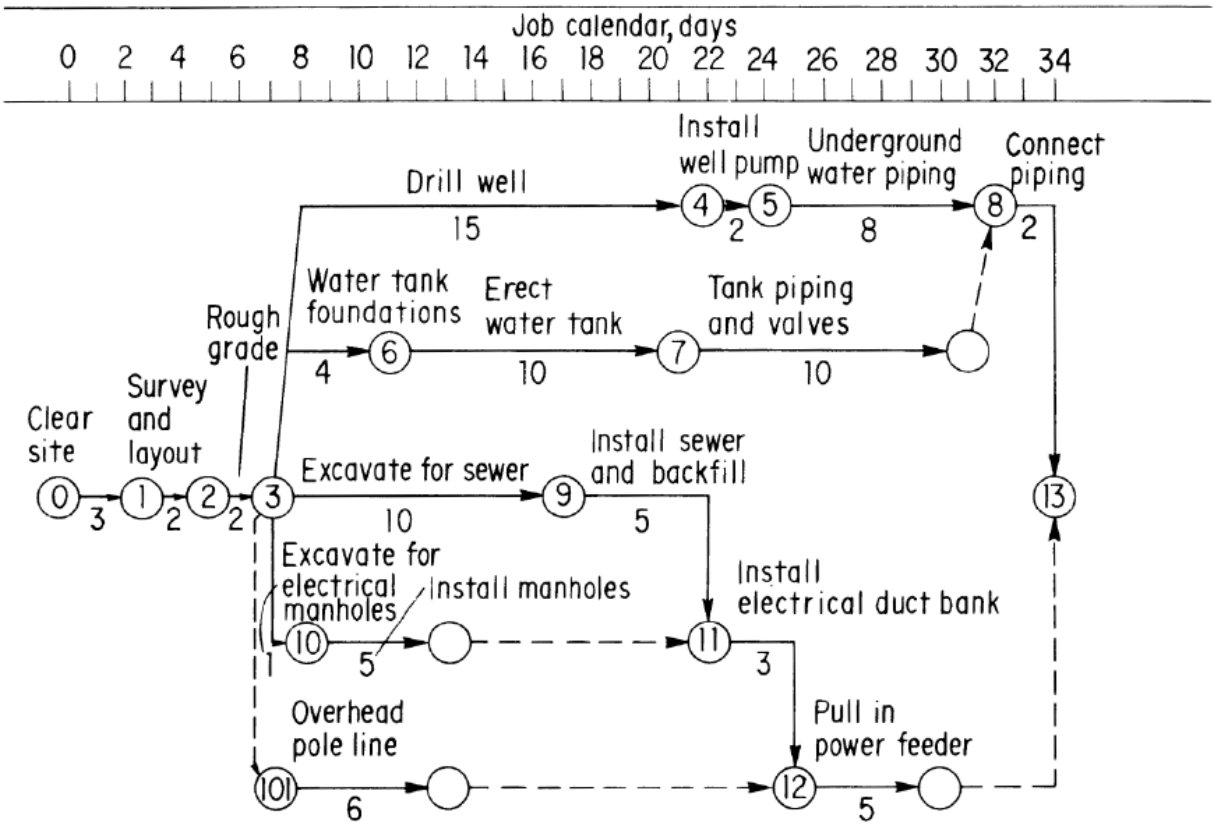


Figure 6.8.1 Time scale network: John Doe project (plotted to early times).

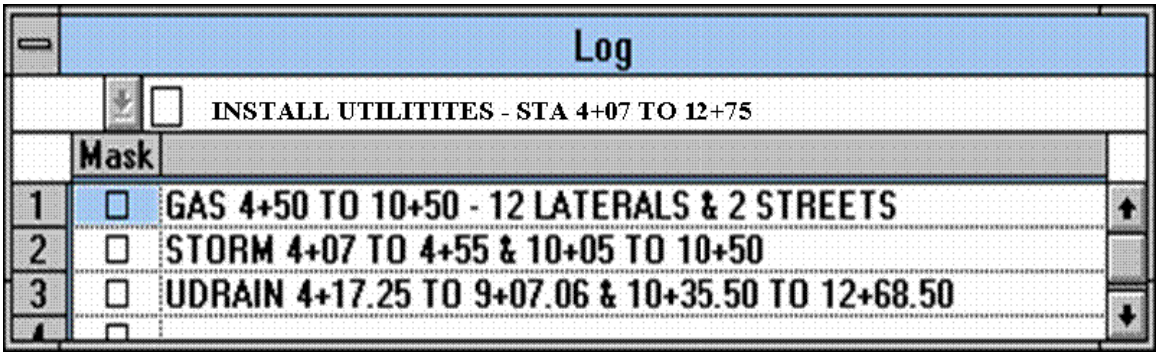


Figure 7.4.1 Primavera P3 Logs note detail of utility installation activity under direction of one foreman

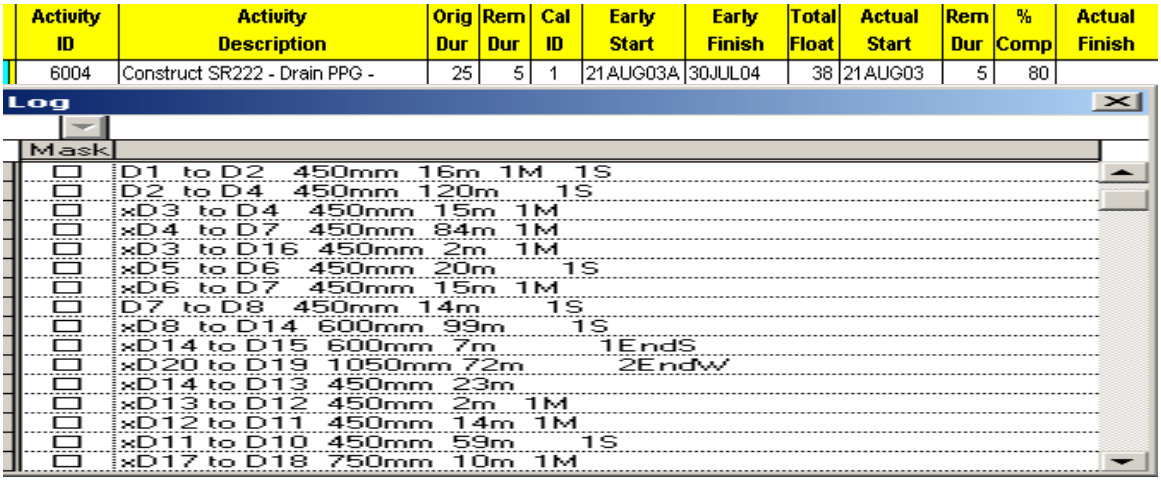


Figure 7.4.2 Primavera P3 Logs note individual bents of a drainage pipe – Each line is checked off as performed

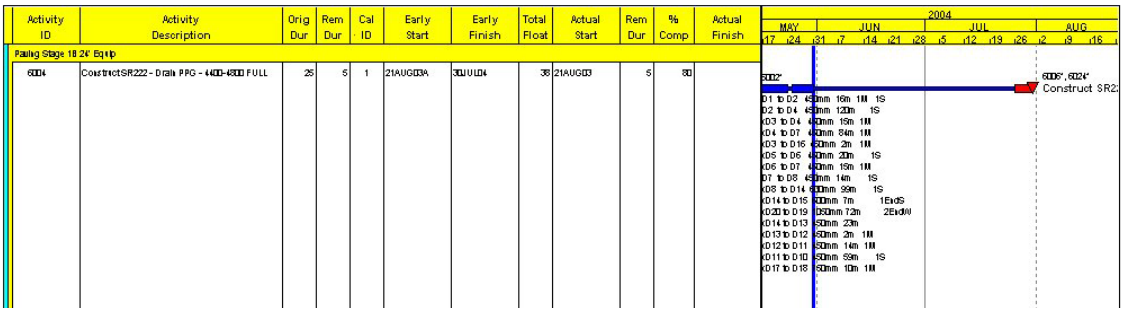


Figure 7.4.3 Primavera P3 Logs note individual bents of a drainage pipe – Each bent is checked off as performed

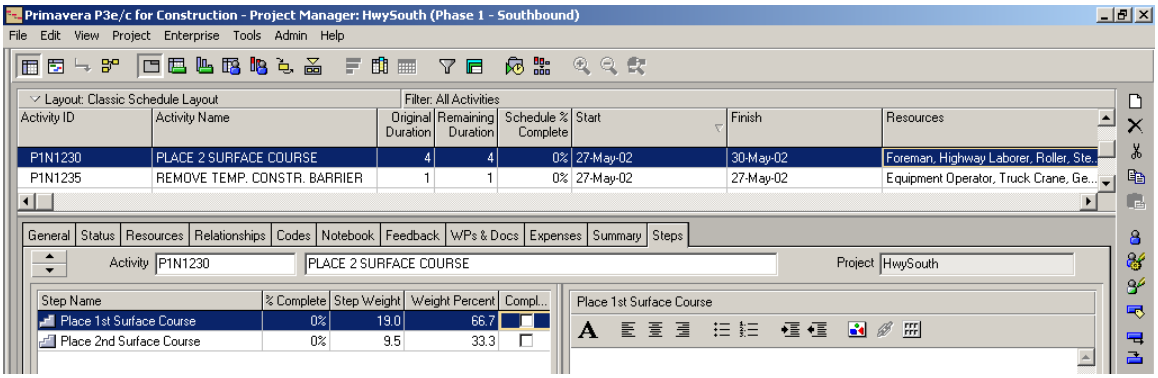


Figure 7.4.4 Primavera P3e/c Steps allows user to specify tasks within the "Place 2 SURFACE COURSE" activity User may check-off as work performed – 19mm 1st Course is 67%, 9.5mm 2nd Course is 33% of this 4 day activity

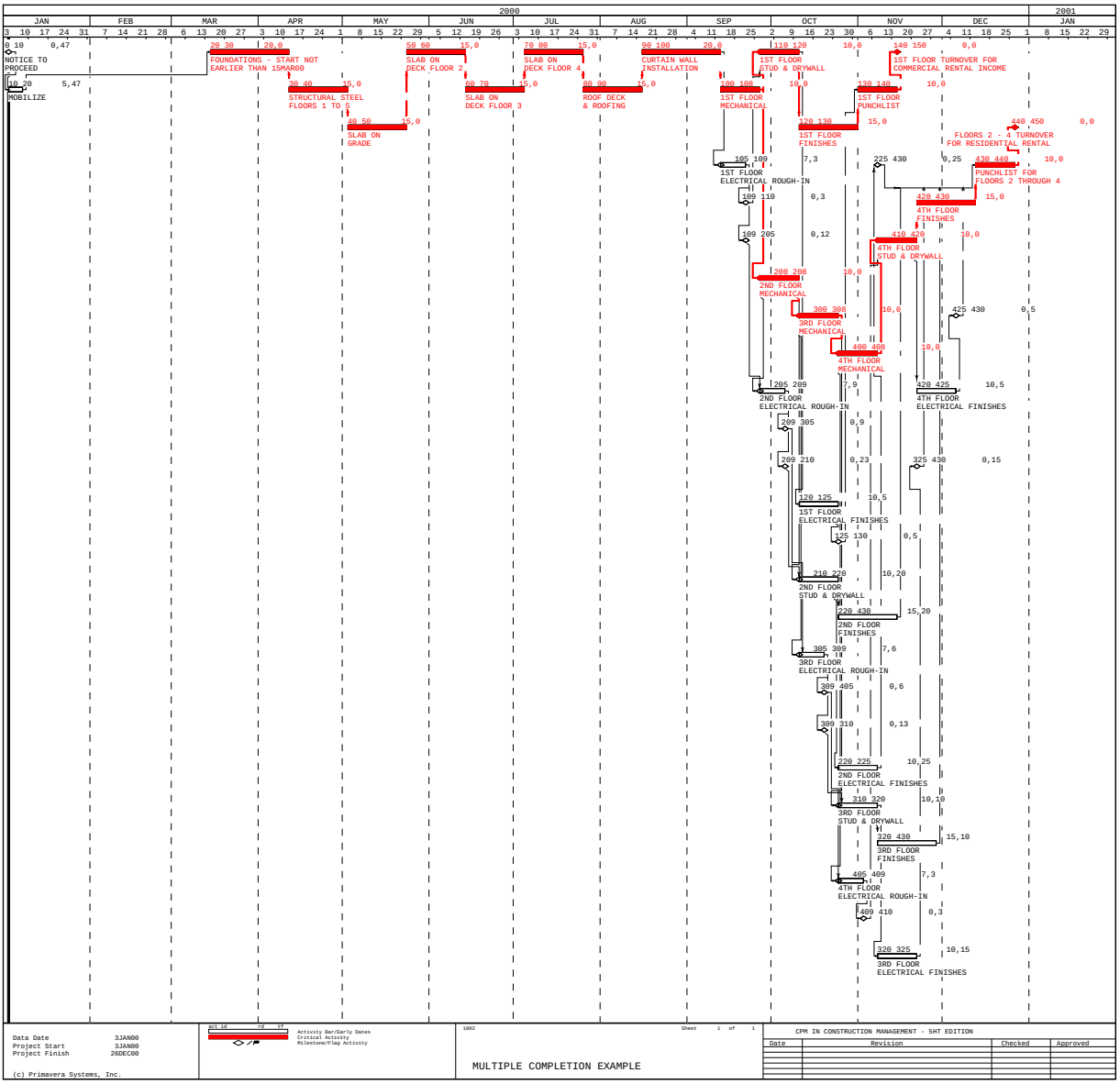


Figure 7.7.1 Multiple completions of project, both being calculated critical

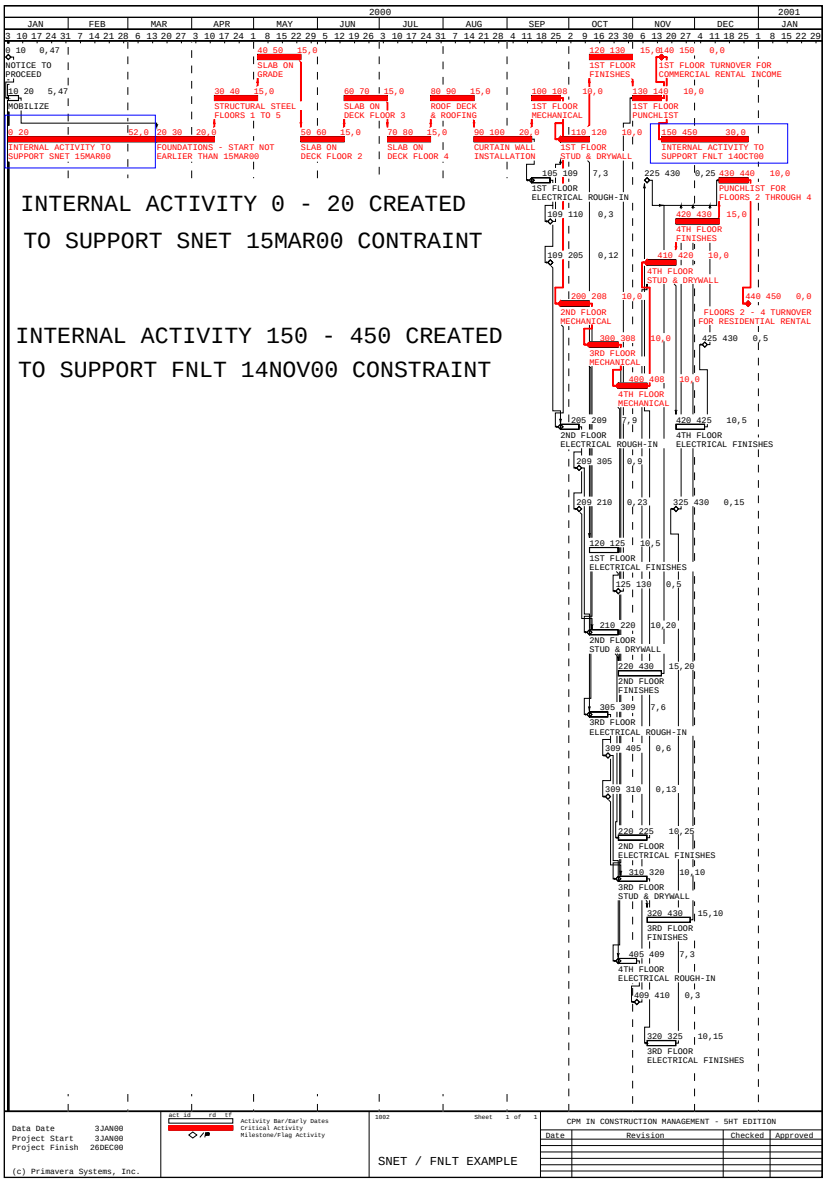


Figure 7.8.1 Internal logic for supporting SNET and FNLT constraints.

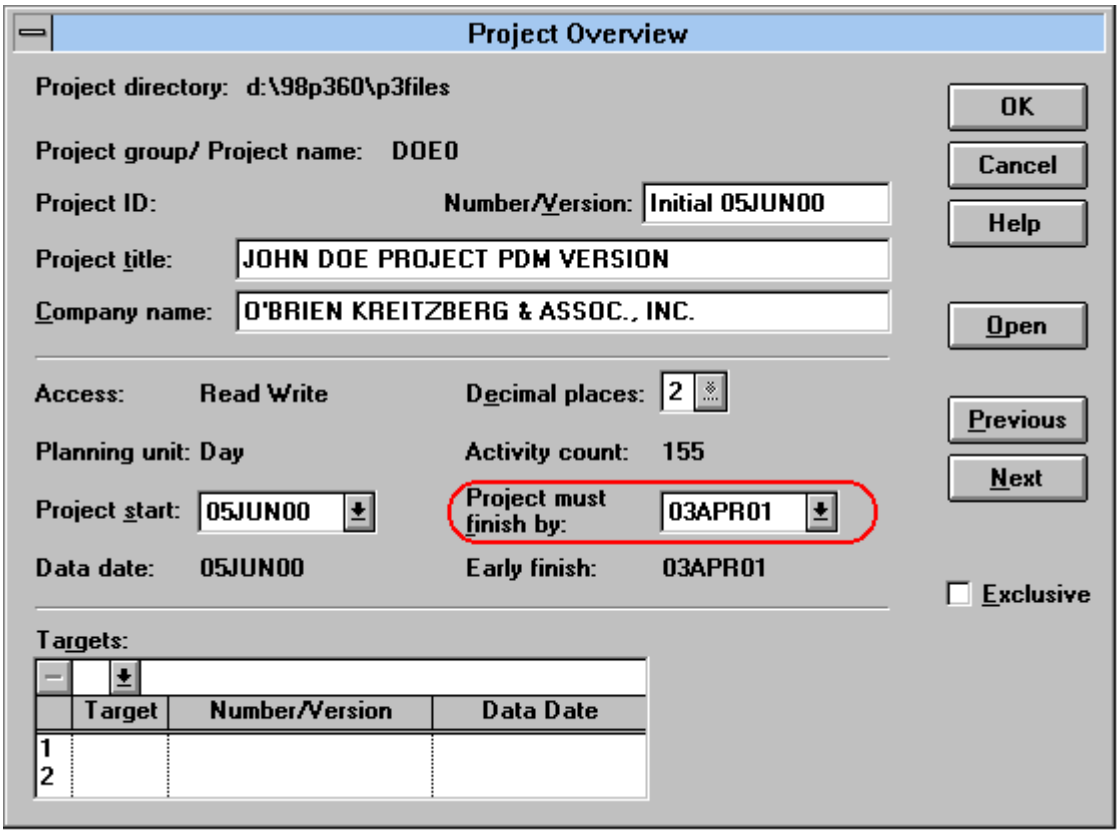


Figure 7.11.1 FNLT box, if used, will set this date as LF of project.

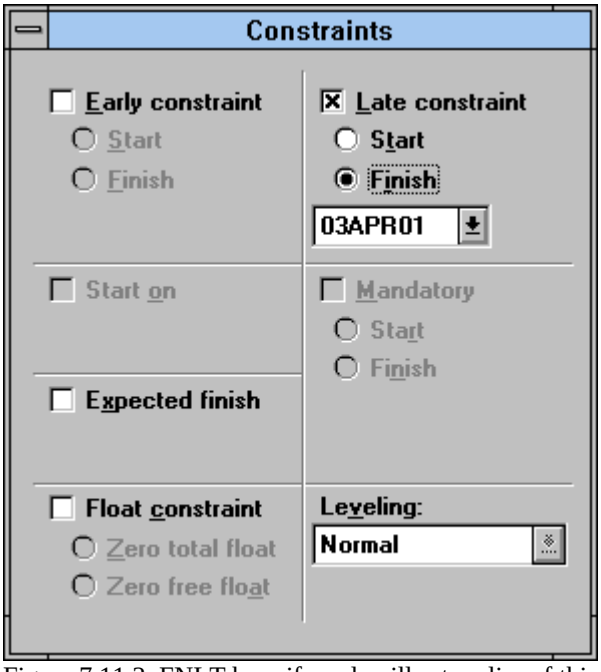


Figure 7.11.2 FNLT box, if used, will set earlier of this date or calculated LF as the LF of this activity

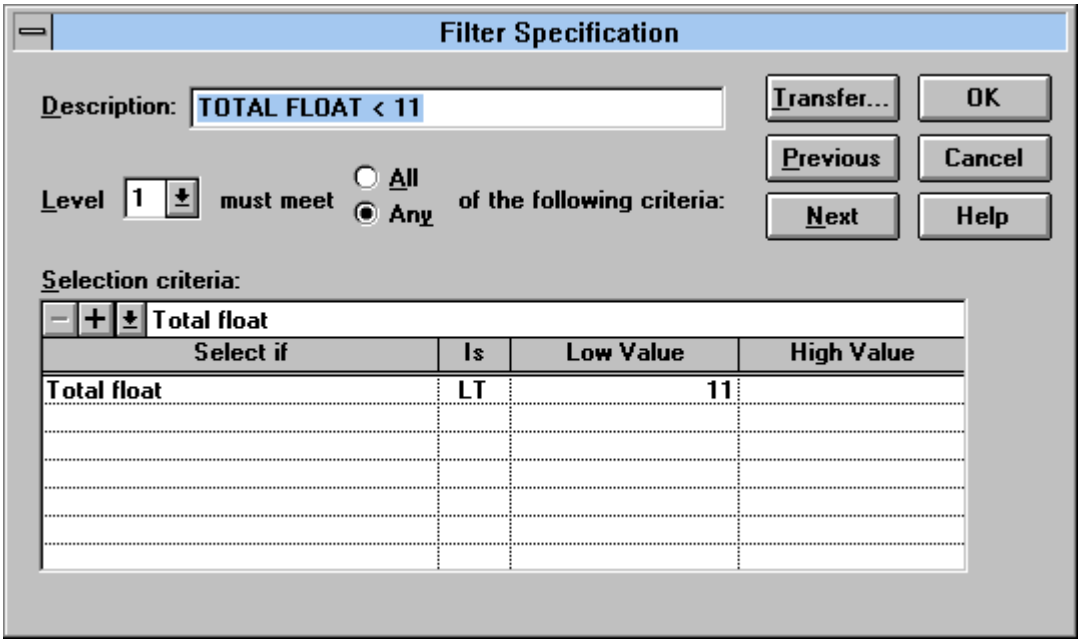


Figure 7.11.3 Filter defining "critical" as all activities with less than 11 days total float.

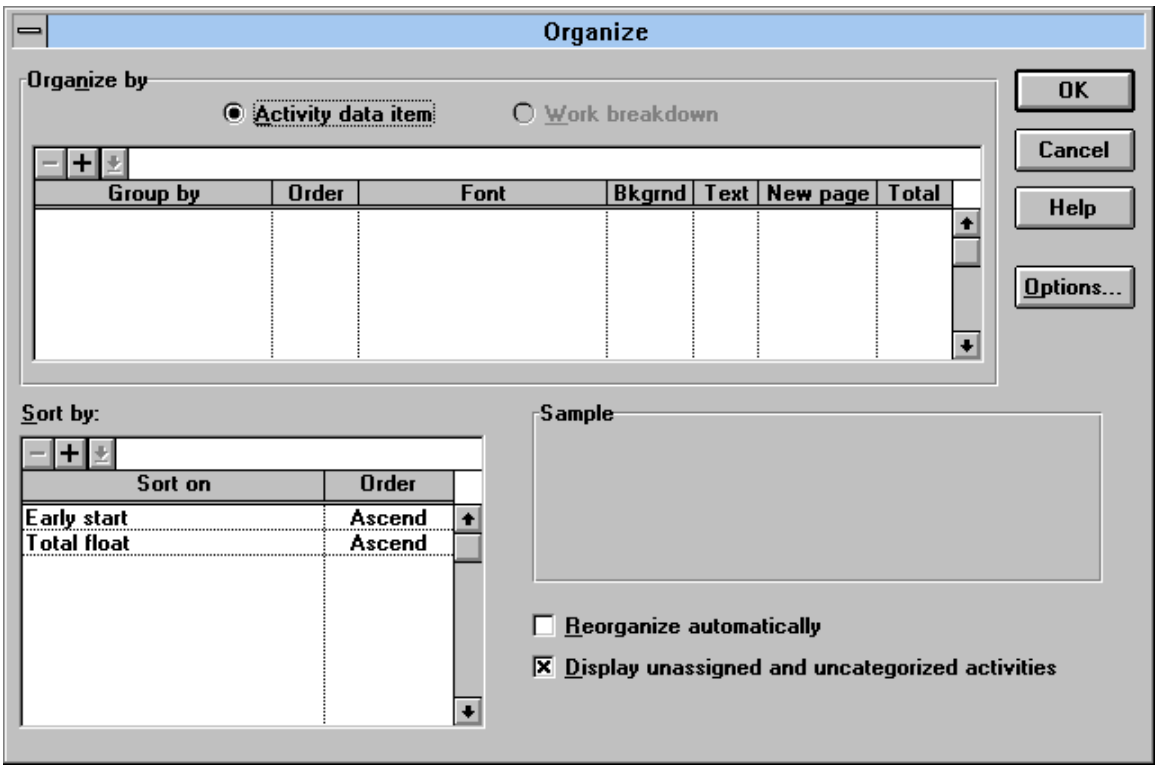


Figure 7.11.4 Sort instruction to list by early start, then by most critical for each date.

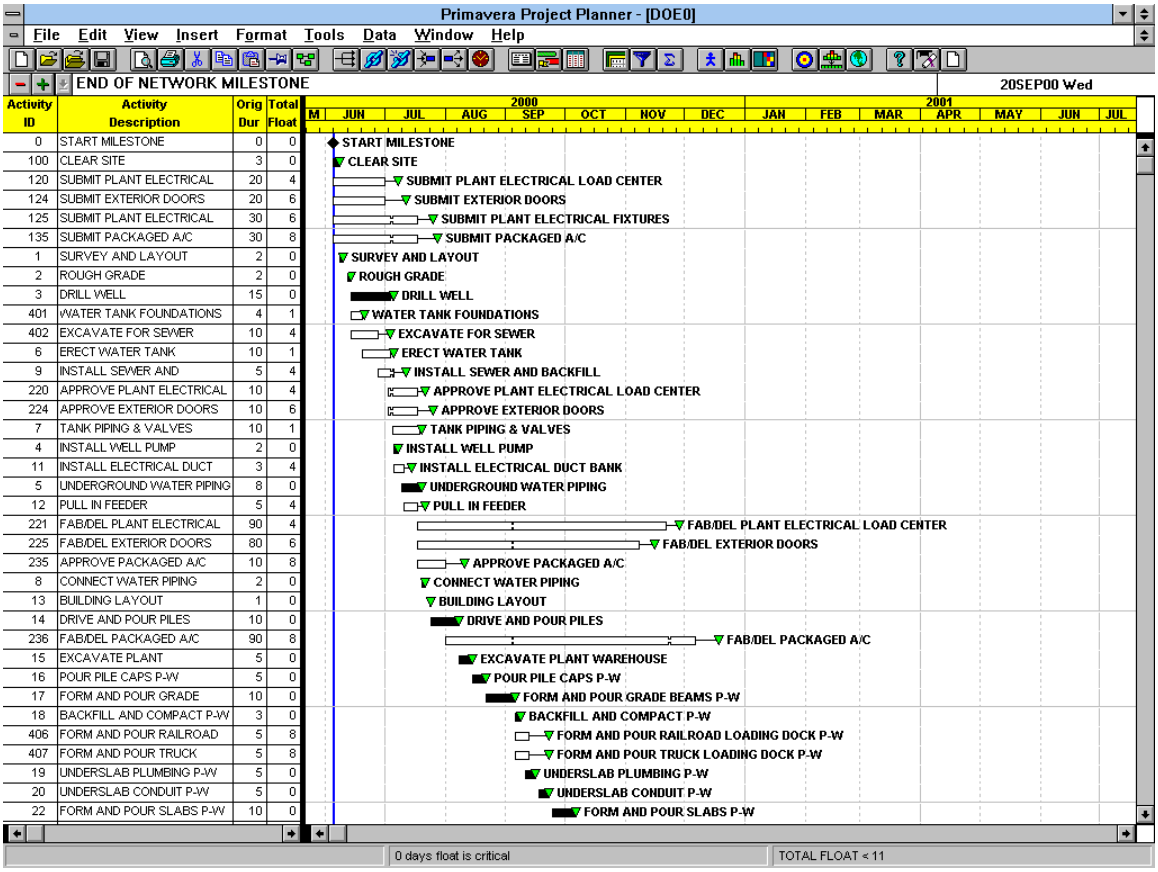


Figure 7.11.5 Graphic created by use of filter and sort instruction to list only "near-critical" activities.

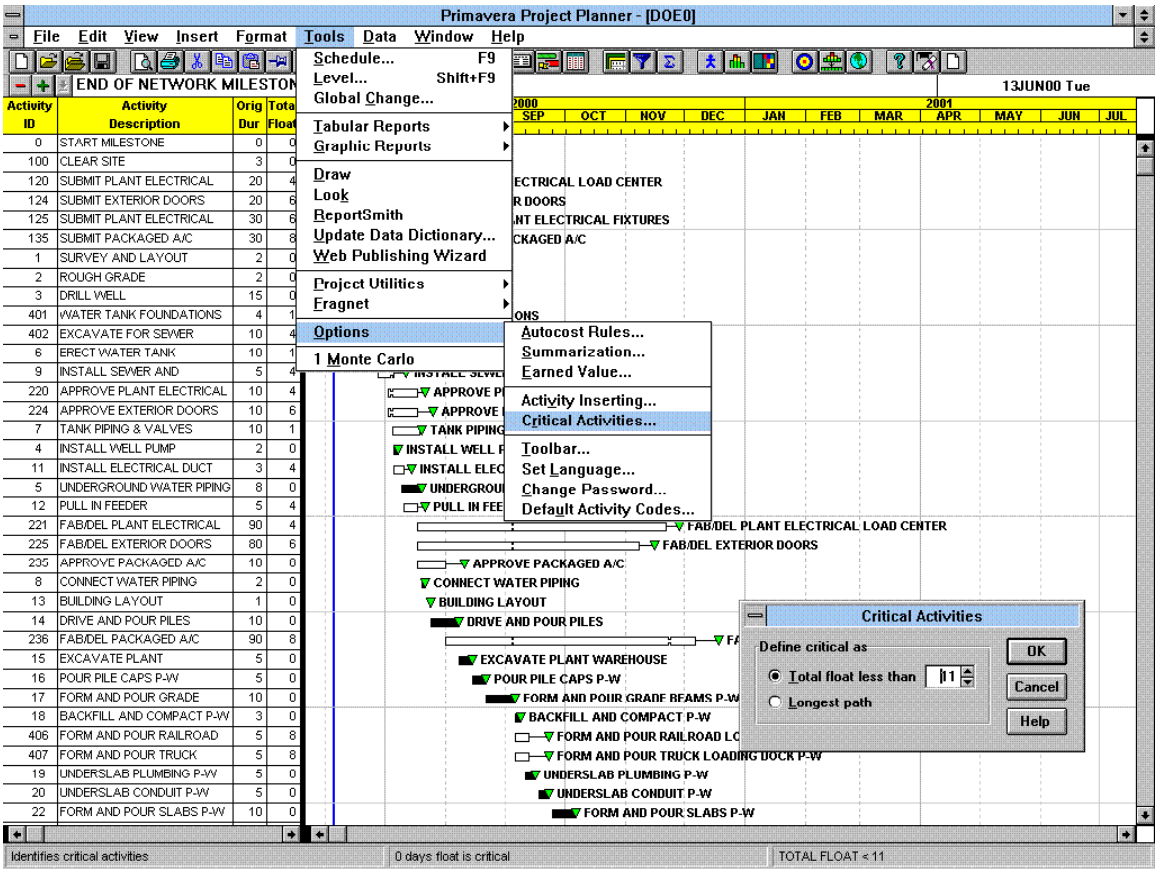
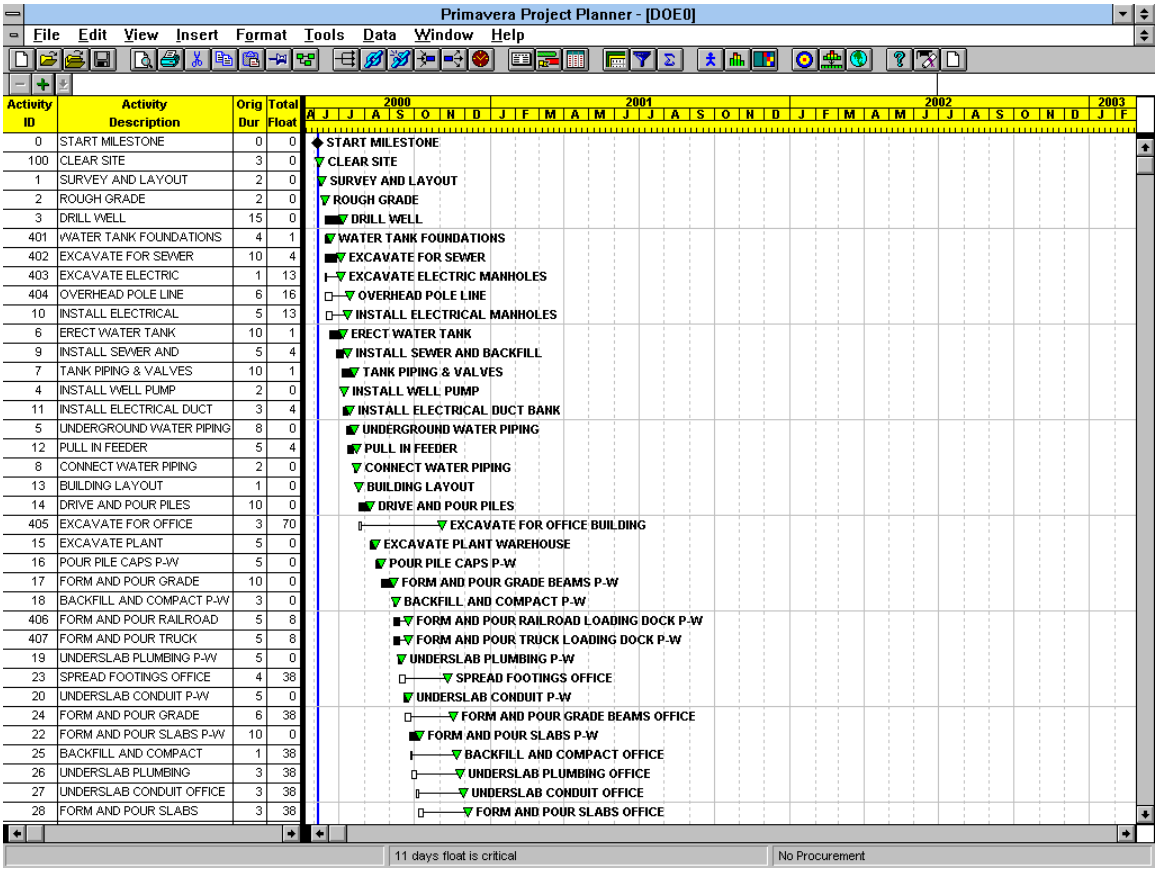


Figure 7.11.6 Critical Activities to be designated as all those with under 11 days of total float.



Activity ID	Activity Description	Orig Dur	Total Float
0	START MILESTONE	0	0
100	CLEAR SITE	3	0
1	SURVEY AND LAYOUT	2	0
2	ROUGH GRADE	2	0
3	DRILL WELL	15	0
401	WATER TANK FOUNDATIONS	4	1
402	EXCAVATE FOR SEWER	10	4
403	EXCAVATE ELECTRIC	1	13
404	OVERHEAD POLE LINE	6	16
10	INSTALL ELECTRICAL	5	13
6	ERECT WATER TANK	10	1
9	INSTALL SEWER AND	5	4
7	TANK PIPING & VALVES	10	1
4	INSTALL WELL PUMP	2	0
11	INSTALL ELECTRICAL DUCT	3	4
5	UNDERGROUND WATER PIPING	8	0
12	PULL IN FEEDER	5	4
8	CONNECT WATER PIPING	2	0
13	BUILDING LAYOUT	1	0
14	DRIVE AND POUR PILES	10	0
405	EXCAVATE FOR OFFICE	3	70
15	EXCAVATE PLANT	5	0
16	POUR PILE CAPS P-W	5	0
17	FORM AND POUR GRADE	10	0
18	BACKFILL AND COMPACT P-W	3	0
406	FORM AND POUR RAILROAD	5	8
407	FORM AND POUR TRUCK	5	8
19	UNDERSLAB PLUMBING P-W	5	0
23	SPREAD FOOTINGS OFFICE	4	38
20	UNDERSLAB CONDUIT P-W	5	0
24	FORM AND POUR GRADE	6	38
22	FORM AND POUR SLABS P-W	10	0
25	BACKFILL AND COMPACT	1	38
26	UNDERSLAB PLUMBING	3	38
27	UNDERSLAB CONDUIT OFFICE	3	38
28	FORM AND POUR SLABS	3	38

Figure 7.11.7 Critical Activities now designated as those with under 11 days of total float.

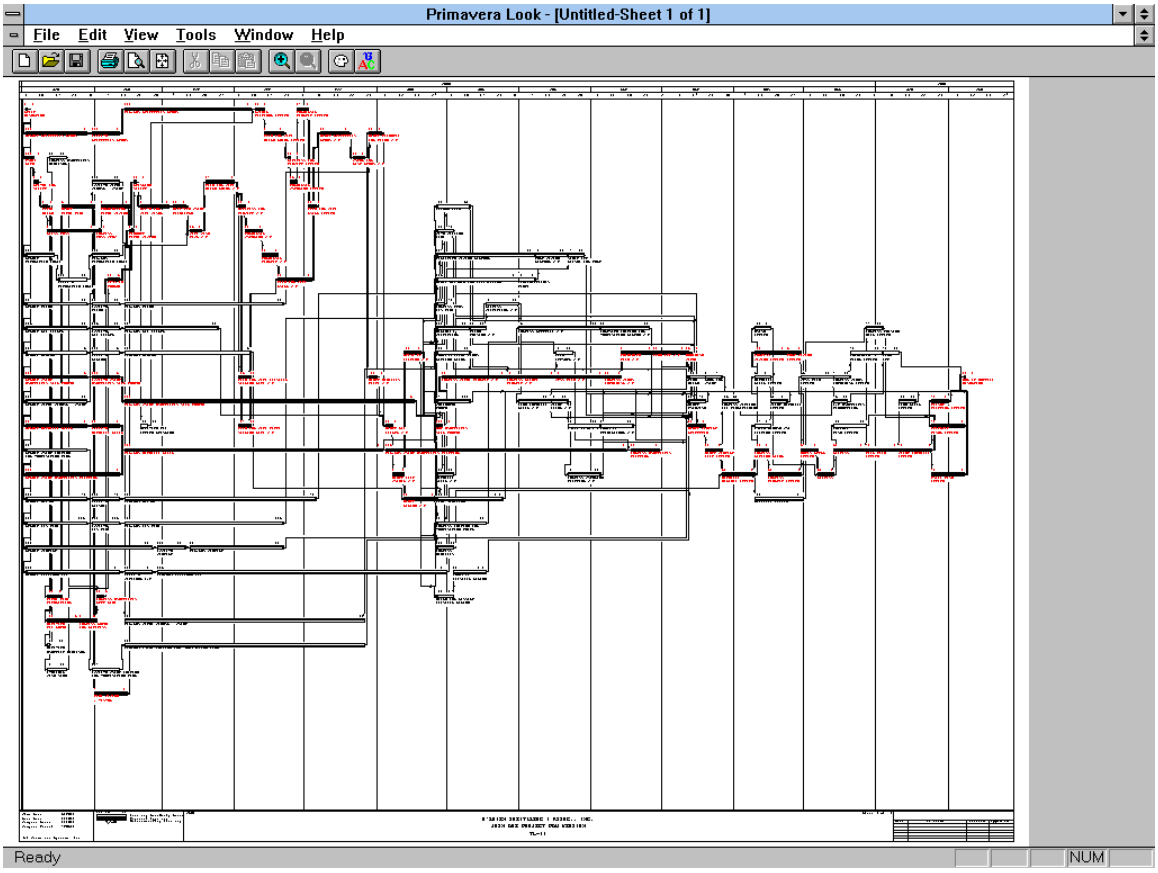


Figure 7.11.8 Critical Activities now designated as those with under 11 days of total float

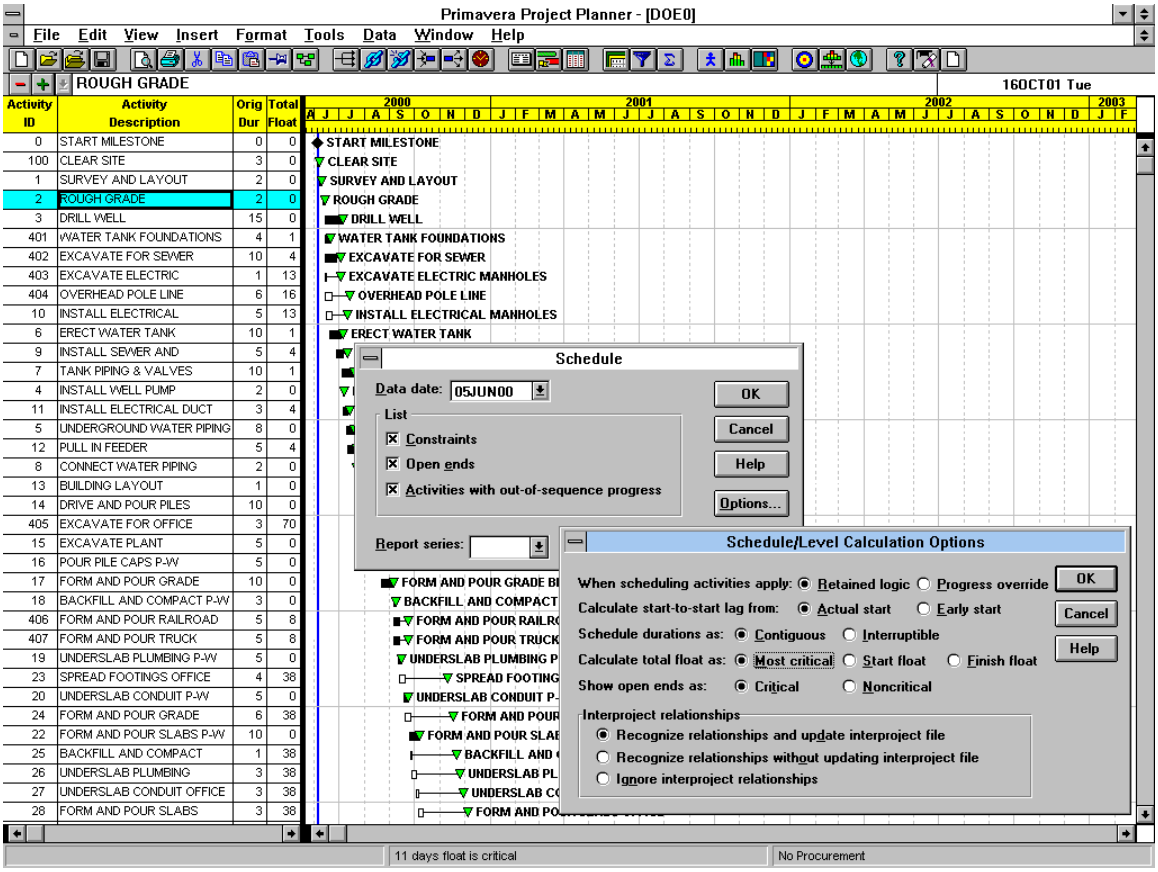


Figure 7.14.1 Choice of Retained Logic vs. Progress Override

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish	Late Start	Late Finish	Total Float
10	NOTICE TO PROCEED	0	17SEP01		17SEP01		0
15	MOBILIZE	10	17SEP01	28SEP01	17SEP01	28SEP01	0
20	FORM FOUNDATION A	6	01OCT01	08OCT01	01OCT01	08OCT01	0
25	REBAR FOUNDATION A	8	09OCT01	18OCT01	09OCT01	18OCT01	0
30	POUR FOUNDATION A	1	19OCT01	19OCT01	19OCT01	19OCT01	0
35	CURE FOUNDATION A	5	22OCT01	26OCT01	22OCT01	26OCT01	0
40	STRIP FOUNDATION A	2	29OCT01	30OCT01	29OCT01	30OCT01	0
45	FORM FOUNDATION B	5	01OCT01	05OCT01	10OCT01	16OCT01	7
50	REBAR FOUNDATION B	7	08OCT01	16OCT01	17OCT01	25OCT01	7
55	POUR FOUNDATION B	1	17OCT01	17OCT01	26OCT01	26OCT01	7
60	CURE FOUNDATION B	0	17OCT01		29OCT01		7
65	STRIP FOUNDATION B	2	18OCT01	19OCT01	29OCT01	30OCT01	7
70	FORM WALL AB	6	31OCT01	07NOV01	31OCT01	07NOV01	0
75	REBAR WALL AB	8	08NOV01	19NOV01	08NOV01	19NOV01	0
80	POUR WALL AB	1	20NOV01	20NOV01	20NOV01	20NOV01	0
85	CURE WALL AB	5	21NOV01	27NOV01	21NOV01	27NOV01	0
90	STRIP WALL AB	2	28NOV01	29NOV01	28NOV01	29NOV01	0

Figure 7.15.1 – Possible depiction of a milestone or zero duration activity

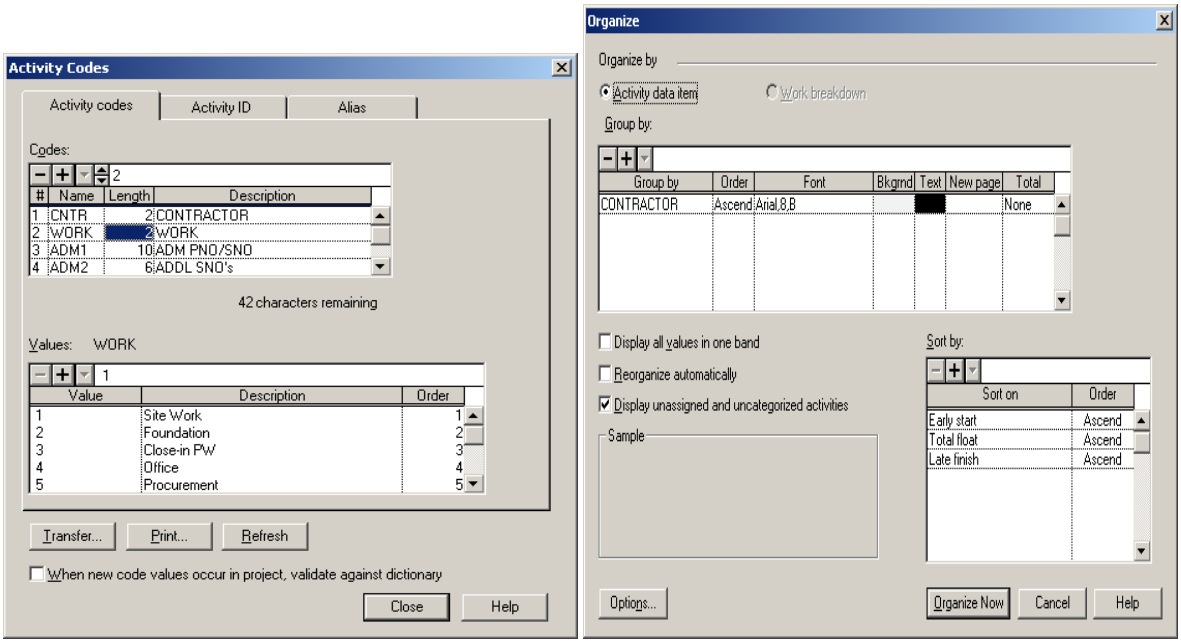


Figure 7.17.1 Activity Code Dictionary and Organize dialog boxes.

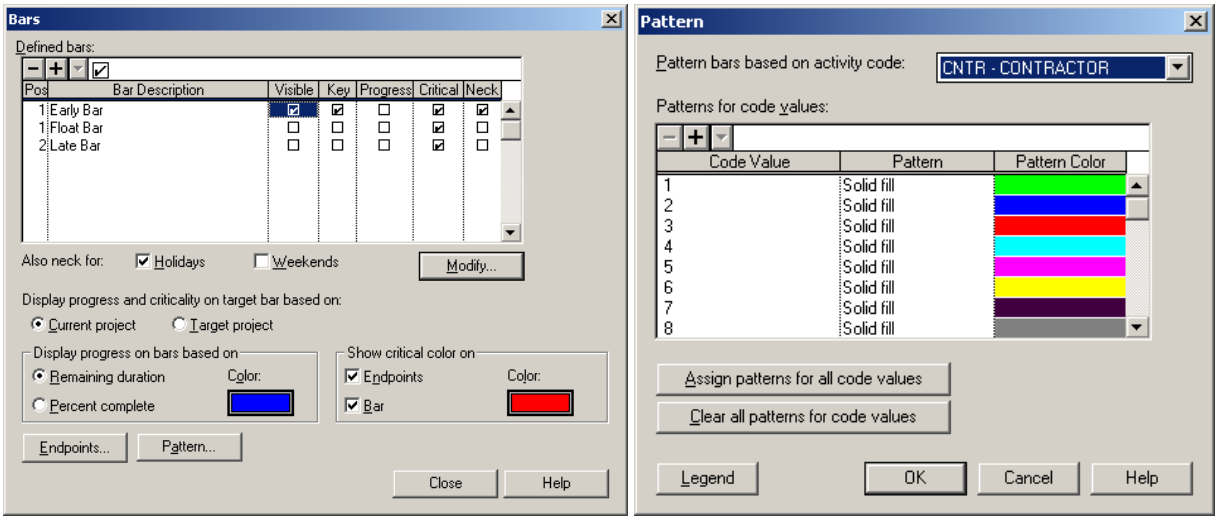


Figure 7.17.2 Bar dialog box, Pattern sub-dialog box

Activity ID	Activity Description	Orig Dur	CNTR	WORK	Early Start	Early Finish	Late Start	Late Finish	Total Float
Excavate and backfill									
100	CLEAR SITE	3	1	1	05JUN00	07JUN00	05JUN00	07JUN00	0
2	ROUGH GRADE	2	1	1	12JUN00	13JUN00	12JUN00	13JUN00	0
402	EXCAVATE FOR SEWER	10	1	1	14JUN00	27JUN00	20JUN00	03JUL00	4
403	EXCAVATE ELECTRIC	1	1	1	14JUN00	14JUN00	03JUL00	03JUL00	13
405	EXCAVATE FOR OFFICE	3	1	2	25JUL00	27JUL00	31OCT00	02NOV00	69
15	EXCAVATE PLANT	5	1	2	08AUG00	14AUG00	08AUG00	14AUG00	0
18	BACKFILL AND COMPACT P-W	3	1	2	05SEP00	07SEP00	05SEP00	07SEP00	0
25	BACKFILL AND COMPACT	1	1	2	27SEP00	27SEP00	17NOV00	17NOV00	37
415	FINE GRADE	5	1	5	20MAR01	26MAR01	20MAR01	26MAR01	0
Survey and layout									
1	SURVEY AND LAYOUT	2	2	1	08JUN00	09JUN00	08JUN00	09JUN00	0
13	BUILDING LAYOUT	1	2	2	24JUL00	24JUL00	24JUL00	24JUL00	0
Concrete									
401	WATER TANK FOUNDATIONS	4	3	1	14JUN00	19JUN00	15JUN00	20JUN00	1
16	POUR PILE CAPS P-W	5	3	2	15AUG00	21AUG00	15AUG00	21AUG00	0
17	FORM AND POUR GRADE	9	3	2	22AUG00	01SEP00	22AUG00	01SEP00	0
406	FORM AND POUR RAILROAD	5	3	2	05SEP00	11SEP00	15SEP00	21SEP00	8
407	FORM AND POUR TRUCK	5	3	2	05SEP00	11SEP00	15SEP00	21SEP00	8
23	SPREAD FOOTINGS OFFICE	4	3	2	13SEP00	18SEP00	03NOV00	08NOV00	37
24	FORM AND POUR GRADE	6	3	2	19SEP00	26SEP00	09NOV00	16NOV00	37
22	FORM AND POUR SLABS P-W	10	3	2	22SEP00	05OCT00	22SEP00	05OCT00	0
28	FORM AND POUR SLABS	3	3	2	06OCT00	10OCT00	29NOV00	01DEC00	37
Electrical									
404	OVERHEAD POLE LINE	6	4	1	14JUN00	21JUN00	07JUL00	14JUL00	16
10	INSTALL ELECTRICAL	5	4	1	15JUN00	21JUN00	05JUL00	11JUL00	13
11	INSTALL ELECTRICAL DUCT	3	4	1	06JUL00	10JUL00	12JUL00	14JUL00	4
12	PULL IN FEEDER	5	4	1	11JUL00	17JUL00	17JUL00	21JUL00	4
20	UNDERSLAB CONDUIT P-W	5	4	2	15SEP00	21SEP00	15SEP00	21SEP00	0
27	UNDERSLAB CONDUIT OFFICE	3	4	2	03OCT00	05OCT00	24NOV00	28NOV00	37
300	SET ELECTRICAL LOAD	2	4	3	28NOV00	29NOV00	28NOV00	29NOV00	0
301	INSTALL POWER PANEL	10	4	3	28NOV00	11DEC00	14DEC00	28DEC00	12
413	AREA LIGHTING	20	4	5	28NOV00	26DEC00	06MAR01	02APR01	68
38	INSTALL POWER CONDUIT P-W	20	4	3	30NOV00	28DEC00	30NOV00	28DEC00	0
419	INSTALL BACKING BOXES	4	4	4	21DEC00	27DEC00	03JAN01	08JAN01	7
65	INSTALL CONDUIT OFFICE	10	4	4	28DEC00	11JAN01	09JAN01	22JAN01	7
43	INSTALL BRANCH CONDUIT	15	4	3	29DEC00	19JAN01	29DEC00	19JAN01	0
66	PULL WIRE OFFICE	10	4	4	12JAN01	25JAN01	20FEB01	05MAR01	27

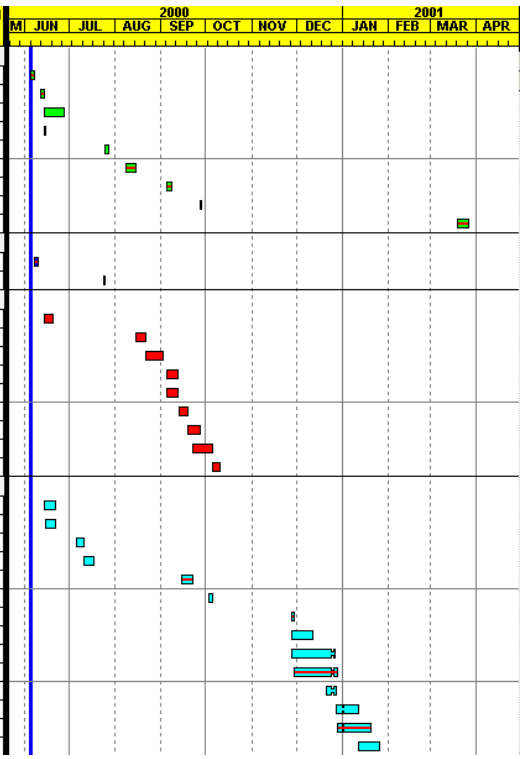


Figure 7.17.3 Detail of project – organized by subcontractor

Activity ID	Activity Description	Orig Dur	CNTR	WORK	Early Start	Early Finish	Late Start	Late Finish	Total Float
+ Excavate and backfill									
		206	1		05JUN00	26MAR01	05JUN00	26MAR01	0
+ Survey and layout									
		32	2		08JUN00	24JUL00	08JUN00	24JUL00	0
+ Concrete									
		83	3		14JUN00	10OCT00	15JUN00	01DEC00	37
+ Electrical									
		194	4		14JUN00	19MAR01	05JUL00	02APR01	10
+ Plumbing									
		182	5		28JUN00	15MAR01	05JUL00	02APR01	12
+ Structural / rigging									
		41	6	3	06OCT00	04DEC00	06OCT00	08JAN01	23
+ Precast									
		23	7		11OCT00	10NOV00	08NOV00	15DEC00	24
+ HVAC									
		88	8		25OCT00	28FEB01	02JAN01	20MAR01	14
+ Well									
		17	9	1	14JUN00	07JUL00	14JUN00	07JUL00	0
+ Water Tank									
		23	10	1	20JUN00	21JUL00	21JUN00	21JUL00	0
+ Piles									
		10	11	2	25JUL00	07AUG00	25JUL00	07AUG00	0
+ Roofing									
		5	13	3	13NOV00	17NOV00	20NOV00	27NOV00	5
+ Masonry									
		17	14		28NOV00	20DEC00	15DEC00	02JAN01	7
+ Fencing									
		10	15	5	28NOV00	11DEC00	20MAR01	02APR01	78
+ Paving									
		10	16	5	28NOV00	11DEC00	06MAR01	19MAR01	68
+ RR siding									
		22	17		28NOV00	28DEC00	06MAR01	26MAR01	61
+ Hung ceilings									
		71	18		12DEC00	22MAR01	02JAN01	02APR01	7
+ Drywall									
		36	19		19DEC00	08FEB01	09JAN01	19FEB01	7

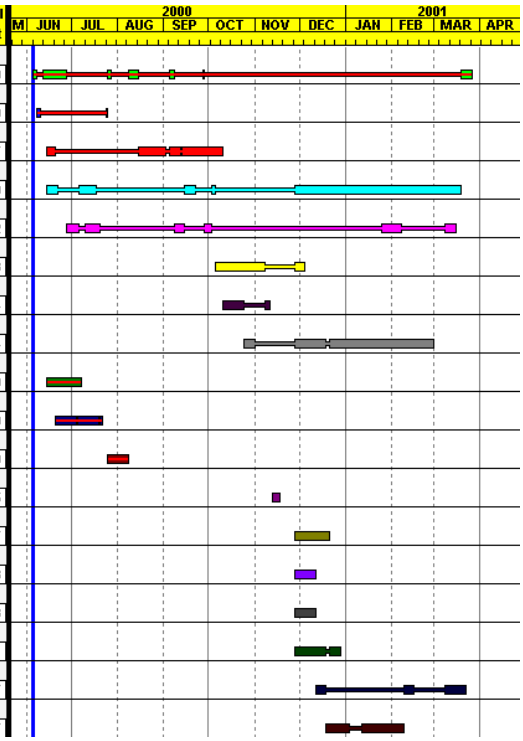


Figure 7.17.4 Summary of project, organized by subcontractor

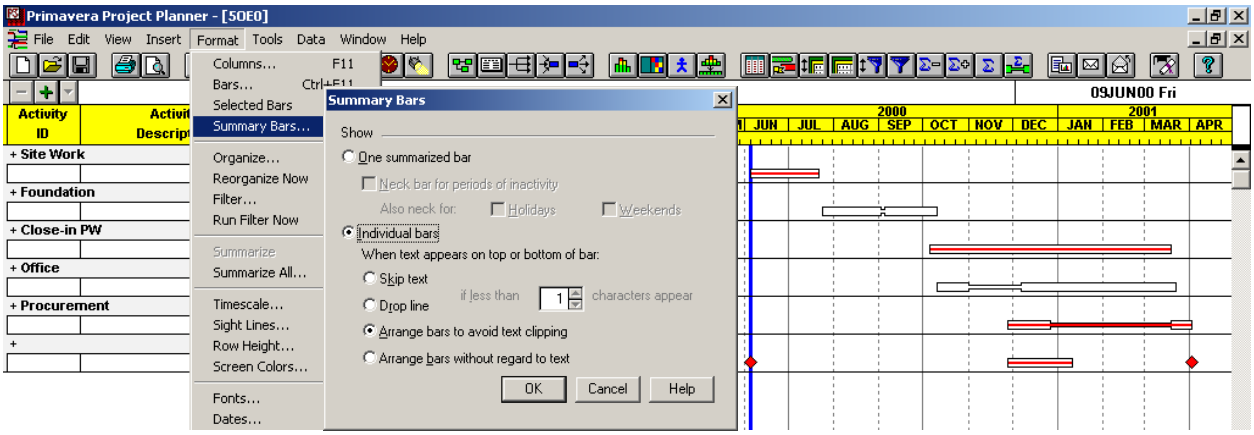


Figure 7.17.5 Summary Bar Dialog Box

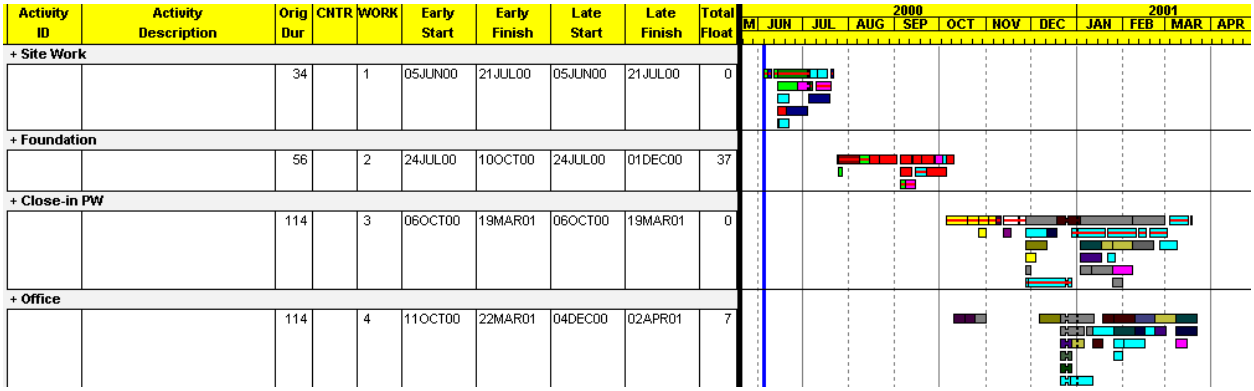


Figure 7.17.6 Summary Bar showing individual activities

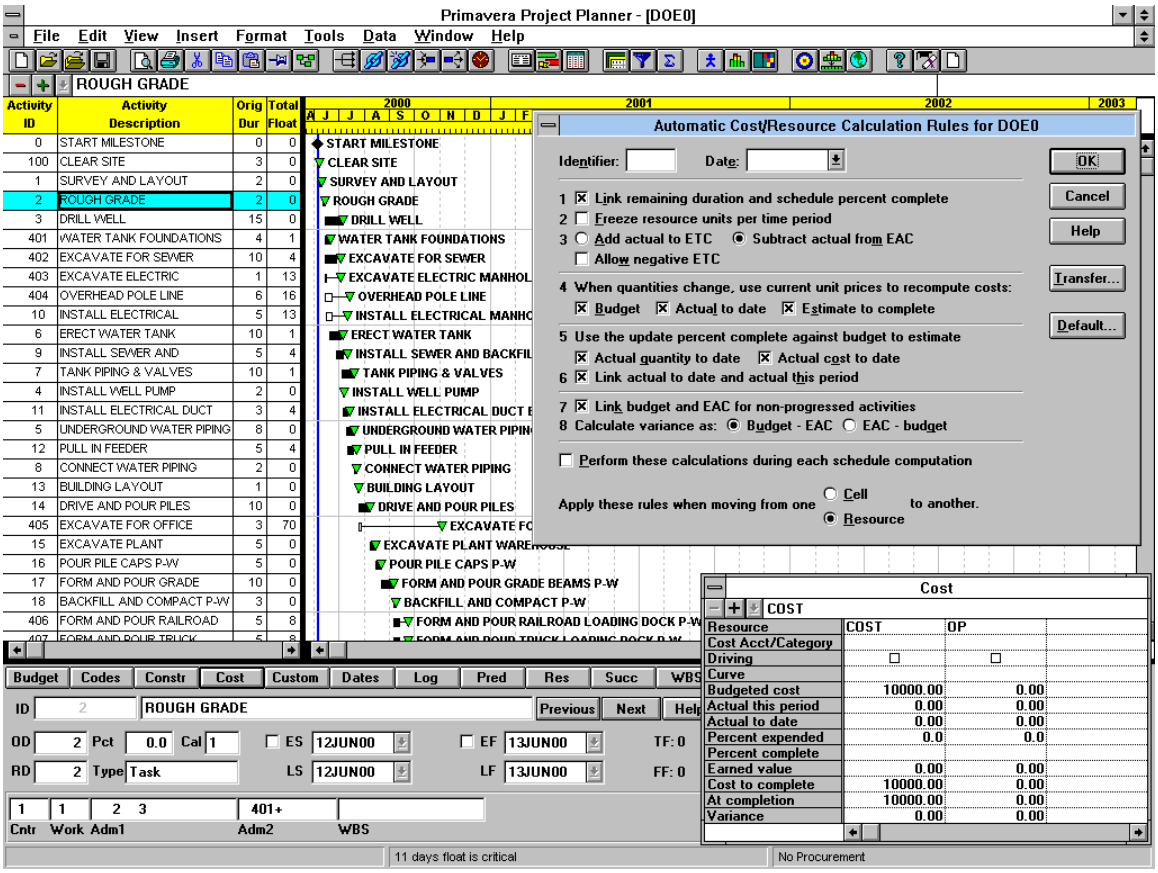


Figure 7.20.1 Configuration screen to choose linkage of percent complete schedule vs. cost

```
ACTIVITY FORM                              DINI
  I node:     3   J node:    13                                        TF:    0
        Title: Hammock #1                                            PCT:  0.0
  ES: 14JUN00   EF: 21JUL00   Orig. duration:   27*       Actual Start:

  LS: 14JUN00   LF: 21JUL00   Rem.  duration:   27*      Actual Finish:

Activity Codes:
-------------------------------------------------------------------------------
DATE CONSTRAINTS:

  Start no earlier than                    Start no later than
 Finish no earlier than                   Finish no later than
               Start on
        Mandatory Start                         Mandatory Finish

FLOAT AND DURATION CONSTRAINTS:   (Choose one) HA
        Zero Free Float (ZFF)              Zero Total Float (ZTF)
        Hammock Activity (HA)              Expected Finish (XF)
                                           Expected Finish Date
Start Flag (SF), Finish Flag (FF),
Start Milestone (SM), Finish Milestone (FM) or None (Blank):
-------------------------------------------------------------------------------
Commands:Add Delete Edit Help More Next Return autoSort Transfer View Window
Windows :Act.codes Budget Constraints Dates Financial Log Pred Res Succ cUstom
```

Figure 7.23.2 P3 for DOS designation of Hammock as a constraint type

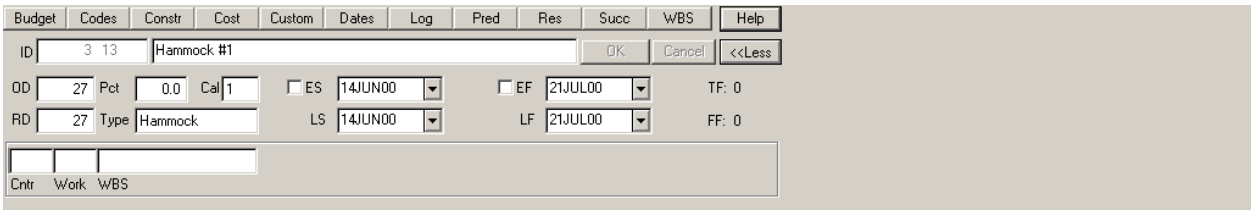


Figure 7.23.3 P3 for Windows designation of Hammock as an activity type

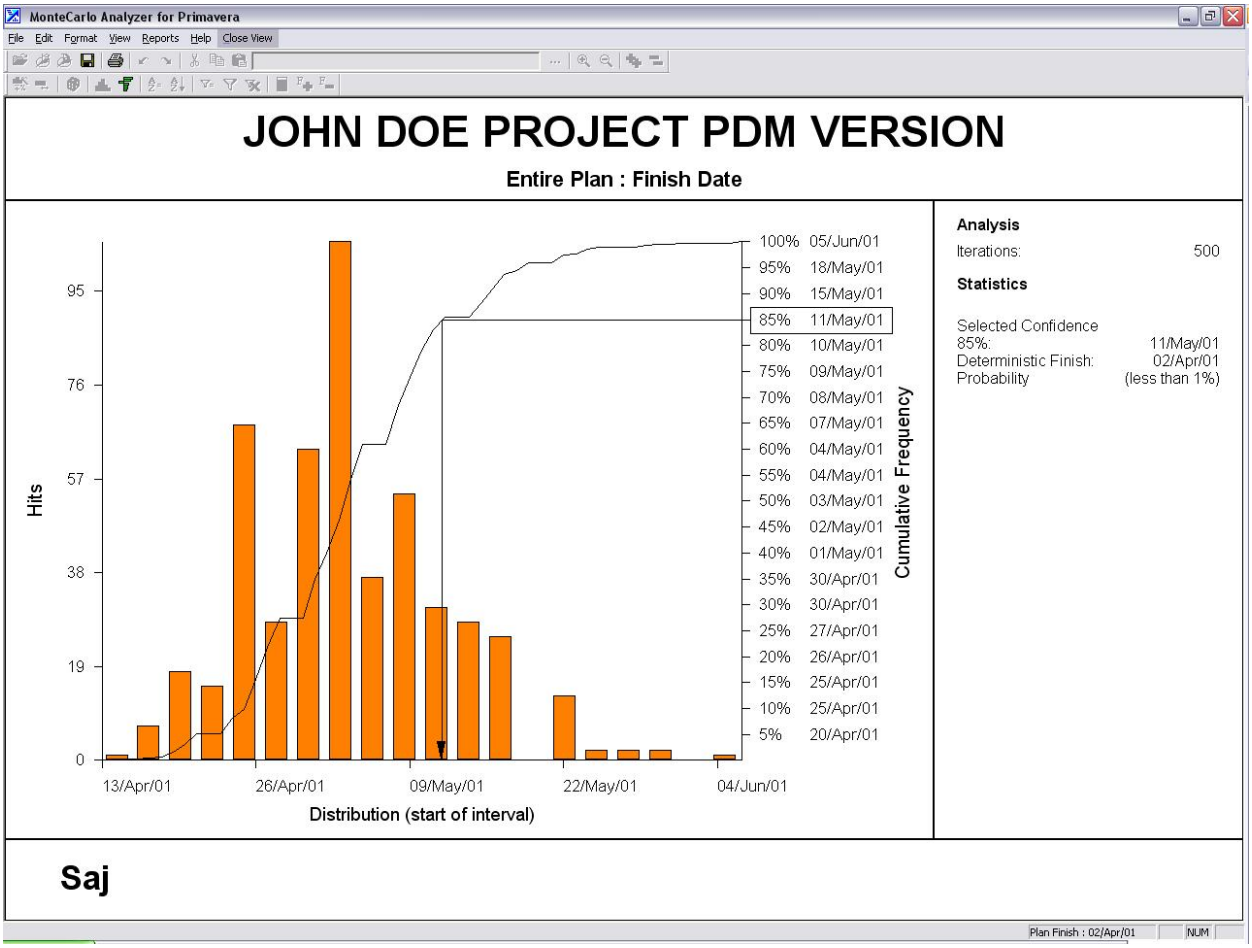


Figure 8.2.1 CPM calculates completion on 02APR01, MCA SPERT calculates 85% chance of completion by 11MAY01

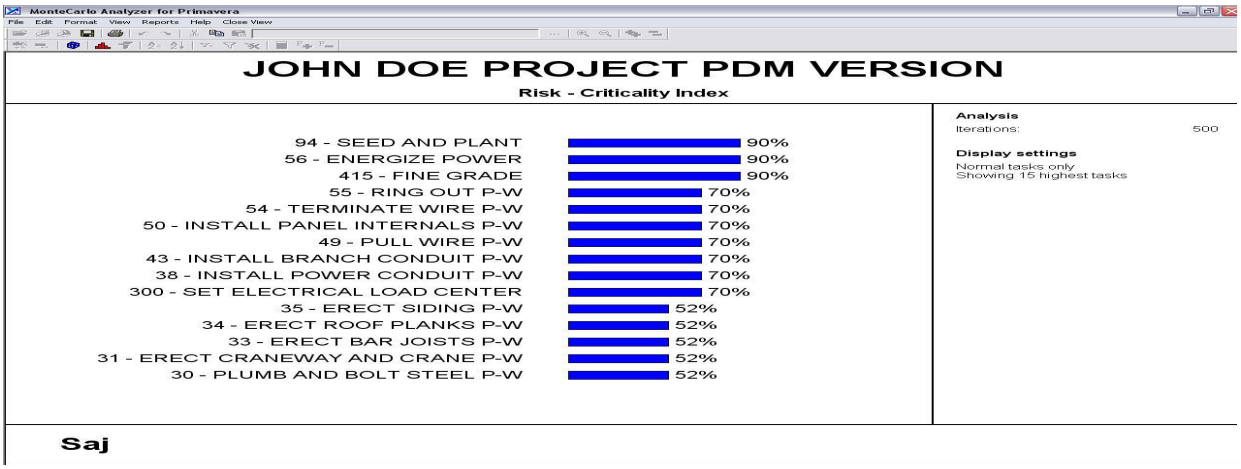


Figure 8.2.2 Pertmaster's MCA software calculates the Activity #30 has only a 52% chance of being critical

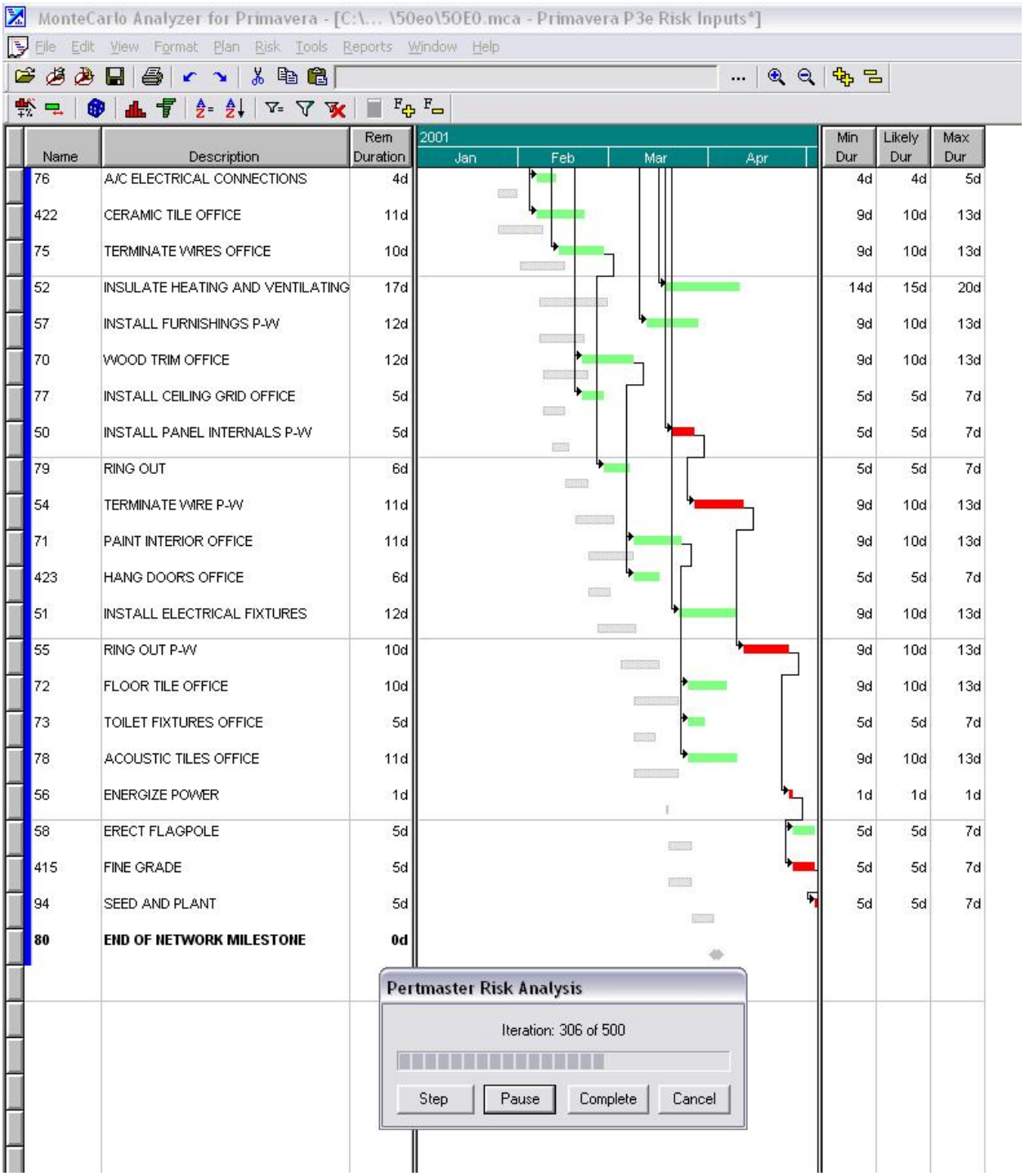


Figure 8.2.3 Comparison of CPM calculation (second bar) to that of SPERT (first bar) – default distribution

Pertmaster Report - Criticality Distribution Profile

Title	Path
JOHN DOE PROJECT PDM VERSION	C:\Documents and Settings\sajid\Desktop\50eo\5OE0.mca

Number of Tasks (Normal Only)	154
Number of Critical Tasks	63
Percentage of Tasks Critical	41%

Criticality Range	Number of Tasks	Relative Percentage
Never	91	59%
1 to 10	10	6%
11 to 20	18	12%
21 to 30	3	2%
31 to 40	0	0%
41 to 50	3	2%
51 to 60	19	12%
61 to 70	7	5%
71 to 80	0	0%
81 to 90	3	2%
91 to 100	0	0%
TOTAL	**154**	**100%**

Figure 8.2.4 Pertmaster calculates 91 of 154 activities of John Doe project will never become critical, 19 activities have a 51% to 60% chance of becoming critical, only 3 have a 81% to 90% of becoming critical, none are guaranteed to be critical.

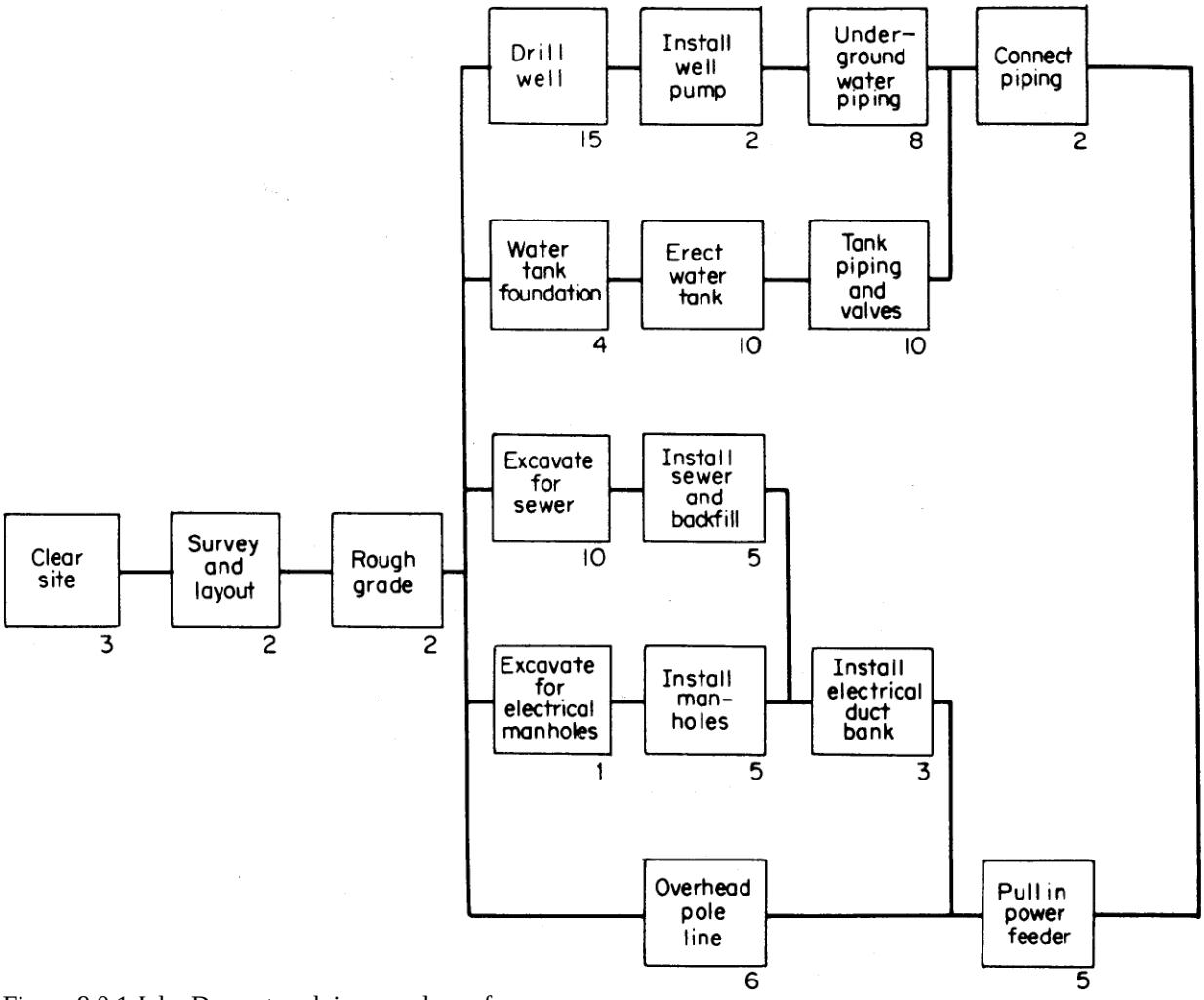


Figure 9.0.1 John Doe network in precedence form.

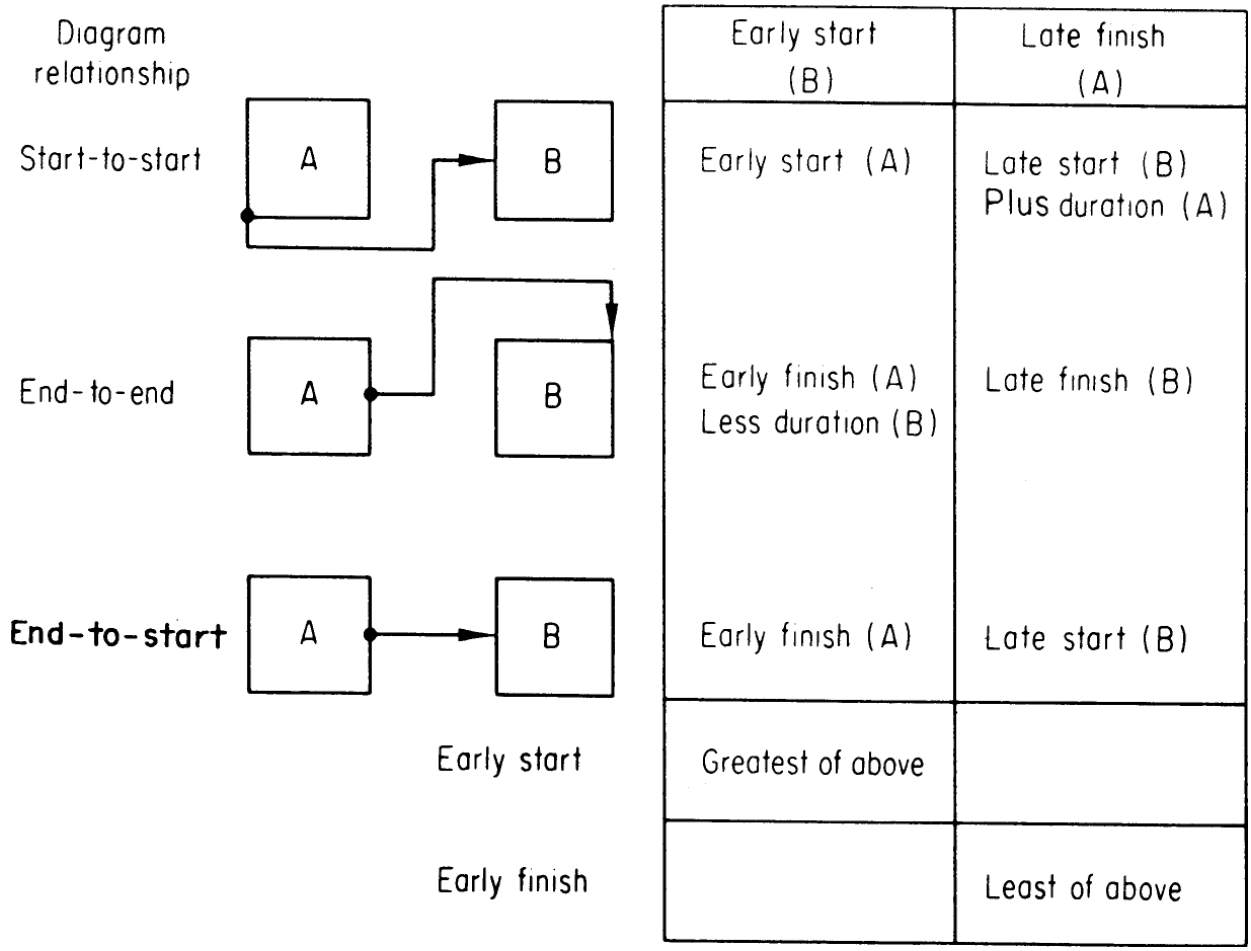


Figure 9.1.1 Typical precedence relations.

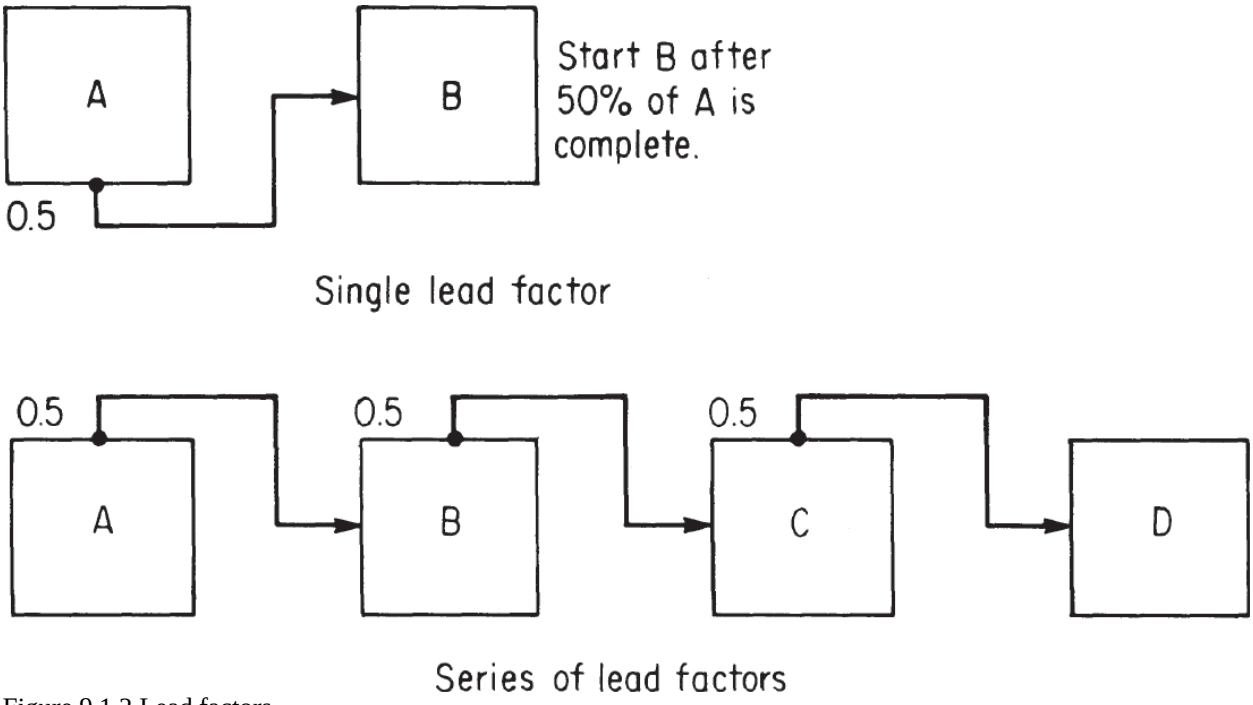


Figure 9.1.2 Lead factors.

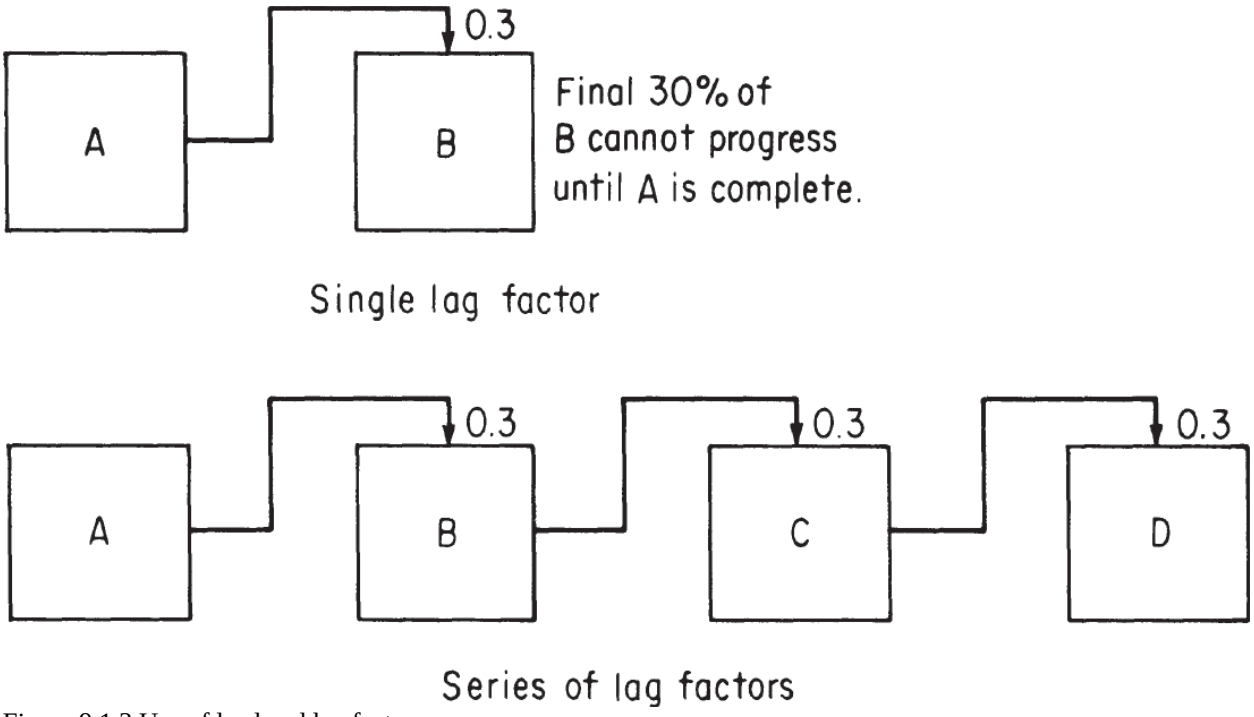


Figure 9.1.3 Use of lead and lag factors.

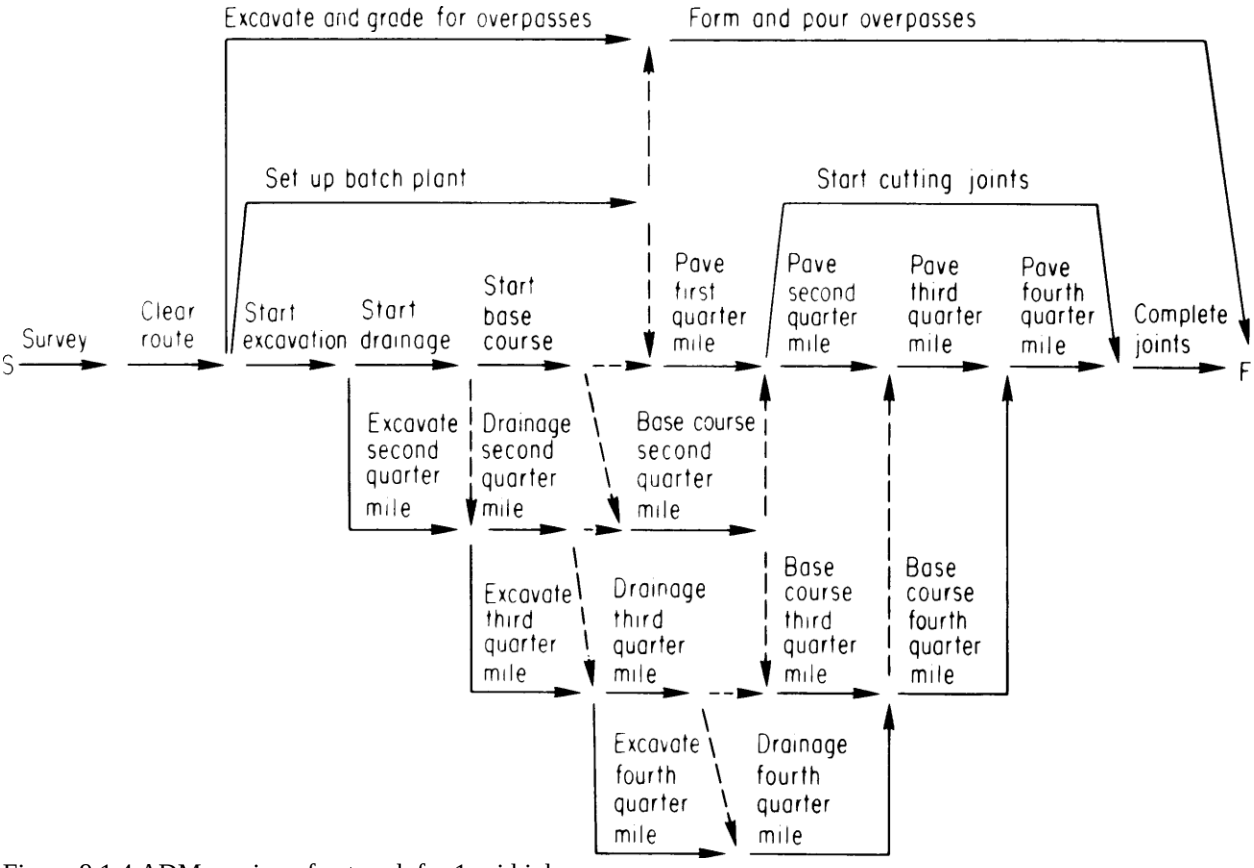


Figure 9.1.4 ADM version of network for 1-mi highway.

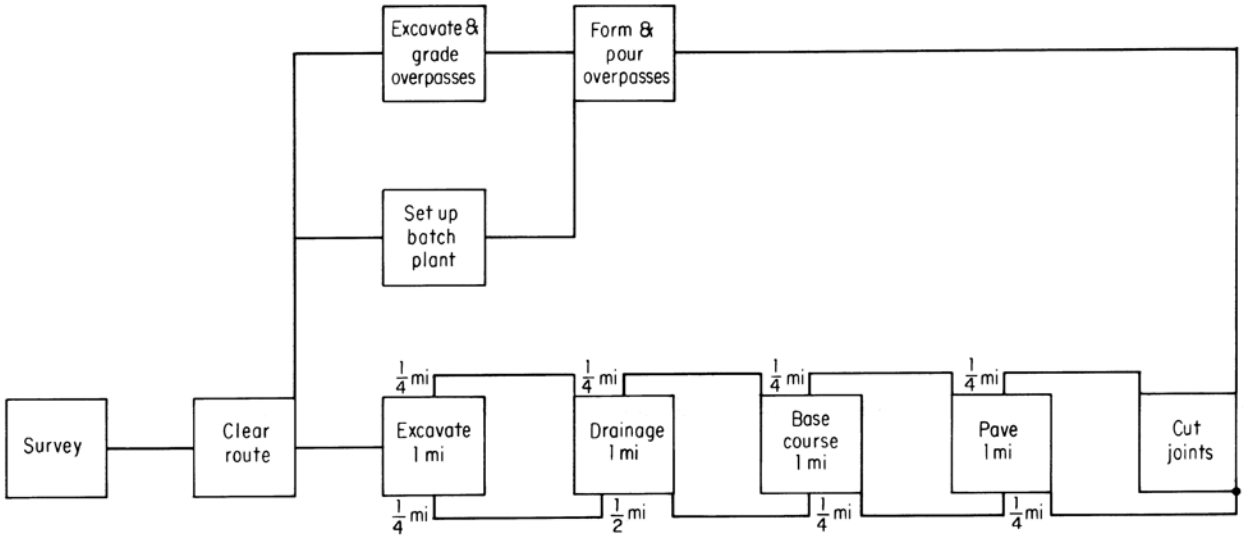


Figure 9.1.5 PDM version of network for 1-mi highway.

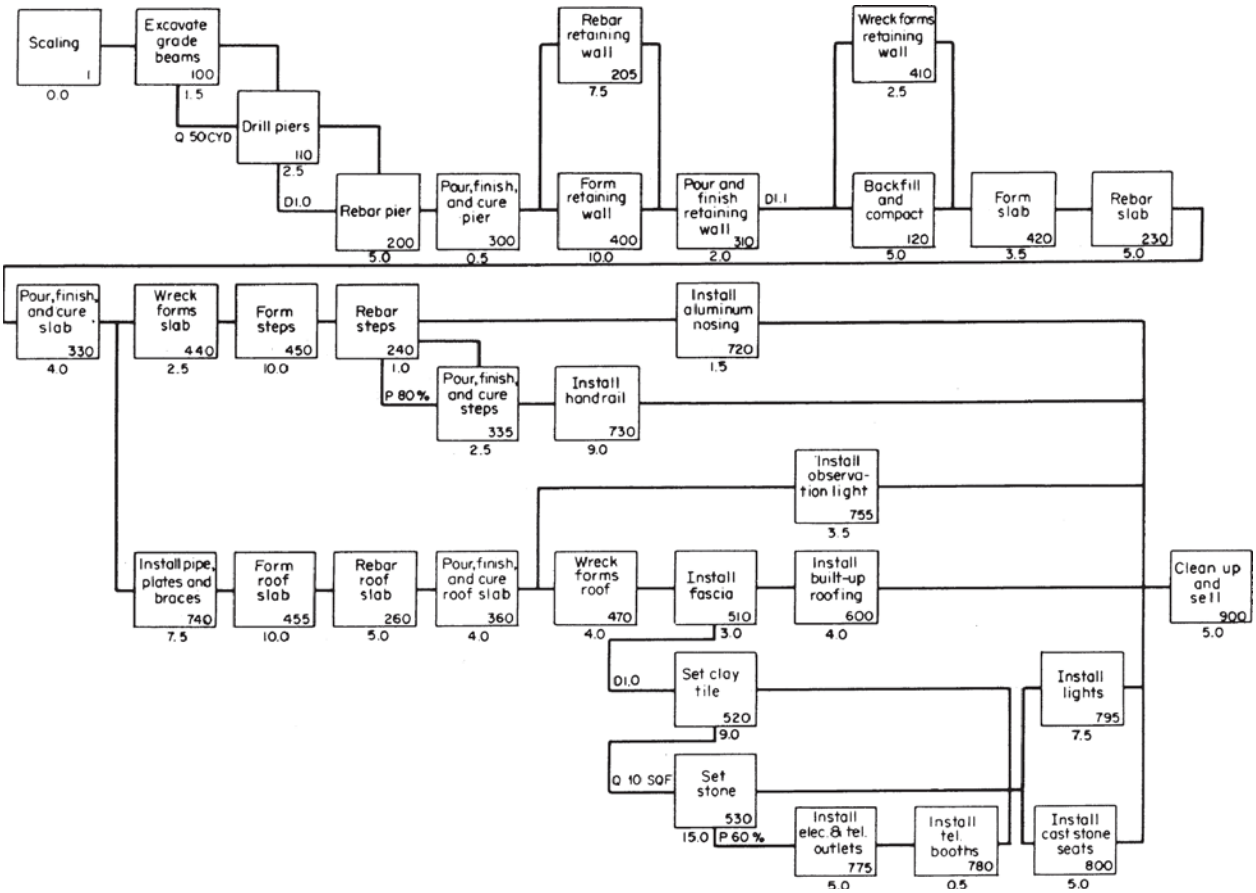
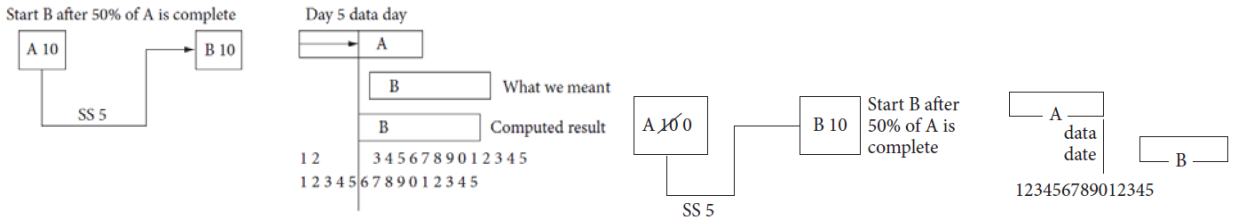


Figure 9.4.1 Precedence example



Figures 10.1.1, 10.1.2, 10.2.1 All illustrate “Start after 50%” is ambiguous

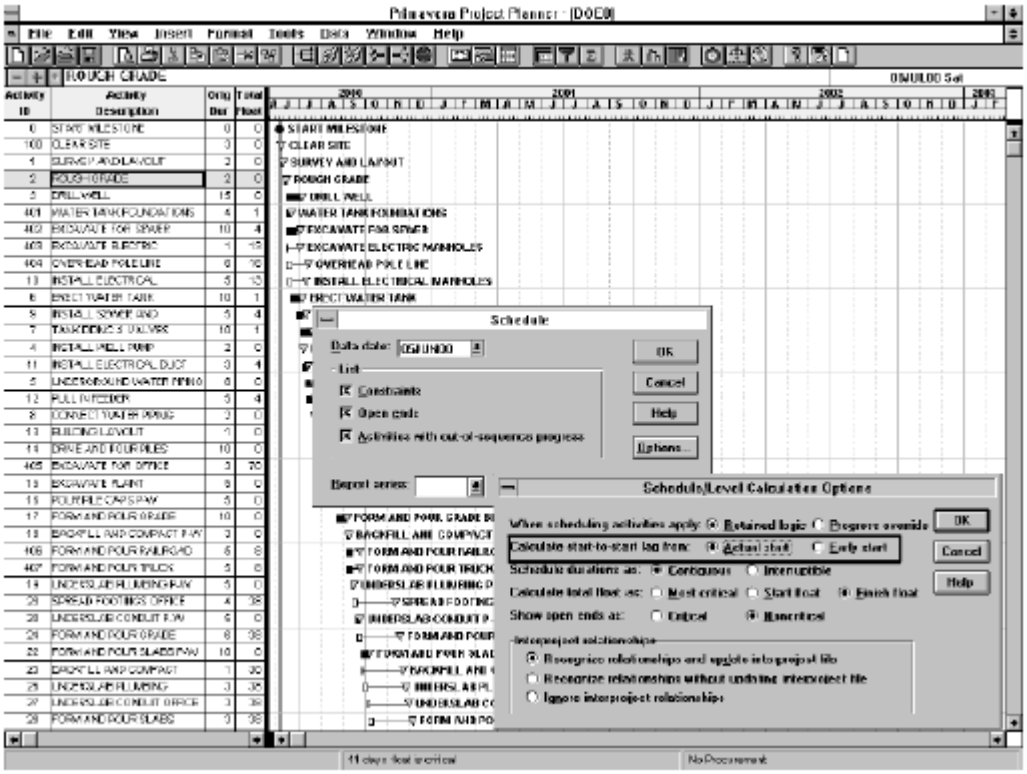


Figure 10.2.2 Actual start vs. Early start options

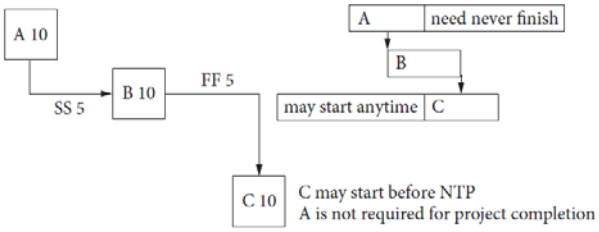


Figure 10.2.3 Orphaned relationships.

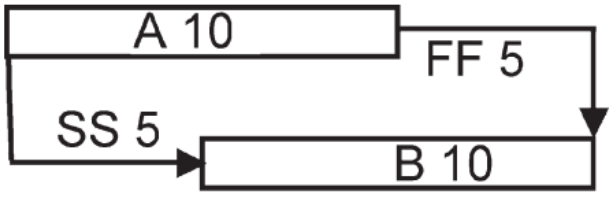


Figure 10.2.4 “SS5 + “FF5” equals MSCS “Z5” code.

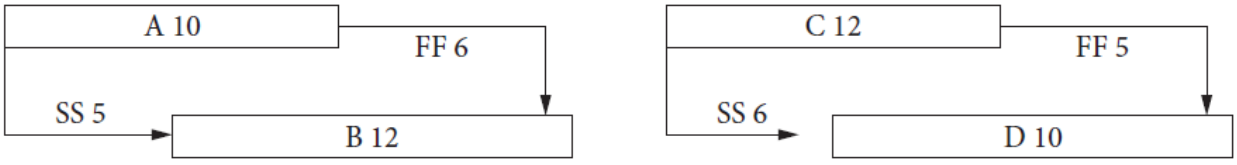


Figure 10.2.5 Passage type of lags. Note only one lag will drive second activity if durations are not equal.

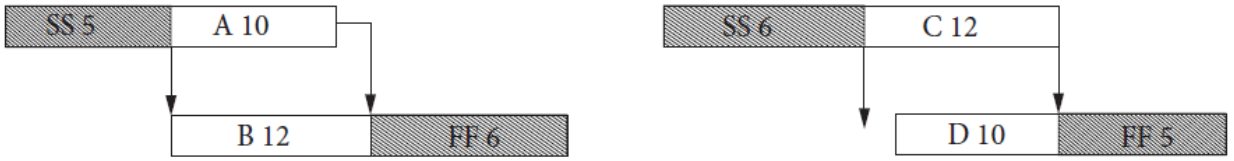


Figure 10.2.6 Progress type of lags.

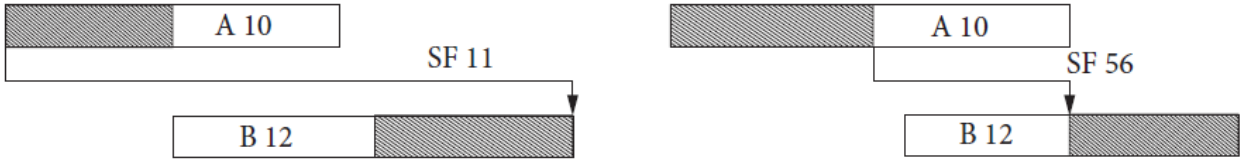


Figure 10.2.7 Examples of passage versus progress type of start-to-finish lag

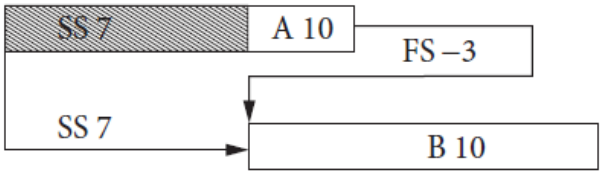


Figure 10.3.1 FS negative 3 equals SS plus 7.

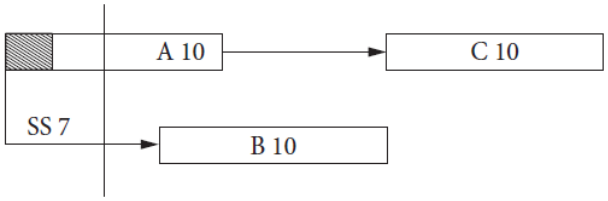


Figure 10.4.1 2 days progress over 5 days – B starts when?

```
TD-01                                                                    DINI

                ORIG
I NODE J NODE    DUR                      DESCRIPTION
------ ------   -----  ------------------------------------------------
    2      3       2   ROUGH GRADE
    3     13      27*  Hammock #1
    3      4      15   DRILL WELL
    3      6       4   WATER TANK FOUNDATIONS
    3      9      10   EXCAVATE FOR SEWER
    3     10       1   EXCAVATE ELECTRIC MANHOLES
    3     12       6   OVERHEAD POLE LINE
    4      5       2   INSTALL WELL PUMP
    5      8       8   UNDERGROUND WATER PIPING
    6      7      10   ERECT WATER TANK
    7      8      10   TANK PIPING & VALVES
    8     13       2   CONNECT WATER PIPING
    9     11       5   INSTALL SEWER AND BACKFILL
   10     11       5   INSTALL ELECTRICAL MANHOLES
   11     12       3   INSTALL ELECTRICAL DUCT BANK
   12     13       5   PULL IN FEEDER
   13     14       1   BUILDING LAYOUT
--------------------------------------------------------------------------------
ACT ID:            DES:                          RES:          ACC:
--------------------------------------------------------------------------------
Commands: Add Copy Delete Edit Help Insert-res Next Return autoSort Table
```

Figure 10.6.1a Hammock in ADM

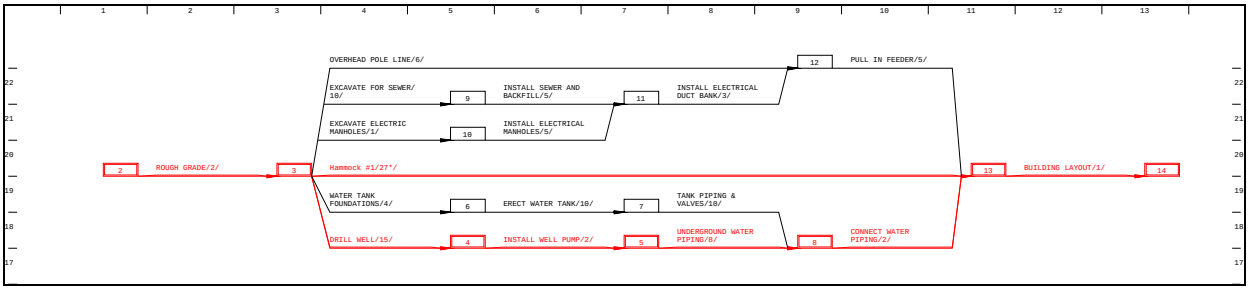


Figure 10.6.1b Hammock in ADM

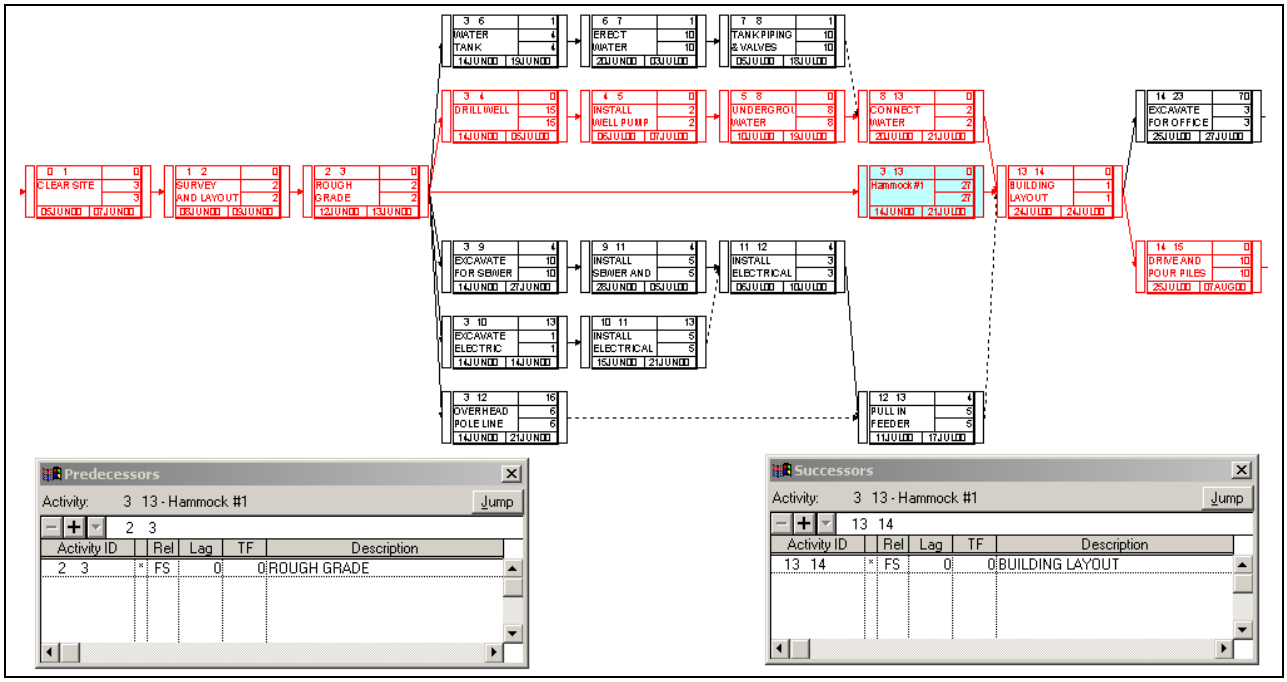


Figure 10.6.1c Hammock in ADM

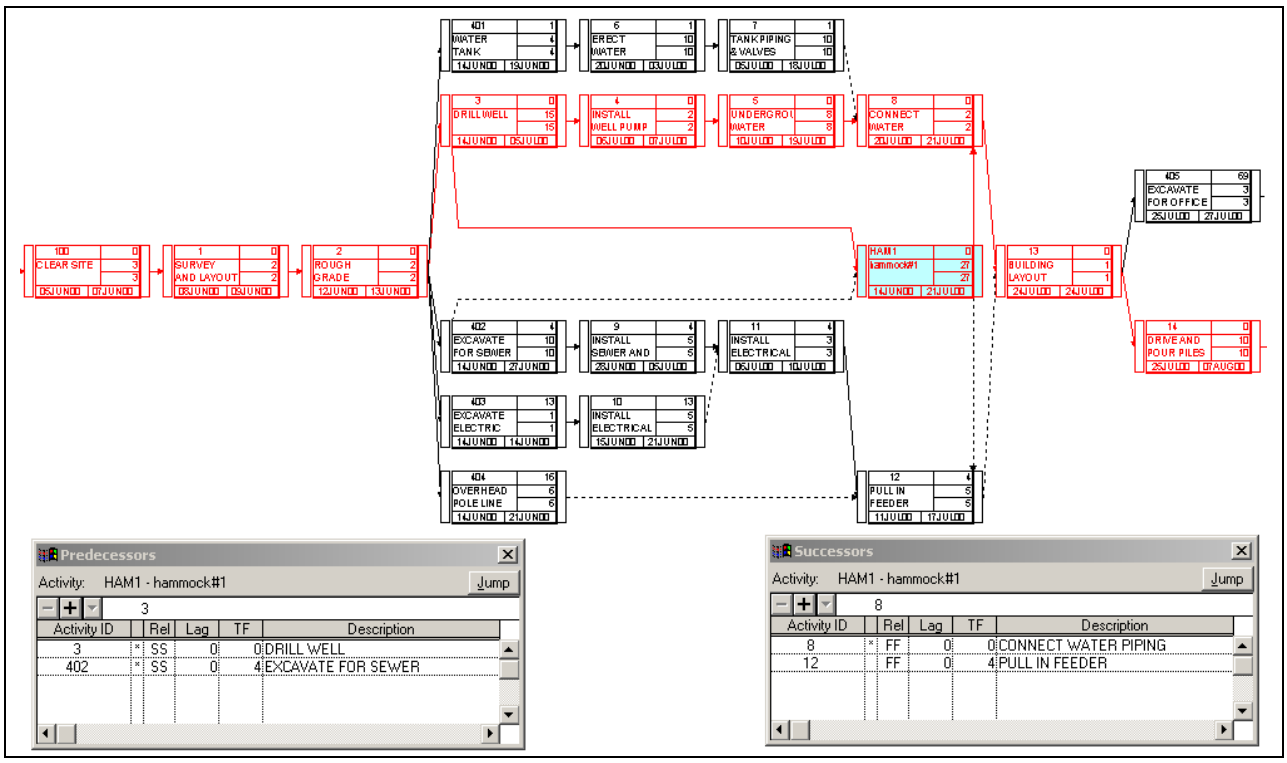


Figure 10.6.2 Hammock in PDM

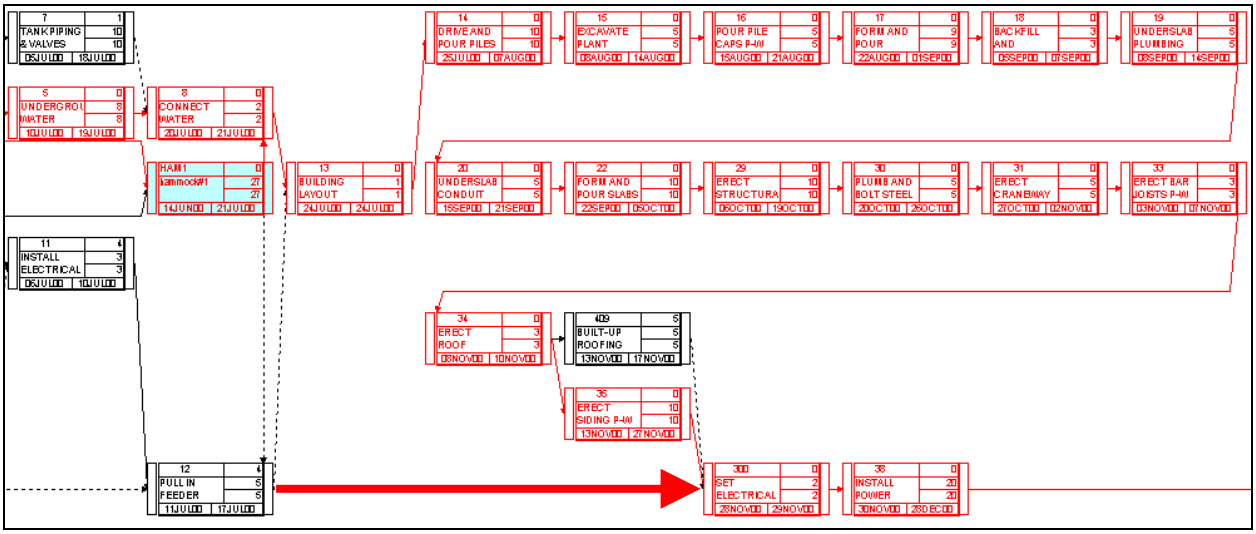


Figure 10.6.3 Cannot create a hammock from Activity #12 to #300 as start of #13 is driven by #8

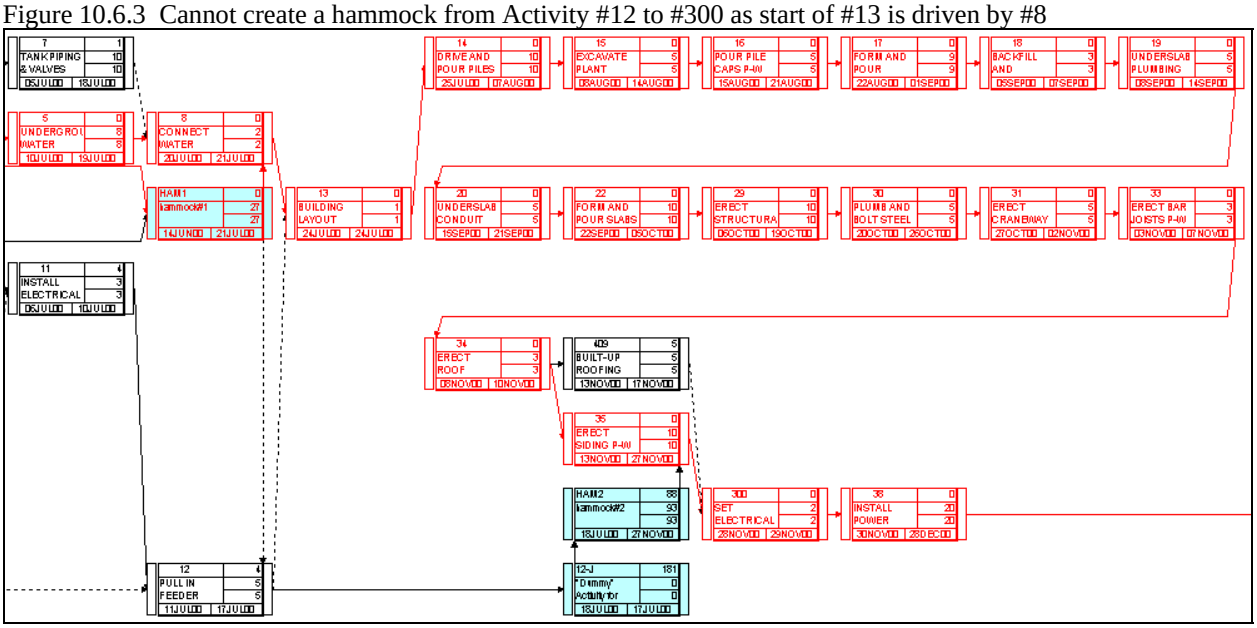


Figure 10.6.4 Cannot create a hammock from Act #12 to #300 in PDM except with “dummy” activity

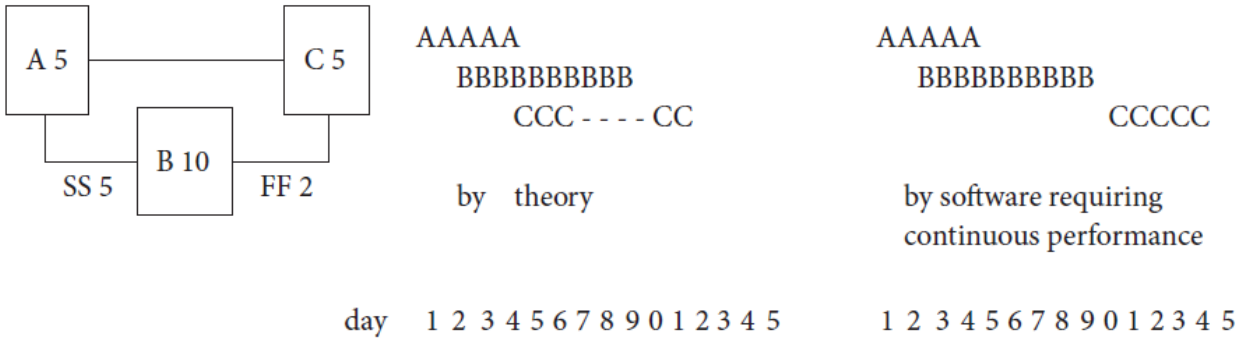


Figure 10.7.1 Interruptible versus continuous progress

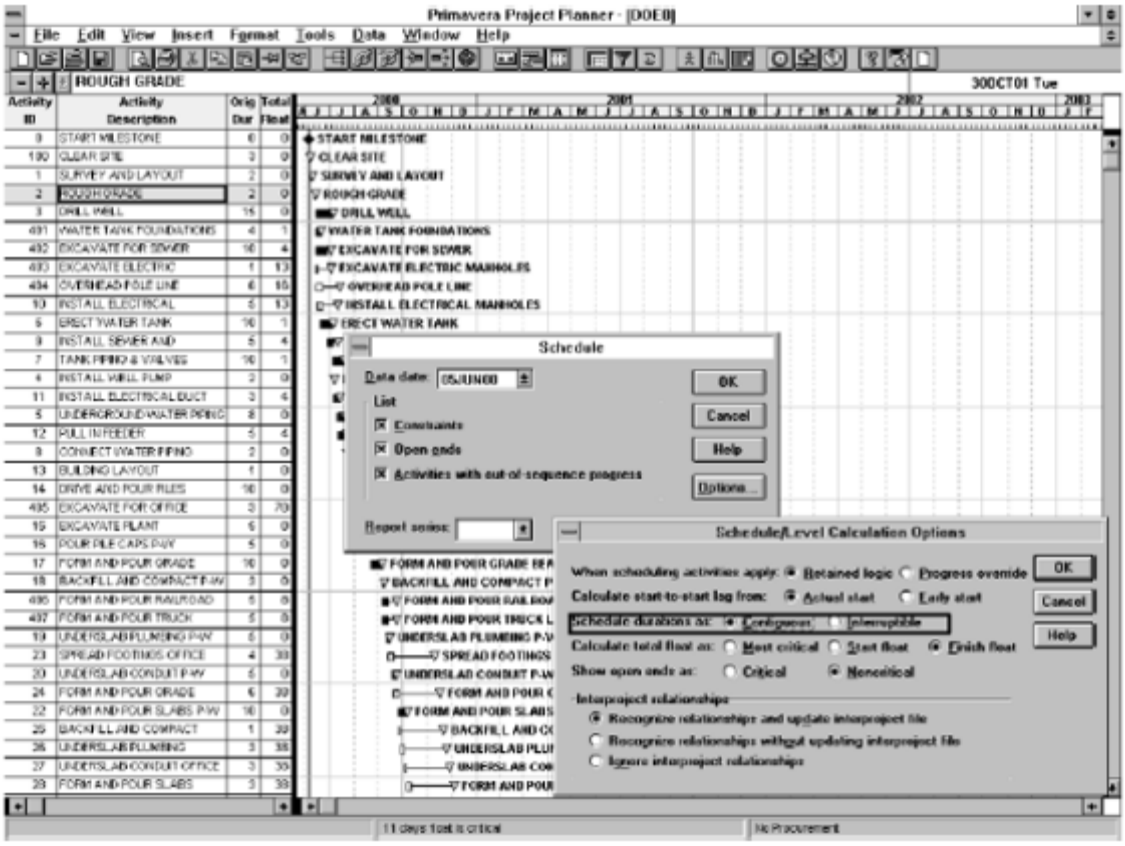


Figure 10.7.2 Choice of contiguous versus interruptible options

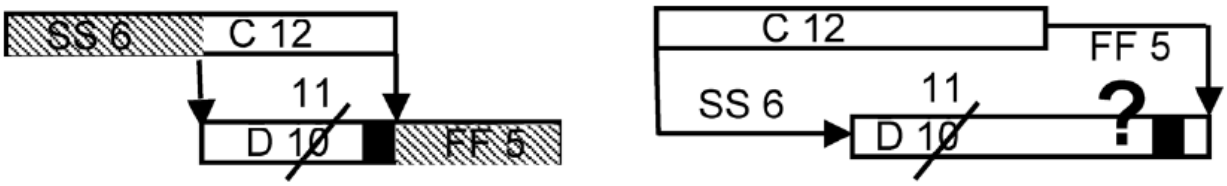


Figure 10.7.3 Continuous versus interruptible duration for progress versus passage type of lag.

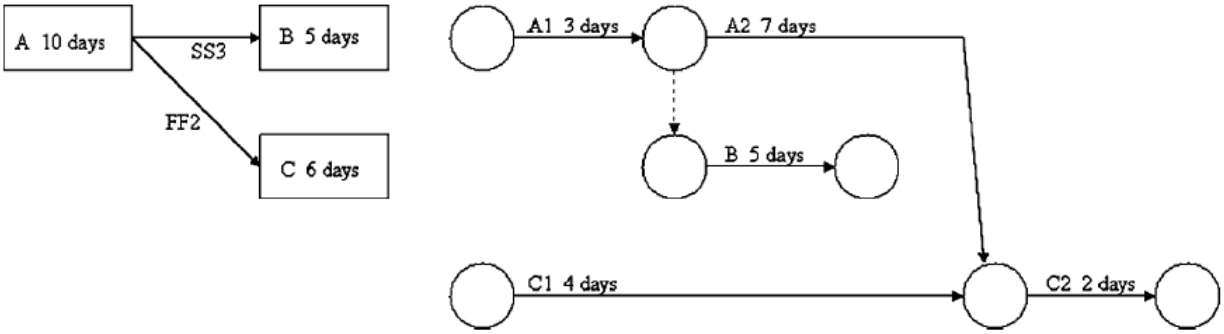


Figure 10.8.1 Conversion of PDM to ADM.

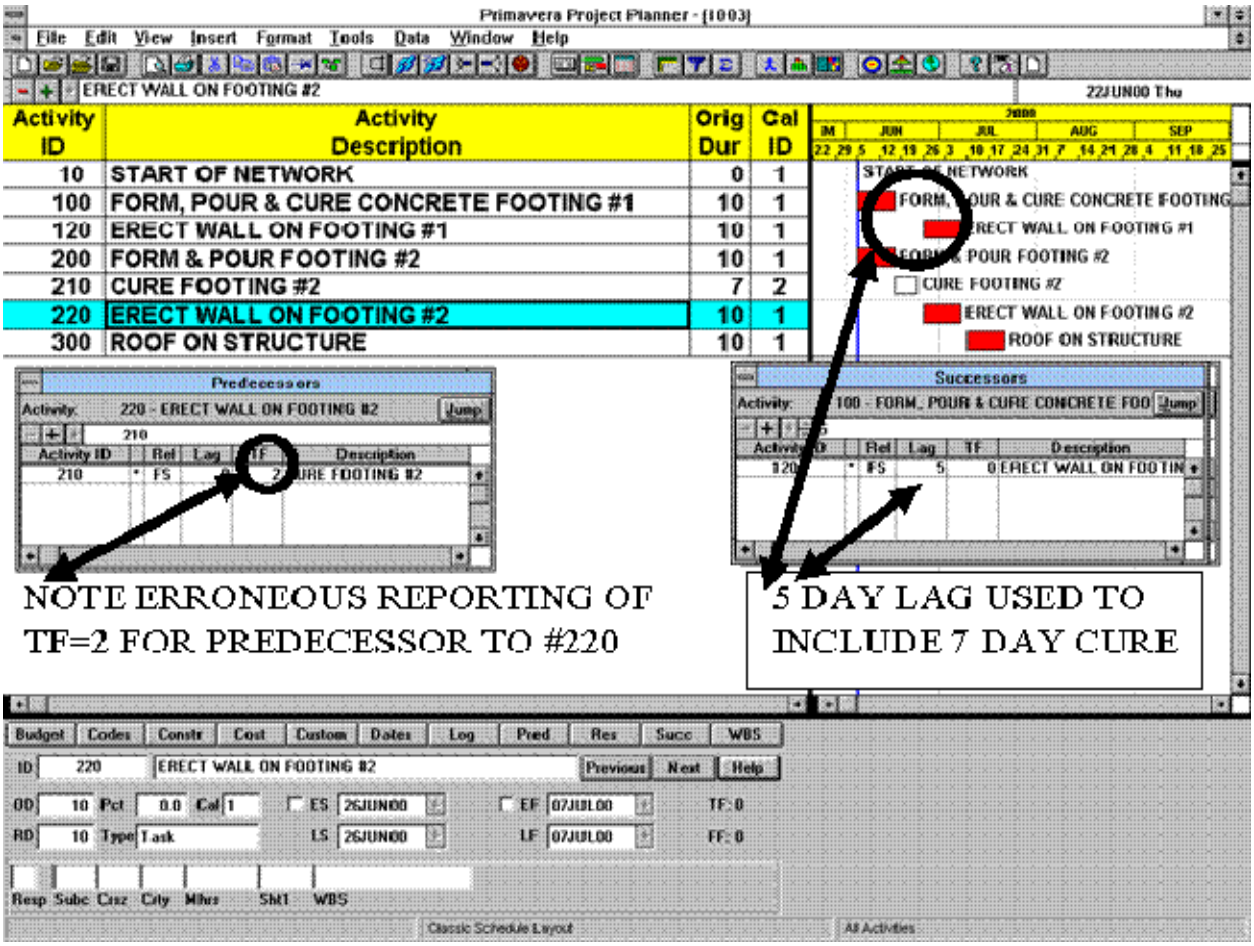


Figure 10.9.1 Problems with multiple calendars.

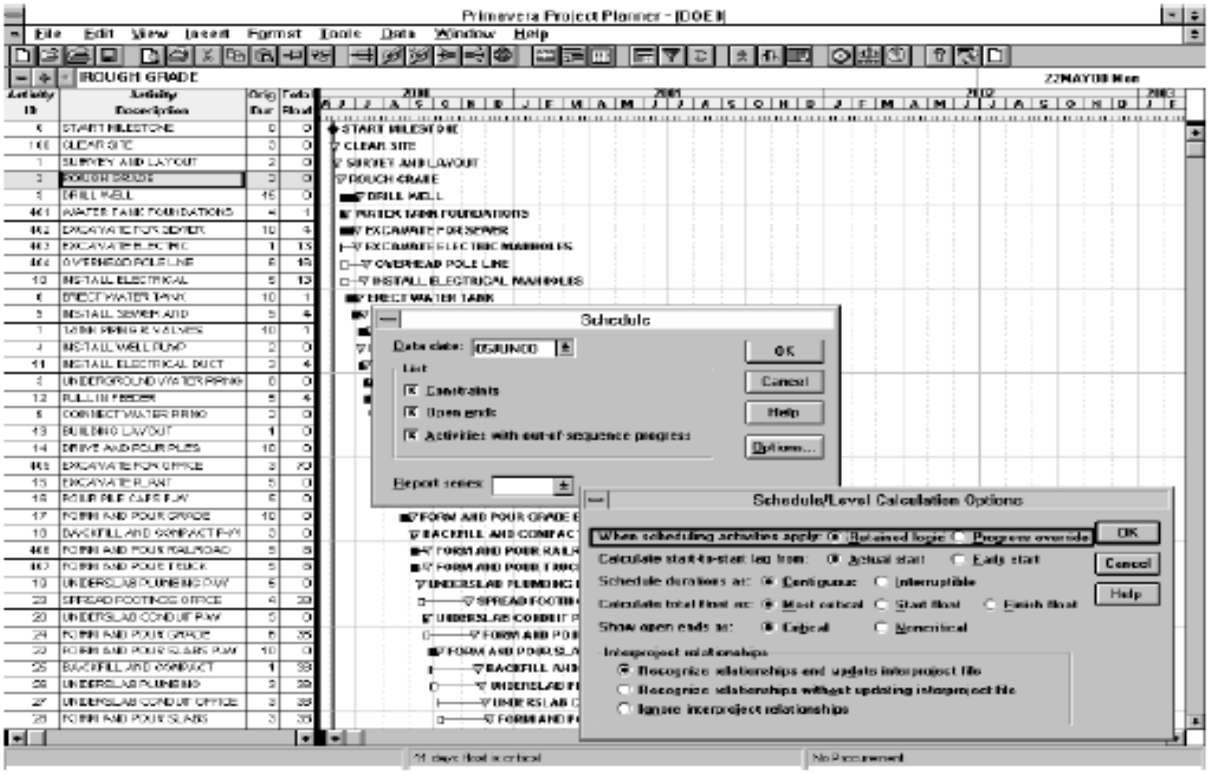


Figure 10.10.1 Retained Logic vs. Progress Override options.

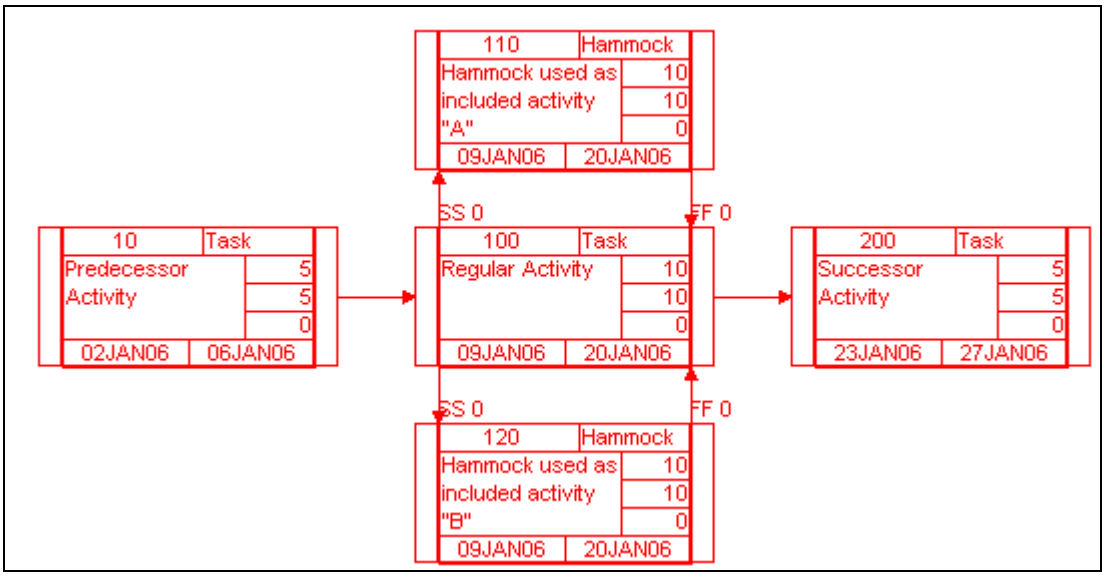


Figure 10.12.2 Hammock as included activity accepted by P3 and SureTrak, but not by P3e/c

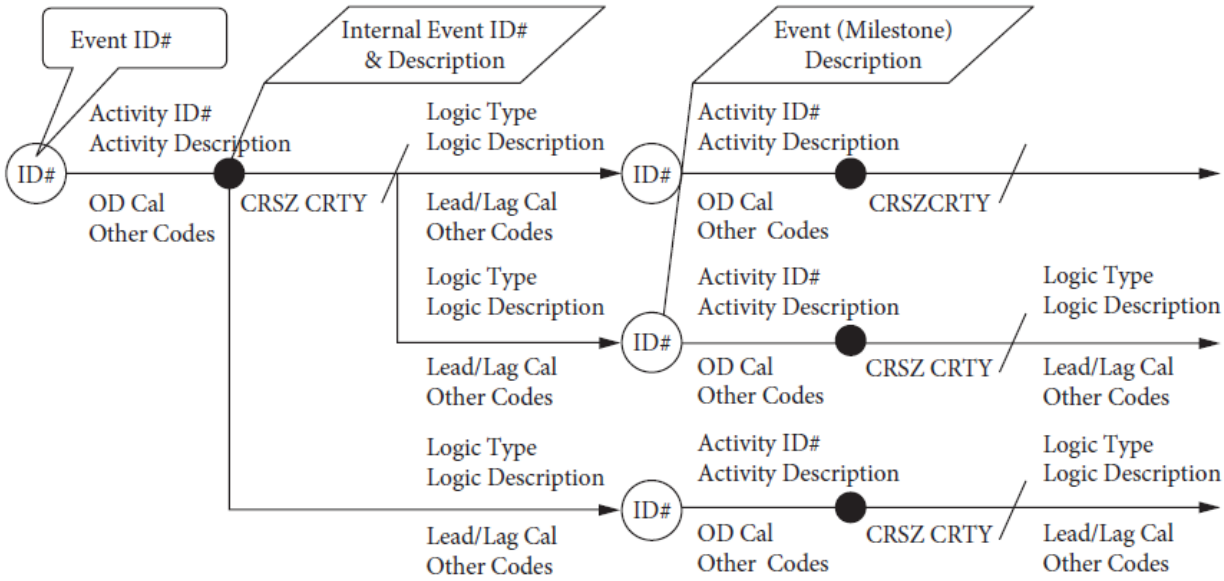


Figure 11.1.1 Elements of a RDCPM® Logic Network.

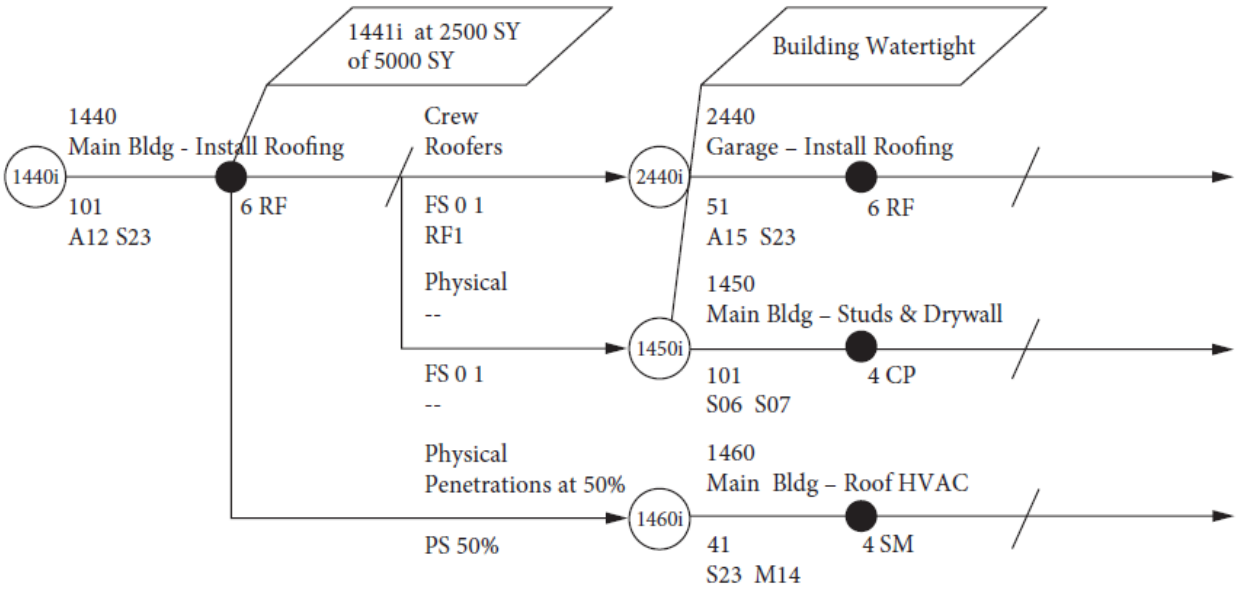


Figure 11.1.2 Example of a segment of a RDCPM® Logic Network.

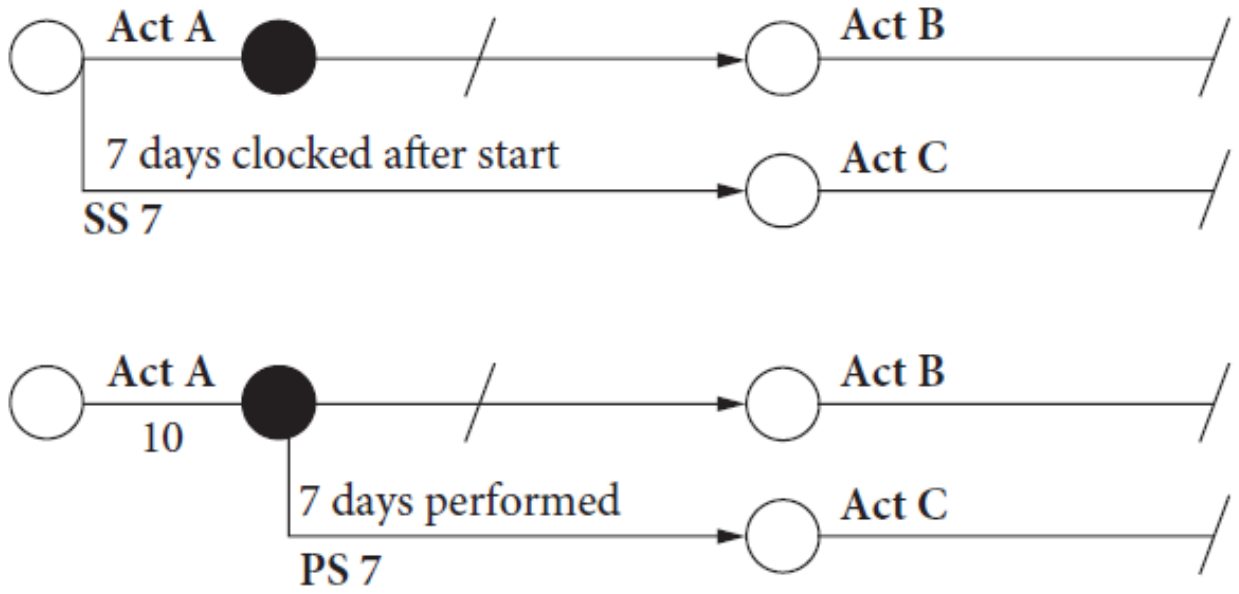


Figure 11.1.3 RDM distinguishes Start-to-Start from Progressed-to-Start.

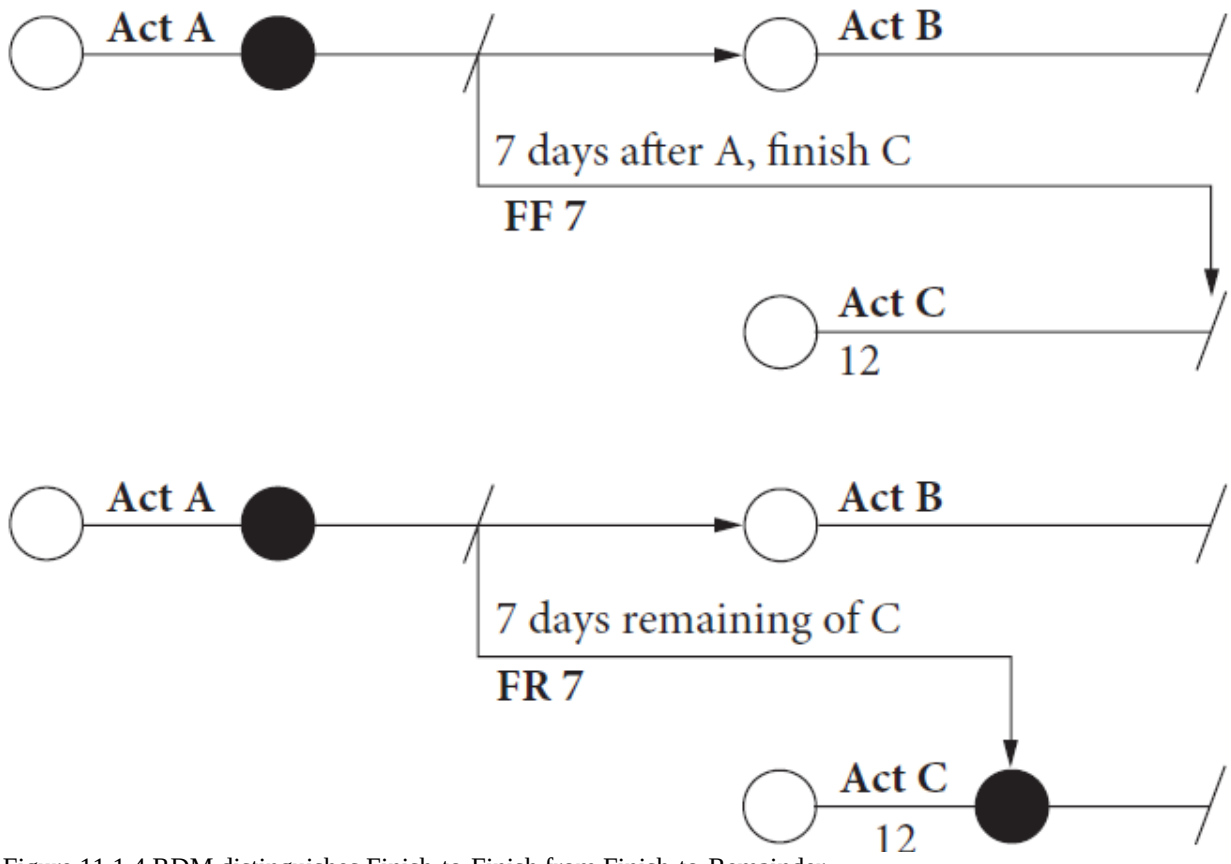


Figure 11.1.4 RDM distinguishes Finish-to-Finish from Finish-to-Remainder.

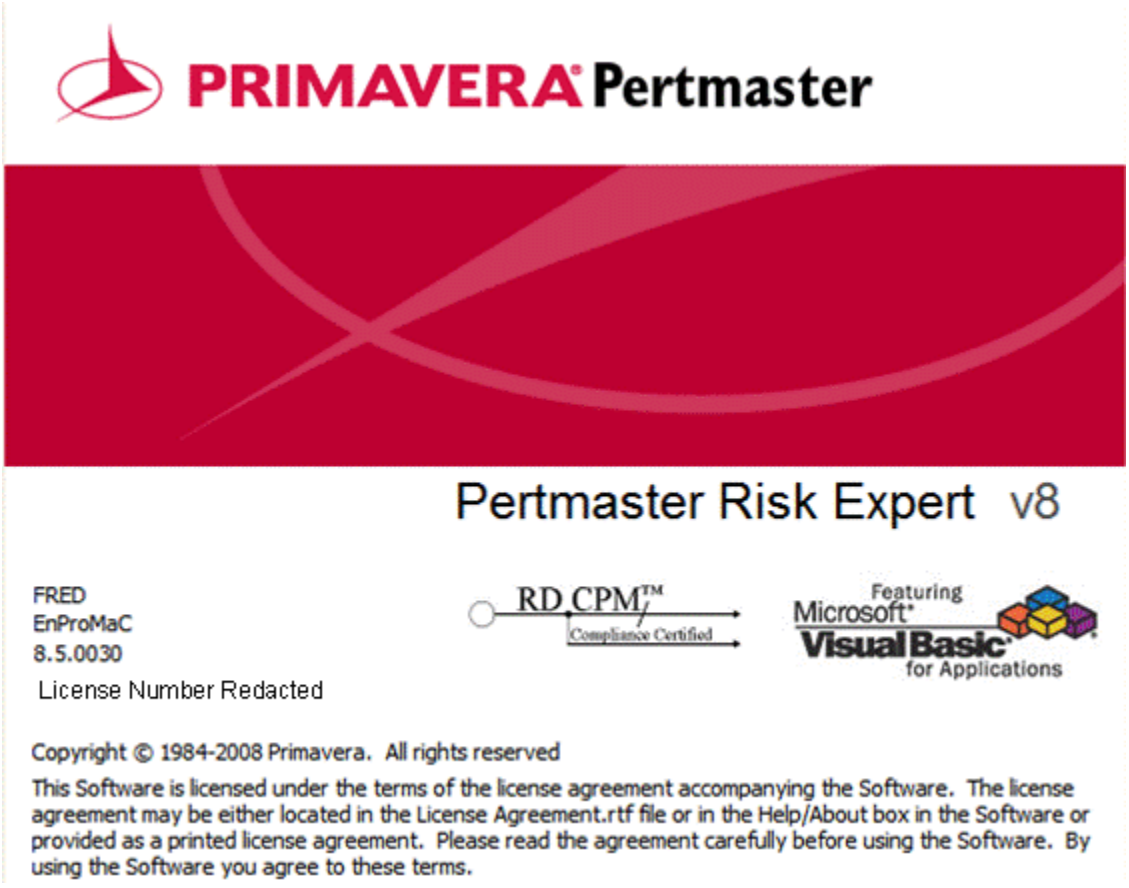


Figure 11.5.1 Opening flash screen

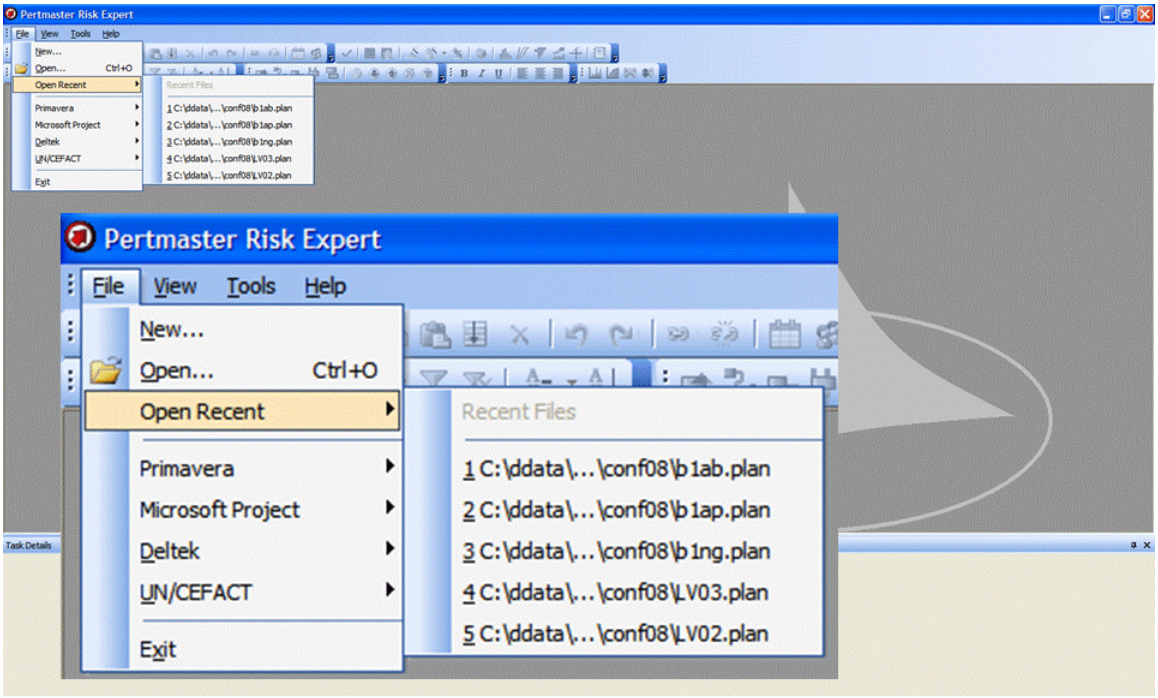


Figure 11.5.2 Options to start new, open existing, open recent , or import a project

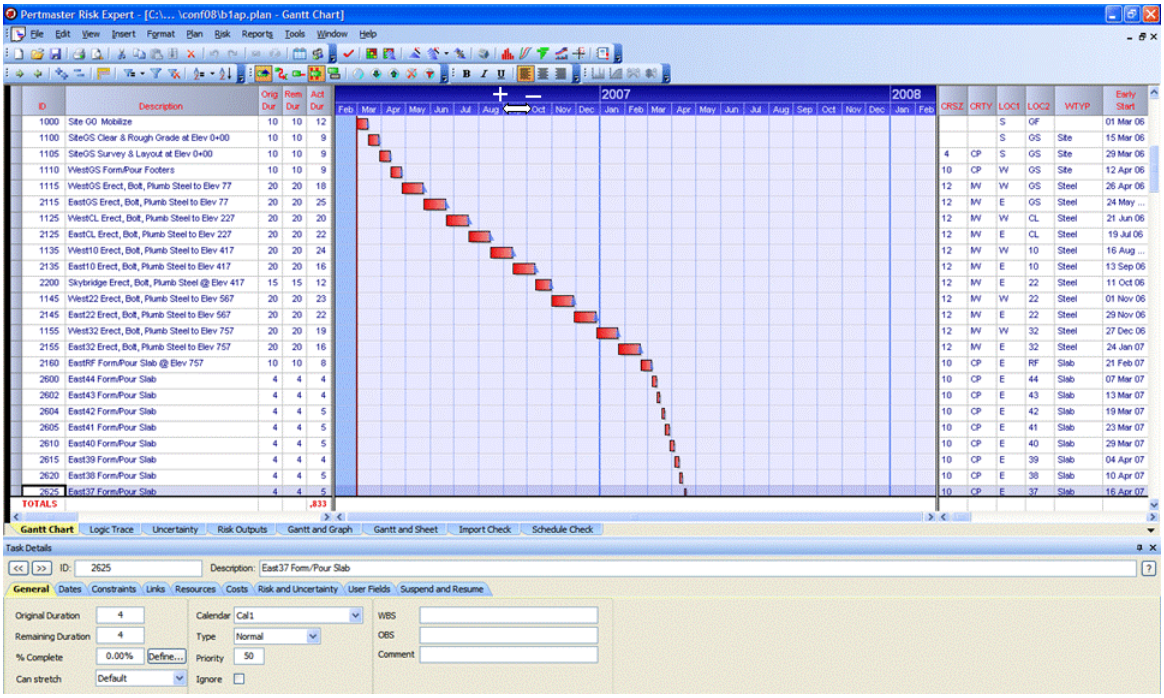


Figure 11.5.3 Opening screen for a project

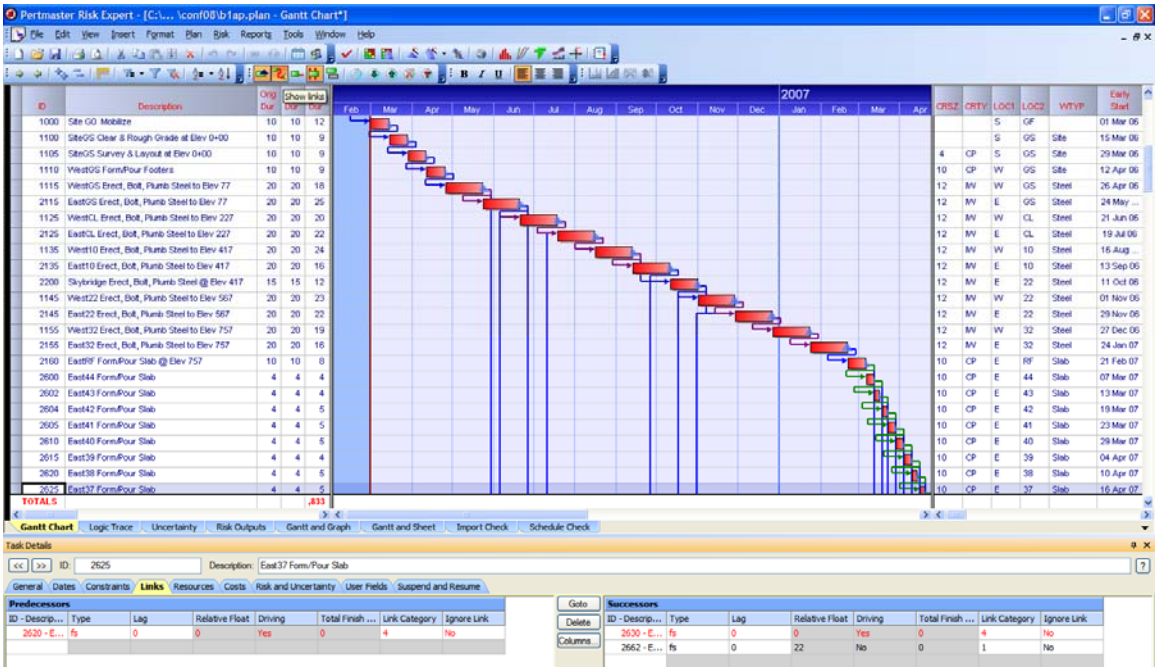


Figure 11.5.4 Choosing to display the restraints between activities

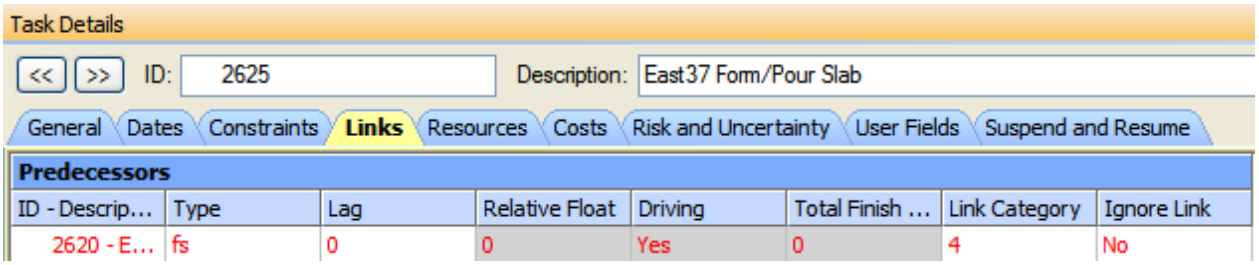


Figure 11.5.5 Detail of data on restraints (or links)

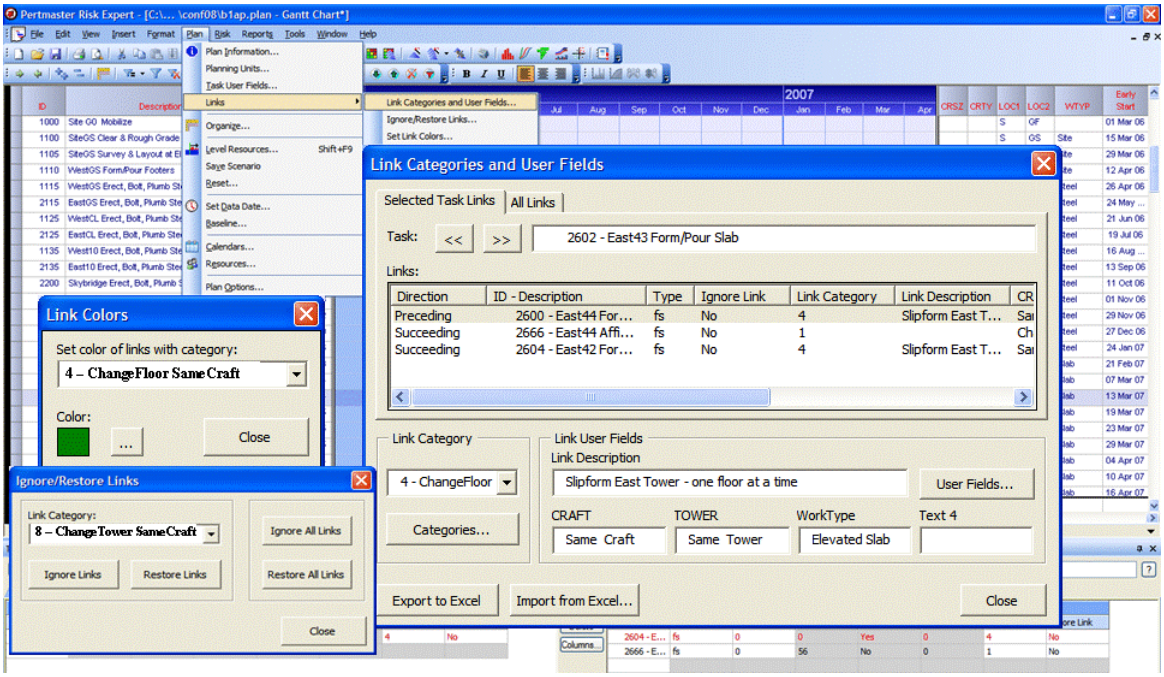


Figure 11.5.6 Dialog boxes for setting data details on restraints

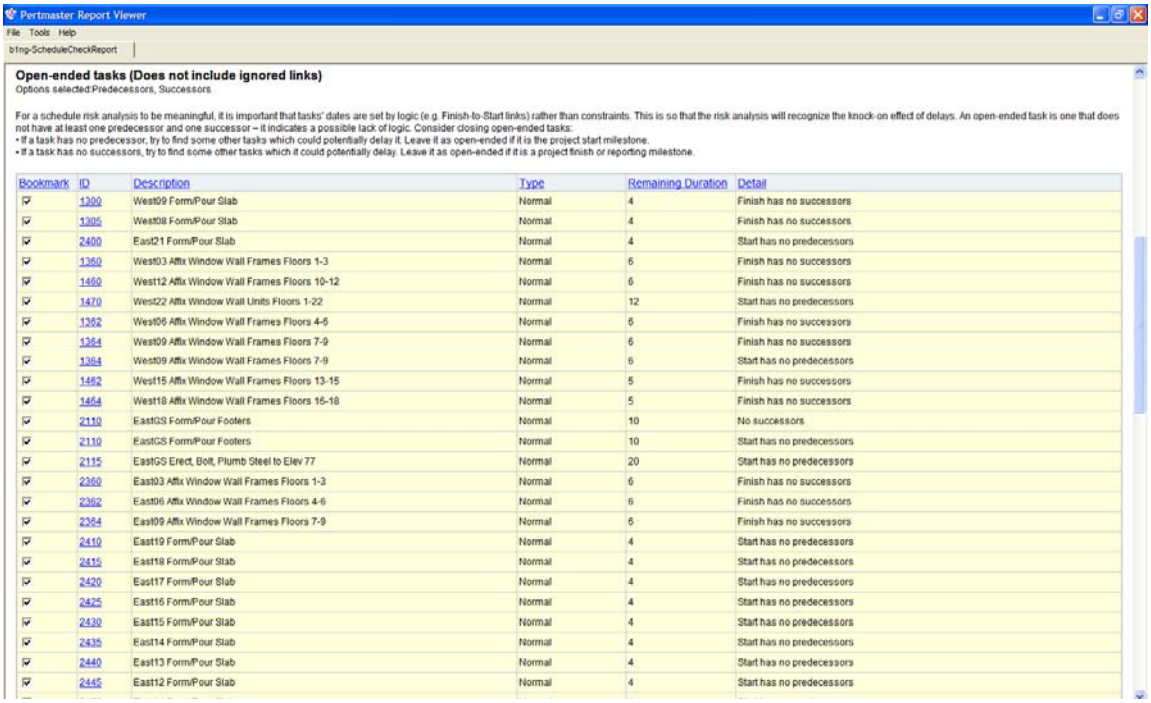


Figure 11.5.7 List of activities without physical predecessors

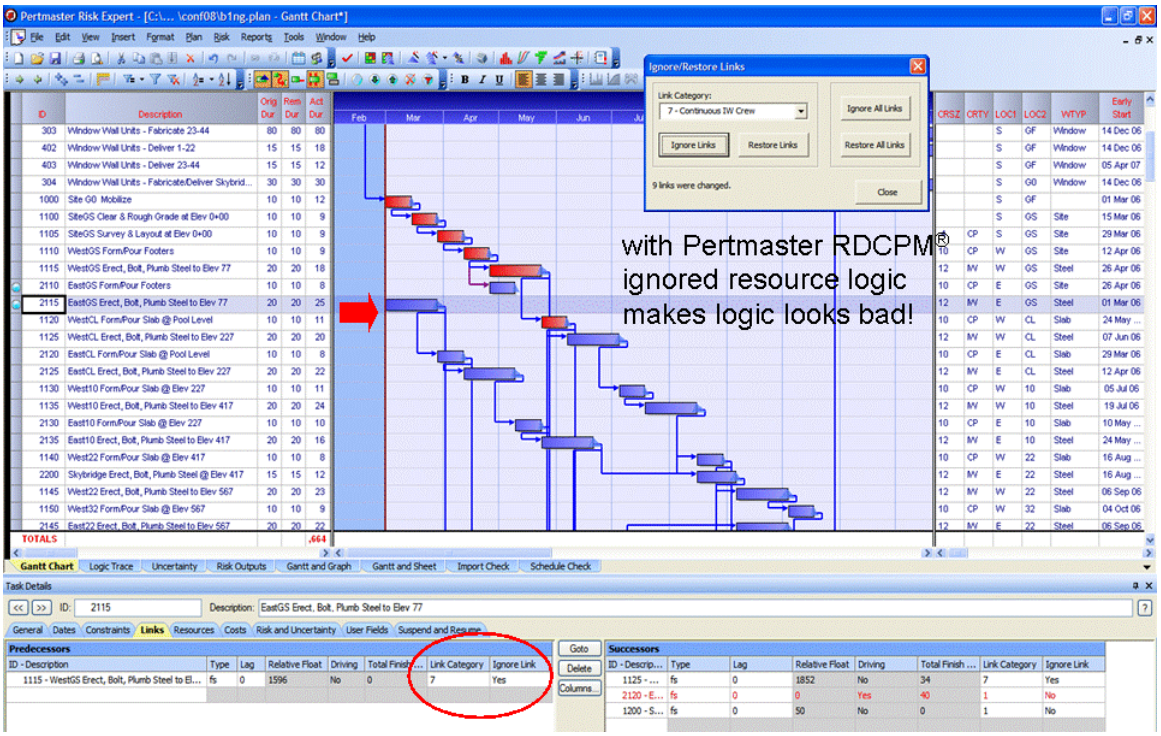


Figure 11.5.8 Example where restraints for movement of ironworker crew are globally Ignored

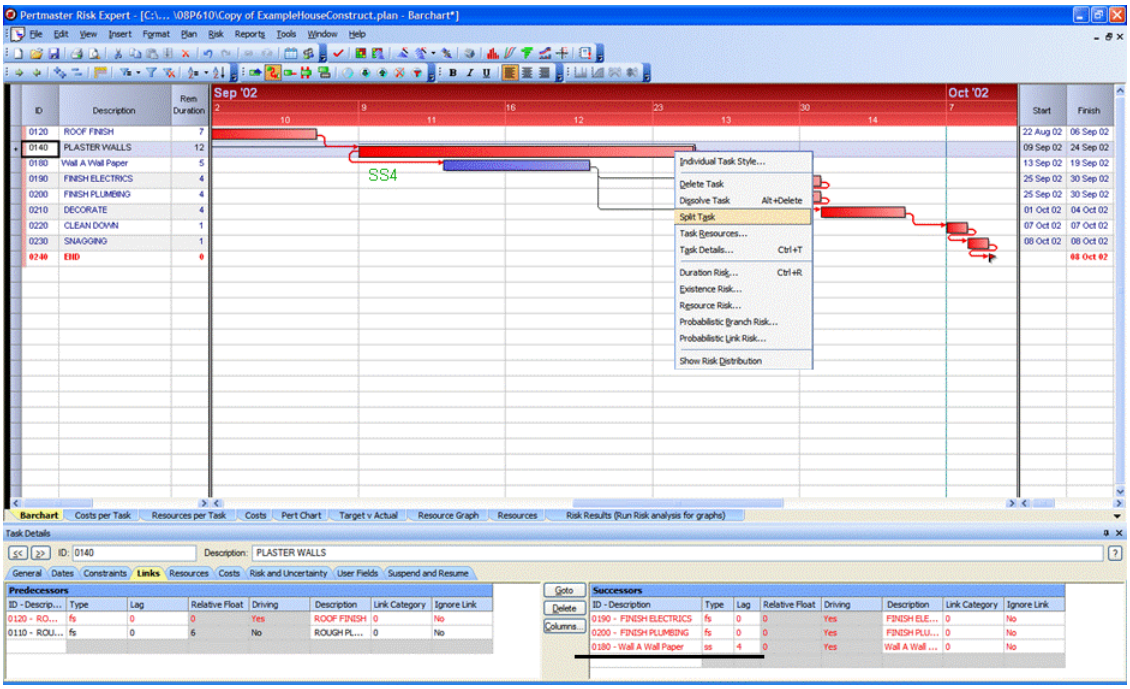


Figure 11.5.9 Wallpaper to be applied after one of several walls is plastered – prepare to split activity

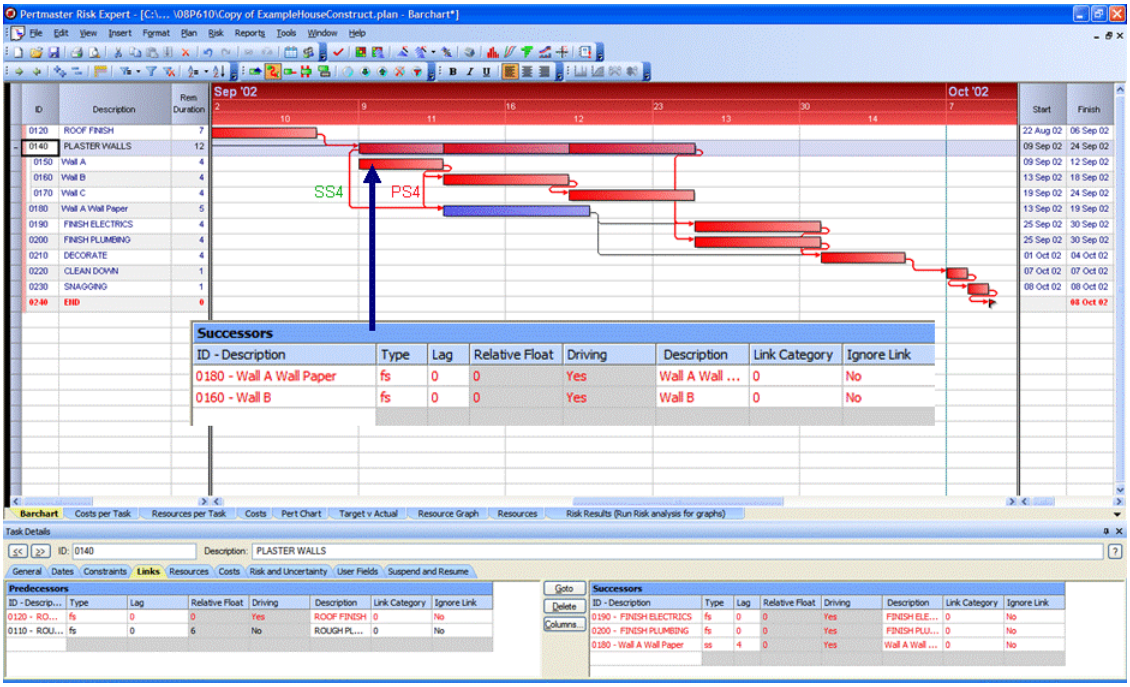


Figure 11.5.10 Activity 140 is split, a virtual PS4 restraint created to Activity 180

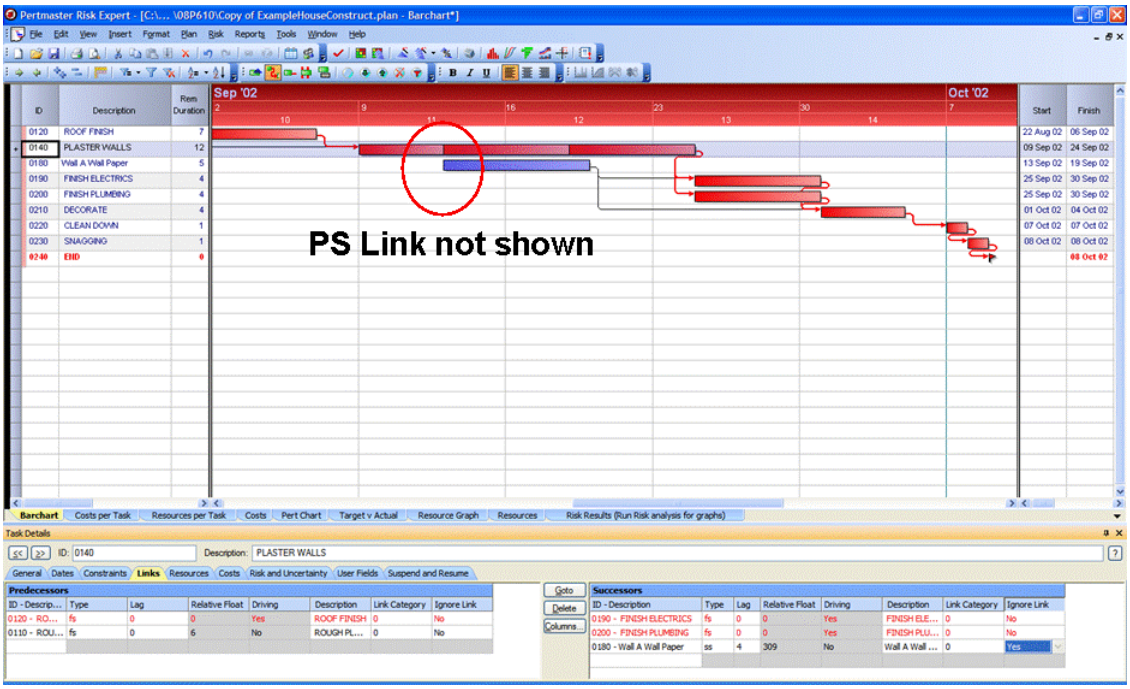


Figure 11.5.11 PS4 logic from activity 150 portion of 140 to 180 is not shown

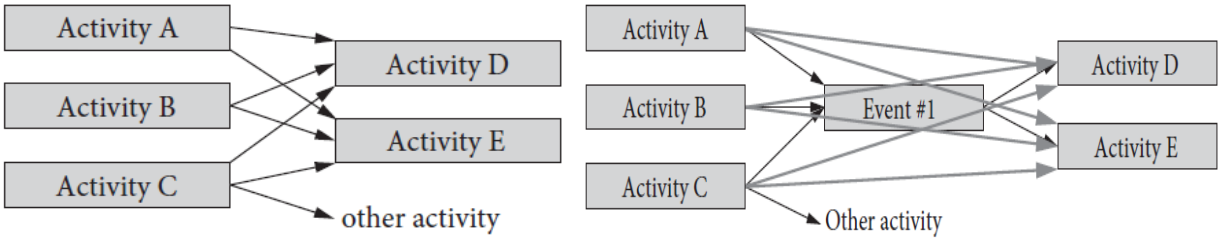


Figure 11.6.1 and 11.6.2 Choke point of three activities to two activities – Event created at choke point.

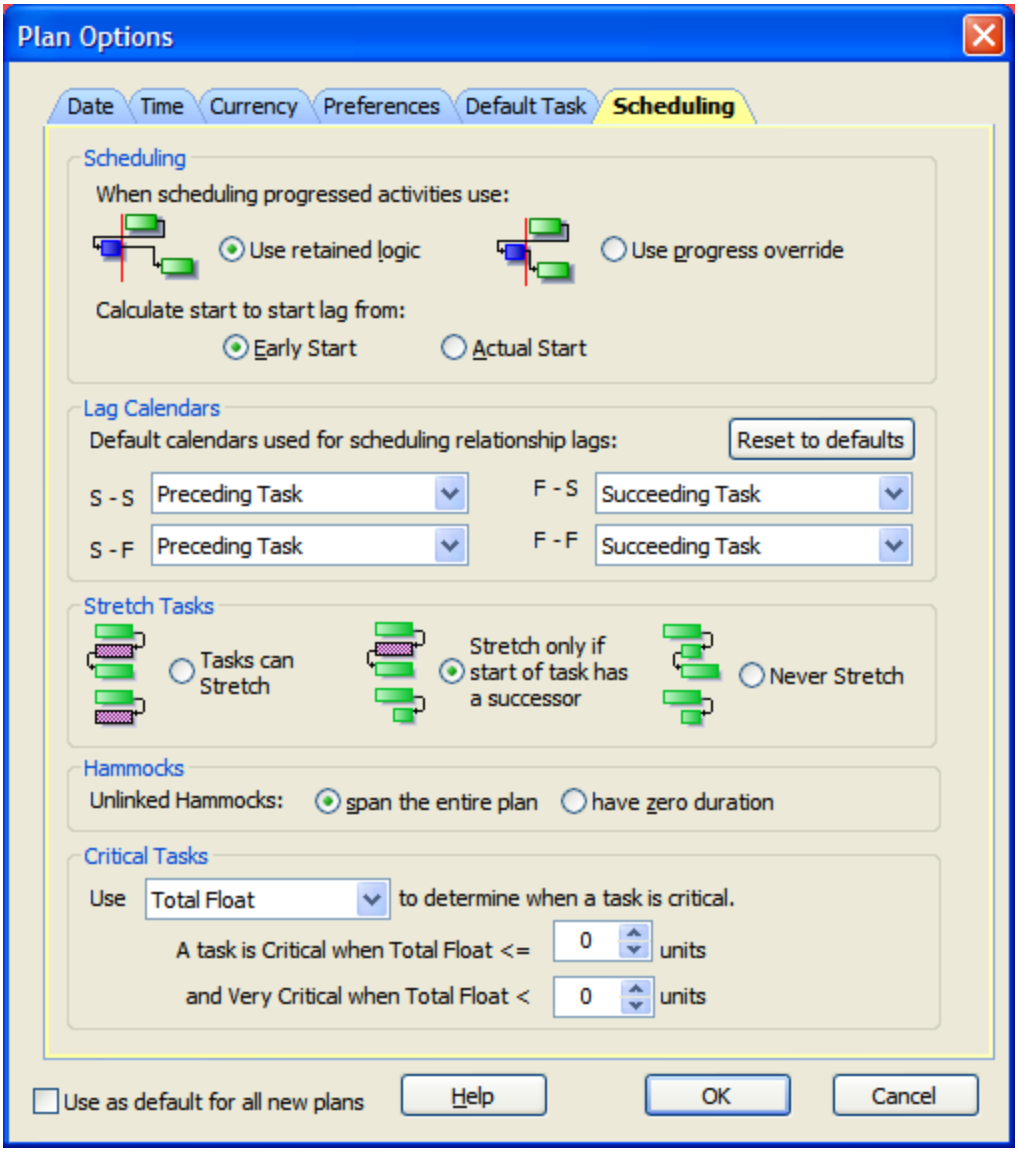


Figure 11.6.3 Pertmaster supports stretched duration activities

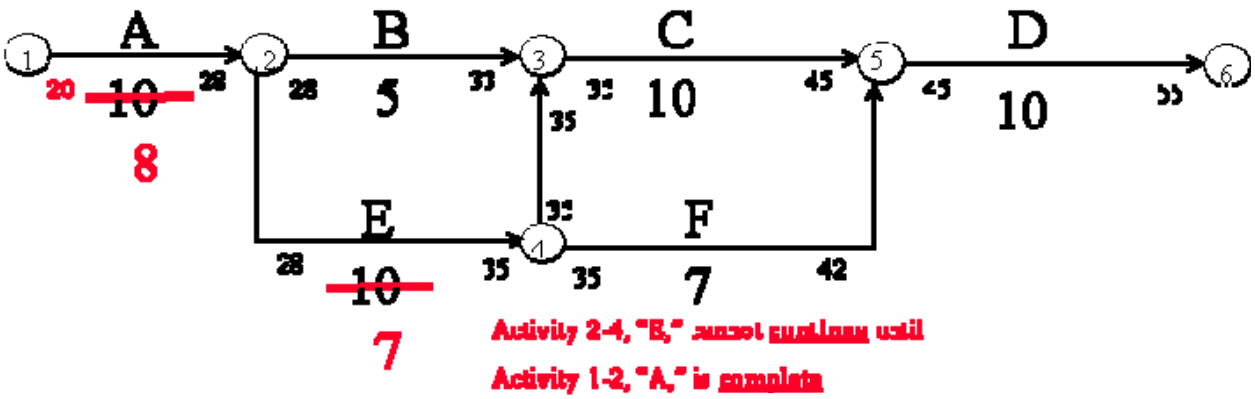


Figure 11.6.4 Retained Logic option.

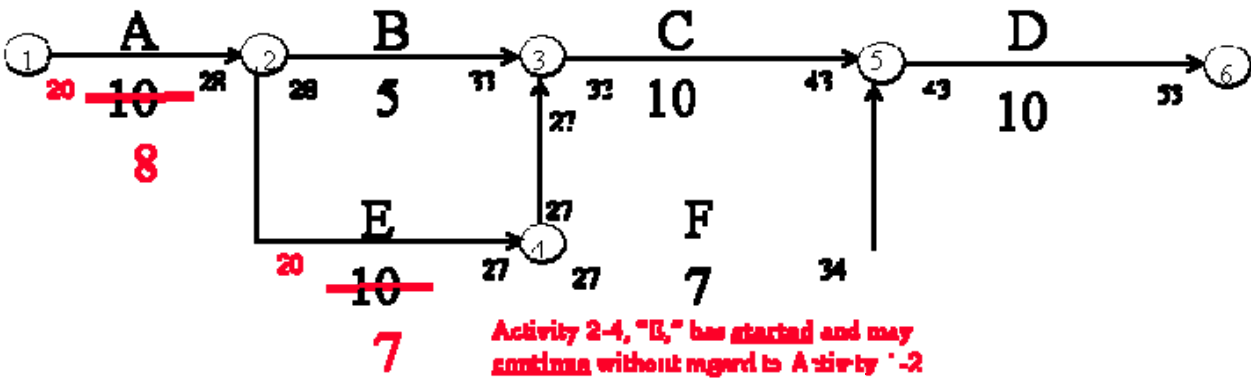


Figure 11.6.5 Progress Override option.

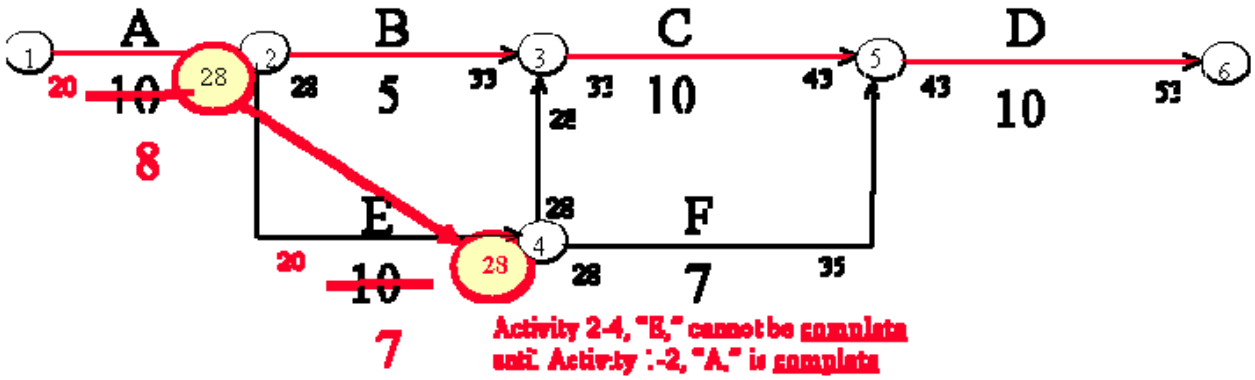


Figure 11.6.6 Modified Out-of-Sequence option.

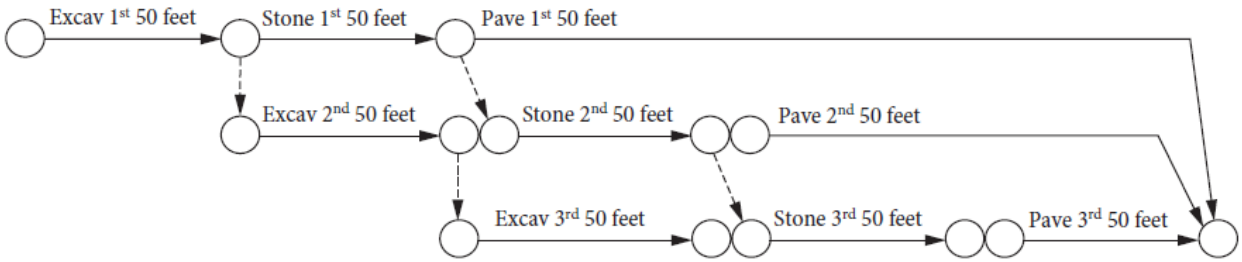


Figure 11.6.9 ADM means to show overlap of physical activities.

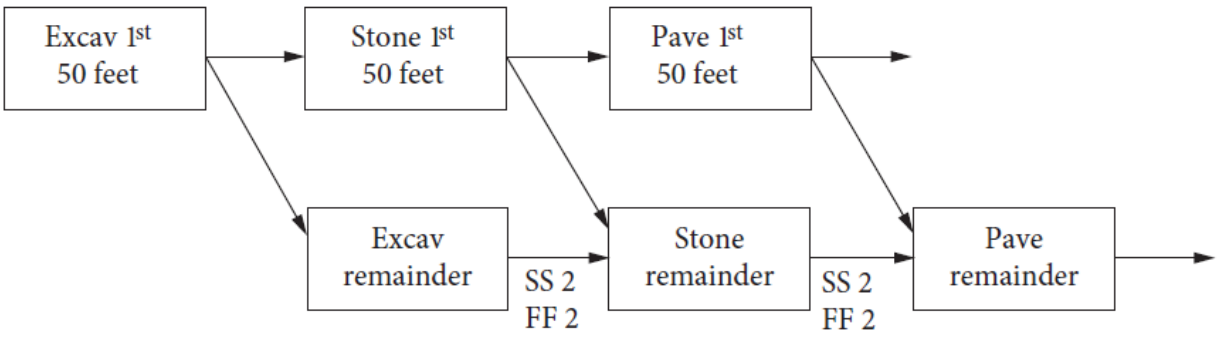


Figure 11.6.10 PDM means to reduce confusing detail.

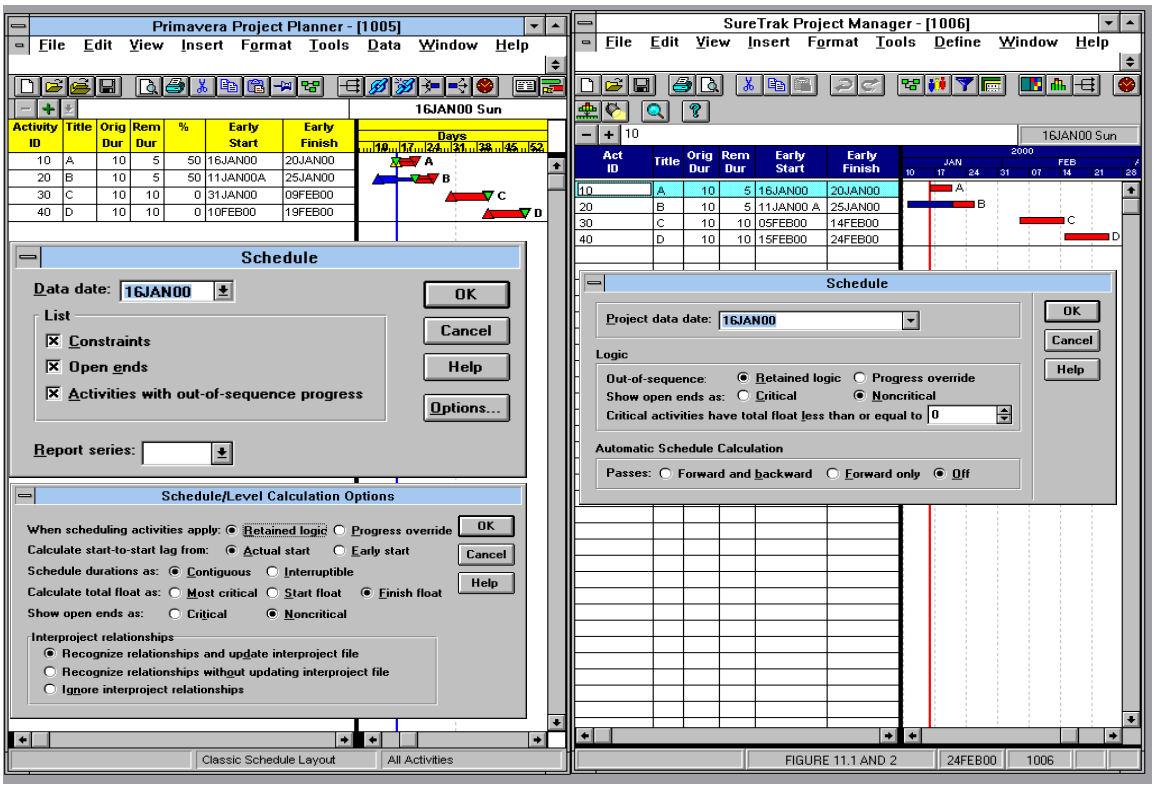


Figure 12.2.1 Comparison of P3 and Suretrak Schedule Option Screens

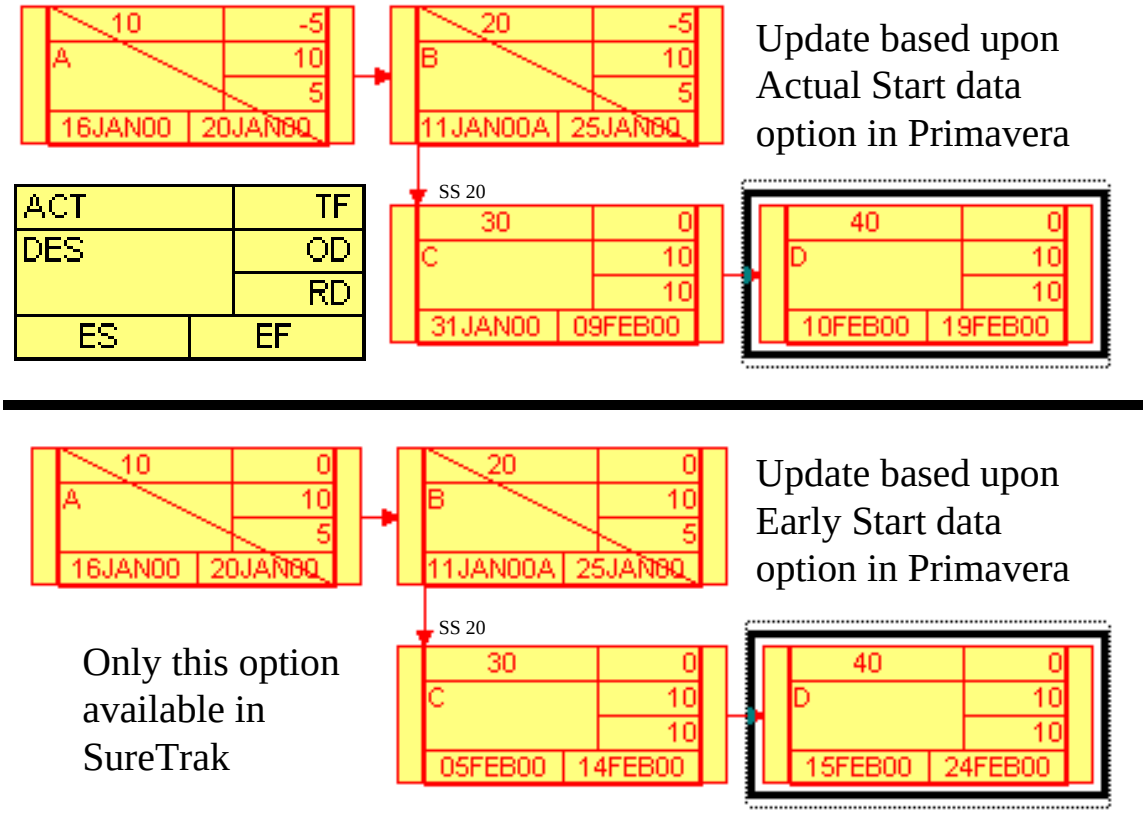


Figure 12.2.2 Comparison of schedule output for various algorithm options

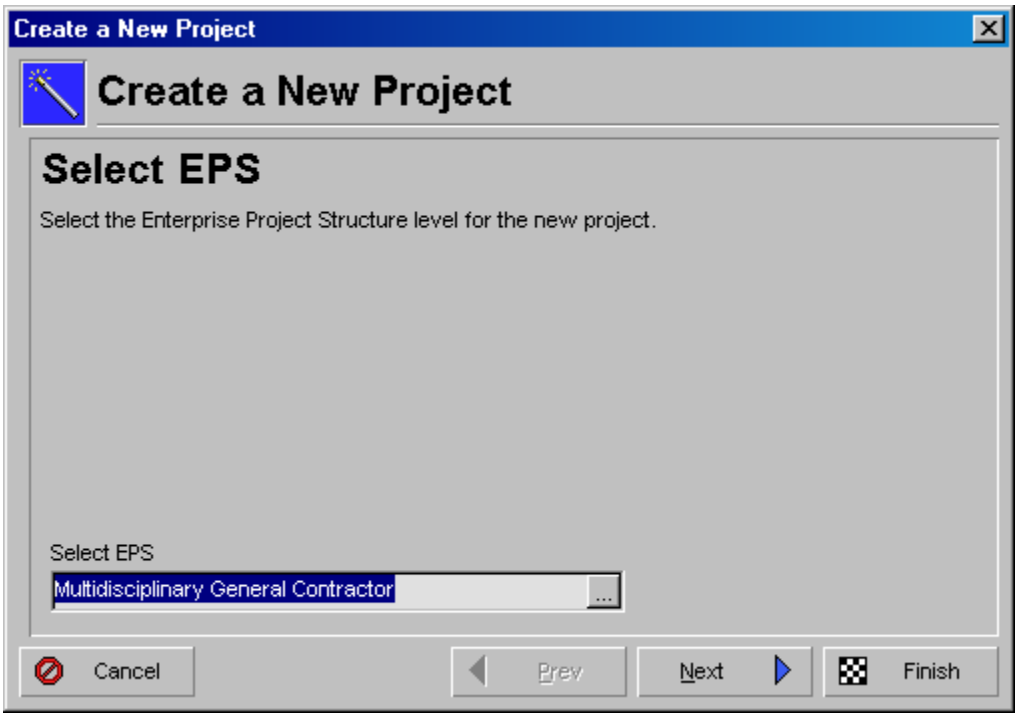


Figure 12.4.1 Opening P6 screen to add a new project

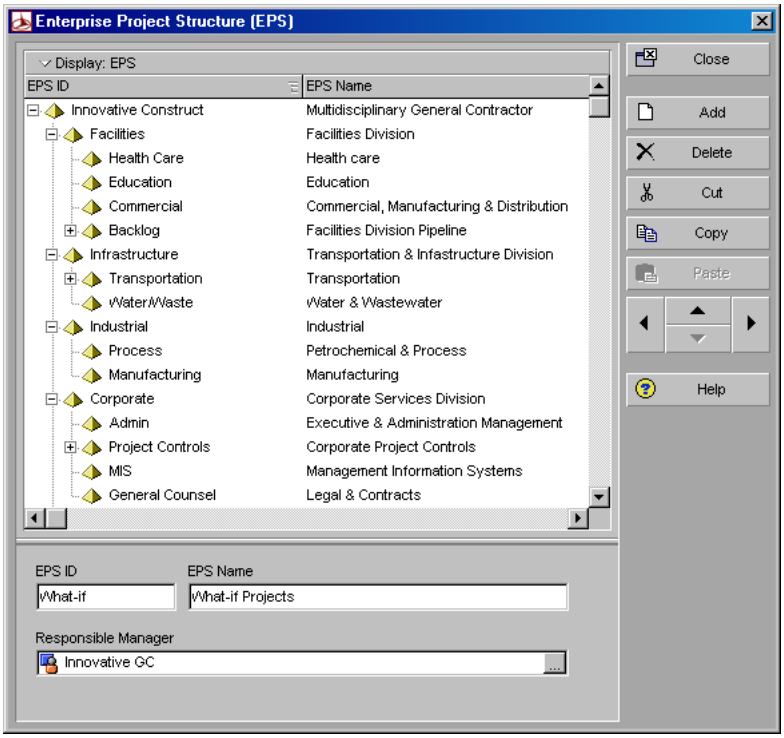


Figure 12.4.2 Adding and placing a new Enterprise

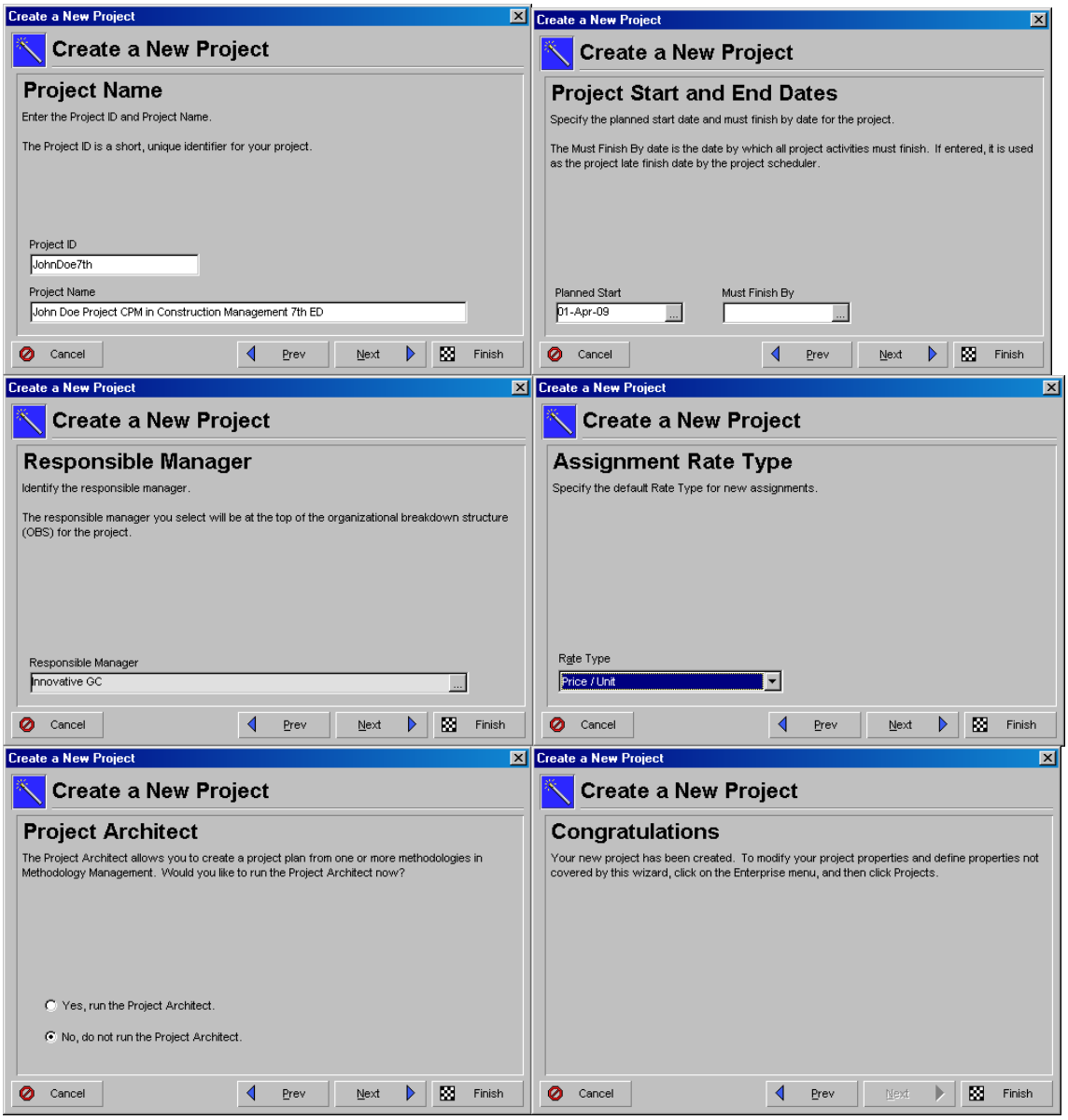


Figure 12.4.3 Process of adding a new project to the database.

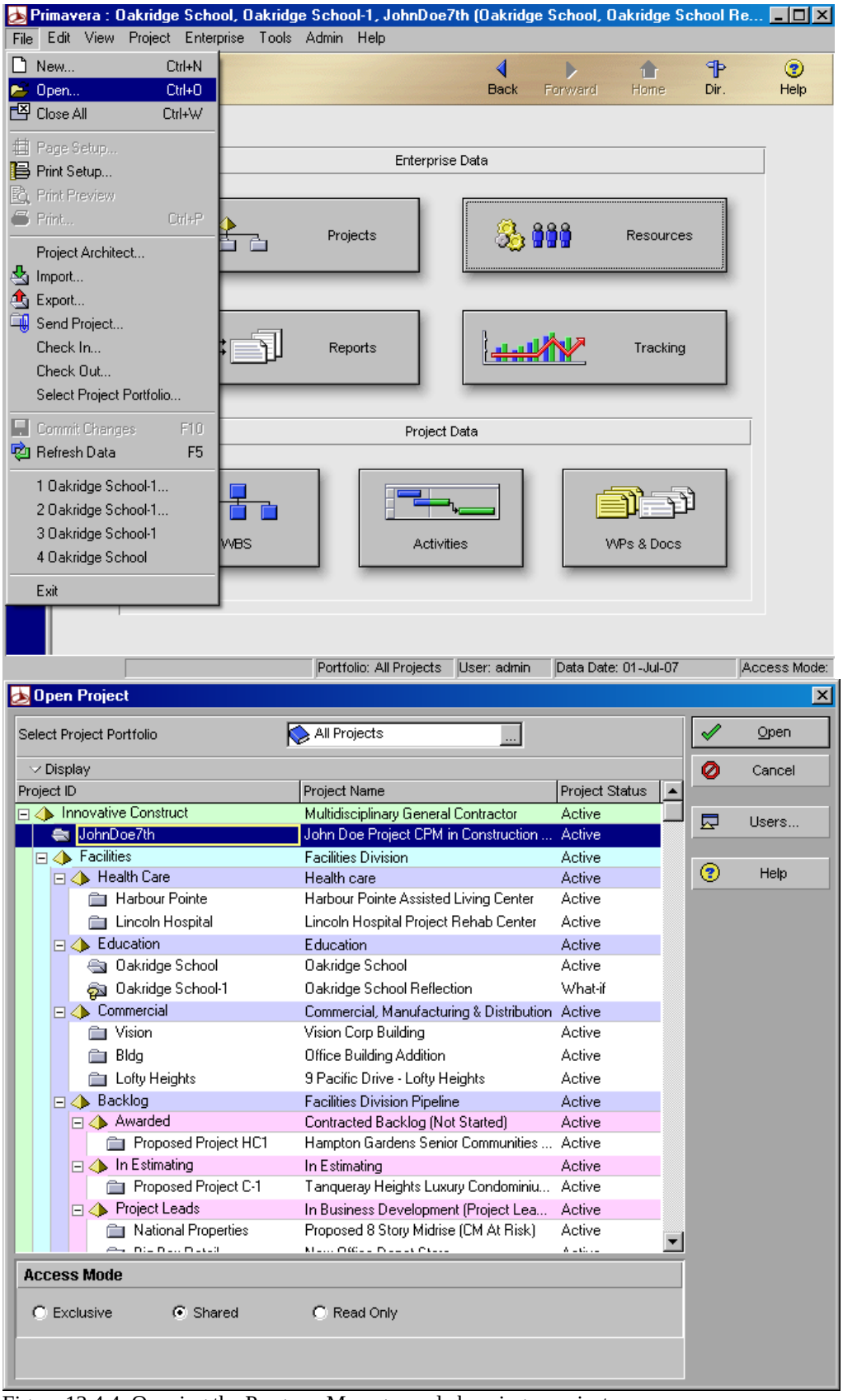


Figure 12.4.4 Opening the Program Manager and choosing a project.

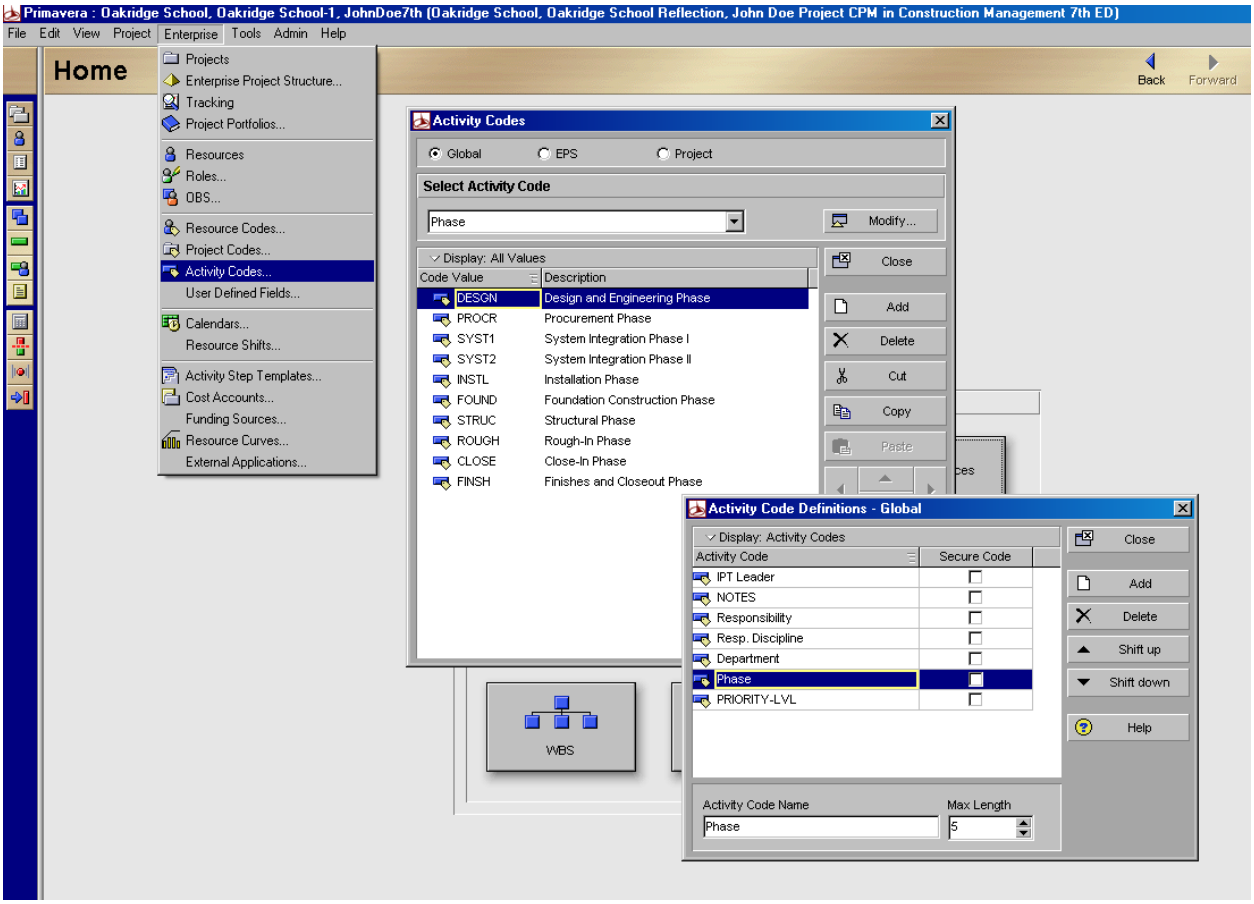


Figure previously in 7th Edition - Selecting global or project level codes.

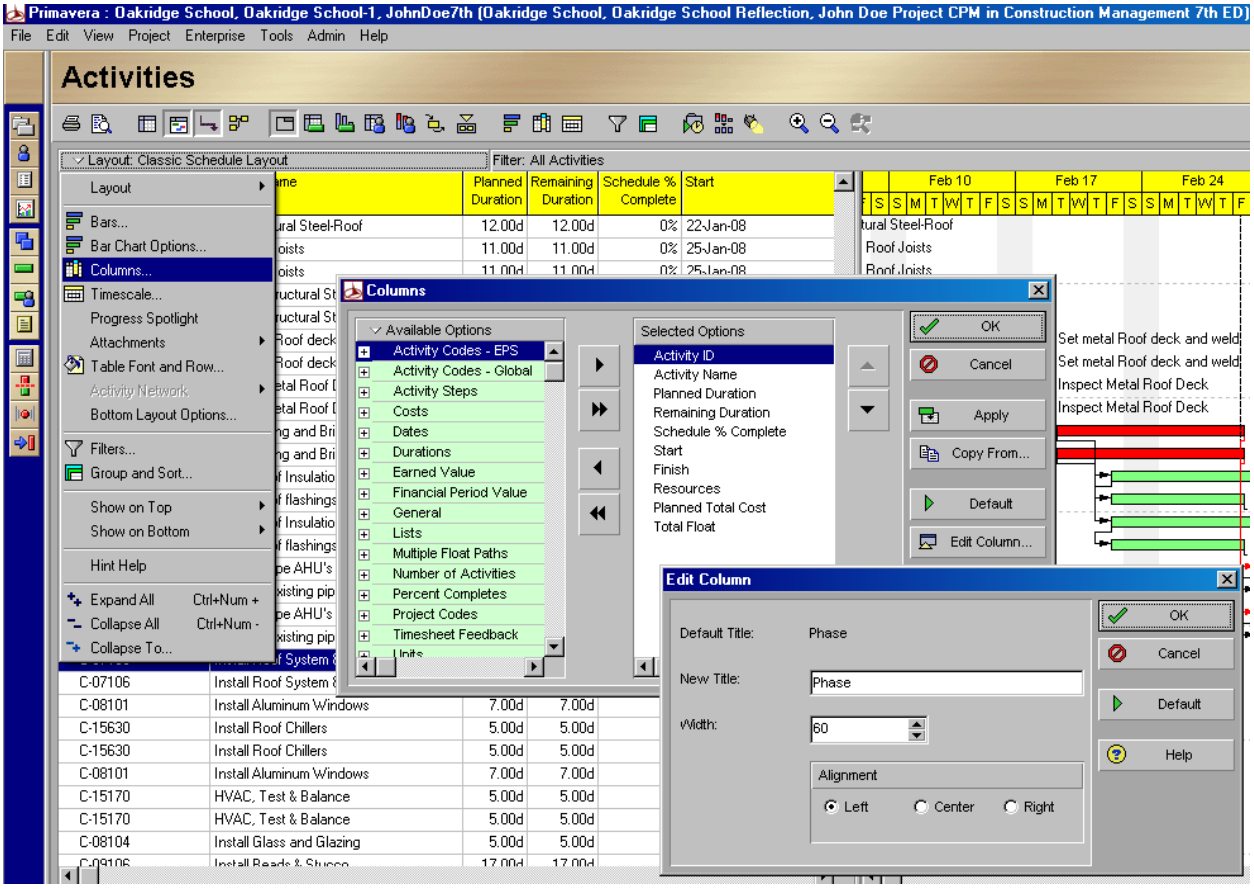


Figure previously in 7th Edition - Including codes in the tabular layout.

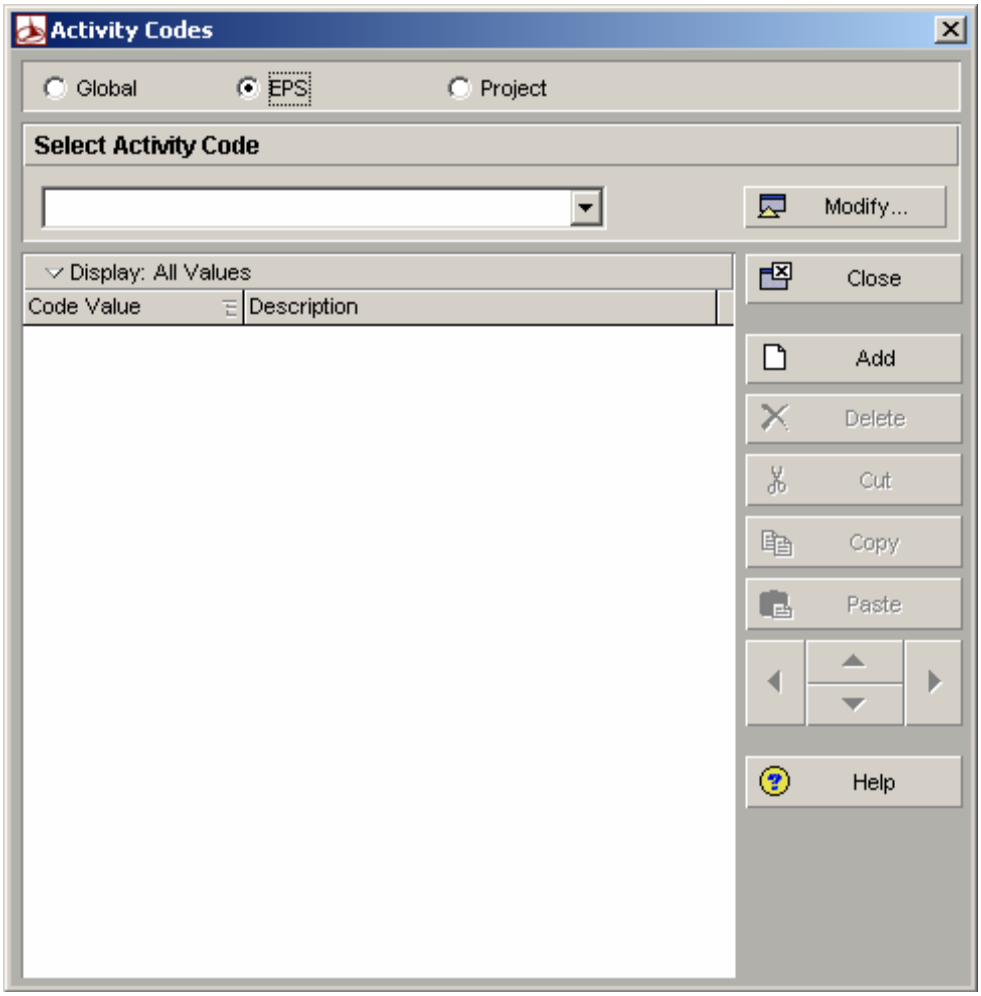


Figure previously in 7th Edition - Three levels of codes.

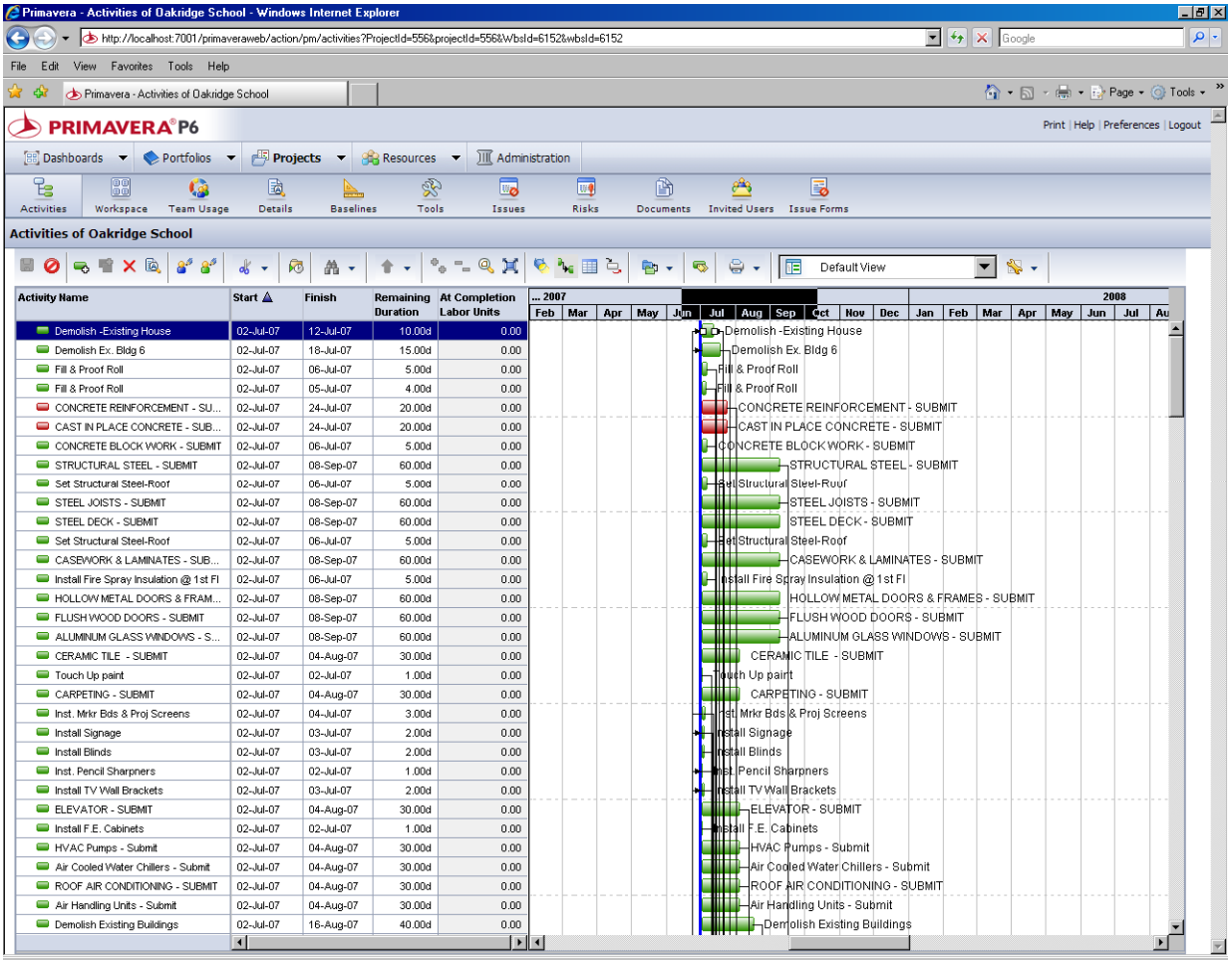


Figure previously in 7th Edition - Project Activity Data inTabular and Bar-chart View

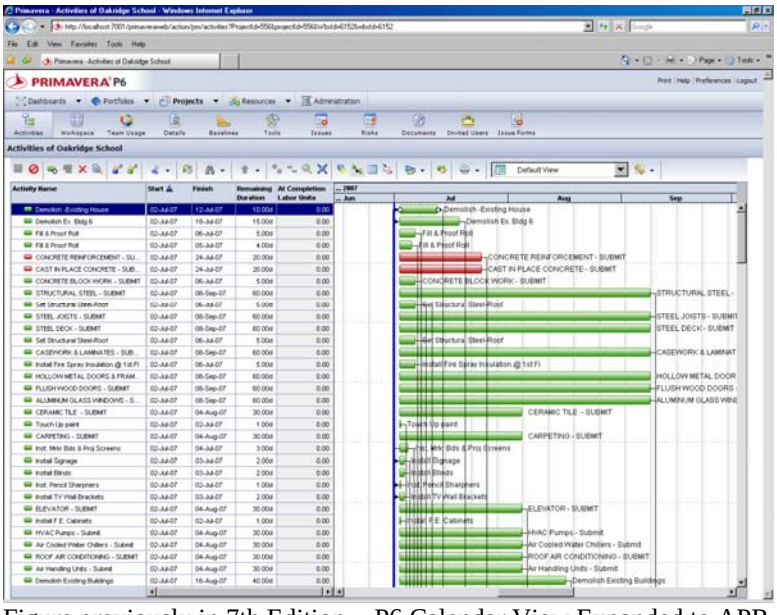


Figure previously in 7th Edition - P6 Calendar View Expanded to APR-OCT

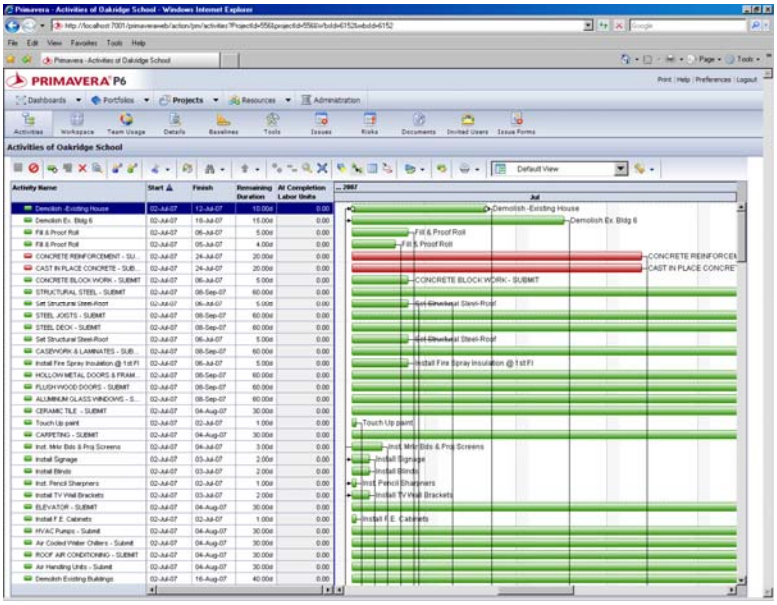


Figure previously in 7th Edition - P6 Calendar View Expanded to JULY

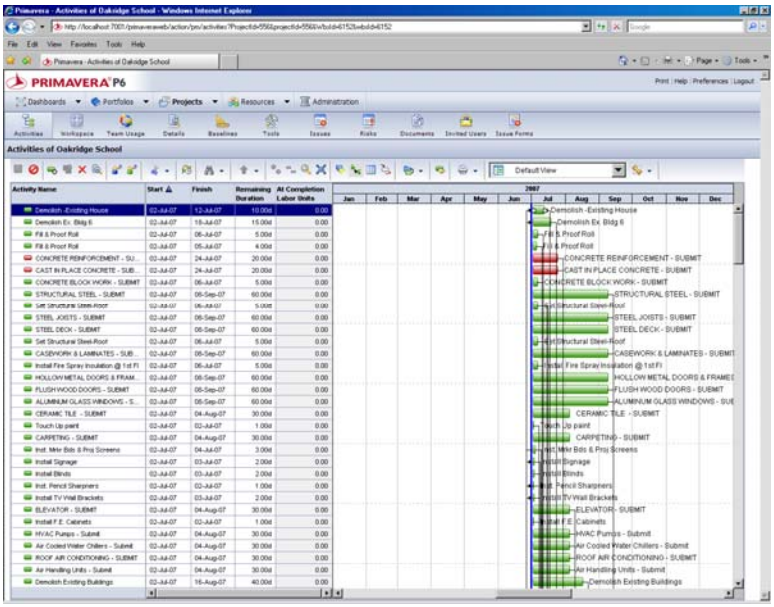


Figure previously in 7th Edition - P6 Calendar View Compressed to show all 2009

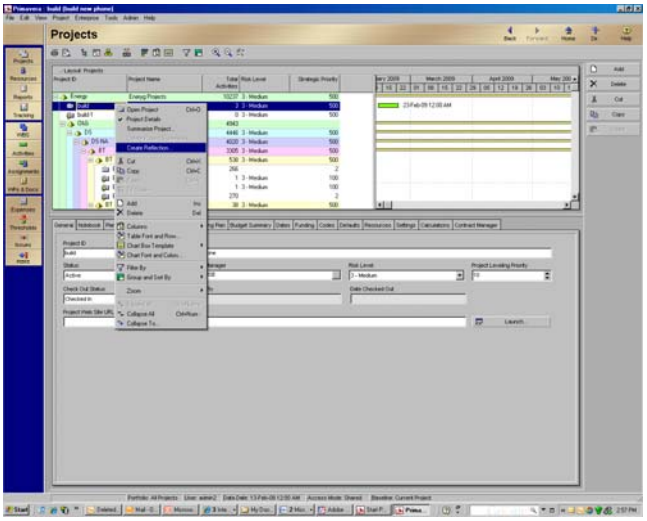


Figure 12.5.1 Process to create a reflection project from an existing update or baseline

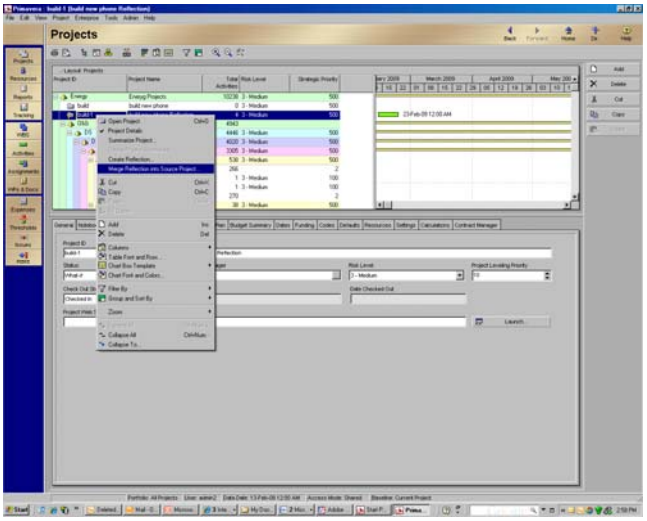


Figure 12.5.2 Initiation of the merge reflection project process

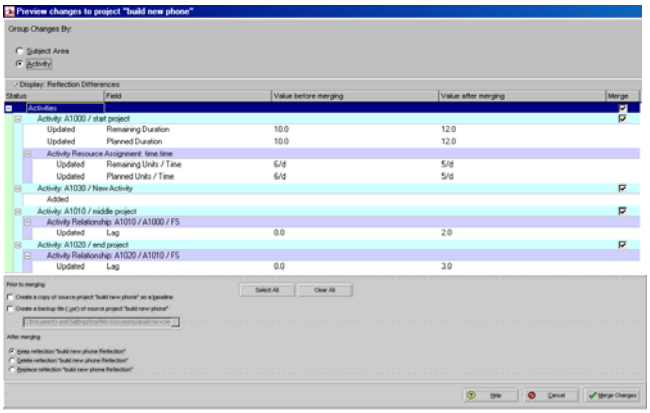


Figure 12.5.3 Detail of the Merge Reflection Project process

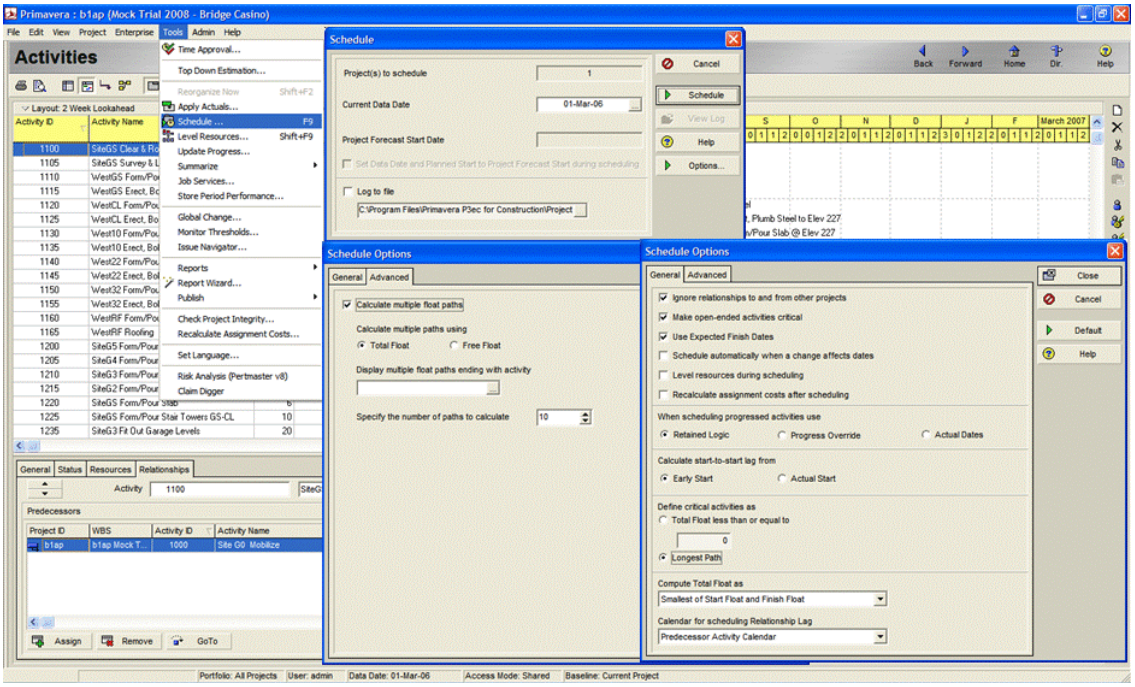


Figure 12.6.2 setup for multiple critical float paths

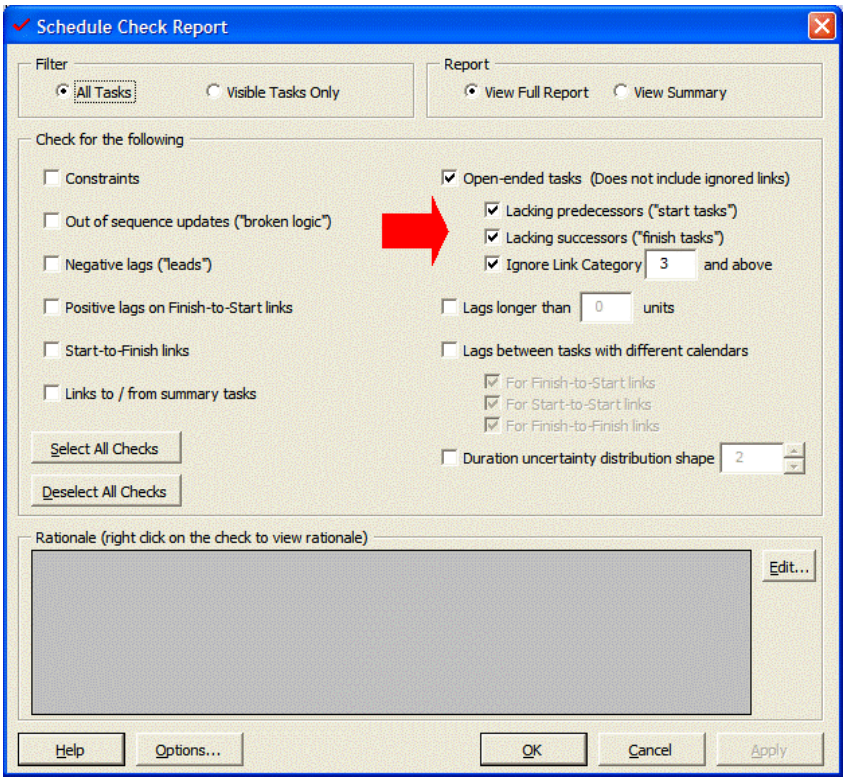


Figure 12.7.1 Pertmaster "Open-End" Diagnostic

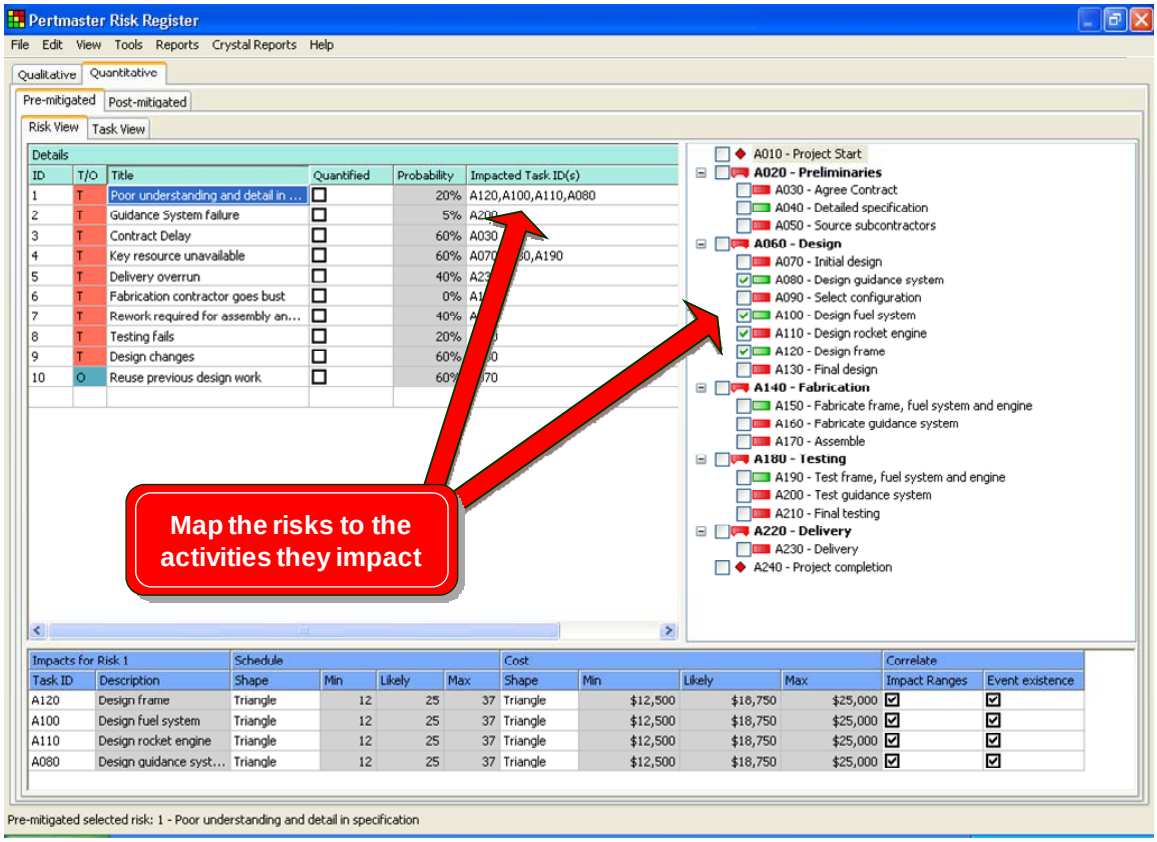


Figure 12.7.2 Risk Register maps correlation of common risks to multiple activities

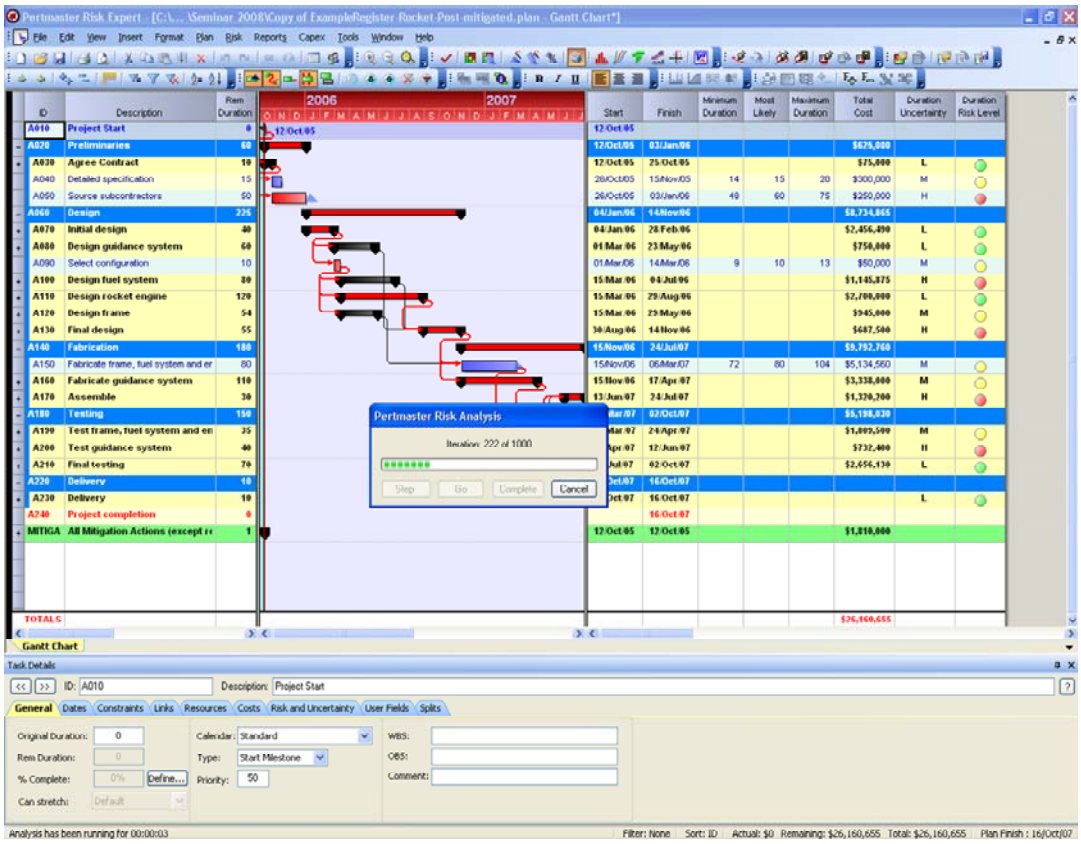


Figure 12.7.3 Pertmaster risk analysis typically set for 1000 iterations

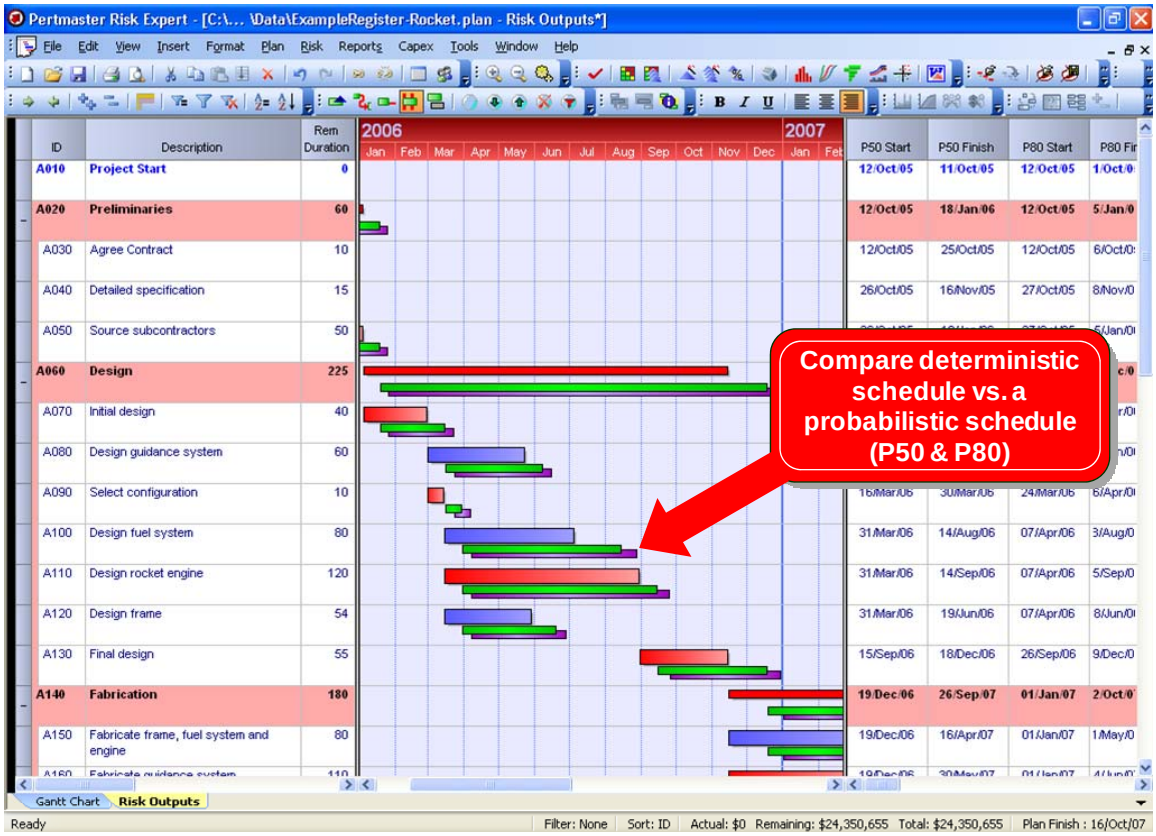


Figure 12.7.4 Comparison of deterministic v probable schedule dates

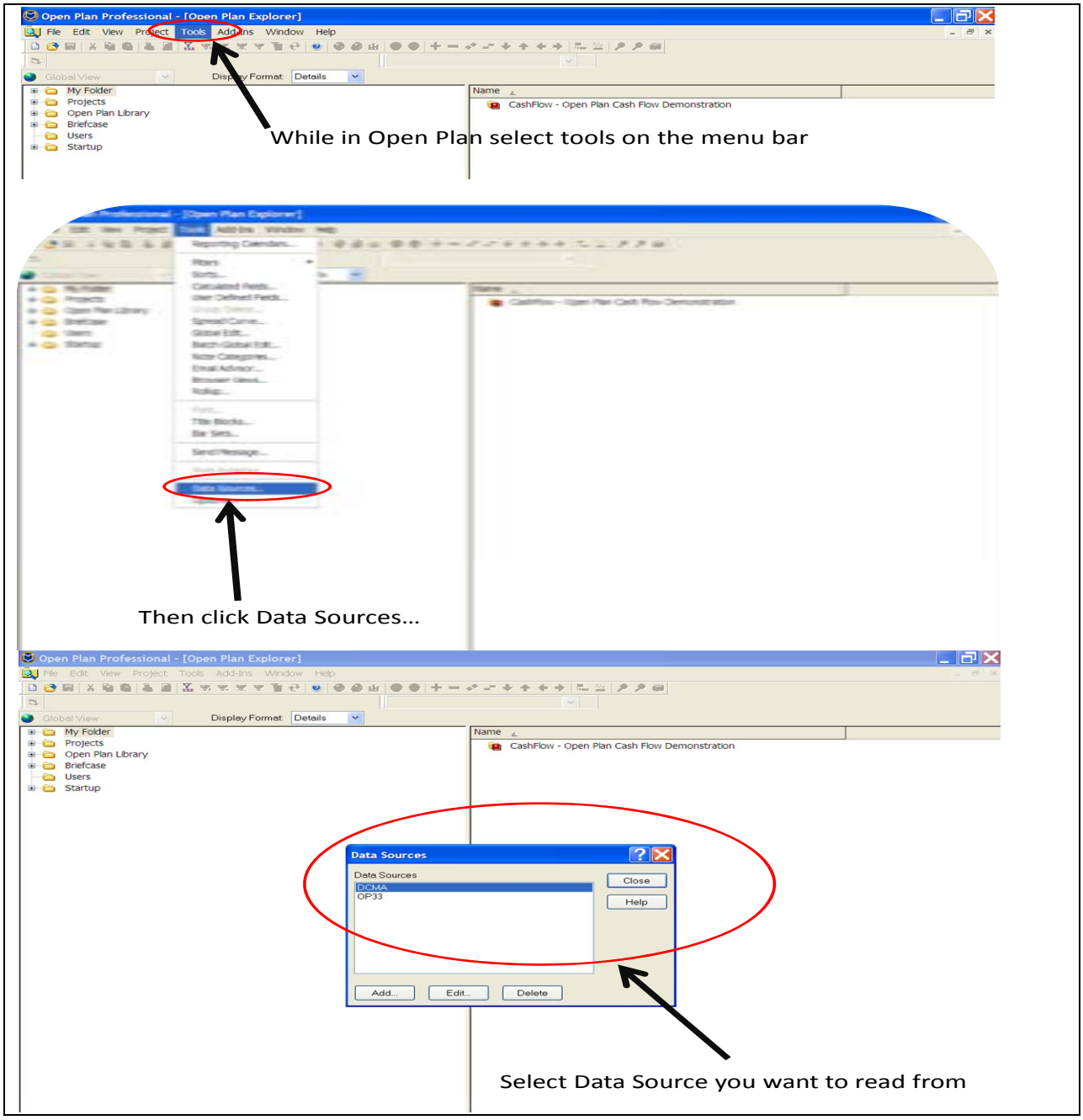


Figure 12.8.1 Selecting Data Sources in Open Plan

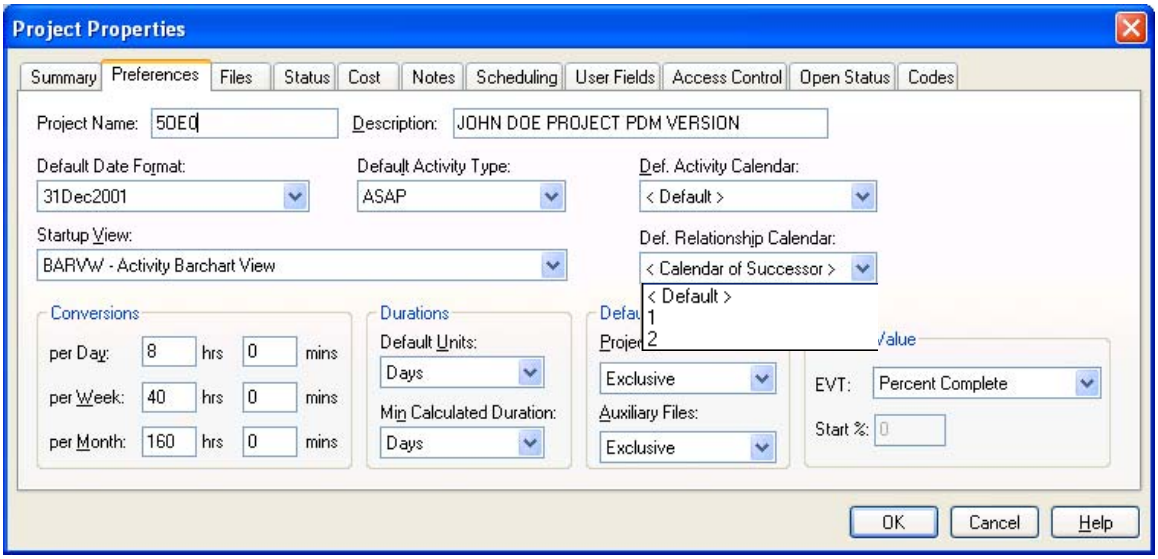


Figure 12.8.2 Open Plan Project Properties – User may set default calendar for lags, but not to predecessor

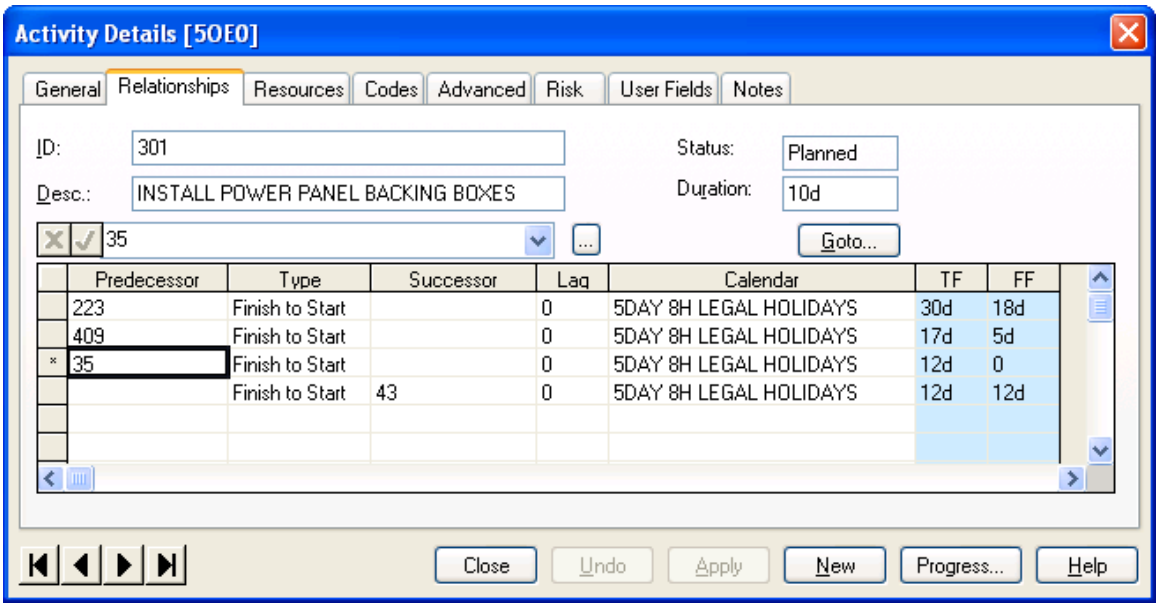


Figure 12.8.3 Open Plan Activity Details dialog box at Relationships tab

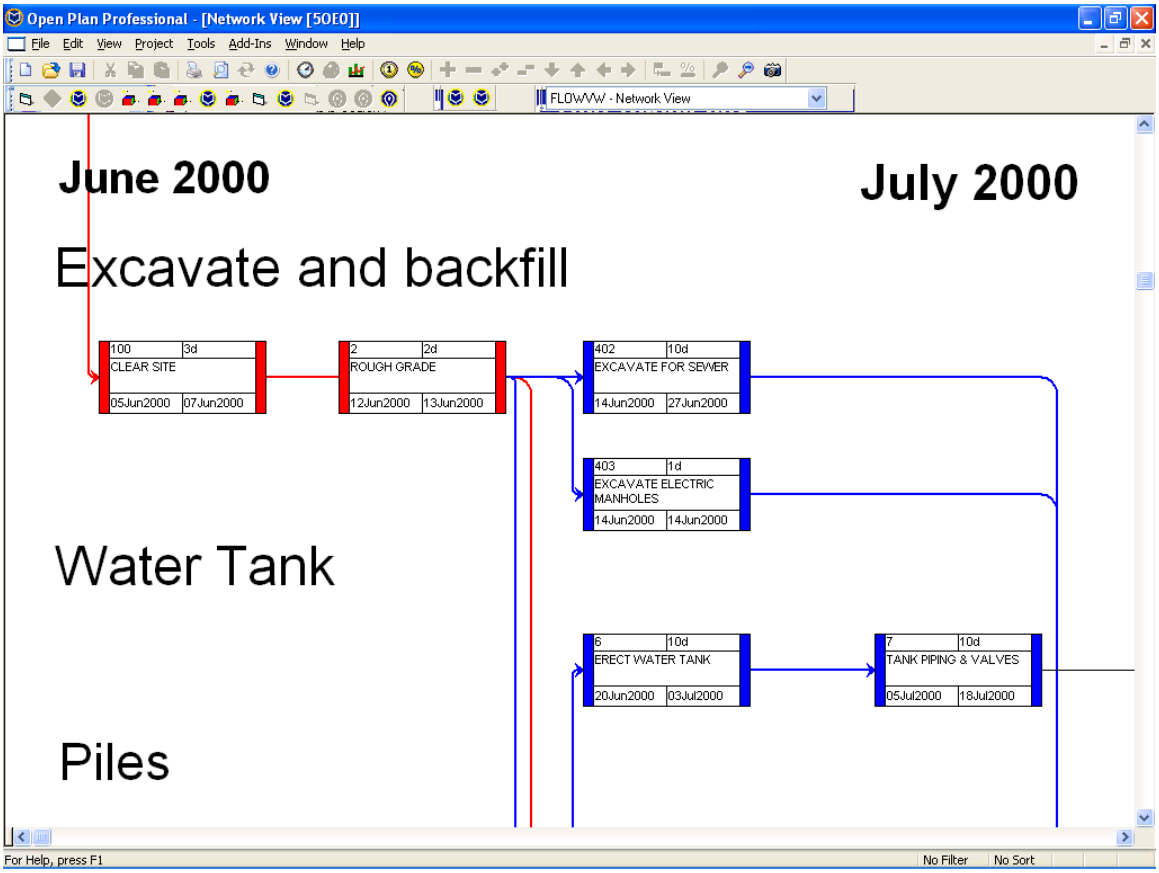


Figure 12.8.4 Open Plan Network View

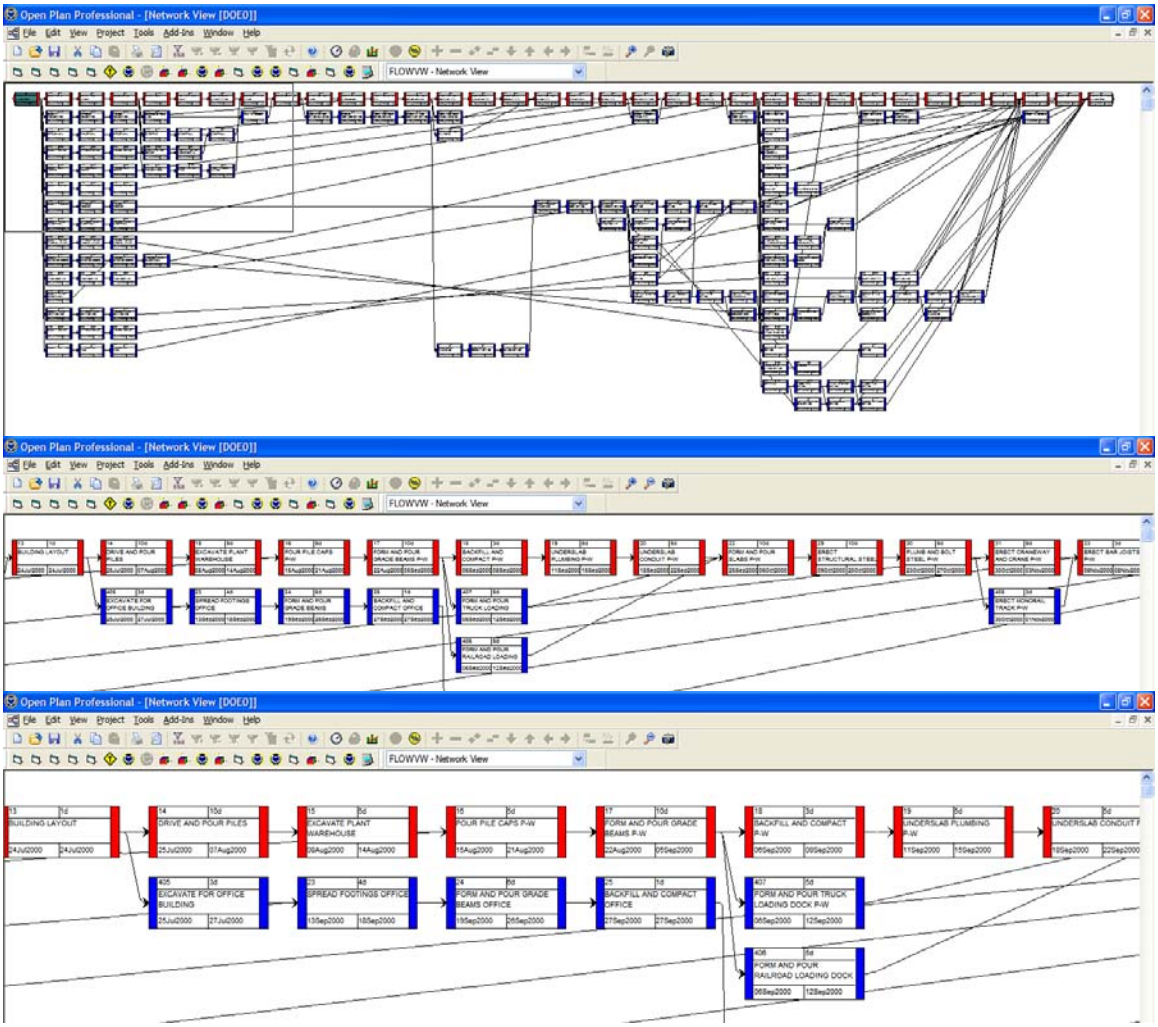
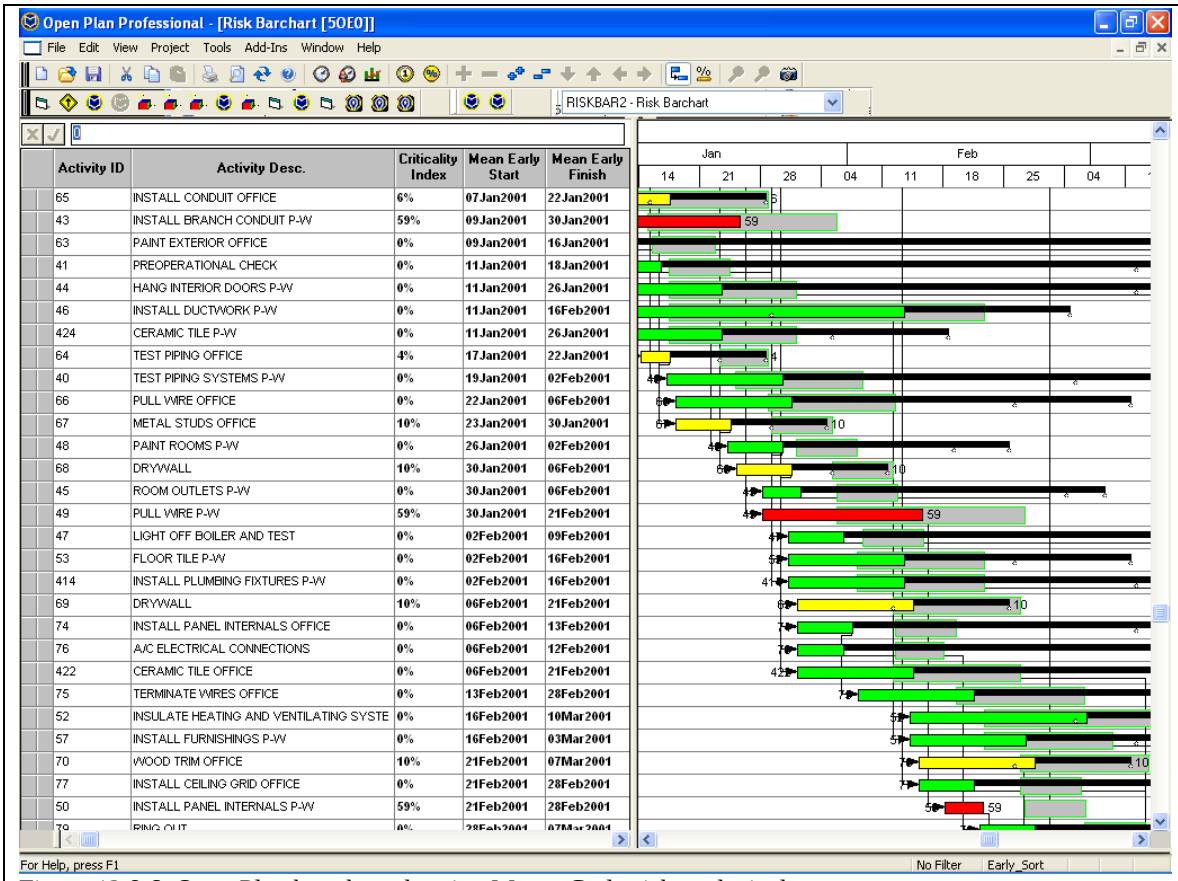


Figure 12.8.5 Open Plan Pure Logic Views (Zoomed Out and In) of John Doe Project



Activity ID	Activity Desc.	Criticality Index	Mean Early Start	Mean Early Finish
65	INSTALL CONDUIT OFFICE	6%	07Jan2001	22Jan2001
43	INSTALL BRANCH CONDUIT P-W	59%	09Jan2001	30Jan2001
63	PAINT EXTERIOR OFFICE	0%	09Jan2001	16Jan2001
41	PREOPERATIONAL CHECK	0%	11Jan2001	18Jan2001
44	HANG INTERIOR DOORS P-W	0%	11Jan2001	26Jan2001
46	INSTALL DUCTWORK P-W	0%	11Jan2001	16Feb2001
424	CERAMIC TILE P-W	0%	11Jan2001	26Jan2001
64	TEST PIPING OFFICE	4%	17Jan2001	22Jan2001
40	TEST PIPING SYSTEMS P-W	0%	19Jan2001	02Feb2001
66	PULL WIRE OFFICE	0%	22Jan2001	06Feb2001
67	METAL STUDS OFFICE	10%	23Jan2001	30Jan2001
48	PAINT ROOMS P-W	0%	26Jan2001	02Feb2001
68	DRYWALL	10%	30Jan2001	06Feb2001
45	ROOM OUTLETS P-W	0%	30Jan2001	06Feb2001
49	PULL WIRE P-W	59%	30Jan2001	21Feb2001
47	LIGHT OFF BOILER AND TEST	0%	02Feb2001	09Feb2001
53	FLOOR TILE P-W	0%	02Feb2001	16Feb2001
414	INSTALL PLUMBING FIXTURES P-W	0%	02Feb2001	16Feb2001
69	DRYWALL	10%	06Feb2001	21Feb2001
74	INSTALL PANEL INTERNALS OFFICE	0%	06Feb2001	13Feb2001
76	A/C ELECTRICAL CONNECTIONS	0%	06Feb2001	12Feb2001
422	CERAMIC TILE OFFICE	0%	06Feb2001	21Feb2001
75	TERMINATE WIRES OFFICE	0%	13Feb2001	28Feb2001
52	INSULATE HEATING AND VENTILATING SYSTE	0%	16Feb2001	10Mar2001
57	INSTALL FURNISHINGS P-W	0%	16Feb2001	03Mar2001
70	WOOD TRIM OFFICE	10%	21Feb2001	07Mar2001
77	INSTALL CEILING GRID OFFICE	0%	21Feb2001	28Feb2001
50	INSTALL PANEL INTERNALS P-W	59%	21Feb2001	28Feb2001

Figure 12.8.6 Open Plan bar chart showing Monte Carlo risk analysis data
Bar chart highlights criticality index and mean dates
Green = Never Critical
Yellow = 0-50% chance of being critical
Red = 51-100% chance of being critical
Gray bar represents Mean Early Start – Mean Early Finish bar

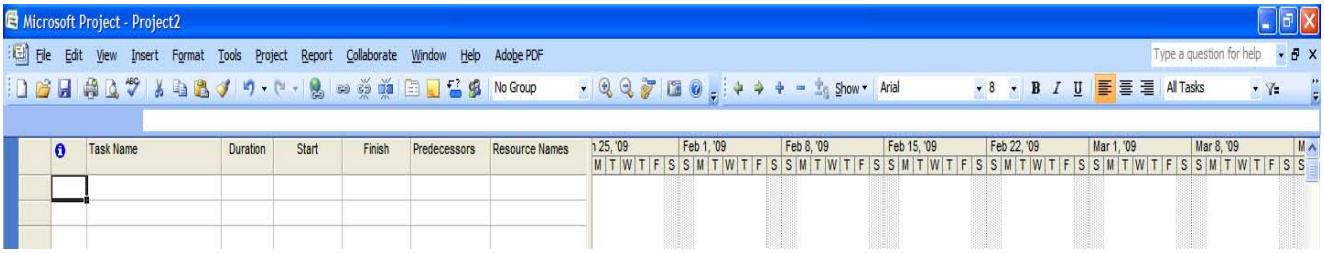


Figure 12.9.1 Opening a New Project with MSProject 2007

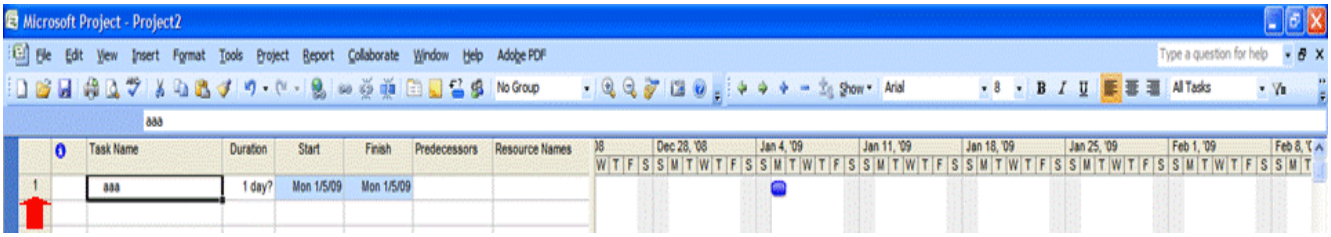


Figure 12.9.2 Automatic but Temporary ID Number for New Activity

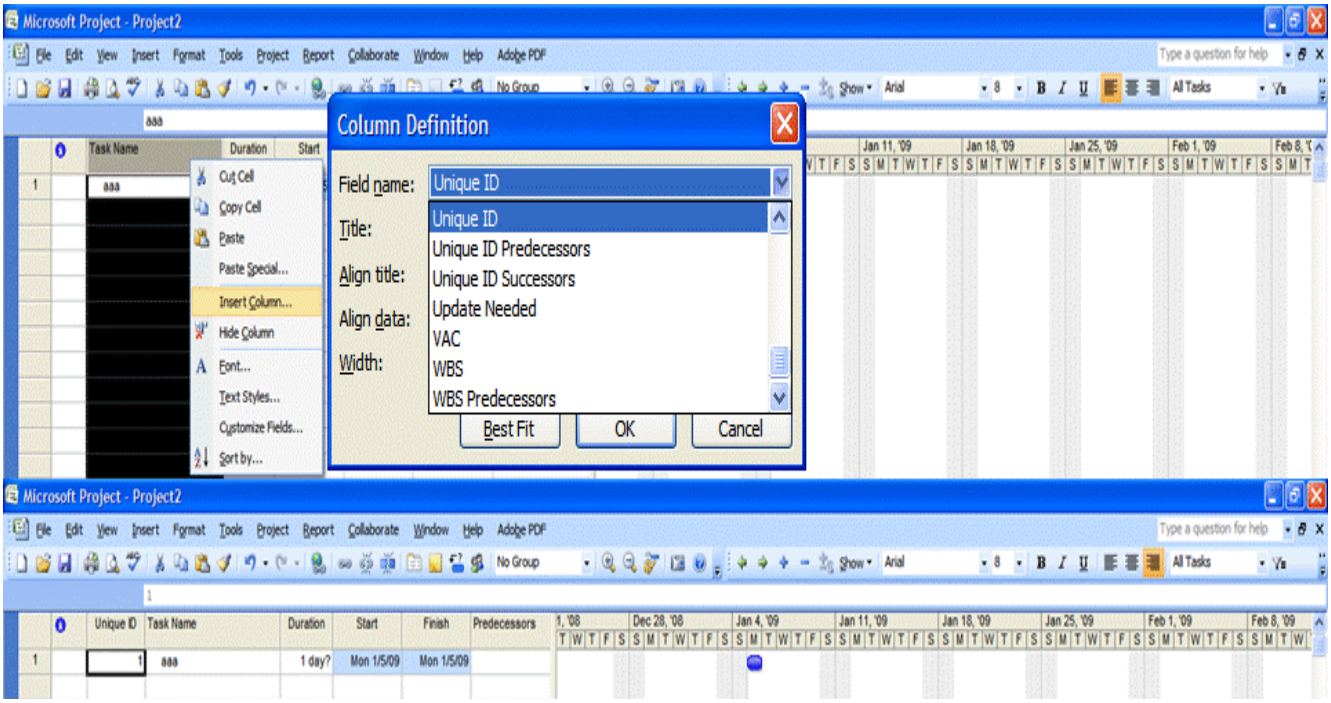


Figure 12.9.3 Inserting a Fixed Unique ID Number Column

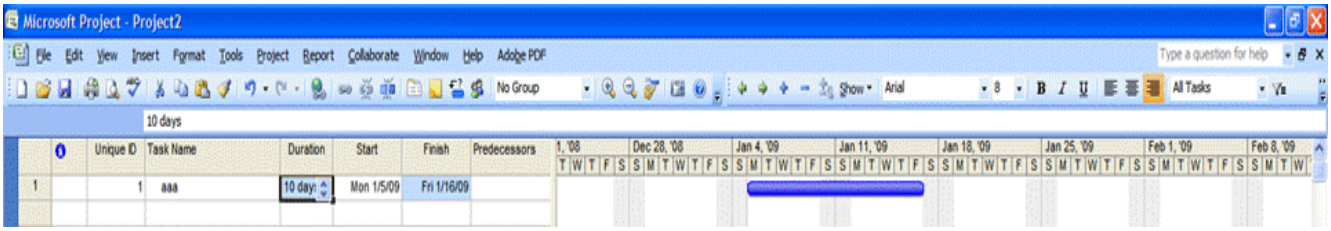


Figure 12.9.4 Entering the first activity

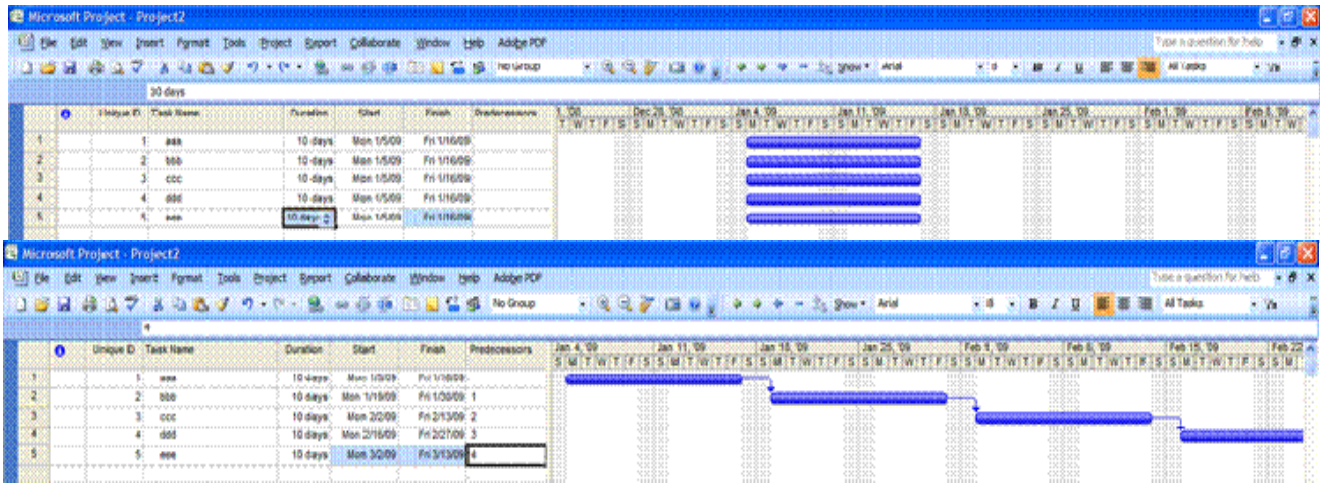


Figure 12.9.5 Adding New Activities and Setting Restraints Between Activities

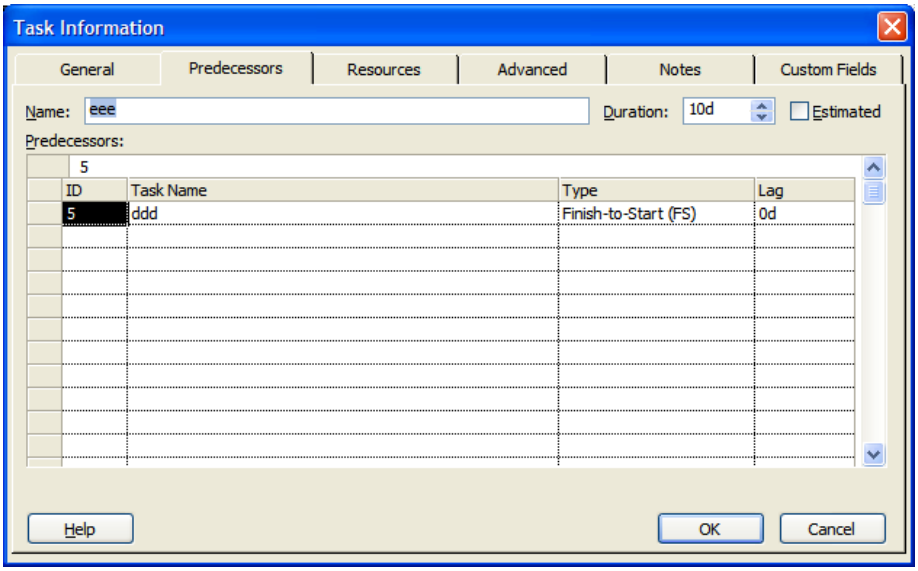


Figure 12.9.6 Dialog Box for Entry of Predecessor Restraint Detail Information

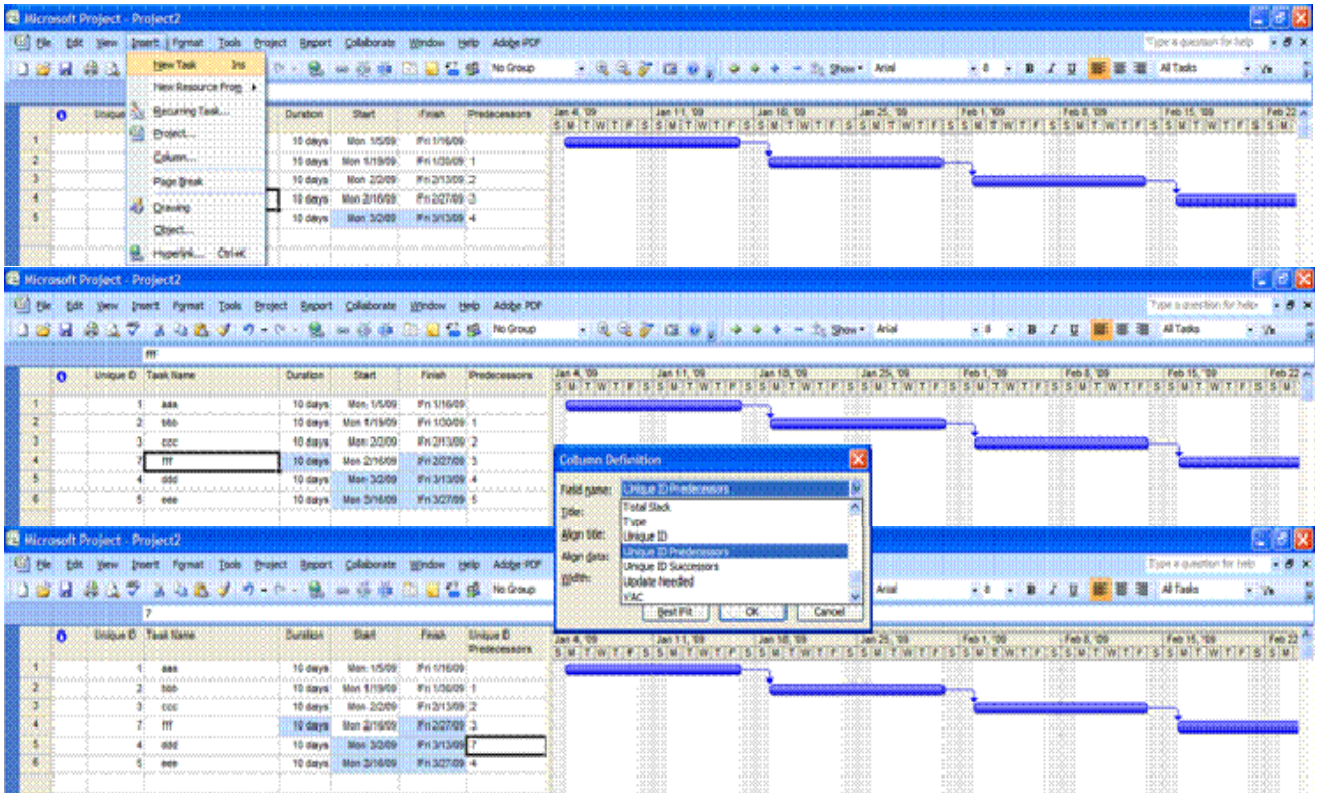


Figure 12.9.7 Inserting New Activities and Replacing Predecessor Column with Unique Predecessor

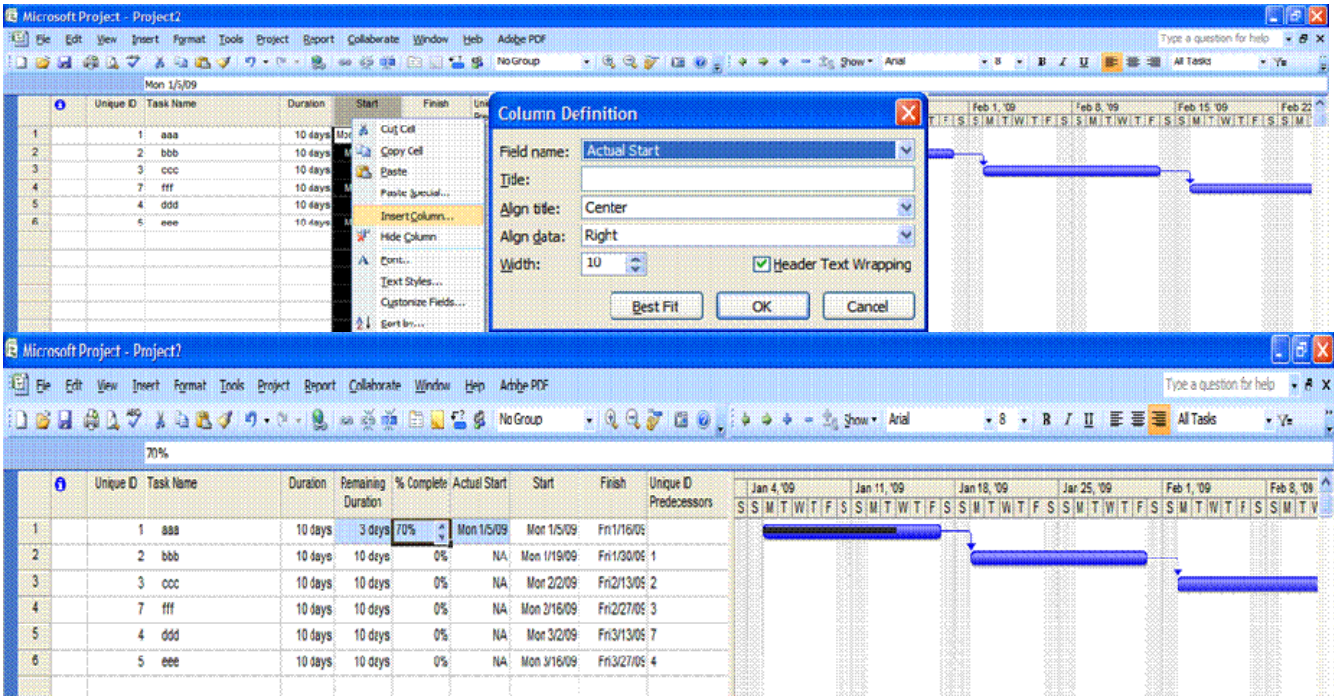


Figure 12.9.8 Inserting New Columns for Remaining Duration, Percent Complete and Actual Start

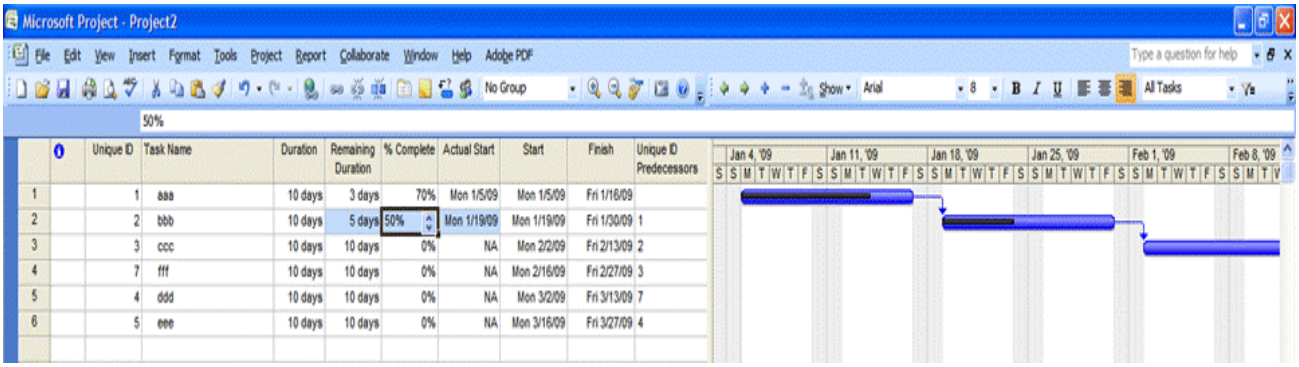


Figure 12.9.9 Reporting % Complete Initiates Some Recalculations of Remaining Duration and Dates

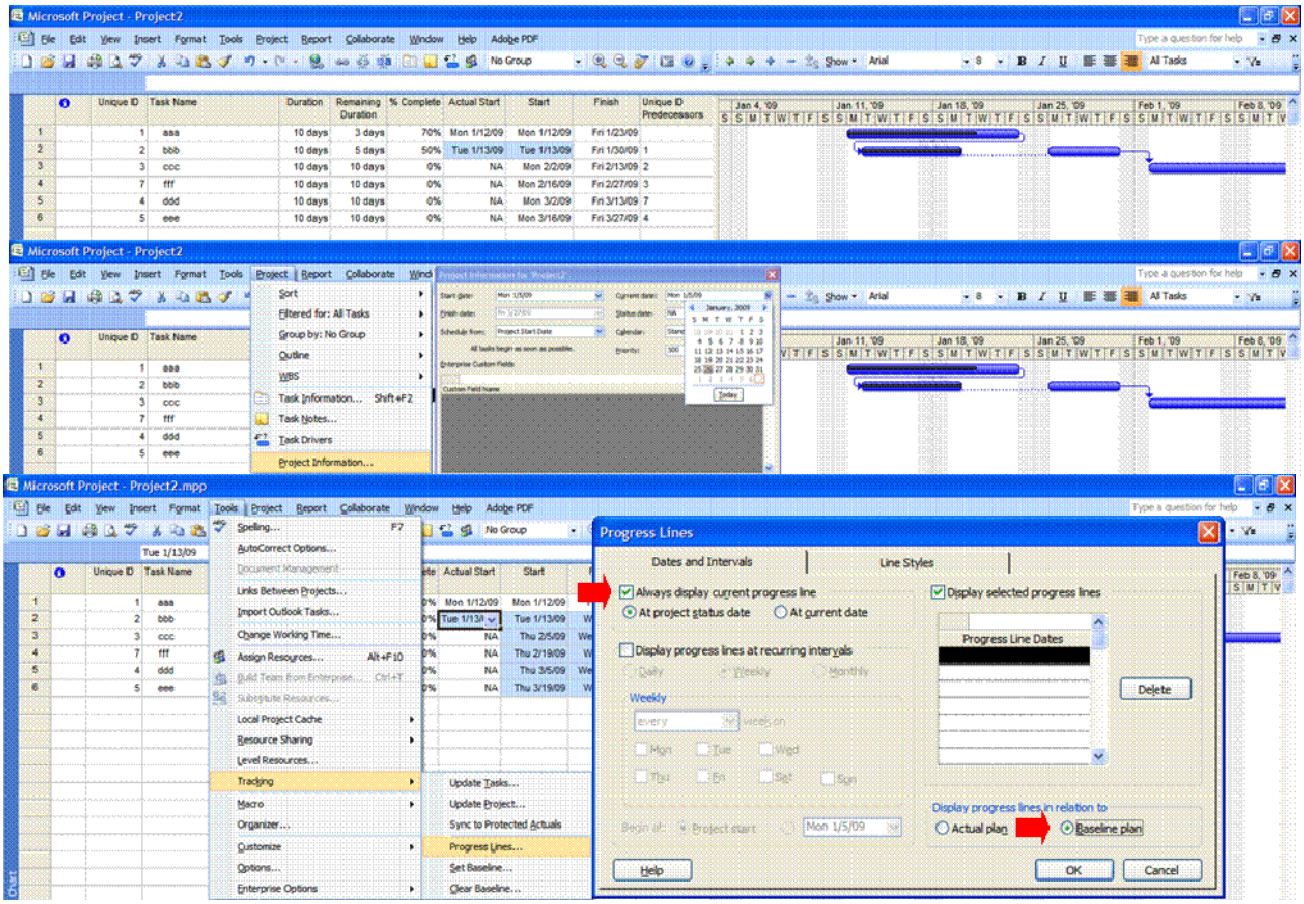


Figure 12.9.10 Entering Actual Start/Finish Data, and Setting/Displaying the Data Date for this Update

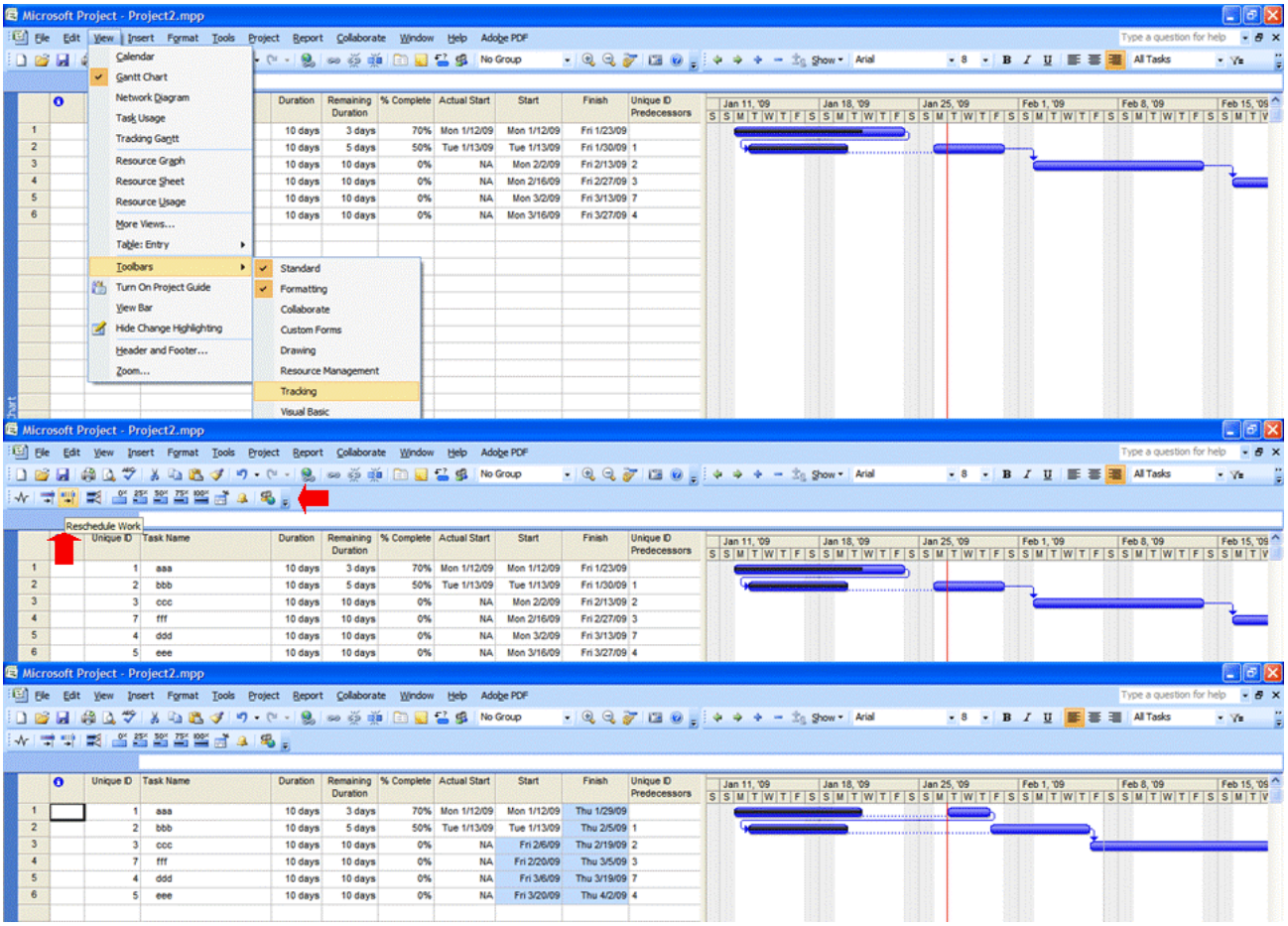


Figure 12.9.11 Displaying the Tracking Toolbar and Rescheduling Work Based Upon Inputs

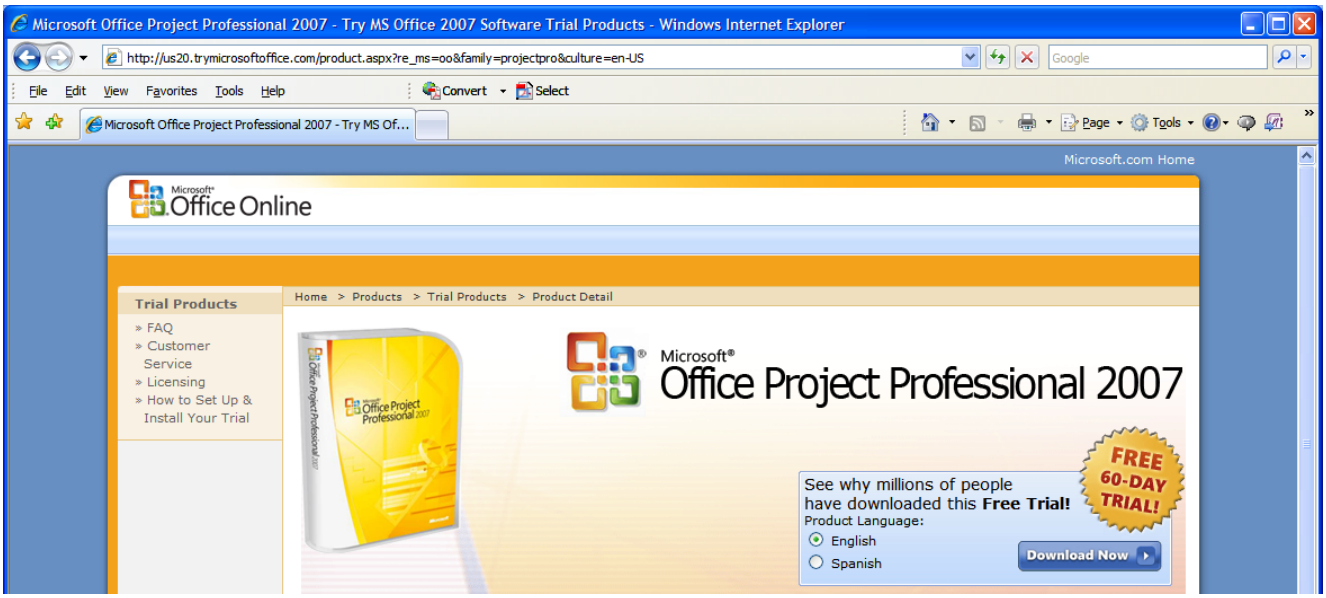
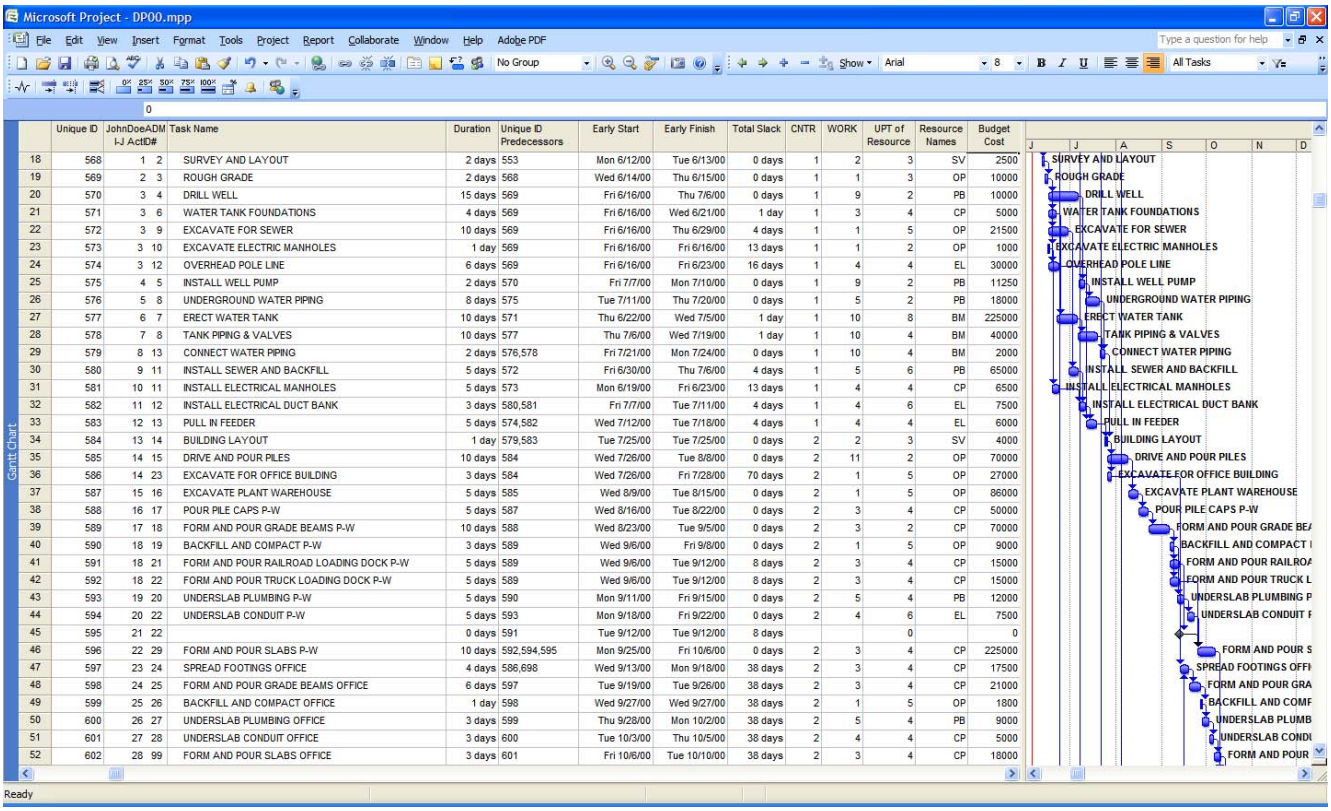
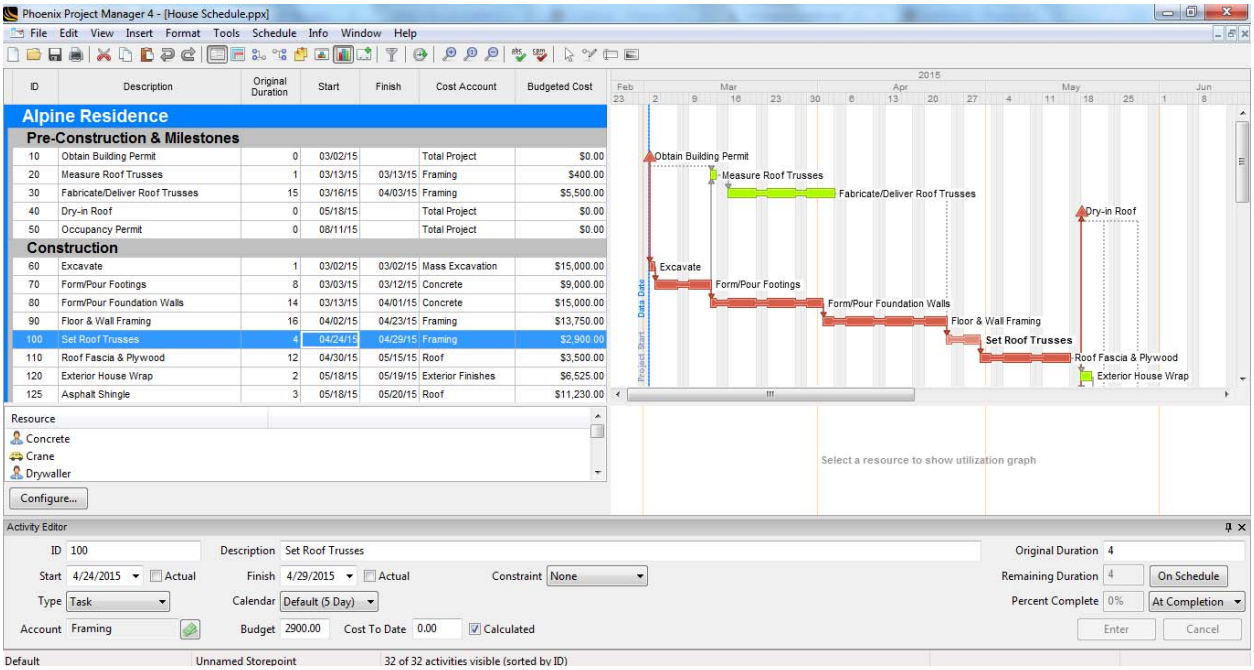


Figure 12.9.12 http://us20.trymicrosoftoffice.com/product.aspx?re_ms=oo&family=projectpro&culture=en-US



	Unique ID	JohnDoeADM I-J ActID#	Task Name	Duration	Unique ID Predecessors	Early Start	Early Finish	Total Slack	CNTR	WORK	UPT of Resource	Resource Names	Budget Cost
18	568	1 2	SURVEY AND LAYOUT	2 days	553	Mon 6/12/00	Tue 6/13/00	0 days	1	2	3	SV	2500
19	569	2 3	ROUGH GRADE	2 days	568	Wed 6/14/00	Thu 6/15/00	0 days	1	1	3	OP	10000
20	570	3 4	DRILL WELL	15 days	569	Fri 6/16/00	Thu 7/6/00	0 days	1	9	2	PB	10000
21	571	3 6	WATER TANK FOUNDATIONS	4 days	569	Fri 6/16/00	Wed 6/21/00	1 day	1	3	4	CP	5000
22	572	3 9	EXCAVATE FOR SEWER	10 days	569	Fri 6/16/00	Thu 6/29/00	4 days	1	1	5	OP	21500
23	573	3 10	EXCAVATE ELECTRIC MANHOLES	1 day	569	Fri 6/16/00	Fri 6/16/00	13 days	1	1	2	OP	1000
24	574	3 12	OVERHEAD POLE LINE	6 days	569	Fri 6/16/00	Fri 6/23/00	16 days	1	4	4	EL	30000
25	575	4 5	INSTALL WELL PUMP	2 days	570	Fri 7/7/00	Mon 7/10/00	0 days	1	9	2	PB	11250
26	576	5 8	UNDERGROUND WATER PIPING	8 days	575	Tue 7/11/00	Thu 7/20/00	0 days	1	5	2	PB	18000
27	577	6 7	ERECT WATER TANK	10 days	571	Thu 6/22/00	Wed 7/5/00	1 day	1	10	8	BM	225000
28	578	7 8	TANK PIPING & VALVES	10 days	577	Thu 7/6/00	Wed 7/19/00	1 day	1	10	4	BM	40000
29	579	8 13	CONNECT WATER PIPING	2 days	576,578	Fri 7/21/00	Mon 7/24/00	0 days	1	10	4	BM	2000
30	580	9 11	INSTALL SEWER AND BACKFILL	5 days	572	Fri 6/30/00	Thu 7/6/00	4 days	1	5	6	PB	65000
31	581	10 11	INSTALL ELECTRICAL MANHOLES	5 days	573	Mon 6/19/00	Fri 6/23/00	13 days	1	4	4	CP	6500
32	582	11 12	INSTALL ELECTRICAL DUCT BANK	3 days	580,581	Fri 7/7/00	Tue 7/11/00	4 days	1	4	6	EL	7500
33	583	12 13	PULL IN FEEDER	5 days	574,582	Wed 7/12/00	Tue 7/18/00	4 days	1	4	4	EL	6000
34	584	13 14	BUILDING LAYOUT	1 day	579,583	Tue 7/25/00	Tue 7/25/00	0 days	2	2	3	SV	4000
35	585	14 15	DRIVE AND POUR PILES	10 days	584	Wed 7/26/00	Tue 8/8/00	0 days	2	11	2	OP	70000
36	586	14 23	EXCAVATE FOR OFFICE BUILDING	3 days	584	Wed 7/26/00	Fri 7/28/00	70 days	2	1	5	OP	27000
37	587	15 16	EXCAVATE PLANT WAREHOUSE	5 days	585	Wed 8/9/00	Tue 8/15/00	0 days	2	1	5	OP	86000
38	588	16 17	POUR PILE CAPS P-W	5 days	587	Wed 8/16/00	Tue 8/22/00	0 days	2	3	4	CP	50000
39	589	17 18	FORM AND POUR GRADE BEAMS P-W	10 days	588	Wed 8/23/00	Tue 9/5/00	0 days	2	3	2	CP	70000
40	590	18 19	BACKFILL AND COMPACT P-W	3 days	589	Wed 9/6/00	Fri 9/8/00	0 days	2	1	5	OP	9000
41	591	18 21	FORM AND POUR RAILROAD LOADING DOCK P-W	5 days	589	Wed 9/6/00	Tue 9/12/00	8 days	2	3	4	CP	15000
42	592	18 22	FORM AND POUR TRUCK LOADING DOCK P-W	5 days	589	Wed 9/6/00	Tue 9/12/00	8 days	2	3	4	CP	15000
43	593	19 20	UNDERSLAB PLUMBING P-W	5 days	590	Mon 9/11/00	Fri 9/15/00	0 days	2	5	4	PB	12000
44	594	20 22	UNDERSLAB CONDUIT P-W	5 days	593	Mon 9/18/00	Fri 9/22/00	0 days	2	4	6	EL	7500
45	595	21 22		0 days	591	Tue 9/12/00	Tue 9/12/00	8 days			0		0
46	596	22 29	FORM AND POUR SLABS P-W	10 days	592,594,595	Mon 9/25/00	Fri 10/6/00	0 days	2	3	4	CP	225000
47	597	23 24	SPREAD FOOTINGS OFFICE	4 days	586,698	Wed 9/13/00	Mon 9/18/00	38 days	2	3	4	CP	17500
48	598	24 25	FORM AND POUR GRADE BEAMS OFFICE	6 days	597	Tue 9/19/00	Tue 9/26/00	38 days	2	3	4	CP	21000
49	599	25 26	BACKFILL AND COMPACT OFFICE	1 day	598	Wed 9/27/00	Wed 9/27/00	38 days	2	1	5	OP	1800
50	600	26 27	UNDERSLAB PLUMBING OFFICE	3 days	599	Thu 9/28/00	Mon 10/2/00	38 days	2	5	4	PB	9000
51	601	27 28	UNDERSLAB CONDUIT OFFICE	3 days	600	Tue 10/3/00	Thu 10/5/00	38 days	2	4	4	CP	5000
52	602	28 99	FORM AND POUR SLABS OFFICE	3 days	601	Fri 10/6/00	Tue 10/10/00	38 days	2	3	4	CP	18000

Figure 12.9.13 Selected View of John Doe Project in MSProject2007



ID	Description	Original Duration	Start	Finish	Cost Account	Budgeted Cost
Alpine Residence						
Pre-Construction & Milestones						
10	Obtain Building Permit	0	03/02/15		Total Project	$0.00
20	Measure Roof Trusses	1	03/13/15	03/13/15	Framing	$400.00
30	Fabricate/Deliver Roof Trusses	15	03/16/15	04/03/15	Framing	$5,500.00
40	Dry-in Roof	0	05/18/15		Total Project	$0.00
50	Occupancy Permit	0	08/11/15		Total Project	$0.00
Construction						
60	Excavate	1	03/02/15	03/02/15	Mass Excavation	$15,000.00
70	Form/Pour Footings	8	03/03/15	03/12/15	Concrete	$9,000.00
80	Form/Pour Foundation Walls	14	03/13/15	04/01/15	Concrete	$15,000.00
90	Floor & Wall Framing	16	04/02/15	04/23/15	Framing	$13,750.00
100	Set Roof Trusses	4	04/24/15	04/29/15	Framing	$2,900.00
110	Roof Fascia & Plywood	12	04/30/15	05/15/15	Roof	$3,500.00
120	Exterior House Wrap	2	05/18/15	05/19/15	Exterior Finishes	$6,525.00
125	Asphalt Shingle	3	05/18/15	05/20/15	Roof	$11,230.00

Figure 12.10.1 Phoenix Project Manager.

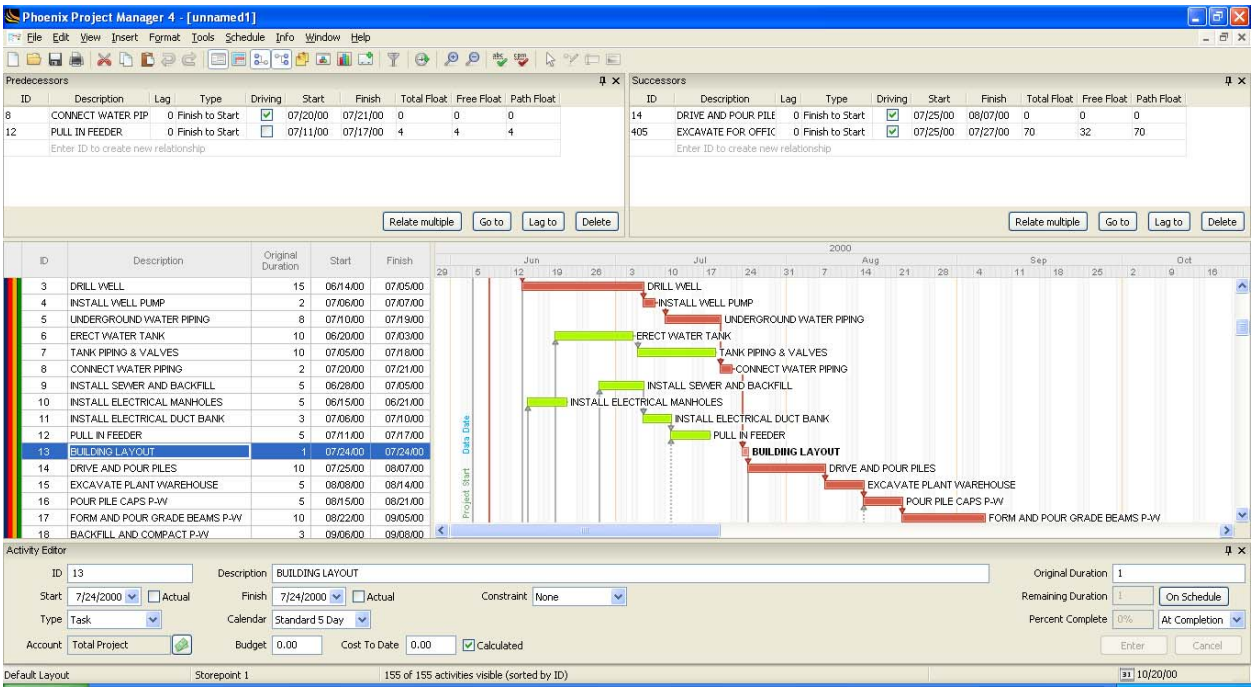


Figure 12.10.2 Phoenix Project Manager rendition of John Doe project (imported P3 file).

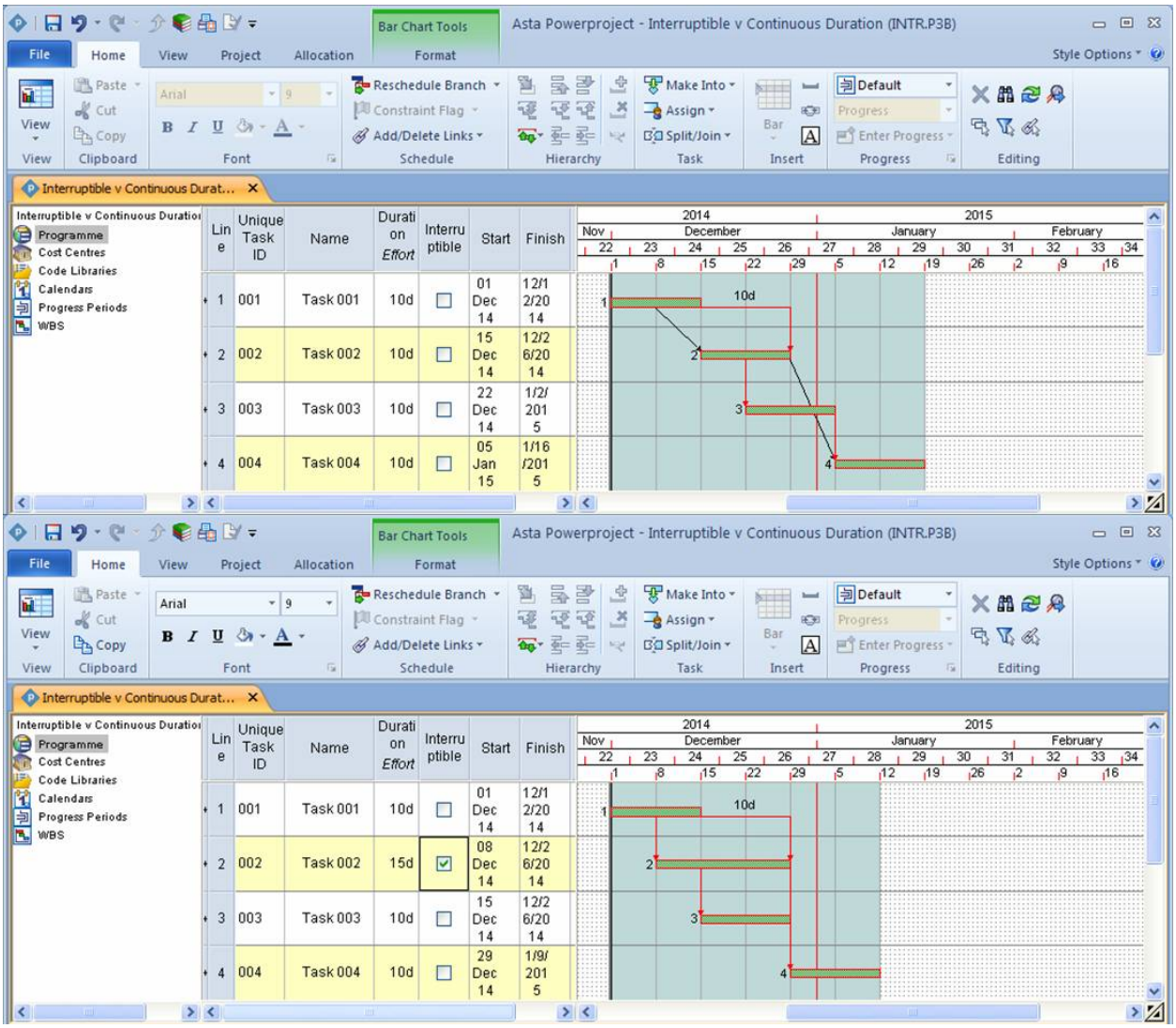


Figure 12.10.3 Asta Powerproject supports interruptible or continuous duration options assignable to each activity.

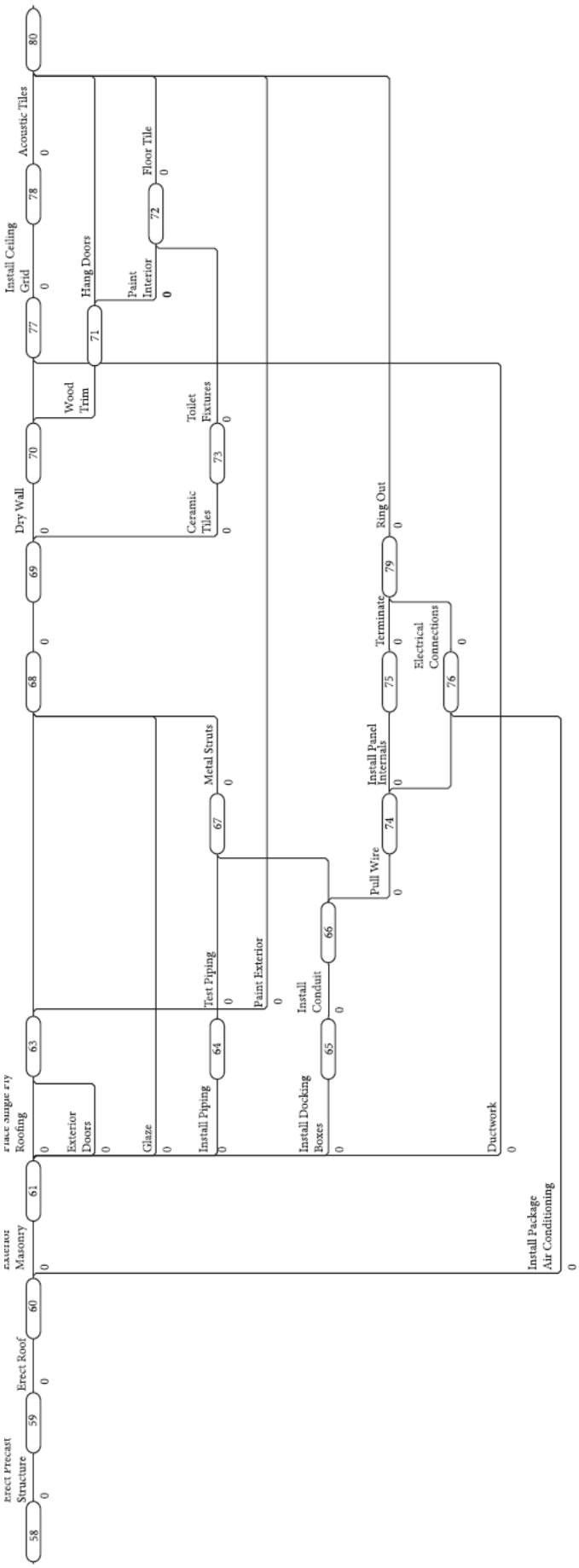


Figure 12.10.4 Example of Micro Planner X-Pert depiction of the John Doe project.

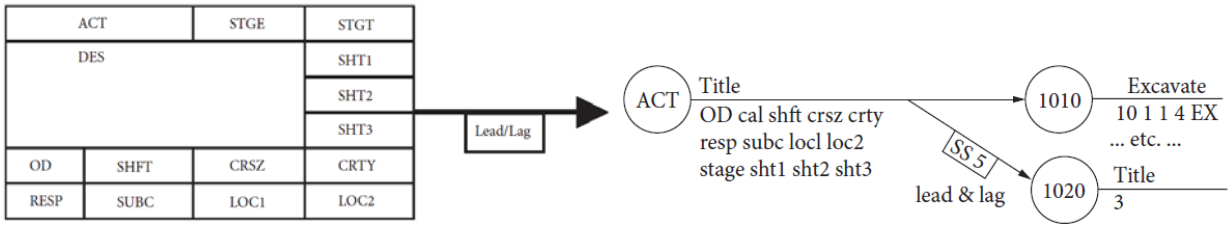


Figure 13.4.1 and 13.4.2 Large and small node formats: activity in box versus activity on arrow with codes.

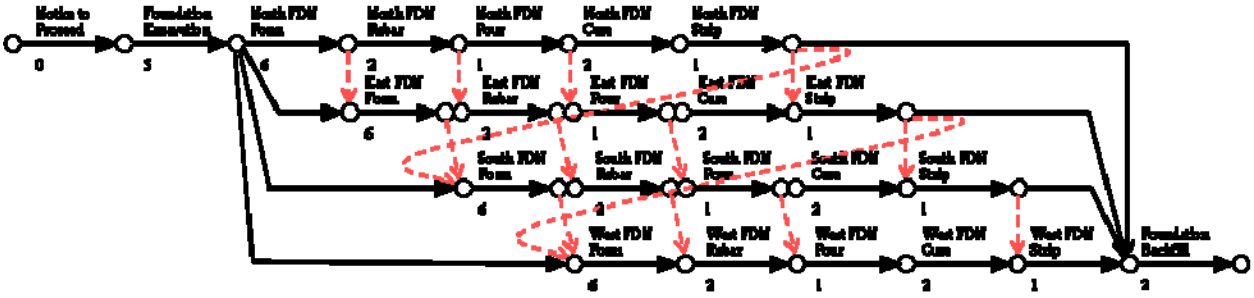


Figure 13.8.2 ADM - events and activities known, relationships simple.

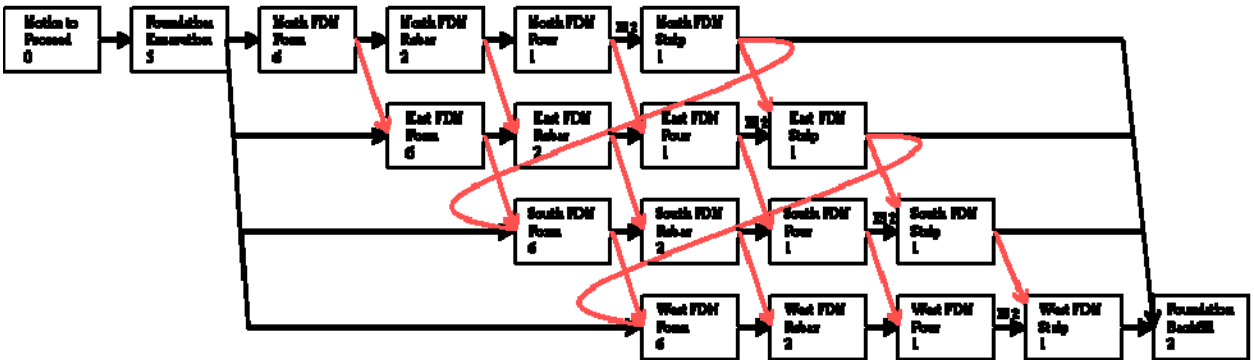


Figure 13.8.3 PDM - activities known, relationships complex. (Sole methodology supported by Primavera.)

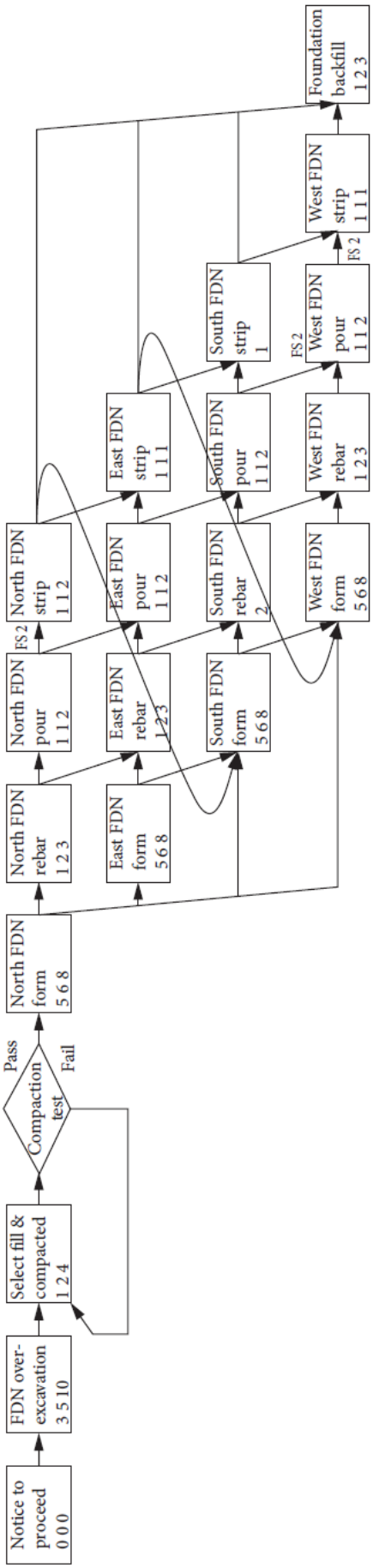


Figure 13.8.4 GERT - choice of path to be taken.

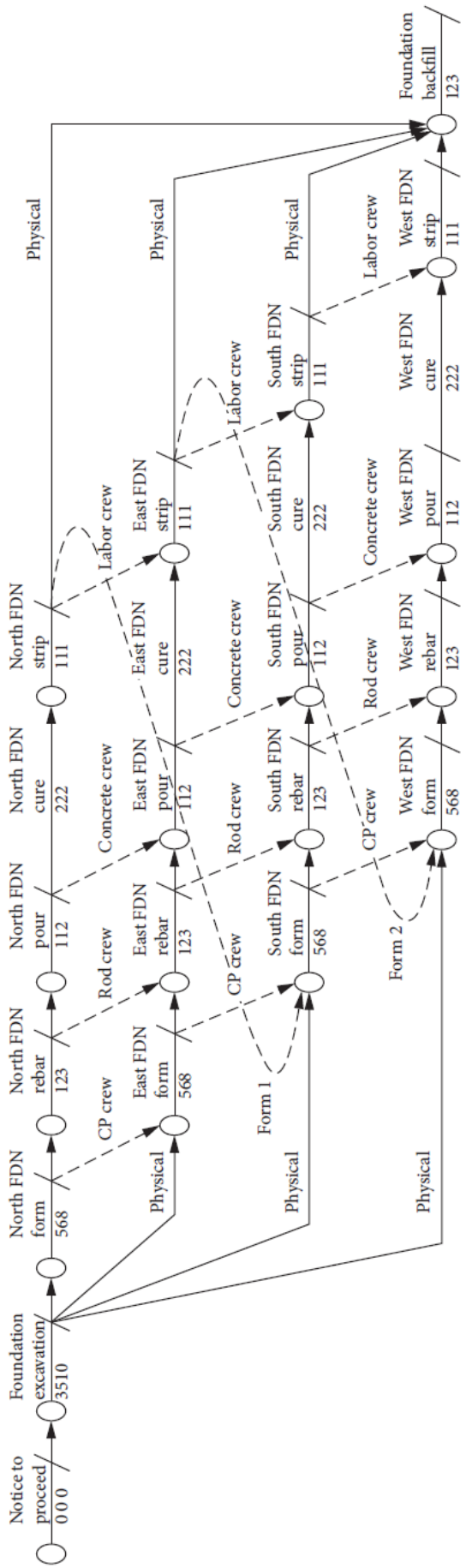
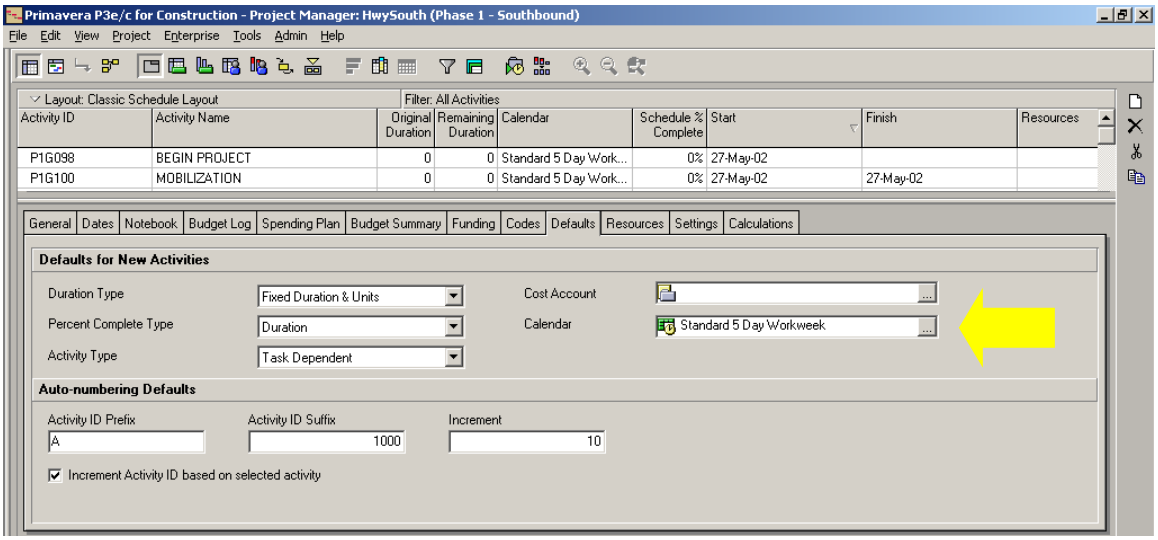


Figure 13.8.5 RDM - recording reasons for relationships

In P6 there is the option to choose which calendar will be assigned as a default. The drop-down box choice of calendar and long-name description of calendar reduces the potential confusion of designation of Calendar #1 or #2 or #3, but also increases the width of column required to display this information and may increase the effort required to enter the information.



This too can be ameliorated by renaming your standard calendars as “5D,” “6D” and “7D,” renaming the column from “Calendar” to “Cal” and adjusting the column width appropriately.

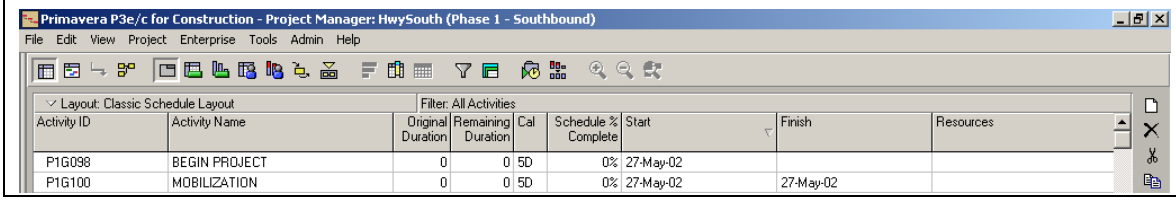


Figure 14.1.1 P6 multiple calendars

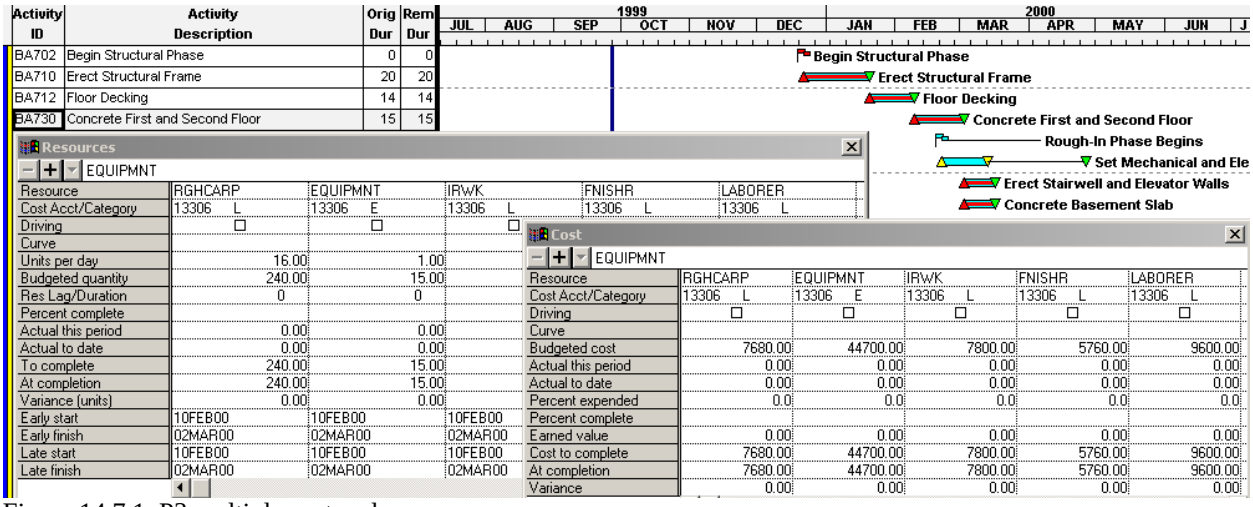


Figure 14.7.1 P3 multiple cost codes

Activity ID	Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Total Float	Resource	Budgeted Cost
Equipment-Crane								
Building Structure								
BA710	Erect Structural Frame	20	20	22DEC99	20JAN00	0	EQUIPMNT	59,600.00
BA712	Floor Decking	14	14	21JAN00	09FEB00	0	EQUIPMNT	41,720.00
BA730	Concrete First and Second Floor	15	15	10FEB00	02MAR00	0	EQUIPMNT	44,700.00
BA731	Concrete Basement Slab	10	10	03MAR00	16MAR00	0	EQUIPMNT	29,800.00
Finisher								
Building Structure								
BA730	Concrete First and Second Floor	15	15	10FEB00	02MAR00	0	FNISHR	5,760.00
BA731	Concrete Basement Slab	10	10	03MAR00	16MAR00	0	FNISHR	3,840.00
Ironworker								
Building Structure								
BA710	Erect Structural Frame	20	20	22DEC99	20JAN00	0	IRWK	52,000.00
BA712	Floor Decking	14	14	21JAN00	09FEB00	0	IRWK	29,120.00
BA730	Concrete First and Second Floor	15	15	10FEB00	02MAR00	0	IRWK	7,800.00
BA731	Concrete Basement Slab	10	10	03MAR00	16MAR00	0	IRWK	5,200.00
Laborer-Construction								
Building Structure								
BA730	Concrete First and Second Floor	15	15	10FEB00	02MAR00	0	LABORER	9,600.00
BA720	Erect Stairwell and Elevator Walls	10	10	03MAR00	16MAR00	0	LABORER	9,600.00
BA731	Concrete Basement Slab	10	10	03MAR00	16MAR00	0	LABORER	6,400.00
Rough Carpenter								
Building Structure								
BA730	Concrete First and Second Floor	15	15	10FEB00	02MAR00	0	RGHCARP	7,680.00
BA731	Concrete Basement Slab	10	10	03MAR00	16MAR00	0	RGHCARP	5,120.00

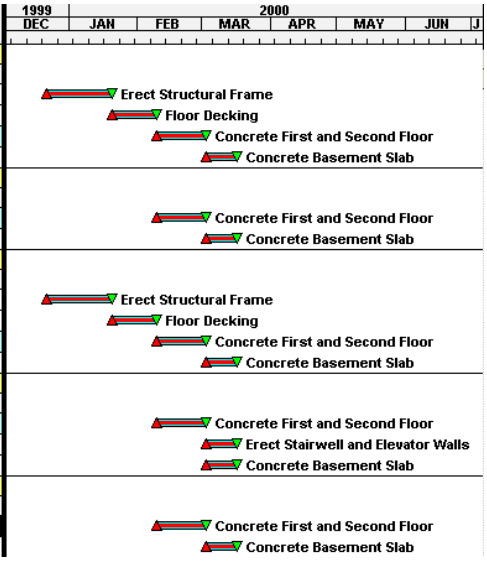


Figure 14.7.2 Multiple cost codes for one activity means activity is listed several times in cost reports

In Primavera P3 Project Planner, a means exists to get around the "Building 'A,' 5th Floor, NW Quadrant" coding noted in the preceding section by the use of "Aliases."

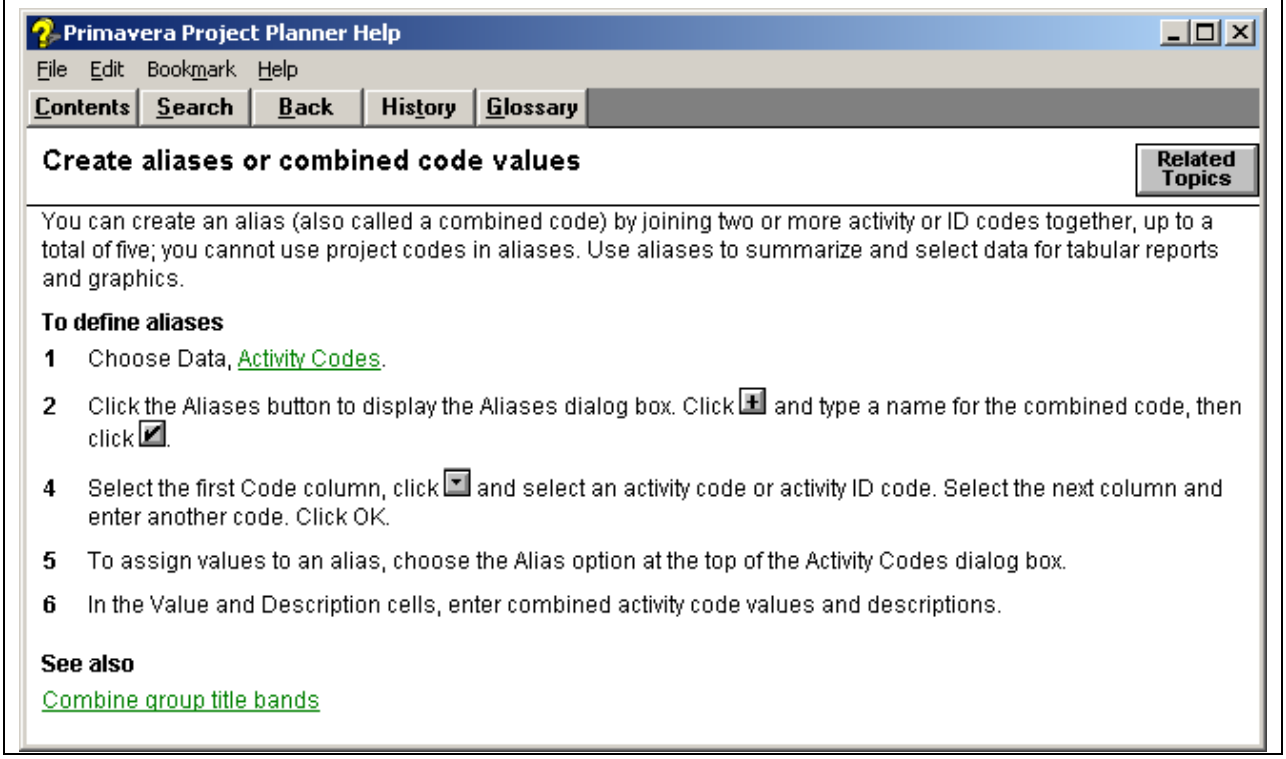


Figure 14.9.1 Primavera Alias described

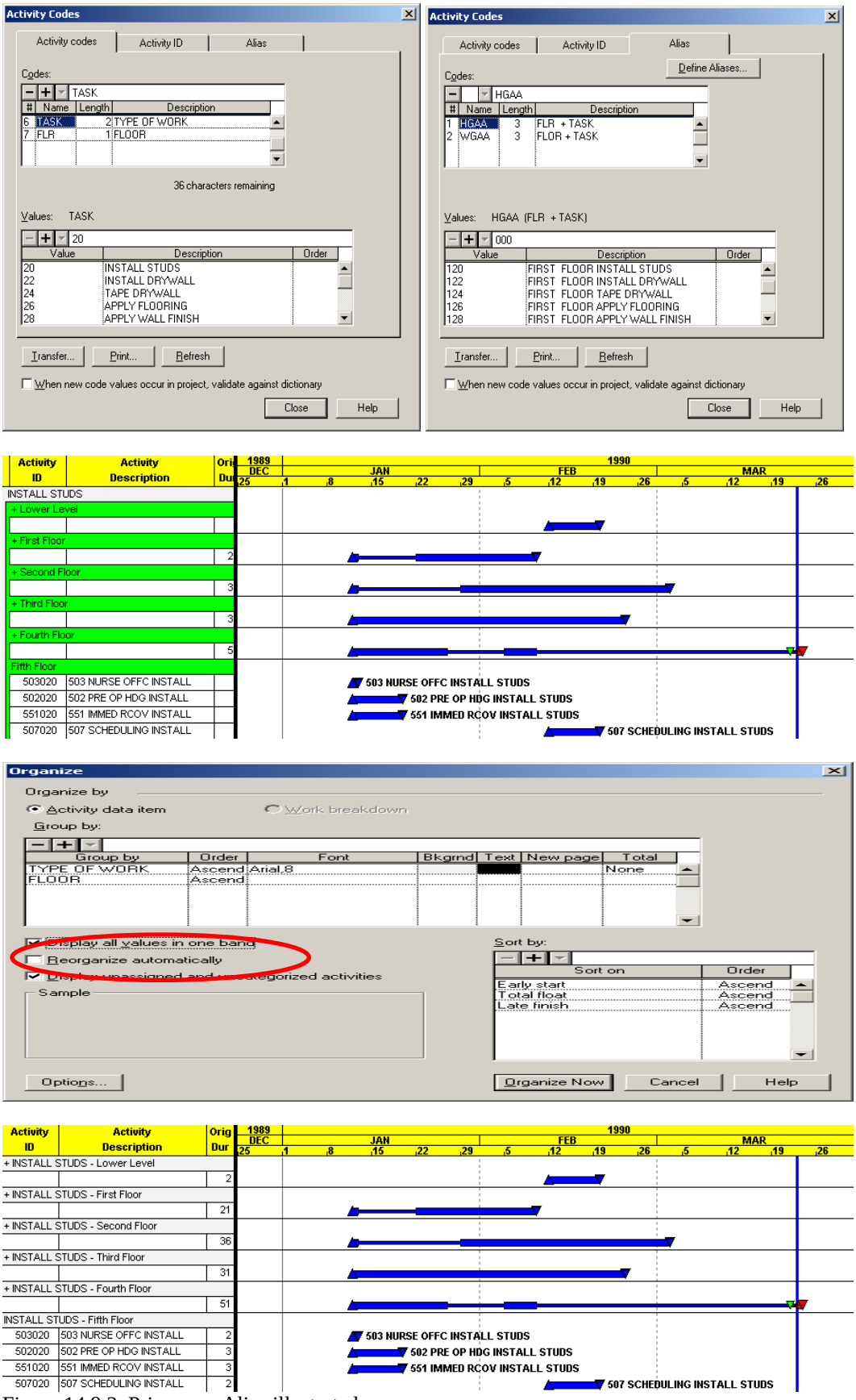


Figure 14.9.2 Primavera Alias illustrated

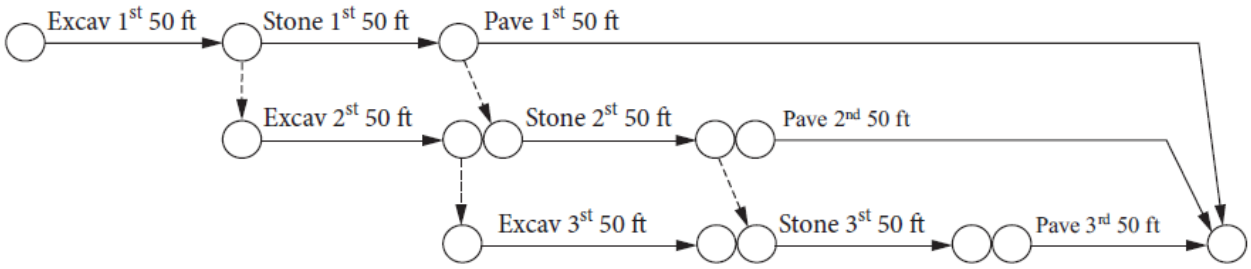


Figure 16.8.1 ADM.

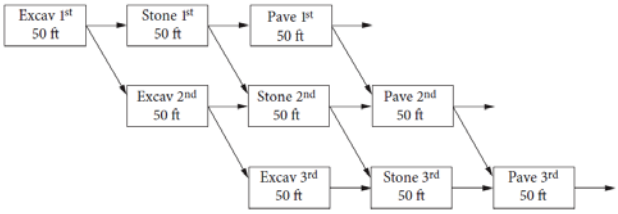


Figure 16.8.2 PDM.

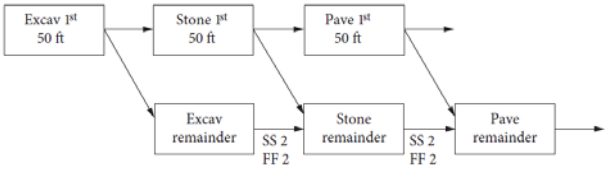


Figure 16.8.3 PDM with some overlap.

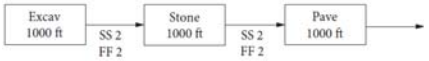


Figure 16.8.4 PDM with more overlap.

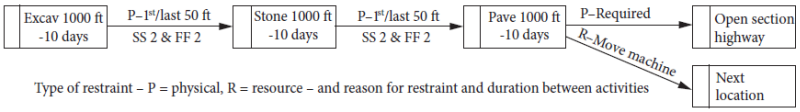


Figure 16.8.5 RDM—Rationale of restraints recorded.

=

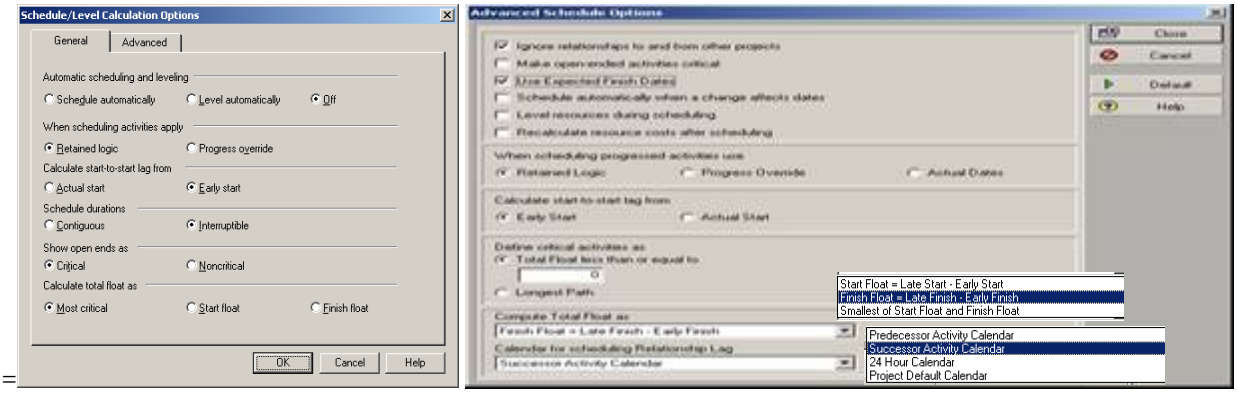


Figure 16.18.1 and 16.18.2 Schedule calculation algorithm switches and P6 advanced schedule options

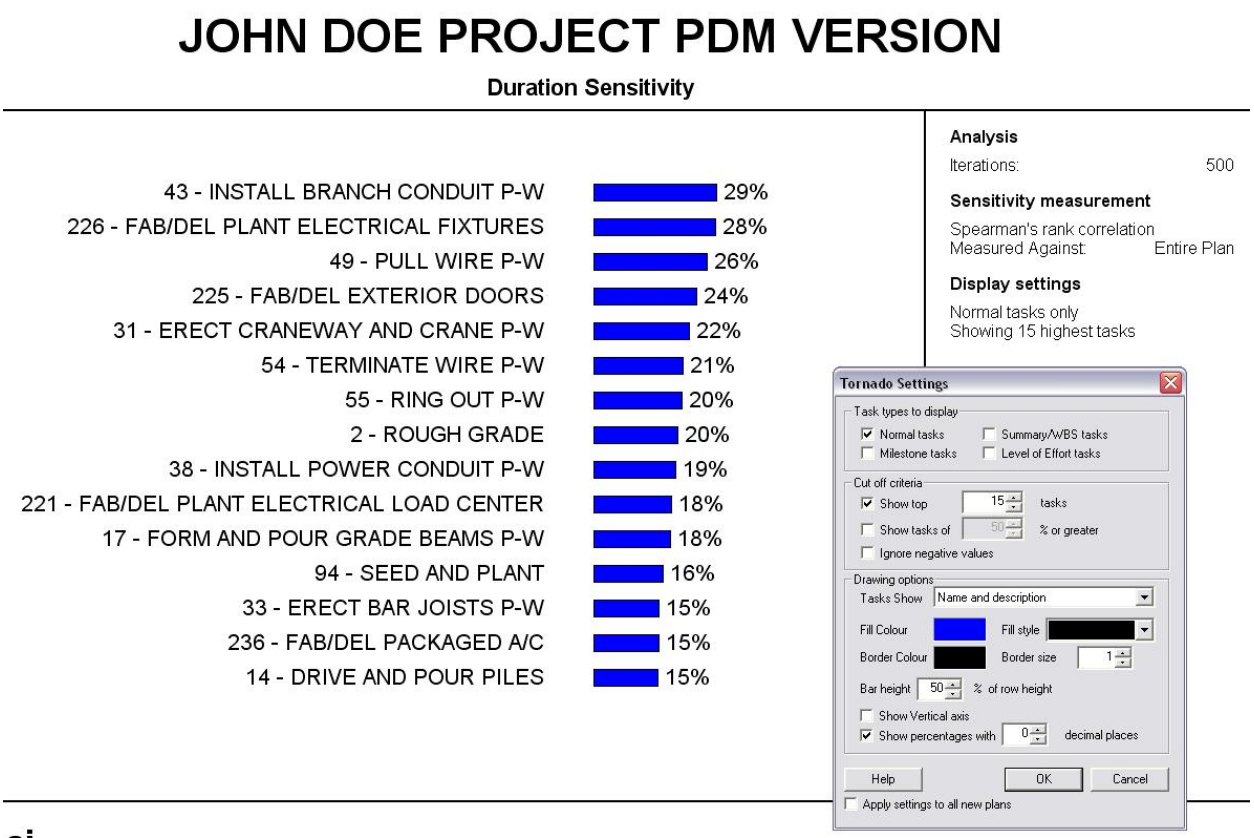


Figure 17.5.1 Pertmaster analysis measures likelihood that a change in duration of one activity may shift the critical path

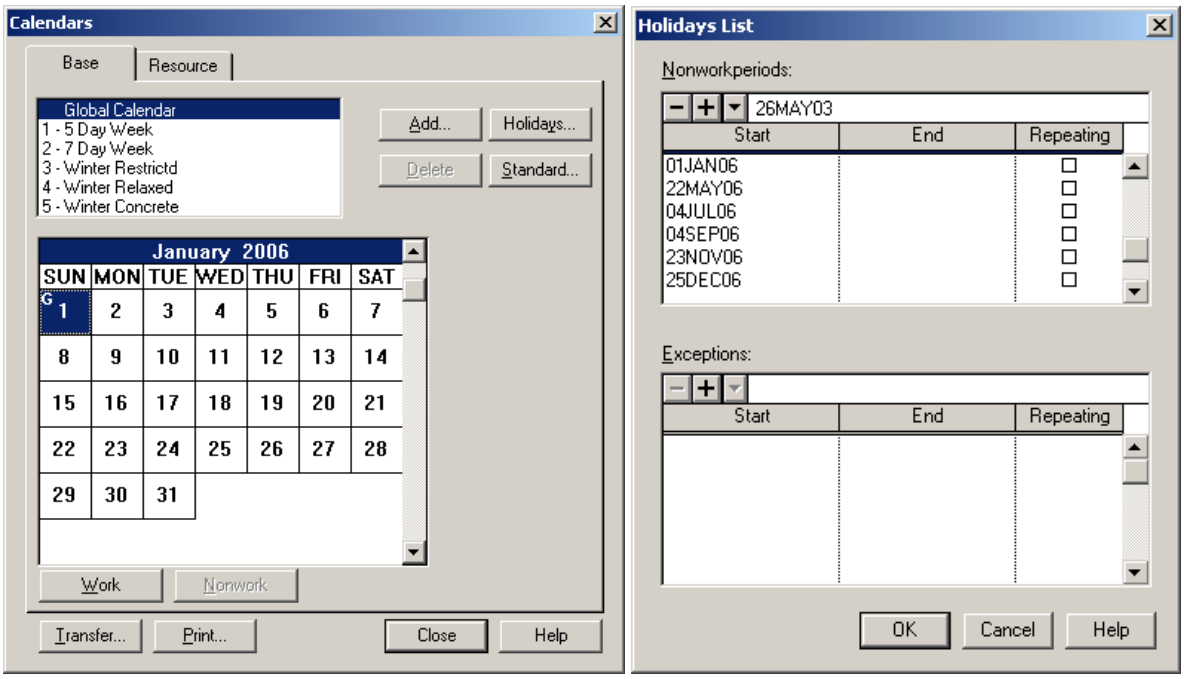


Figure 17.8.1 Global Calendar and global holiday list

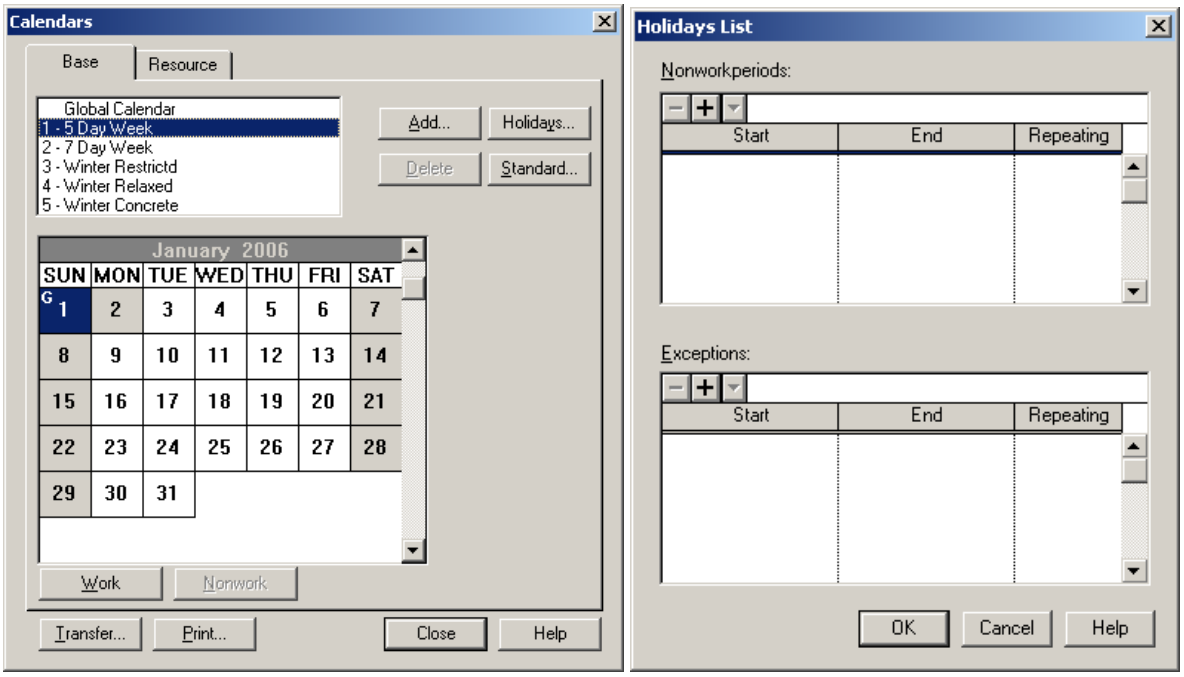


Figure 17.8.2 5-Day Week Calendar and holiday list
Note January 2 is calculated as a holiday since January 1 is a Sunday

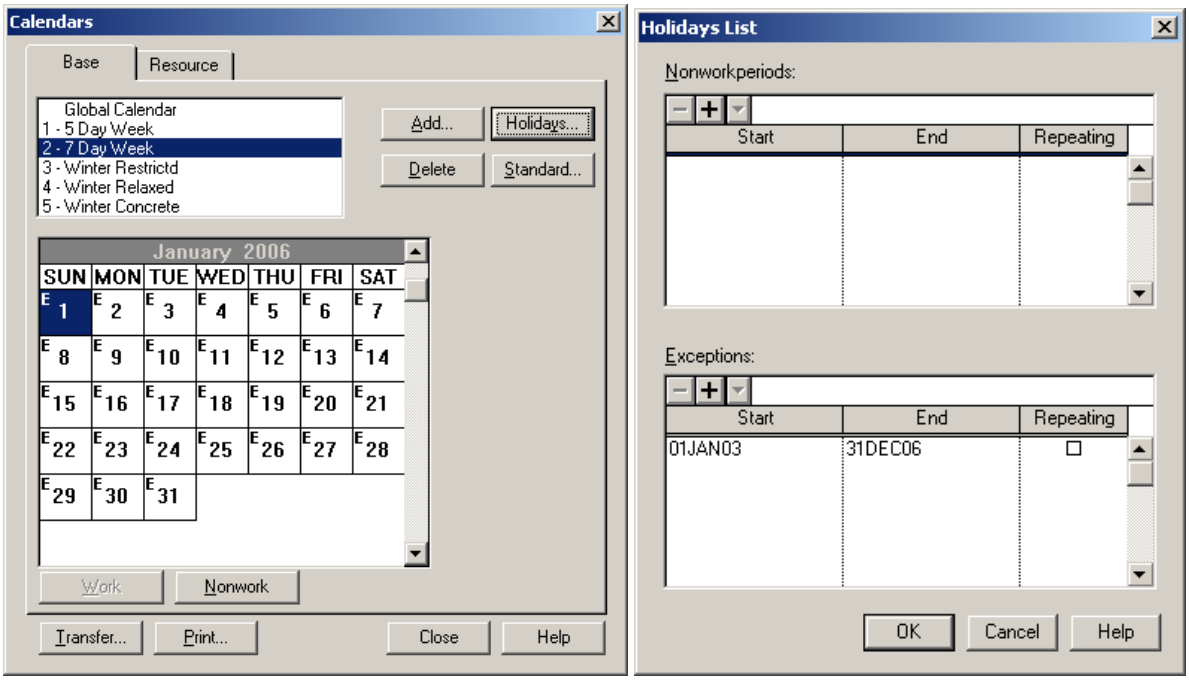


Figure 17.8.3 7-Day Calendar and Holiday List Exceptions

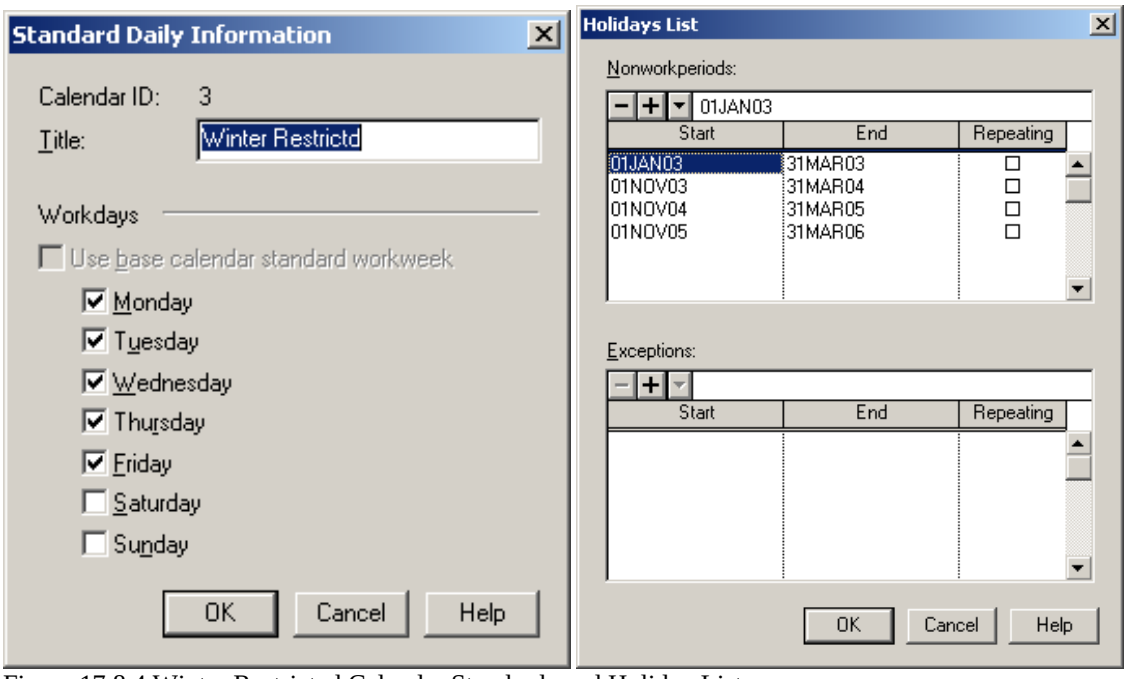


Figure 17.8.4 Winter Restricted Calendar Standards and Holiday List

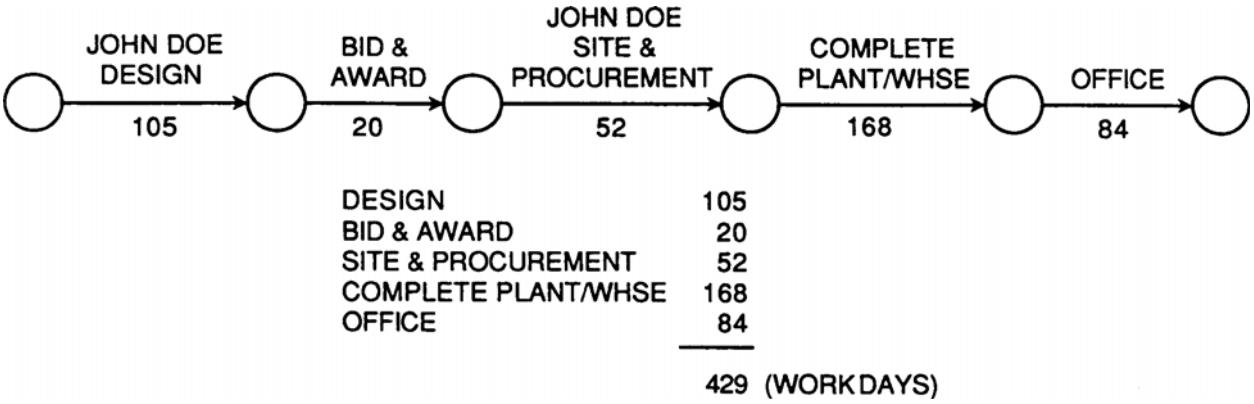


Figure 18.5.1 John Doe schedule without expediting summary level.

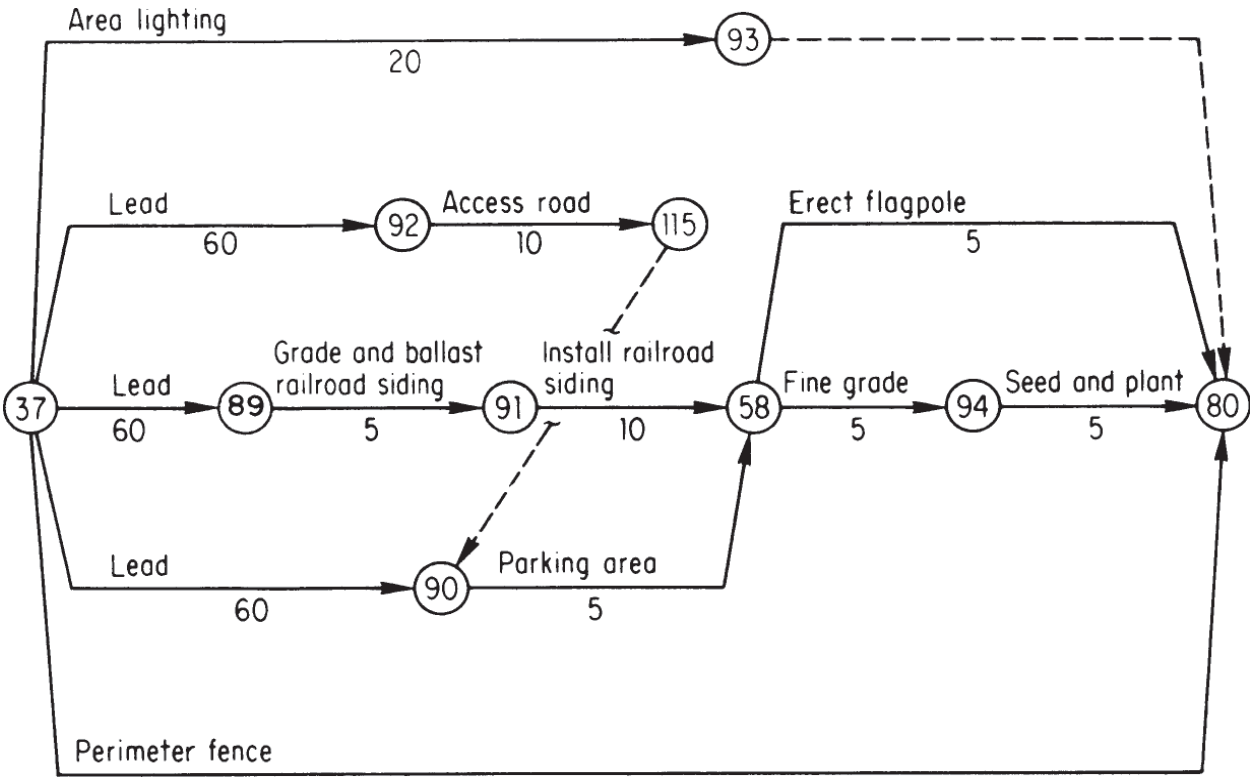


Figure 18.6.1 Lead and sequence arrows; site work.

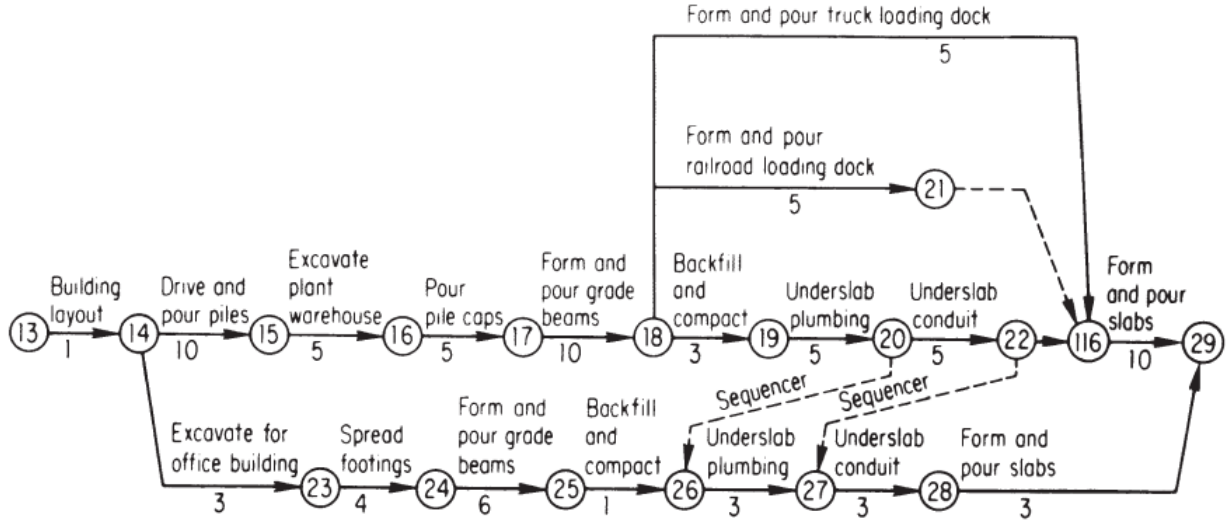


Figure 18.6.2 Work sequence arrows; foundation contract.

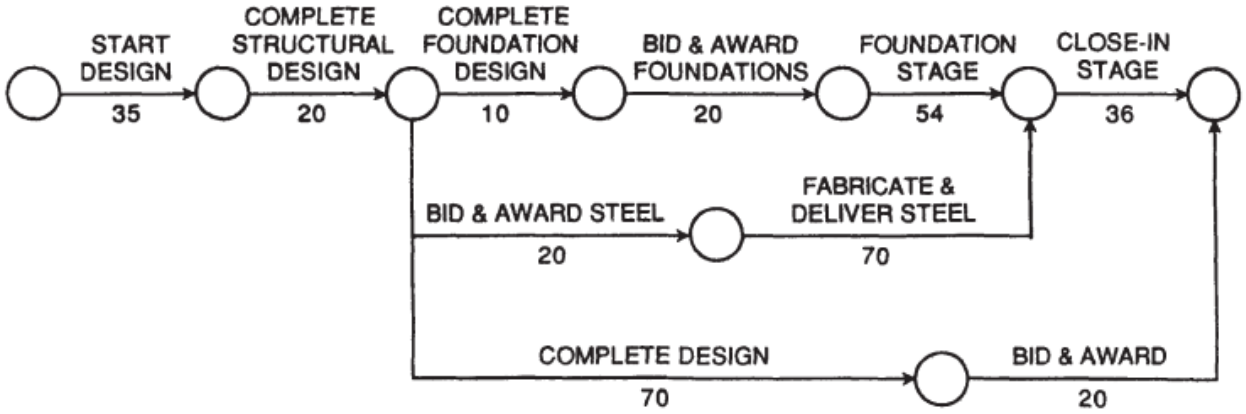


Figure 18.7.1 Fast-track network.

Activity ID	Activity Description	Orig Dur	Total Float	Early Start	Early Finish
0	START MILESTONE	0	0	01MAR04	
100	CLEAR SITE	3	0	01MAR04	03MAR04
1	SURVEY AND LAYOUT	2	0	04MAR04	05MAR04
2	ROUGH GRADE	2	0	08MAR04	09MAR04
3	DRILL WELL	15	0	10MAR04	30MAR04
4	INSTALL WELL PUMP	2	0	31MAR04	01APR04
5	UNDERGROUND WATER PIPING	8	0	02APR04	13APR04
8	CONNECT WATER PIPING	2	0	14APR04	15APR04
13	BUILDING LAYOUT	1	0	16APR04	16APR04
14	DRIVE AND POUR PILES	10	0	19APR04	30APR04
15	EXCAVATE PLANT	5	0	03MAY04	07MAY04
16	POUR PILE CAPS P-W	5	0	10MAY04	14MAY04
17	FORM AND POUR GRADE	10	0	17MAY04	28MAY04
18	BACKFILL AND COMPACT P-W	3	0	31MAY04	02JUN04
19	UNDERSLAB PLUMBING P-W	5	0	03JUN04	09JUN04
20	UNDERSLAB CONDUIT P-W	5	0	10JUN04	16JUN04
22	FORM AND POUR SLABS P-W	10	0	17JUN04	30JUN04
29	ERECT STRUCTURAL STEEL	10	0	01JUL04	14JUL04
30	PLUMB AND BOLT STEEL P-W	5	0	15JUL04	21JUL04
31	ERECT CRANEWAY AND	5	0	22JUL04	28JUL04
33	ERECT BAR JOISTS P-W	3	0	29JUL04	02AUG04
34	ERECT ROOF PLANKS P-W	3	0	03AUG04	05AUG04
35	ERECT SIDING P-W	10	0	06AUG04	19AUG04
300	SET ELECTRICAL LOAD	2	0	20AUG04	23AUG04
38	INSTALL POWER CONDUIT P-W	20	0	24AUG04	20SEP04
43	INSTALL BRANCH CONDUIT	15	0	21SEP04	11OCT04
49	PULL WIRE P-W	15	0	12OCT04	01NOV04
50	INSTALL PANEL INTERNALS	5	0	02NOV04	08NOV04
54	TERMINATE WIRE P-W	10	0	09NOV04	22NOV04
55	RING OUT P-W	10	0	23NOV04	06DEC04
56	ENERGIZE POWER	1	0	07DEC04	07DEC04
415	FINE GRADE	5	0	08DEC04	14DEC04
94	SEED AND PLANT	5	0	15DEC04	21DEC04
80	END OF NETWORK MILESTONE	0	0		21DEC04

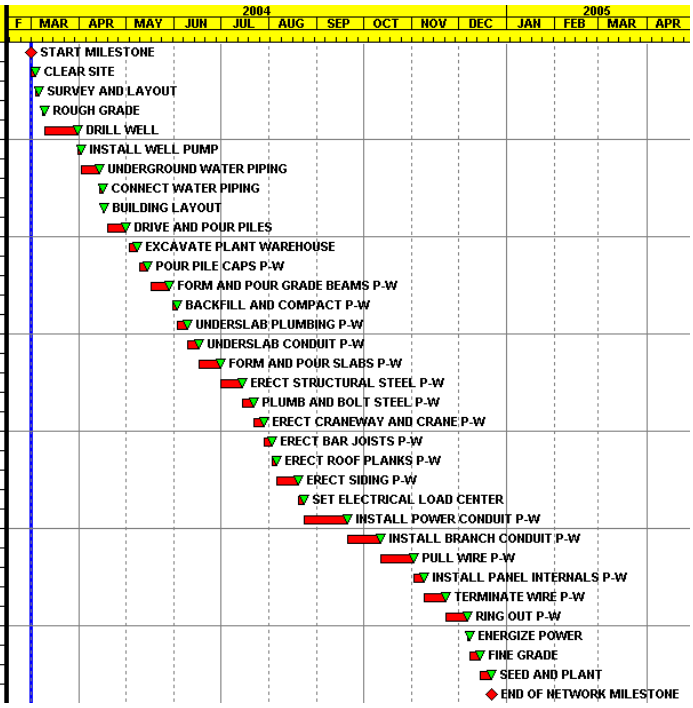


Figure 18.10.1 – Critical Path for a One Path Linear Project (Based on John Doe Project)

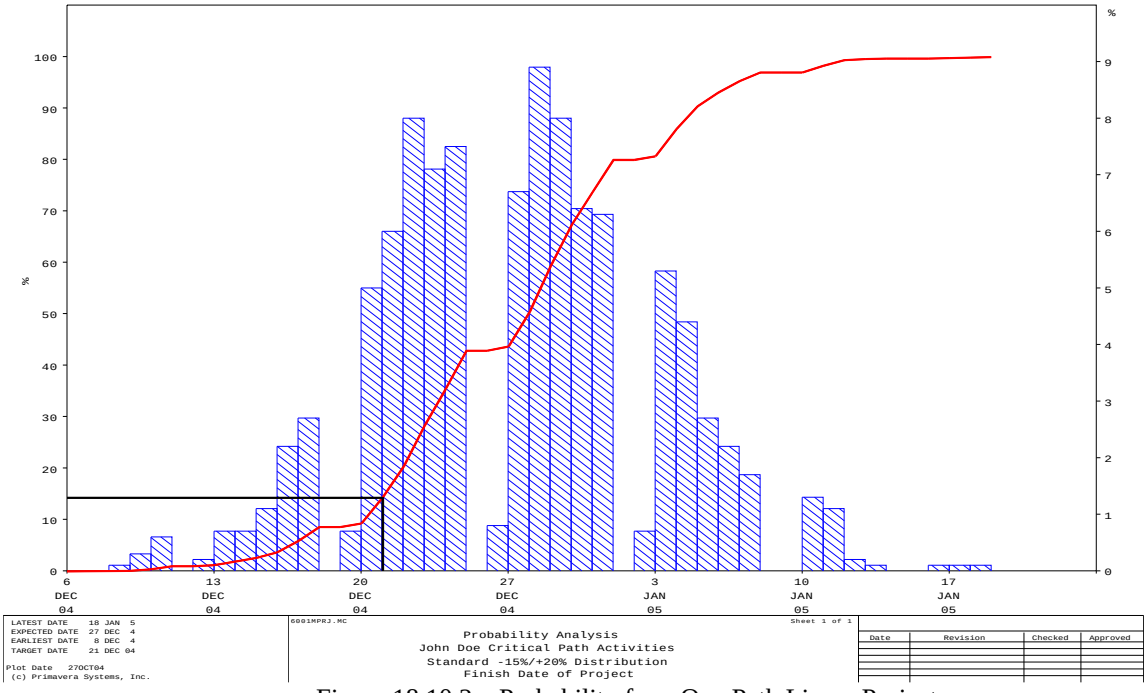


Figure 18.10.2 – Probability for a One Path Linear Project

Activity ID	Activity Description	Orig Dur	Total Float	Early Start	Early Finish
0	START MILESTONE	0	0	01MAR04	
100	CLEAR SITE	3	0	01MAR04	03MAR04
1	SURVEY AND LAYOUT	2	0	04MAR04	05MAR04
2	ROUGH GRADE	2	0	08MAR04	09MAR04
3	DRILL WELL	15	0	10MAR04	30MAR04
4	INSTALL WELL PUMP	2	0	31MAR04	01APR04
5	UNDERGROUND WATER PIPING	8	0	02APR04	13APR04
401	WATER TANK FOUNDATIONS	4	1	10MAR04	15MAR04
6	ERECT WATER TANK	10	1	16MAR04	29MAR04
7	TANK PIPING & VALVES	10	1	30MAR04	12APR04
8	CONNECT WATER PIPING	2	0	14APR04	15APR04
402	EXCAVATE FOR SEWER	10	4	10MAR04	23MAR04
9	INSTALL SEWER AND	5	4	24MAR04	30MAR04
11	INSTALL ELECTRICAL DUCT	3	4	31MAR04	02APR04
12	PULL IN FEEDER	5	4	05APR04	09APR04
13	BUILDING LAYOUT	1	0	16APR04	16APR04
14	DRIVE AND POUR PILES	10	0	19APR04	30APR04
15	EXCAVATE PLANT	5	0	03MAY04	07MAY04
16	POUR PILE CAPS P-W	5	0	10MAY04	14MAY04
17	FORM AND POUR GRADE	10	0	17MAY04	28MAY04
18	BACKFILL AND COMPACT P-W	3	0	31MAY04	02JUN04
19	UNDERSLAB PLUMBING P-W	5	0	03JUN04	09JUN04
20	UNDERSLAB CONDUIT P-W	5	0	10JUN04	16JUN04
22	FORM AND POUR SLABS P-W	10	0	17JUN04	30JUN04
29	ERECT STRUCTURAL STEEL	10	0	01JUL04	14JUL04
30	PLUMB AND BOLT STEEL P-W	5	0	15JUL04	21JUL04
31	ERECT CRANEWAY AND	5	0	22JUL04	28JUL04
33	ERECT BAR JOISTS P-W	3	0	29JUL04	02AUG04
34	ERECT ROOF PLANKS P-W	3	0	03AUG04	05AUG04
35	ERECT SIDING P-W	10	0	06AUG04	19AUG04
300	SET ELECTRICAL LOAD	2	0	20AUG04	23AUG04
38	INSTALL POWER CONDUIT P-W	20	0	24AUG04	20SEP04
43	INSTALL BRANCH CONDUIT	15	0	21SEP04	11OCT04
49	PULL WIRE P-W	15	0	12OCT04	01NOV04
50	INSTALL PANEL INTERNALS	5	0	02NOV04	08NOV04
54	TERMINATE WIRE P-W	10	0	09NOV04	22NOV04
55	RING OUT P-W	10	0	23NOV04	06DEC04
56	ENERGIZE POWER	1	0	07DEC04	07DEC04
415	FINE GRADE	5	0	08DEC04	14DEC04
94	SEED AND PLANT	5	0	15DEC04	21DEC04
80	END OF NETWORK MILESTONE	0	0		21DEC04

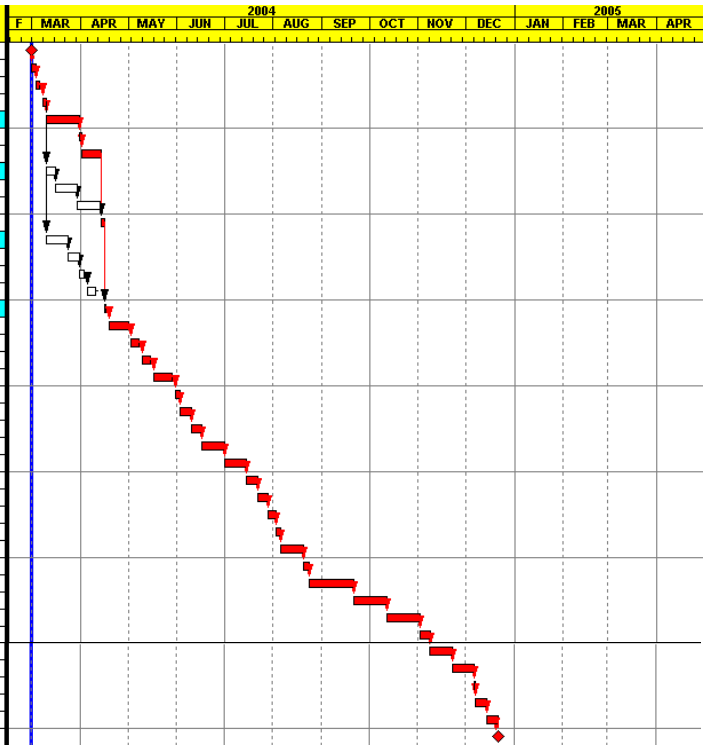


Figure 18.10.3 – Alternate Critical Paths for a project without long duration procurement activities

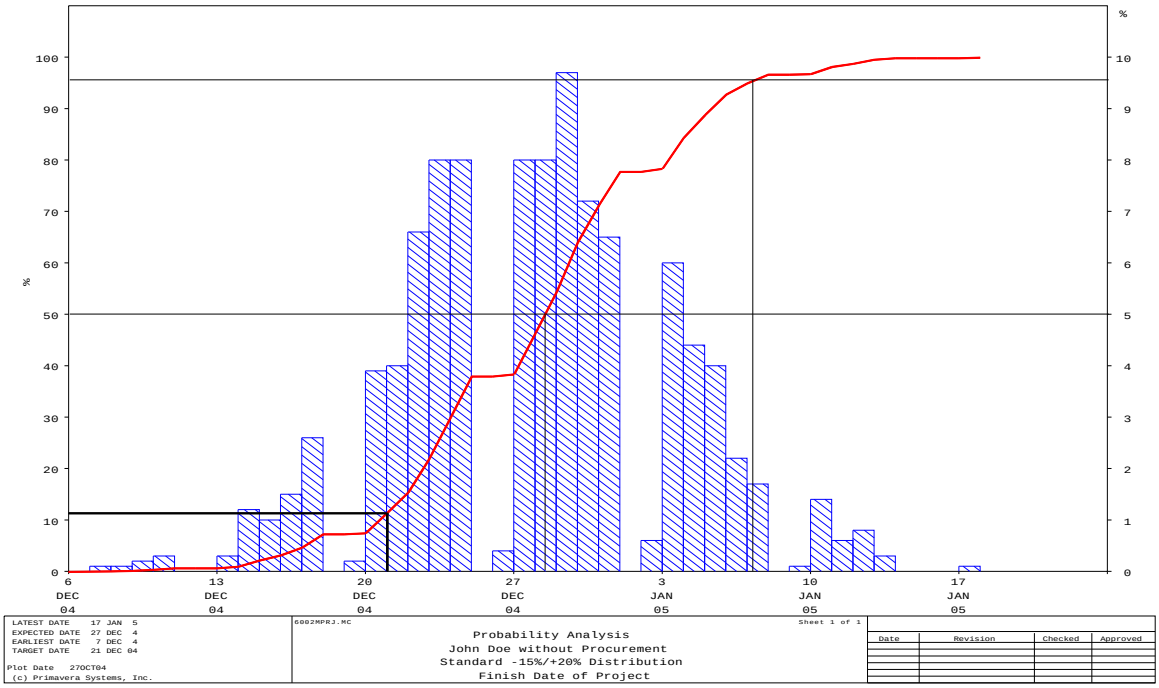


Figure 18.10.4 – Probability for a project without long duration procurement activities

Activity ID	Activity Description	Orig Dur	Total Float	Early Start	Early Finish
0	START MILESTONE	0	0	01MAR04	
135	SUBMIT PACKAGED A/C	30	8	01MAR04	09APR04
235	APPROVE PACKAGED A/C	10	8	12APR04	23APR04
236	FAB/DEL PACKAGED A/C	90	8	26APR04	30AUG04
60	EXTERIOR MASONRY OFFICE	10	8	31AUG04	13SEP04
418	INSTALL PIPING OFFICE	10	8	14SEP04	27SEP04
64	TEST PIPING OFFICE	4	8	28SEP04	01OCT04
67	METAL STUDS OFFICE	5	8	04OCT04	08OCT04
68	DRYWALL	5	8	11OCT04	15OCT04
69	DRYWALL	10	8	18OCT04	29OCT04
70	WOOD TRIM OFFICE	10	8	01NOV04	12NOV04
71	PAINT INTERIOR OFFICE	10	8	15NOV04	26NOV04
72	FLOOR TILE OFFICE	10	8	29NOV04	10DEC04
80	END OF NETWORK MILESTONE	0	0		22DEC04

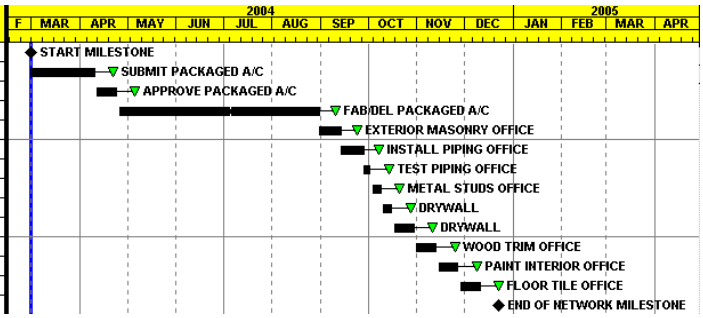


Figure 18.10.5 – Alternate Critical Path for a project with long duration procurement activities

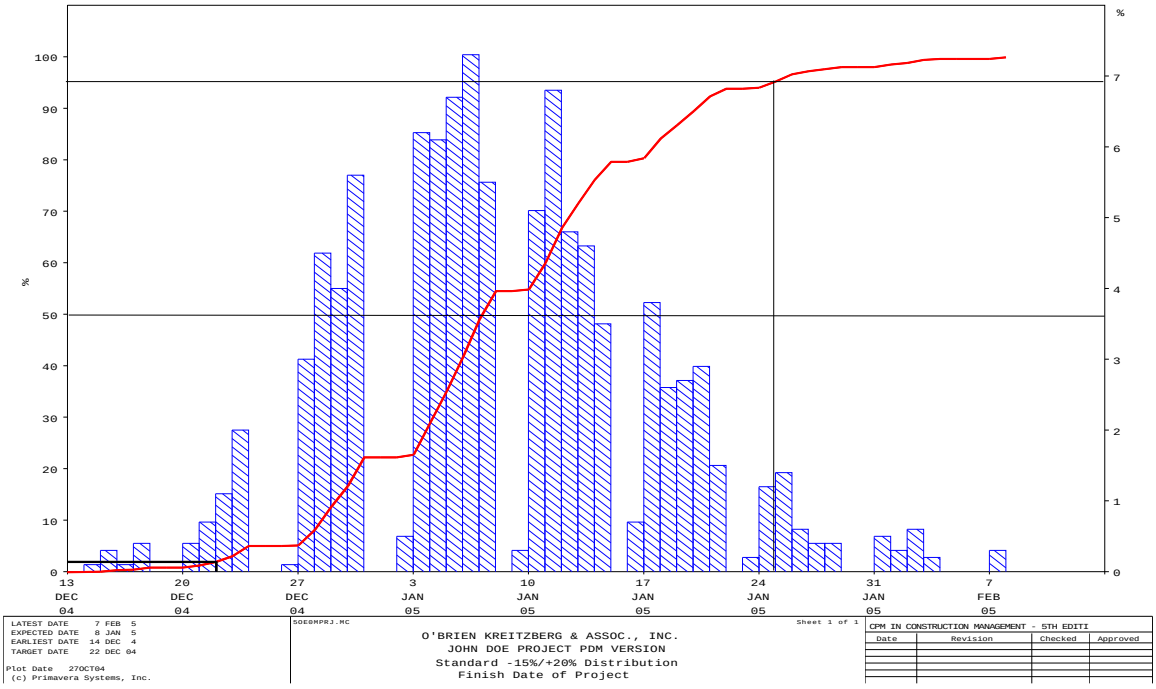


Figure 18.10.6 – Probability for a project with long duration procurement activities

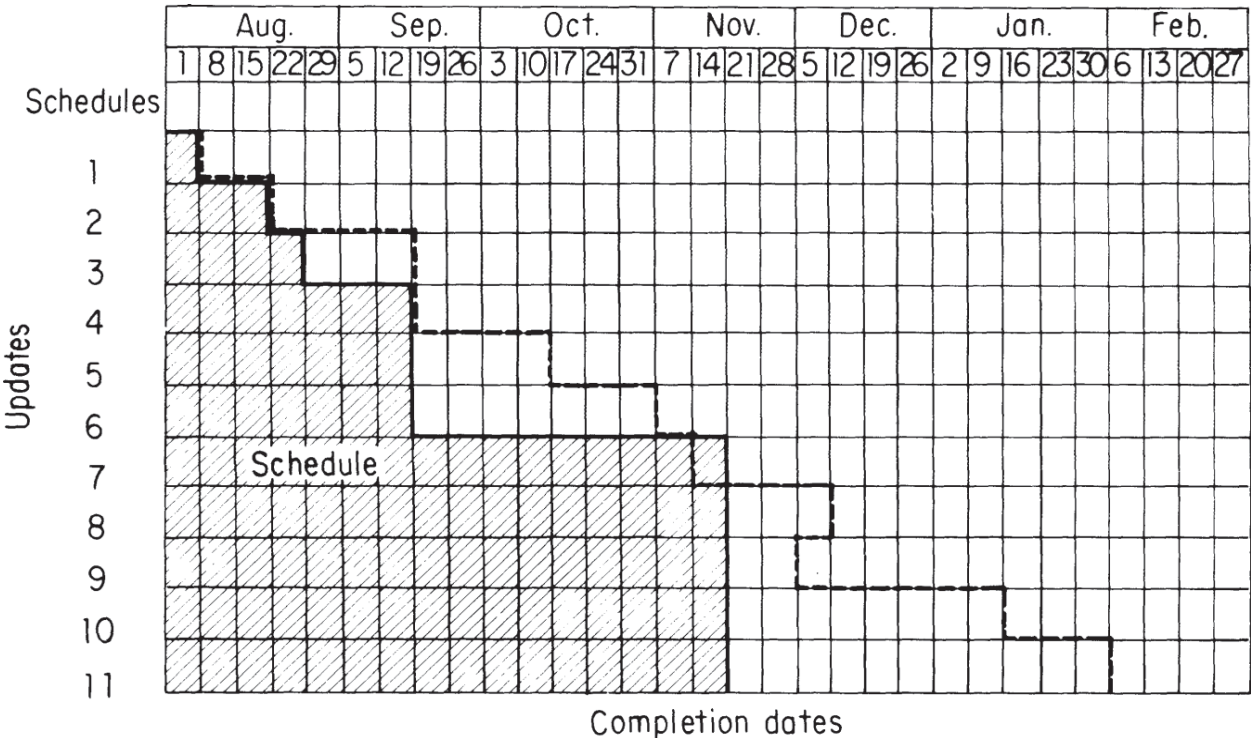


Figure 18.12.1 Schedule slippage over 11 updates.

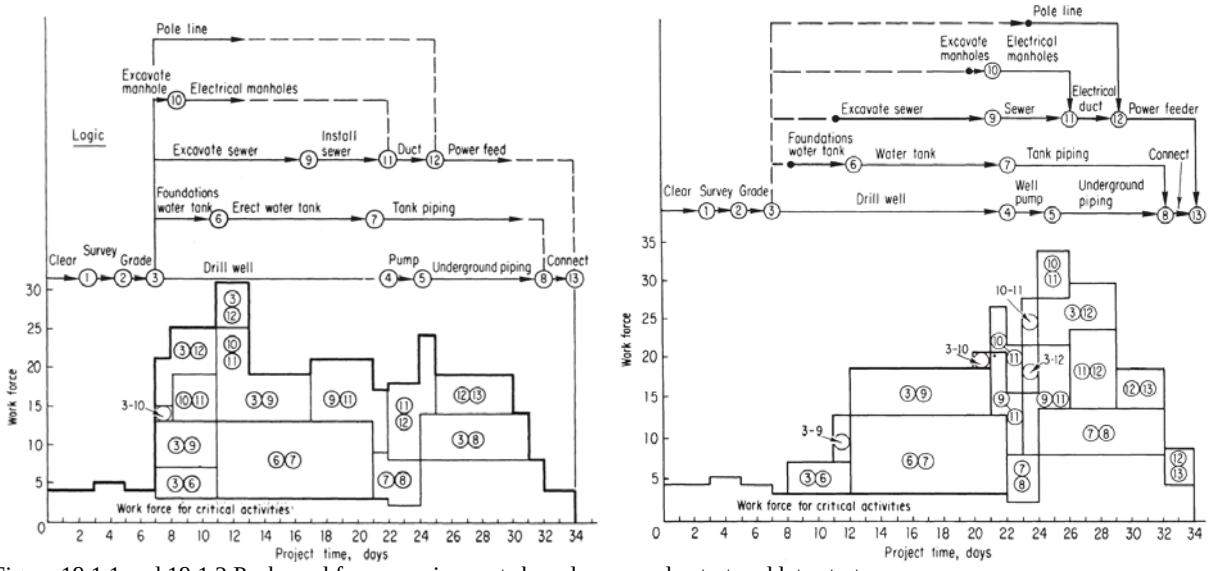


Figure 19.1.1 and 19.1.2 Peak workforce requirements based upon early start and late start.

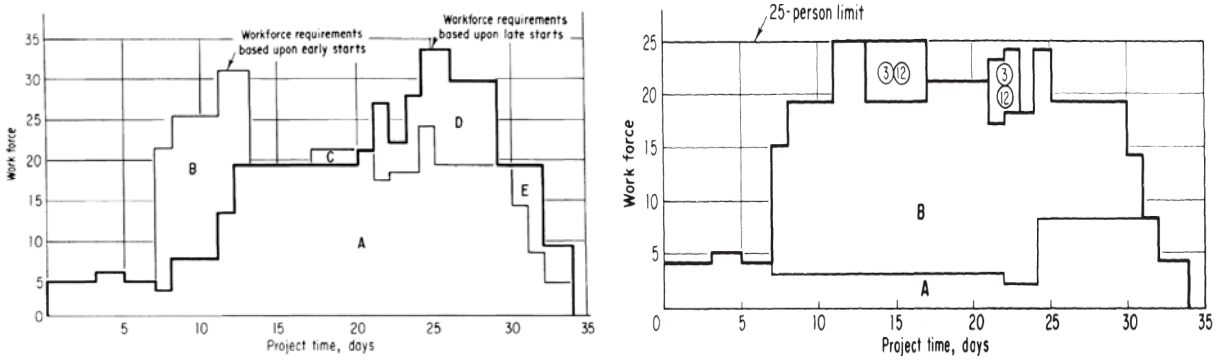


Figure 19.1.3 and 19.1.4 Combined peak workforce requirements for both early and late start dates versus leveled workforce.

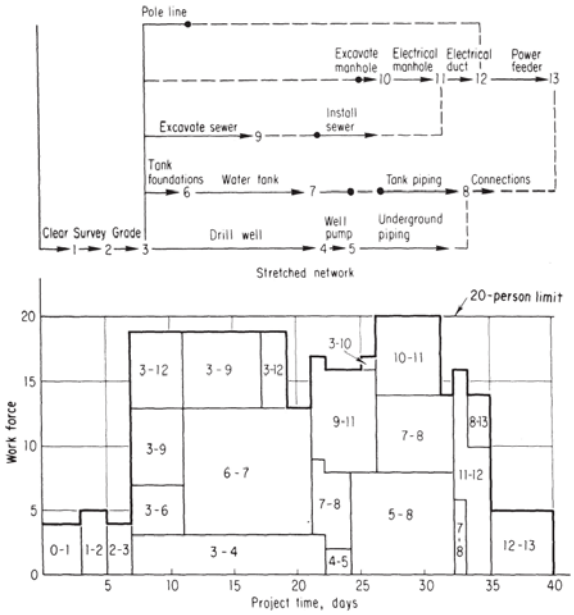


Figure 19.1.5 Limited workforce.

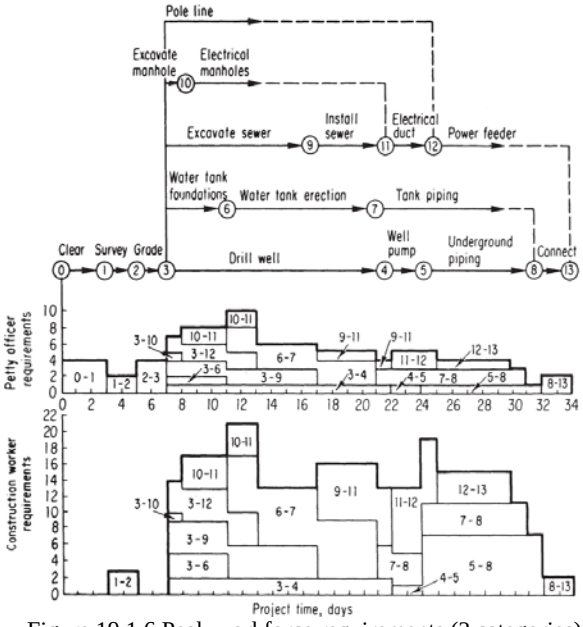


Figure 19.1.6 Peak workforce requirements (2 categories).

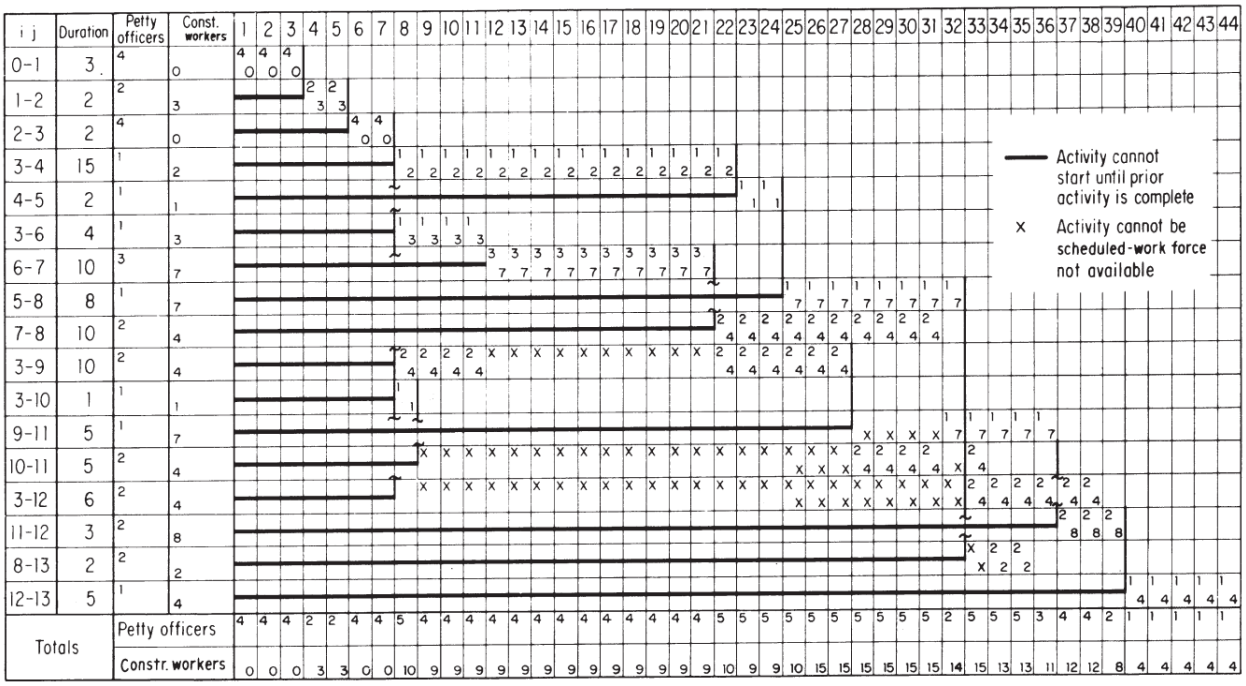


Figure 19.1.7 Workforce calculation: limits 5 petty officers, 15 construction workers.

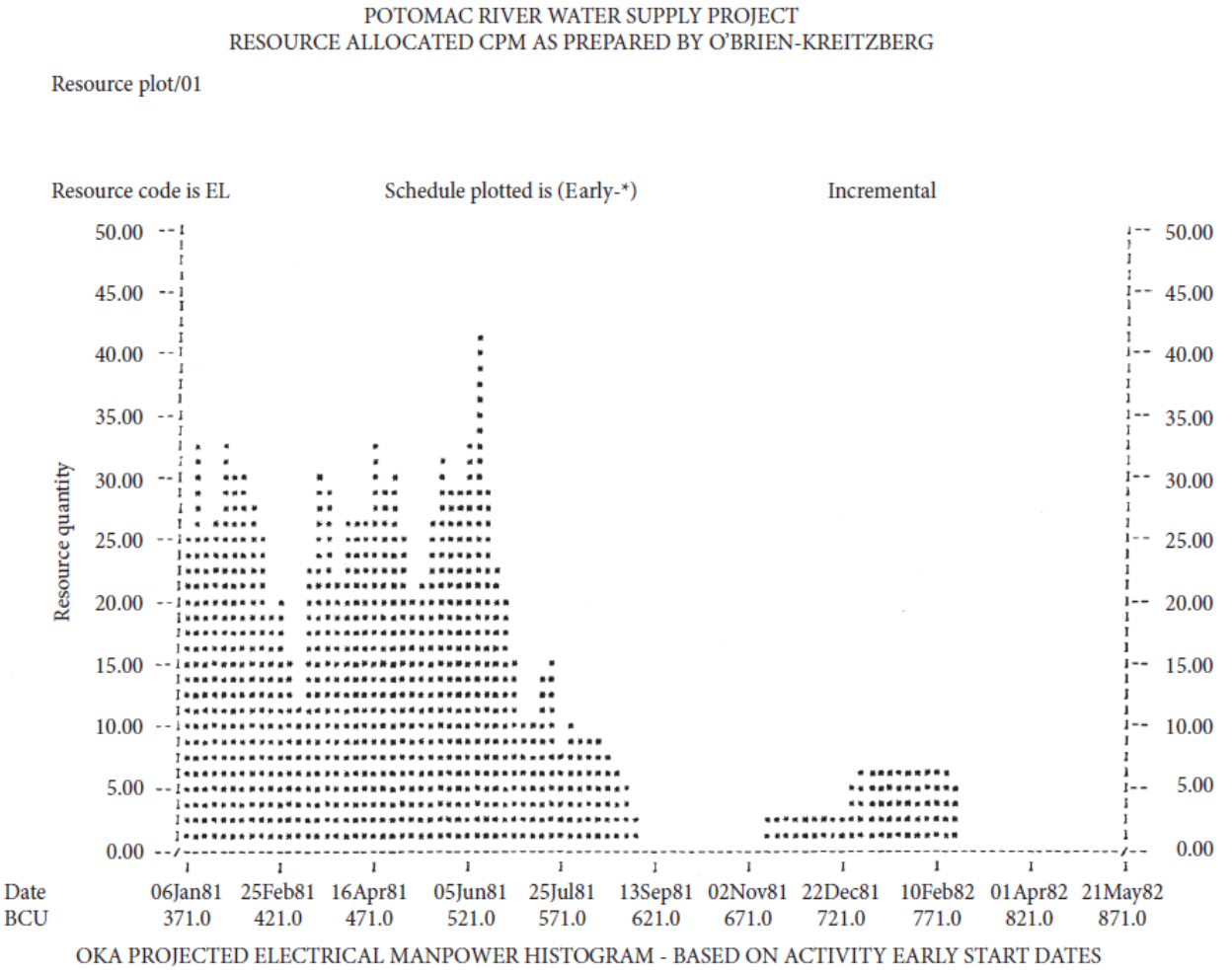
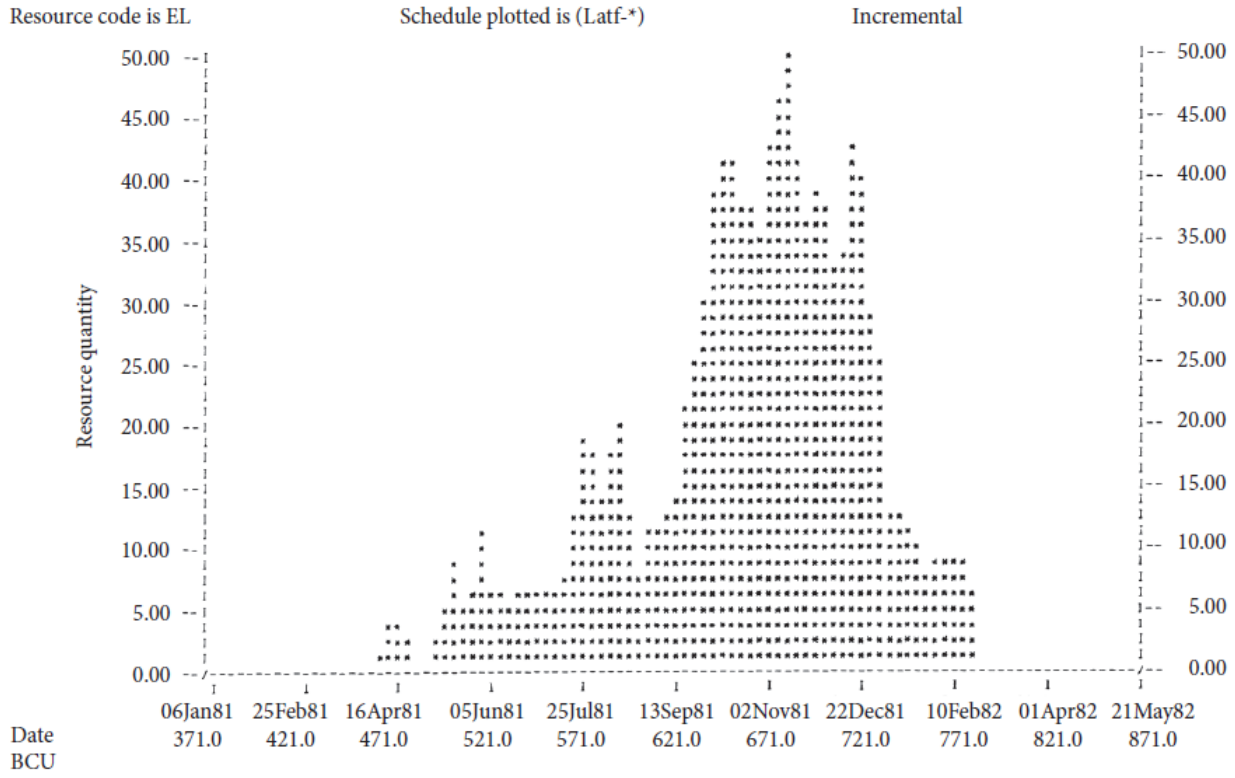


Figure 19.2.1 Projected electrical workforce histogram based upon early activity start dates.

POTOMAC RIVER WATER SUPPLY PROJECT
RESOURCE ALLOCATED CPM AS PREPARED BY O'BRIEN-KREITZBERG



OKA PROJECTED ELECTRICAL MANPOWER HISTOGRAM-BASED ON ACTIVITY LATE START DATES

Figure 19.2.2 Projected electrical workforce histogram based upon late activity start dates.

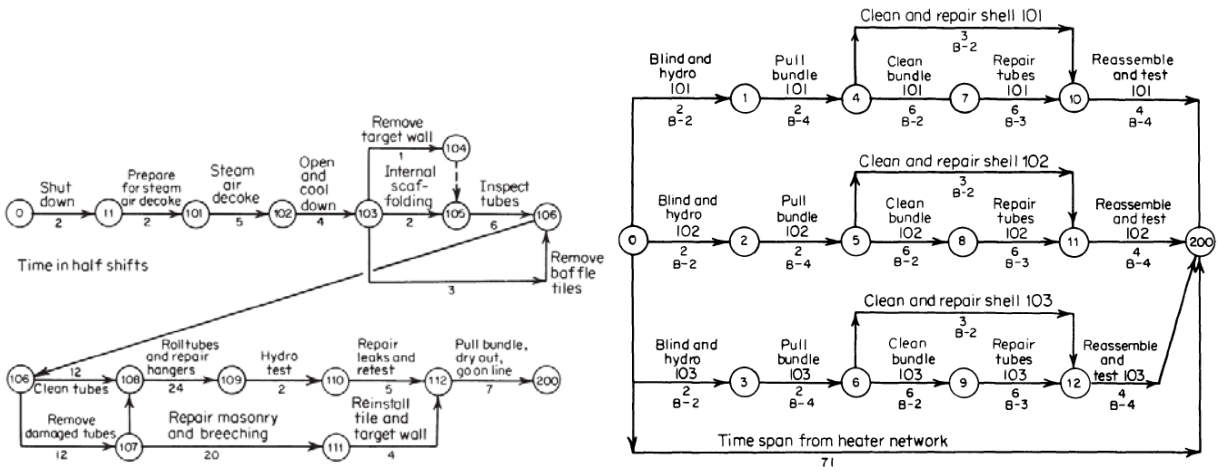


Figure 19.9.1 and 19.9.2 Summary plan for crude heater overhaul of one and three units

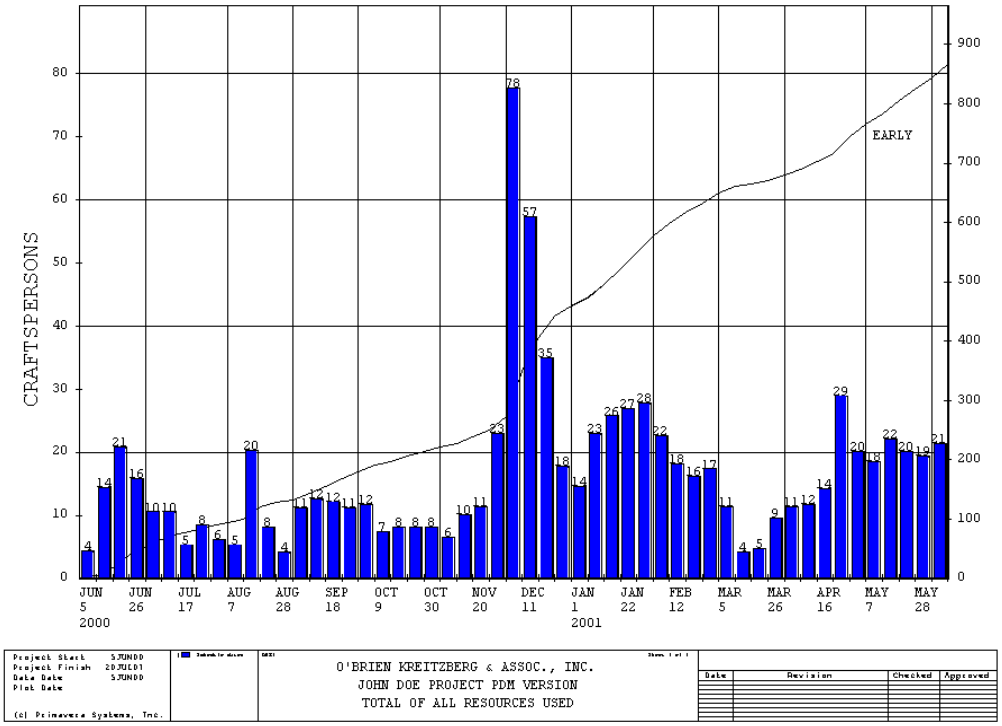


Figure 19.10.1 John Doe project resource histogram and cumulative curve for early dates

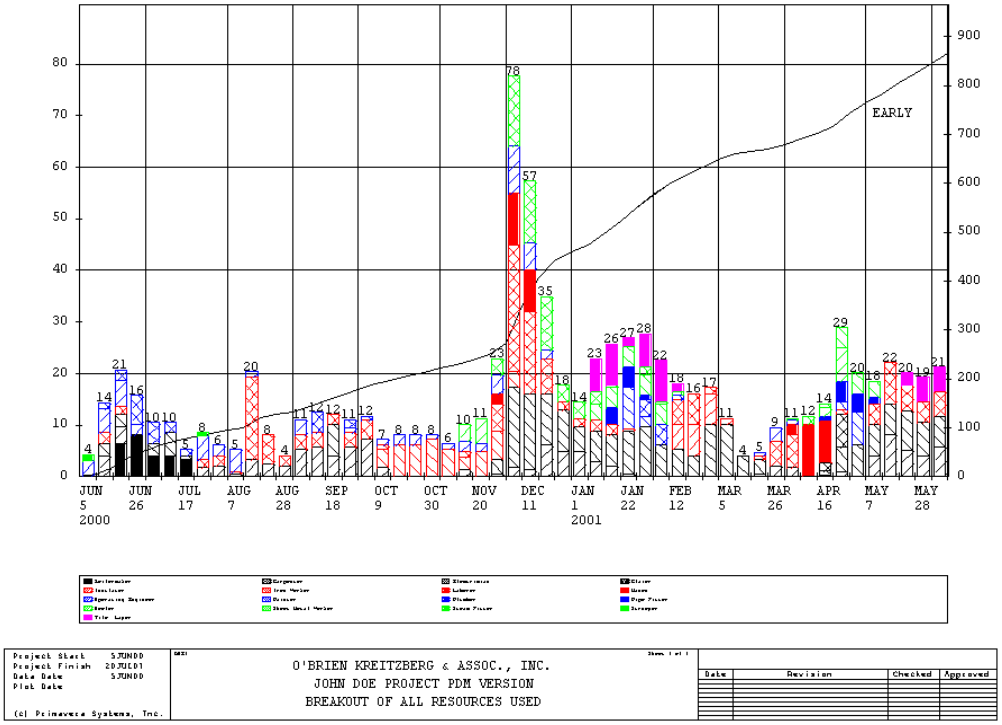


Figure 19.10.2 Resource histogram with stacked resources

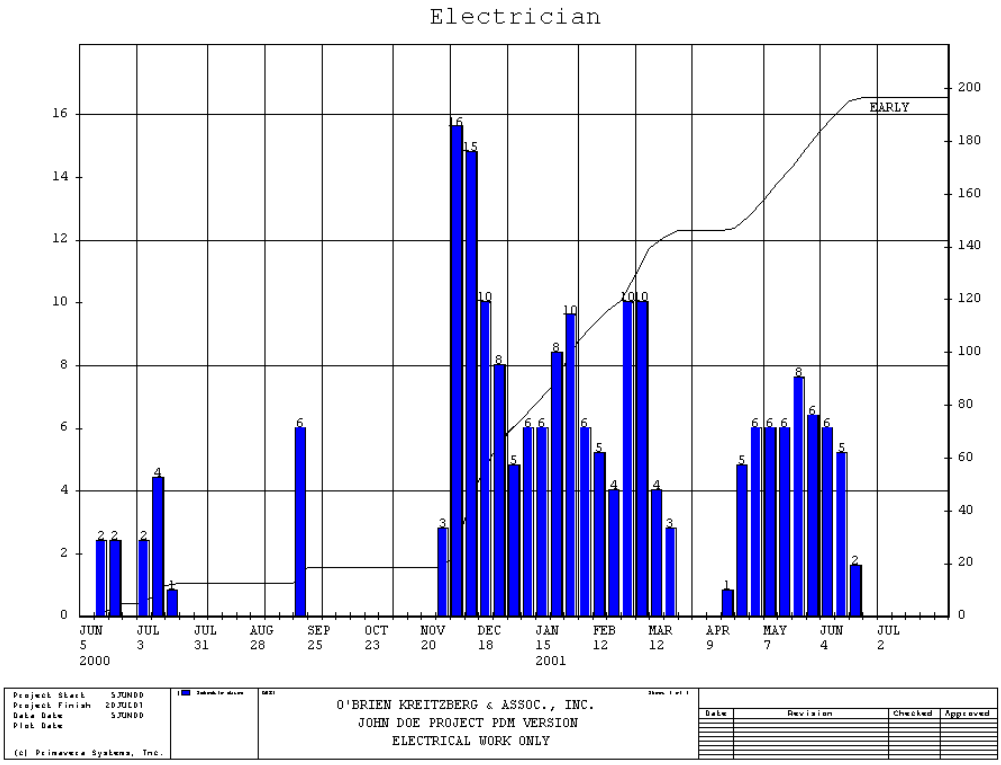


Figure 19.10.3 John Doe project—unleveled use of electricians

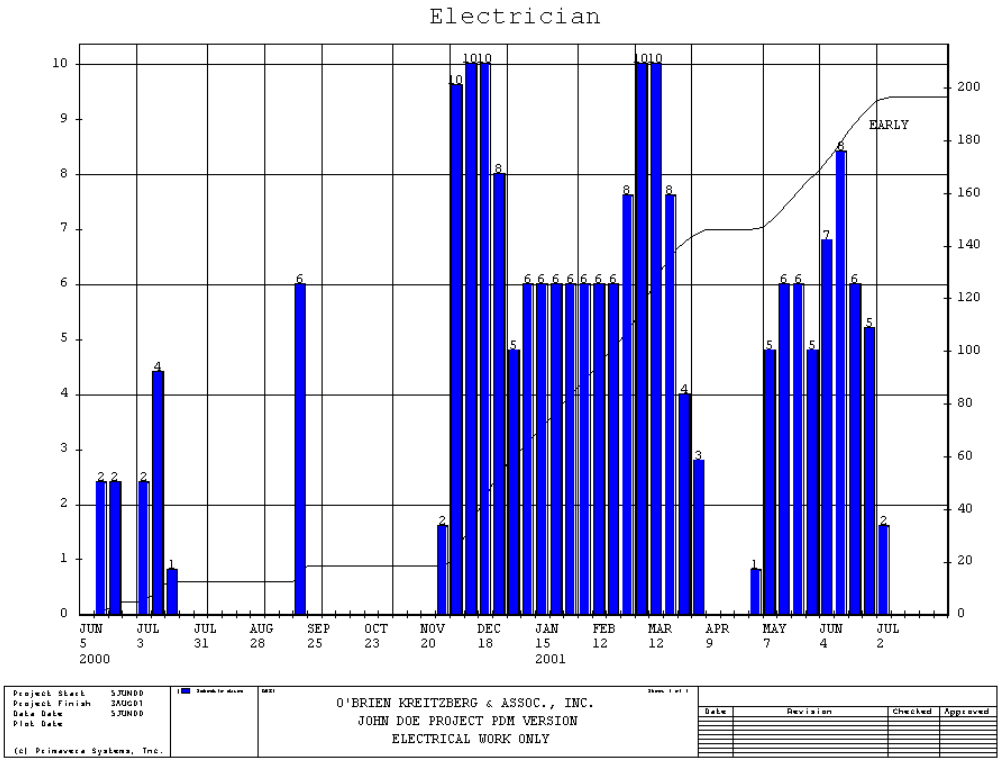


Figure 19.10.4 John Doe project—leveled for a maximum of 10 electricians

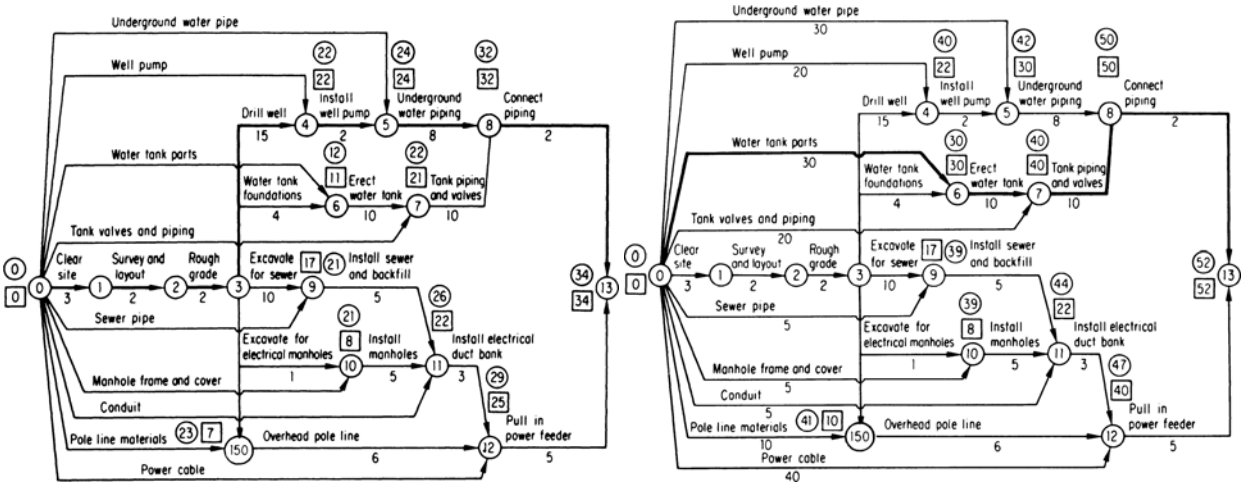


Figure 20.1.1 and 20.1.2 Deliveries for John Doe project site preparation; pre and post calculation.

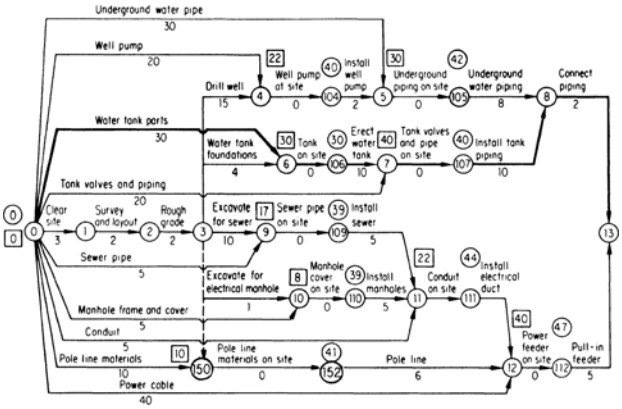


Figure 20.1.3 On-site delivery times.

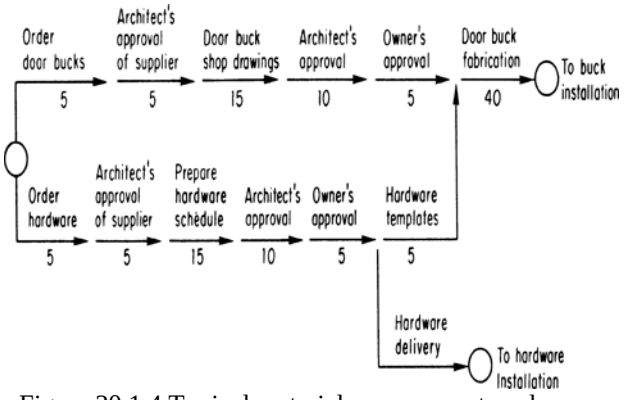


Figure 20.1.4 Typical material procurement cycle.

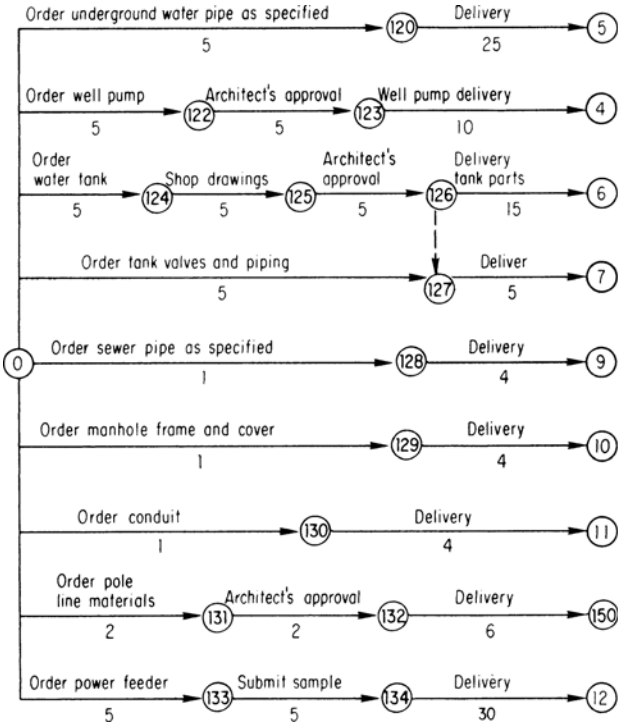


Figure 20.1.5 John Doe project material procurement.

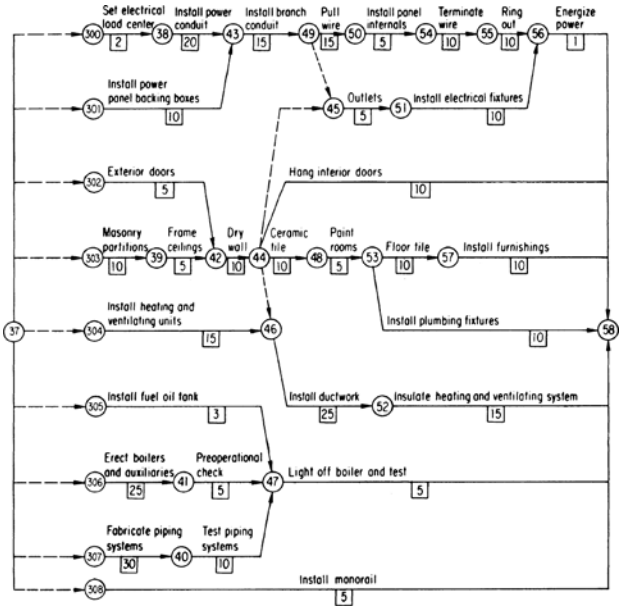


Figure 20.3.1 John Doe plant with added delivery points

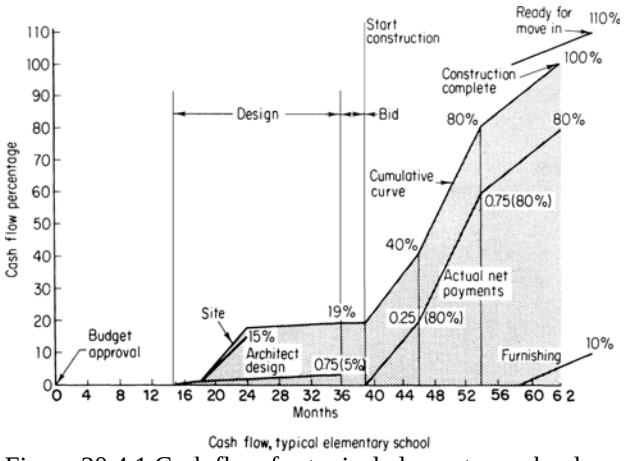


Figure 20.4.1 Cash flow for typical elementary school.

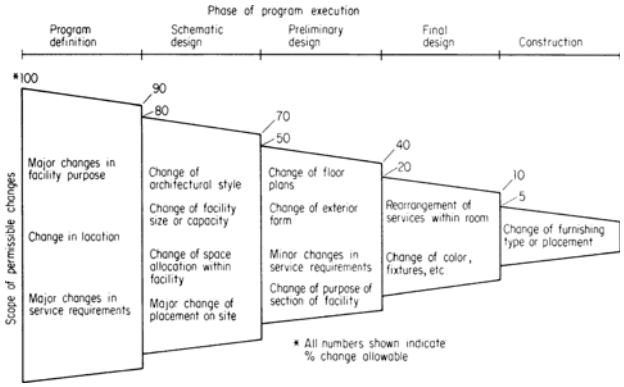


Figure 20.6.1 Design change funnel.

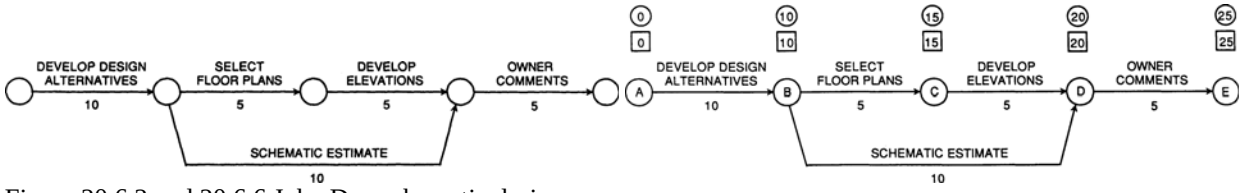


Figure 20.6.2 and 20.6.6 John Doe schematic design.

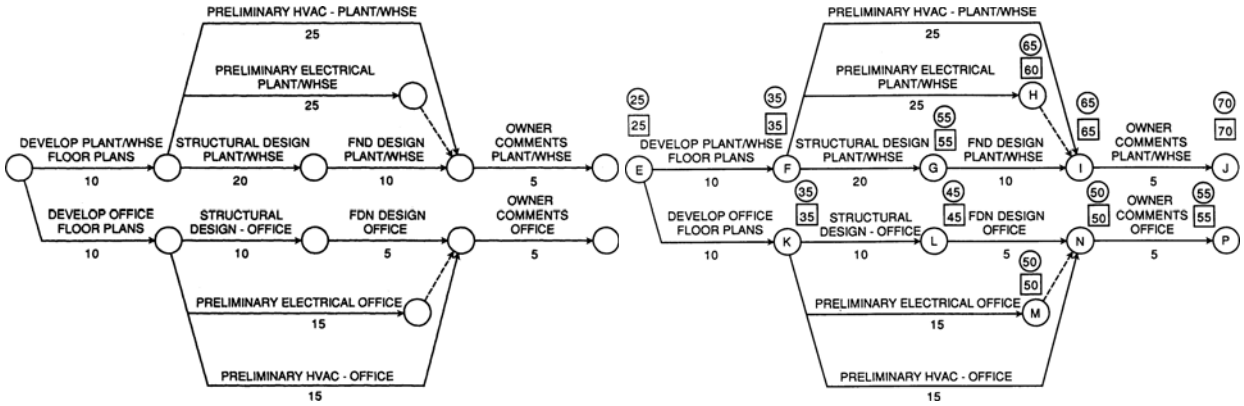


Figure 20.6.3 and 20.6.7 John Doe preliminary design.

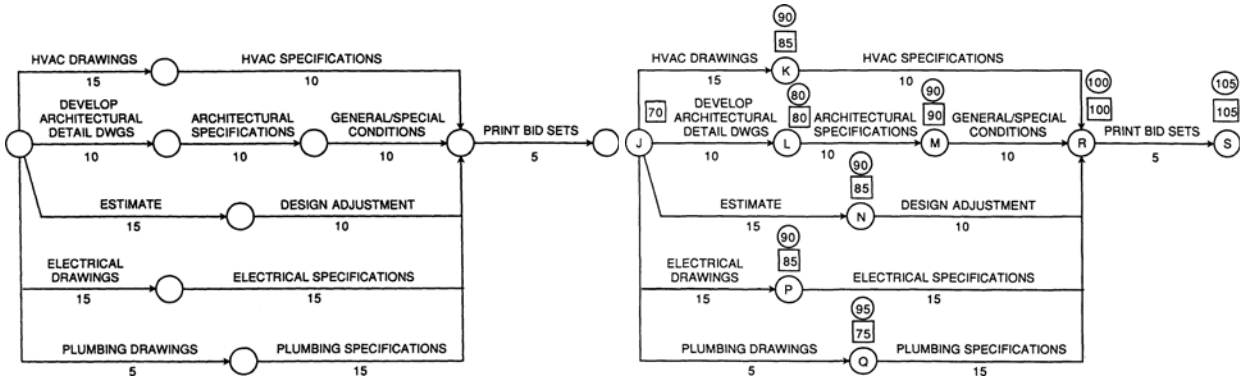


Figure 20.6.4 and 20.6.8 Contract documents: plant and warehouse

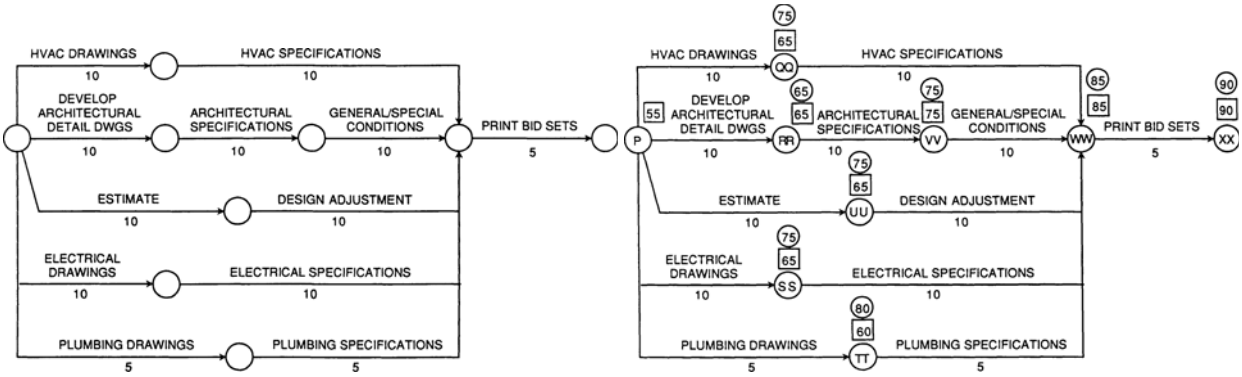


Figure 20.6.5 and 20.6.9 Contract documents: office.

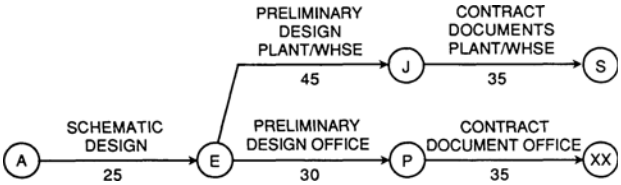


Figure 20.6.10 Summary level CPM for John Doe project.

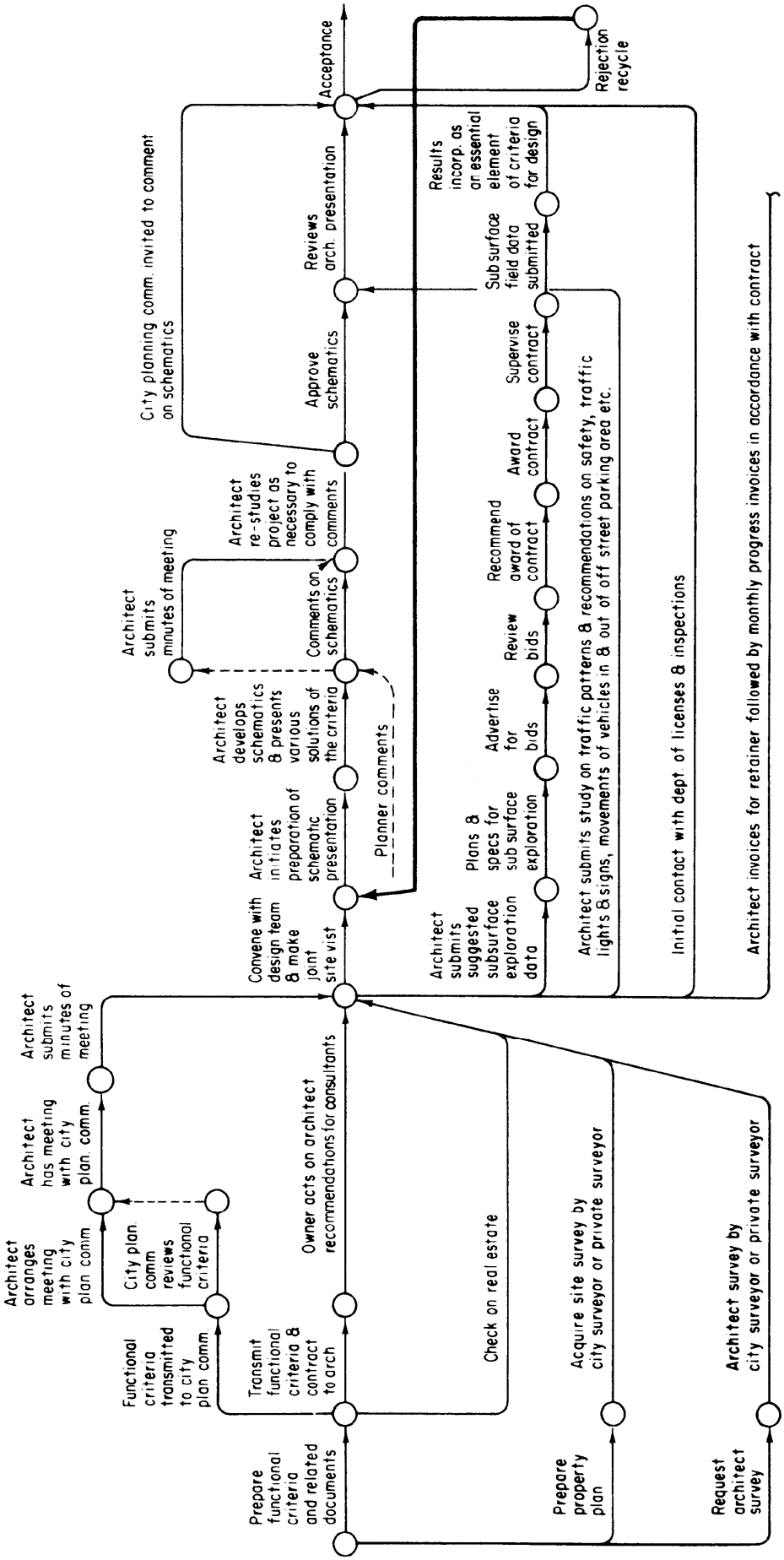


Figure 20.6.10 Network for city school design phase – conception to acceptance

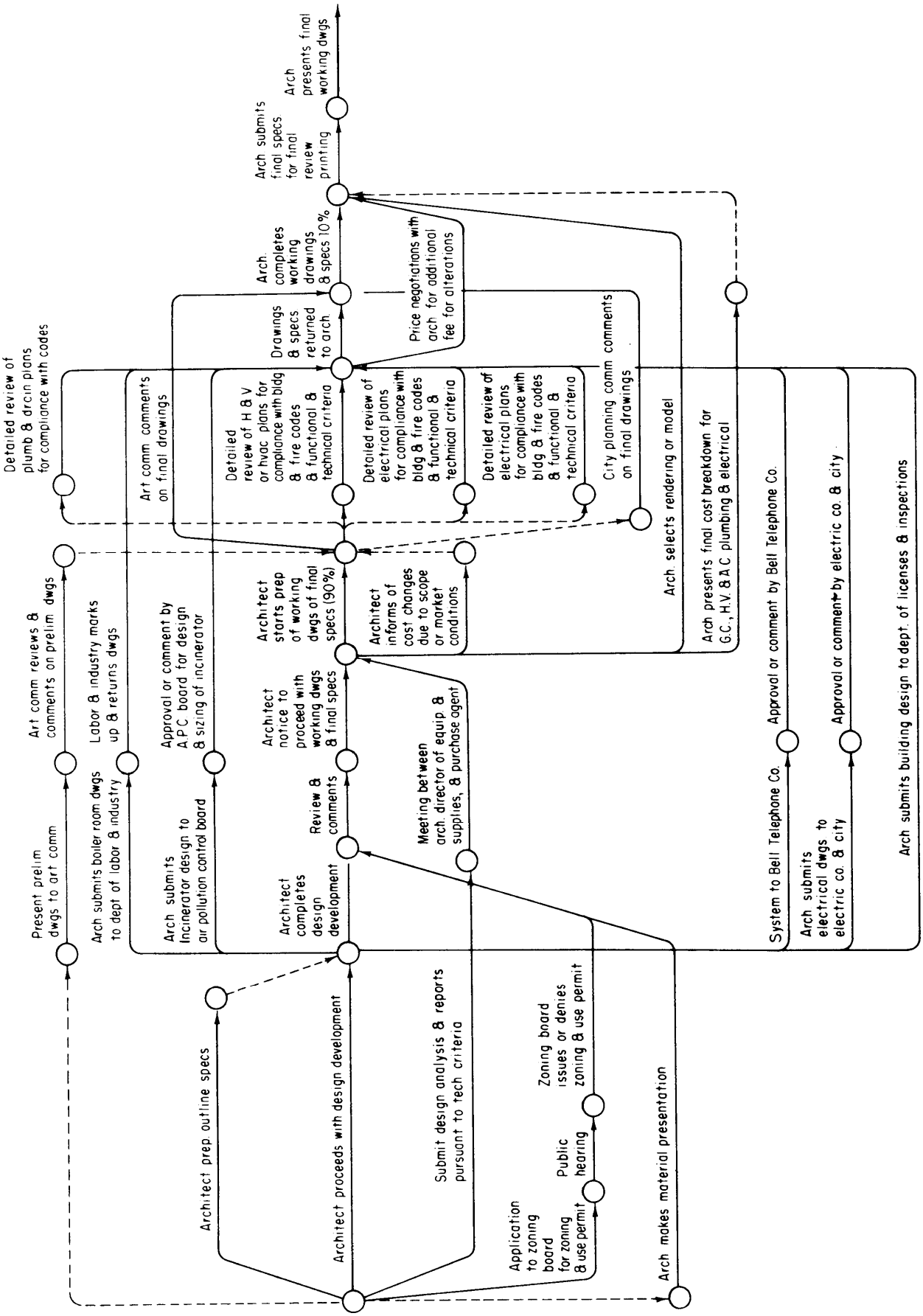


Figure 20.6.11 Network for city school design phase – acceptance to working drawings

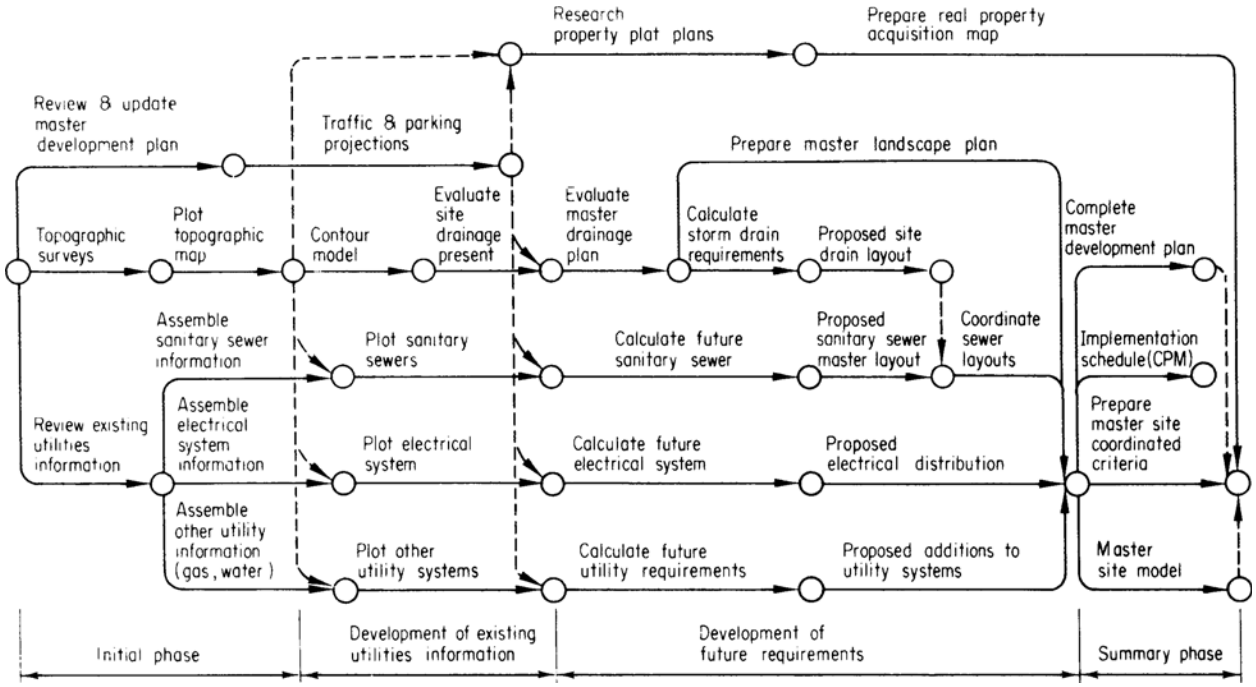


Figure 20.6.12 CPM plan for site development.

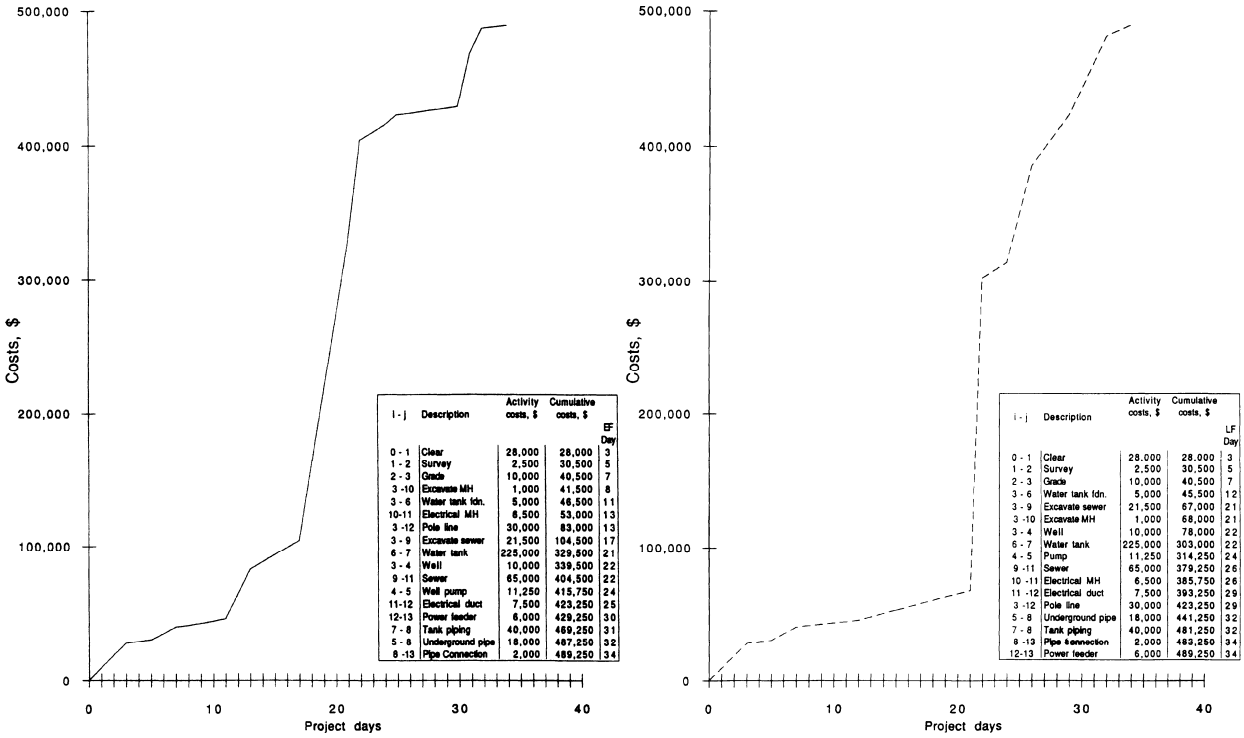


Figure 21.3.1 and 21.3.2 Project days. Cost versus time: early-finish versus late-finish basis.

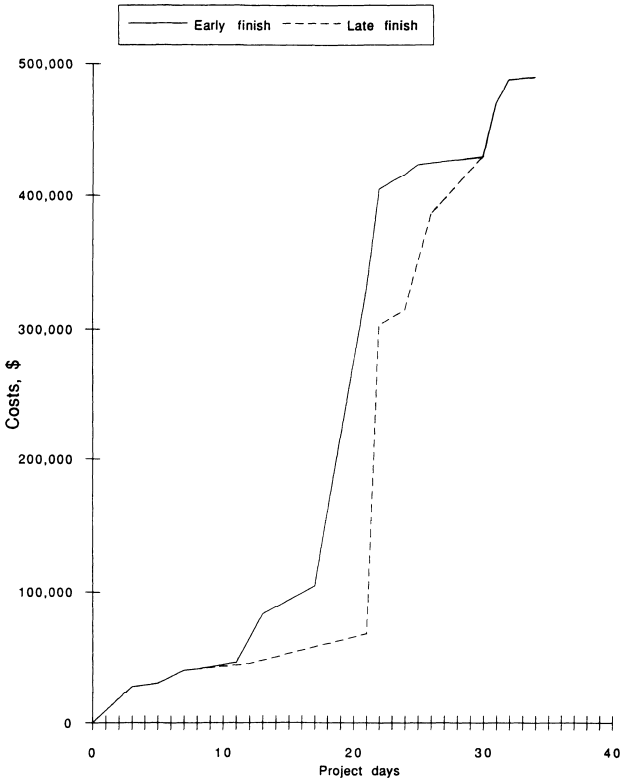


Figure 21.3.3 Comparison of EF/LF costs versus time curves.

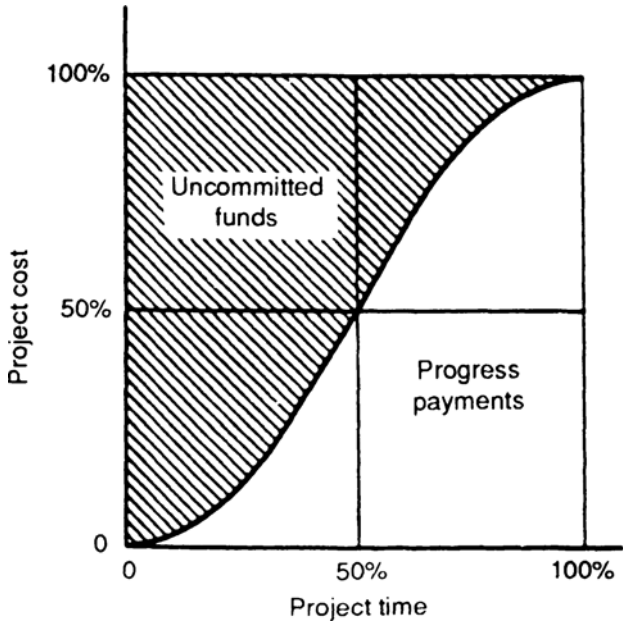


Figure 21.3.7 Project cost versus time curve.

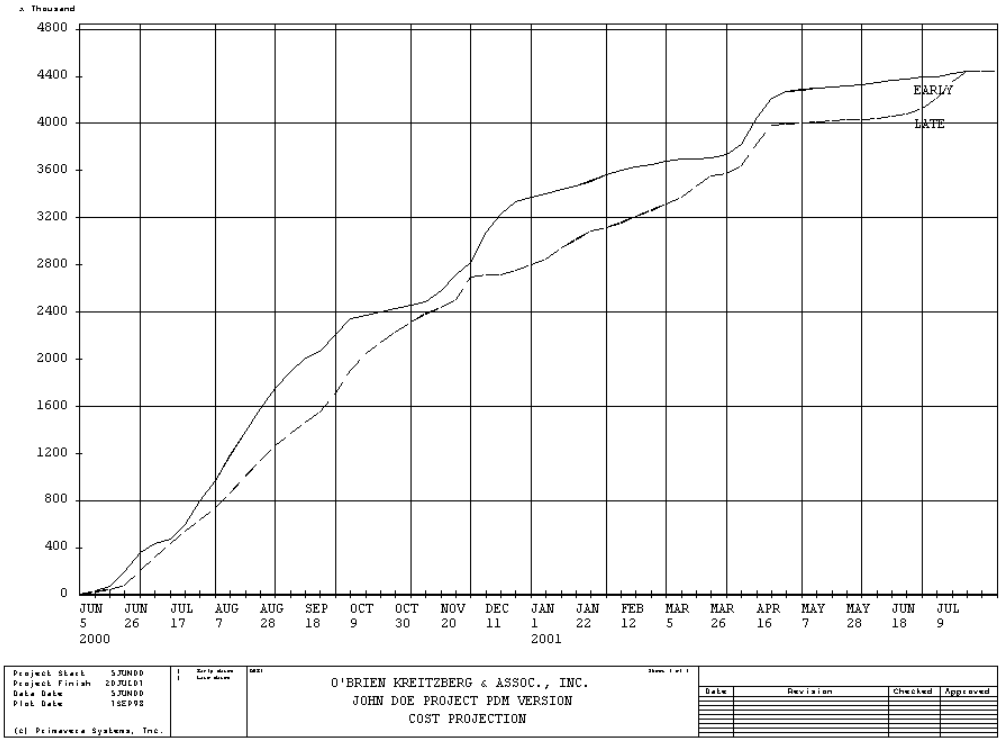


Figure 21.3.4 Computer generated cost forecast for the John Doe project—Early & Late—Cumulative.

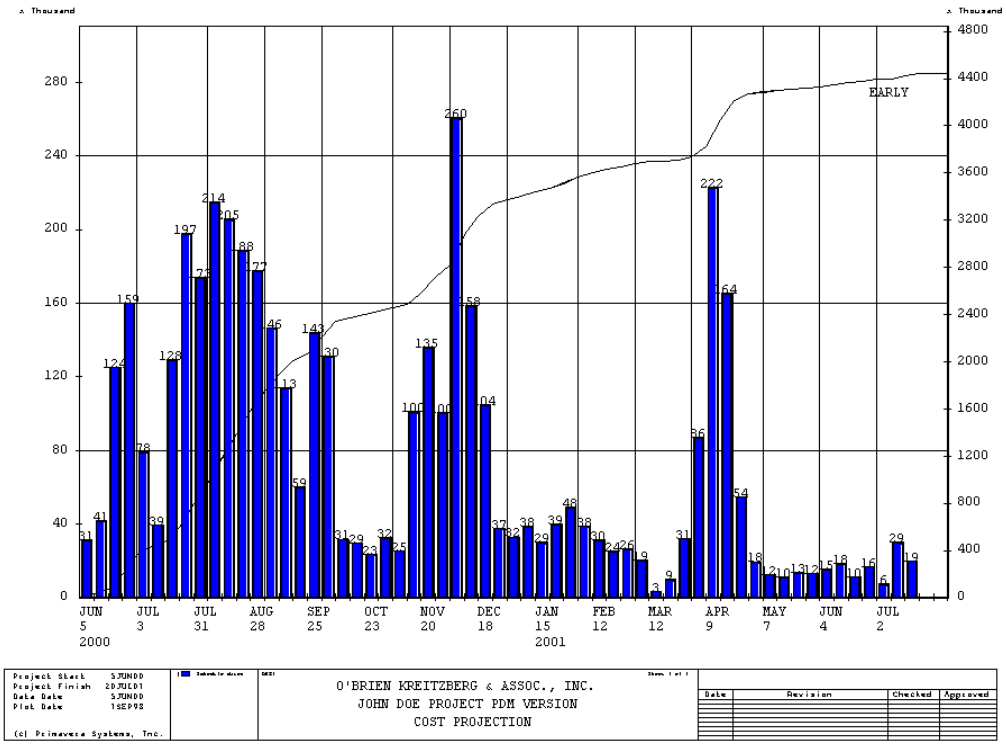


Figure 21.3.5 Computer generated cost forecast for the John Doe project—Early dates—Cumulative and Histogram.

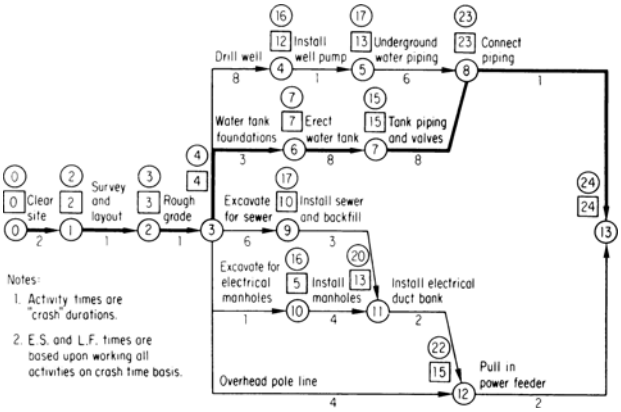


Figure 21.4.1 Full-crash plan for the John Doe project.

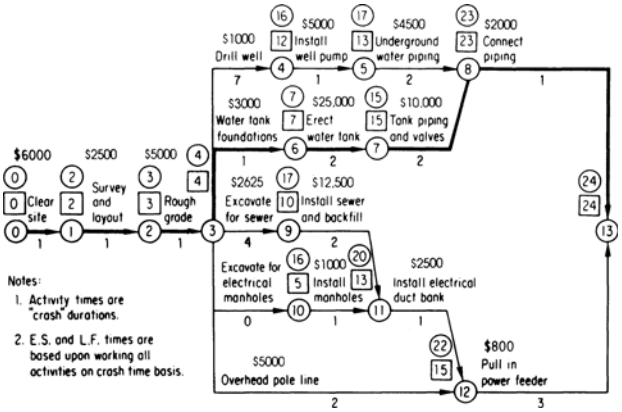


Figure 21.4.3 Cost-time cash planning factors for JD

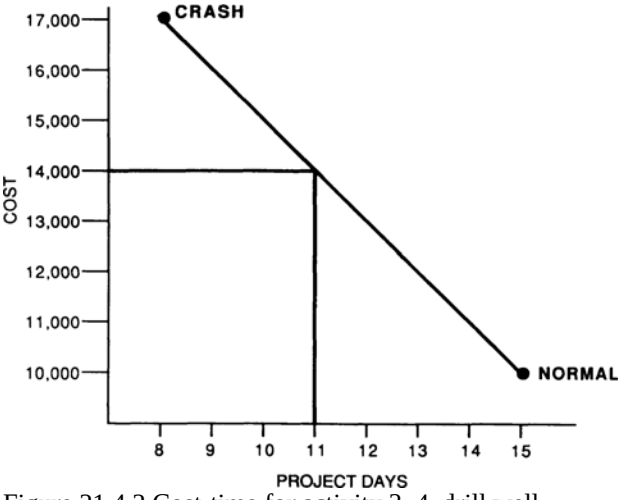


Figure 21.4.2 Cost-time for activity 3–4, drill well.

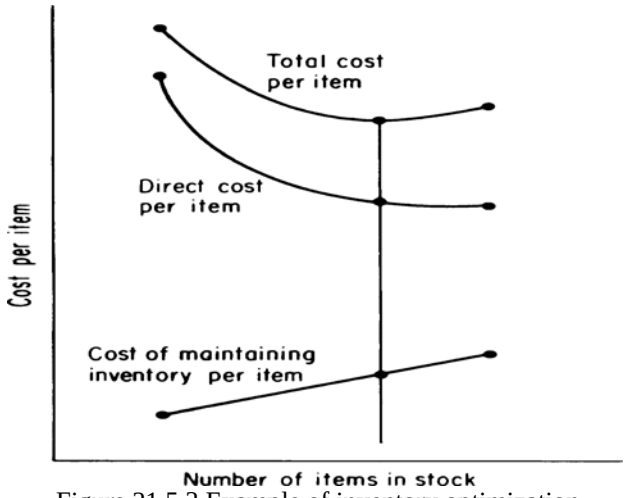


Figure 21.5.3 Example of inventory optimization.

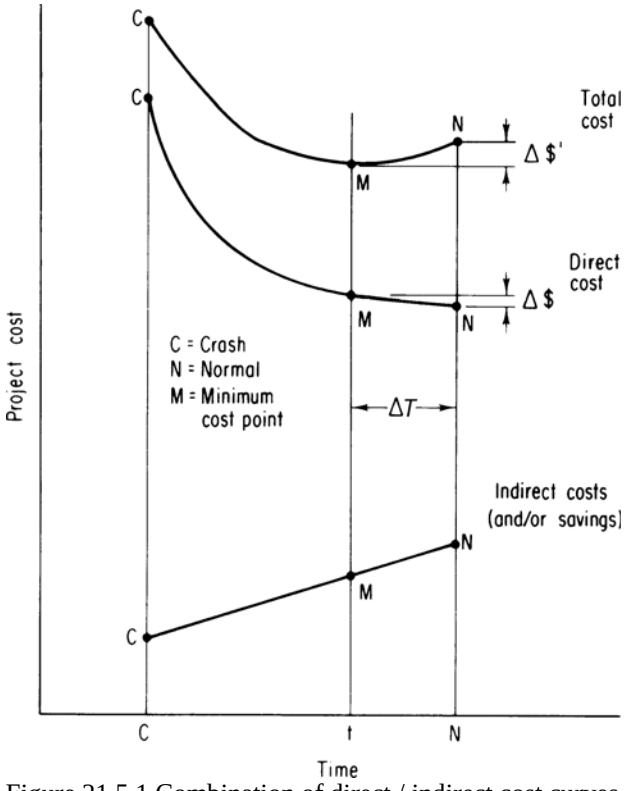


Figure 21.5.1 Combination of direct / indirect cost curves.

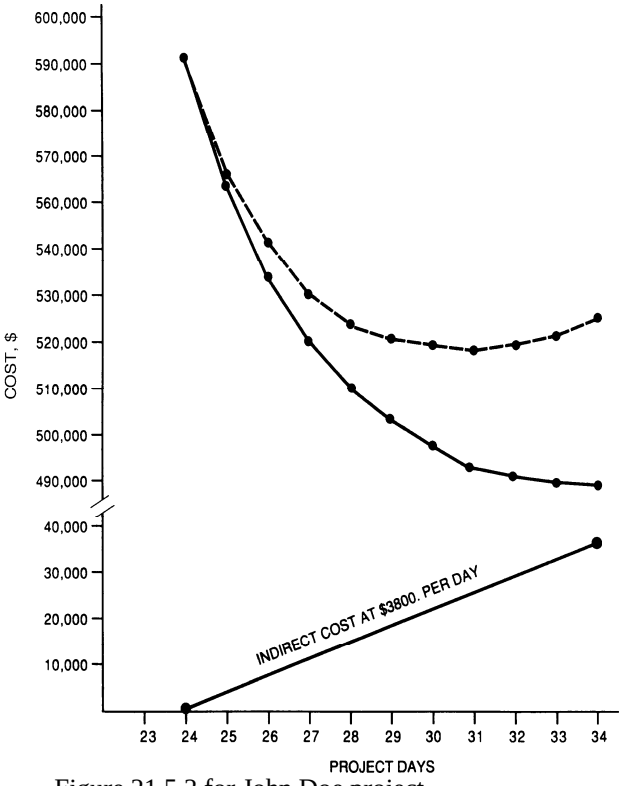


Figure 21.5.2 for John Doe project.

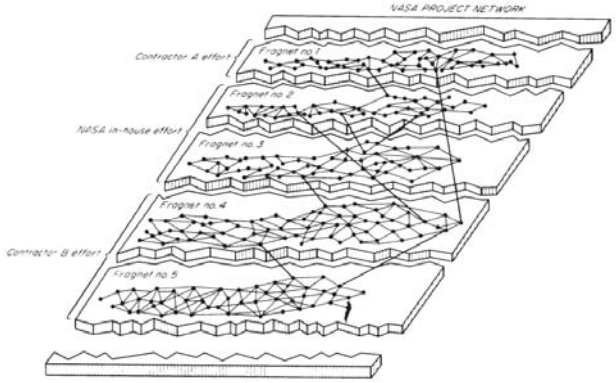


Figure 22.1.1 Multiproject networks.

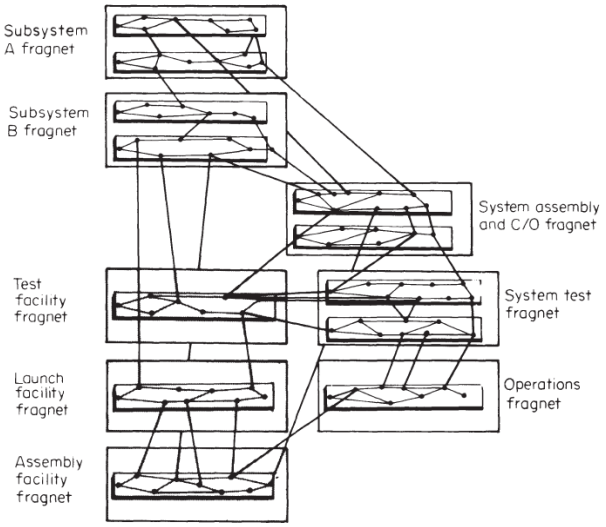


Figure 22.1.2 Functional multi-project network.

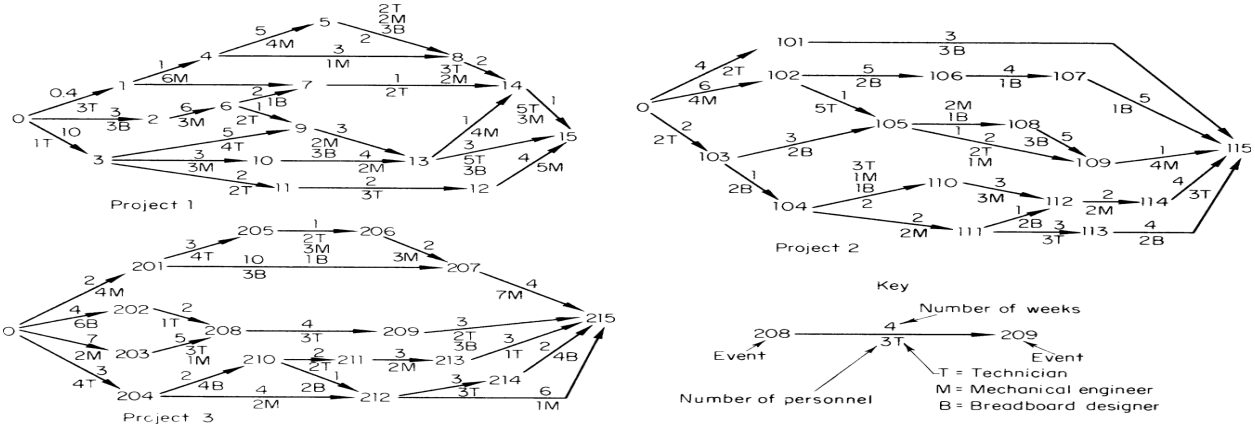


Figure 22.1.3 Design networks – compare style to Figure 2.5.3

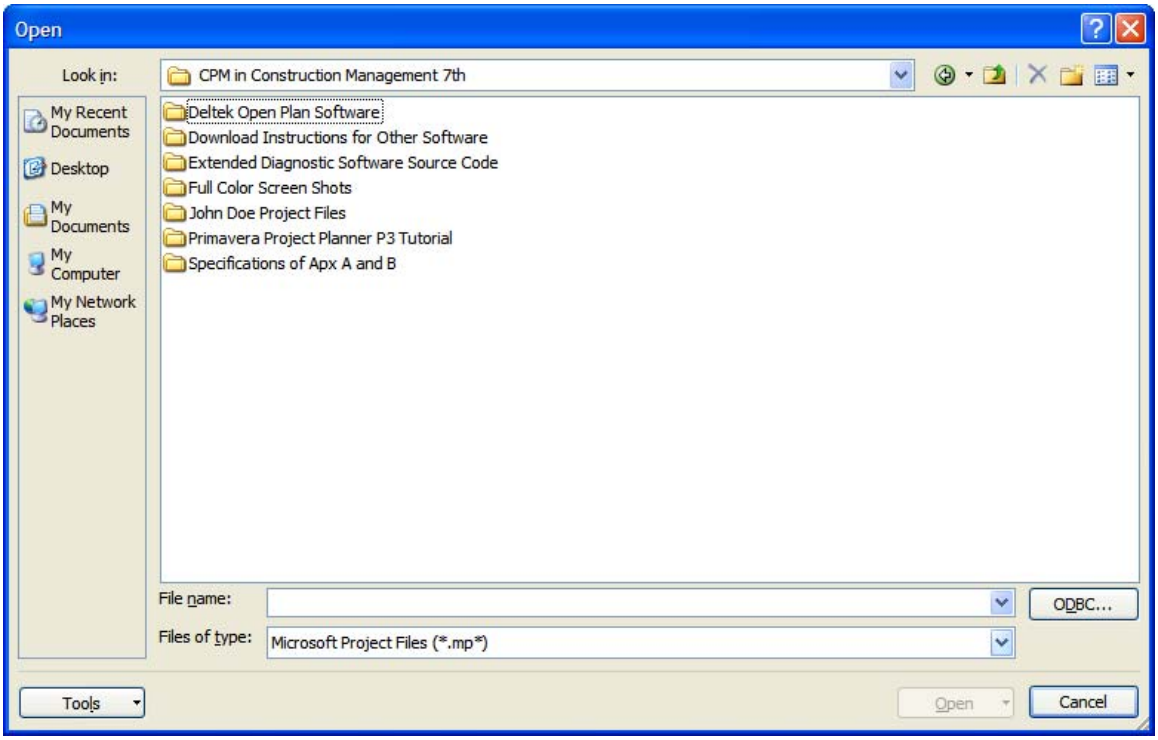


Figure 22.6.1 Microsoft screen to open an existing project from any subdirectory in the world

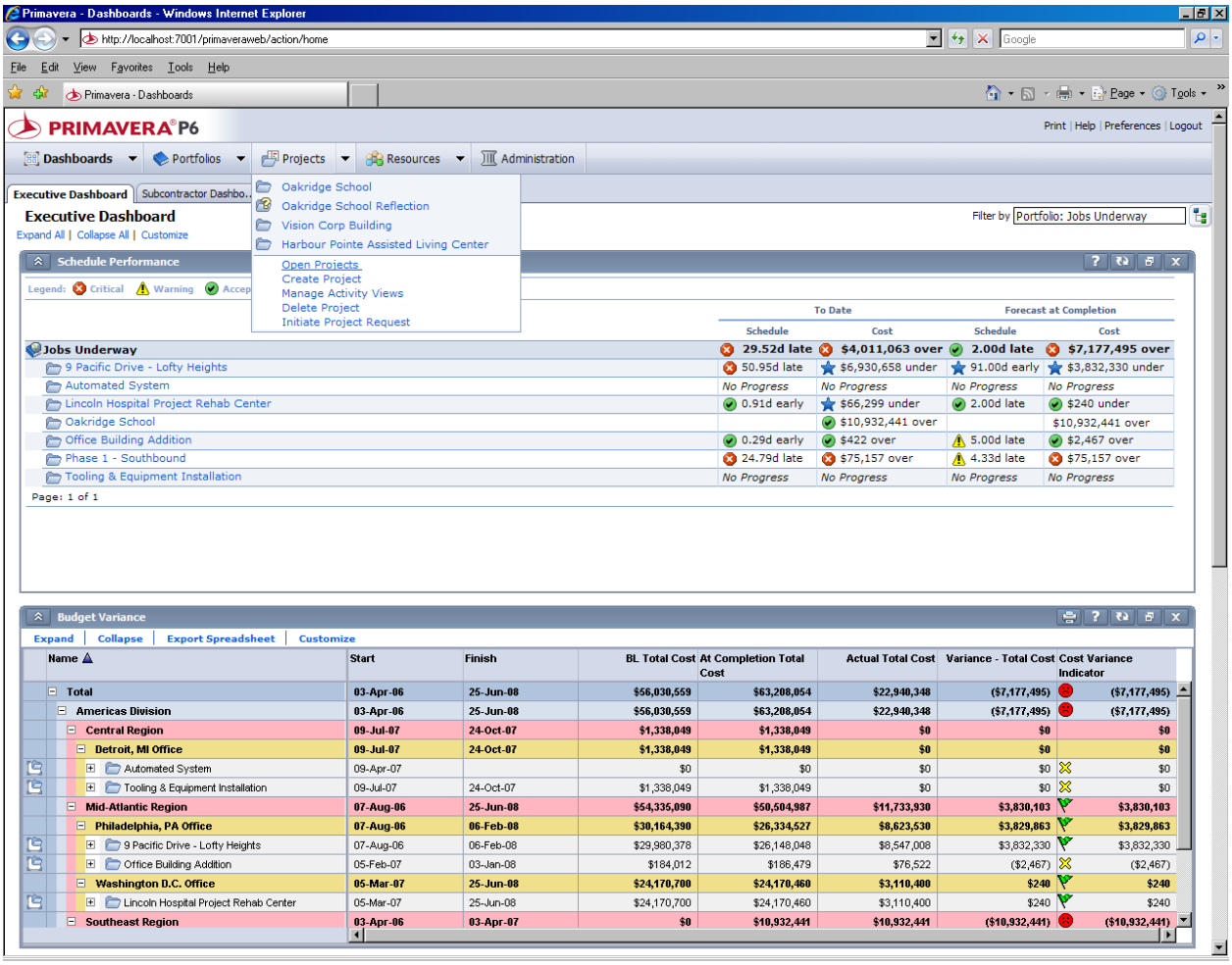


Figure 22.6.3 Oracle Primavera Executive Dashboard

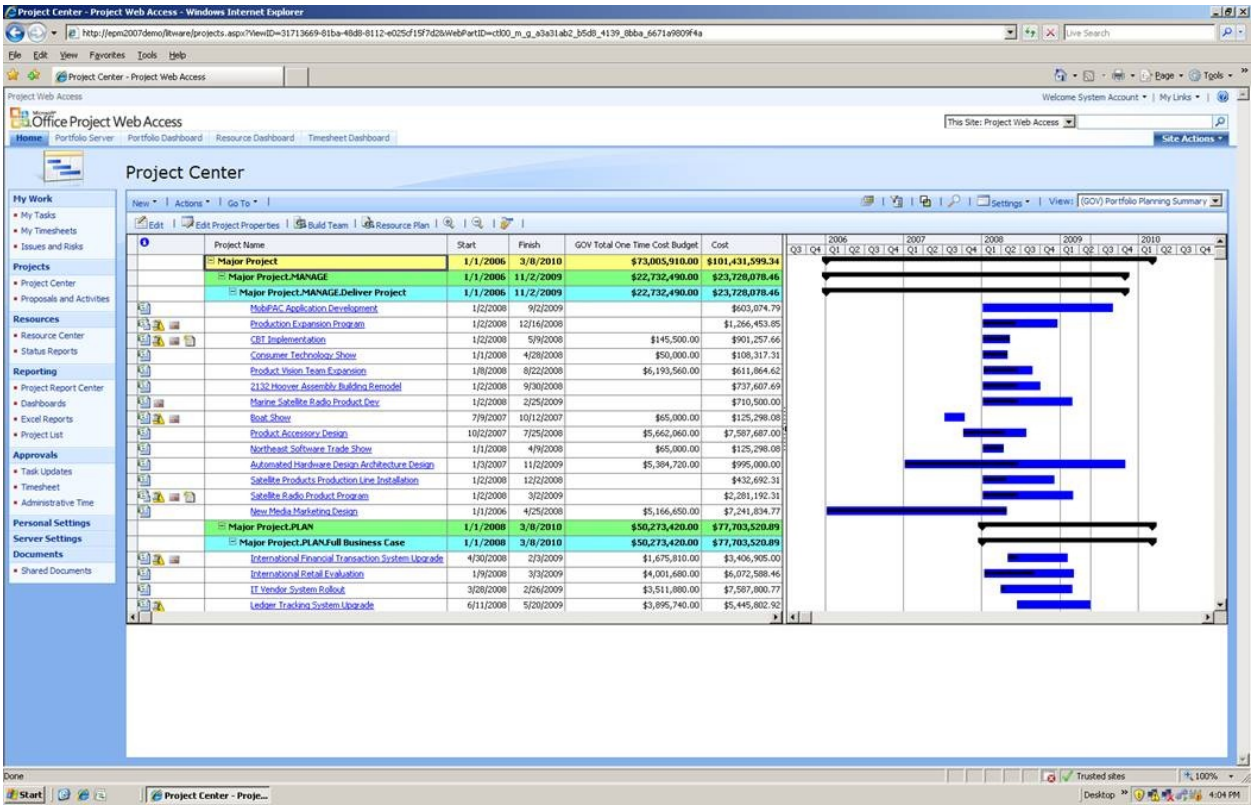


Figure 22.6.4 Microsoft Project Professional 2007 Dashboard

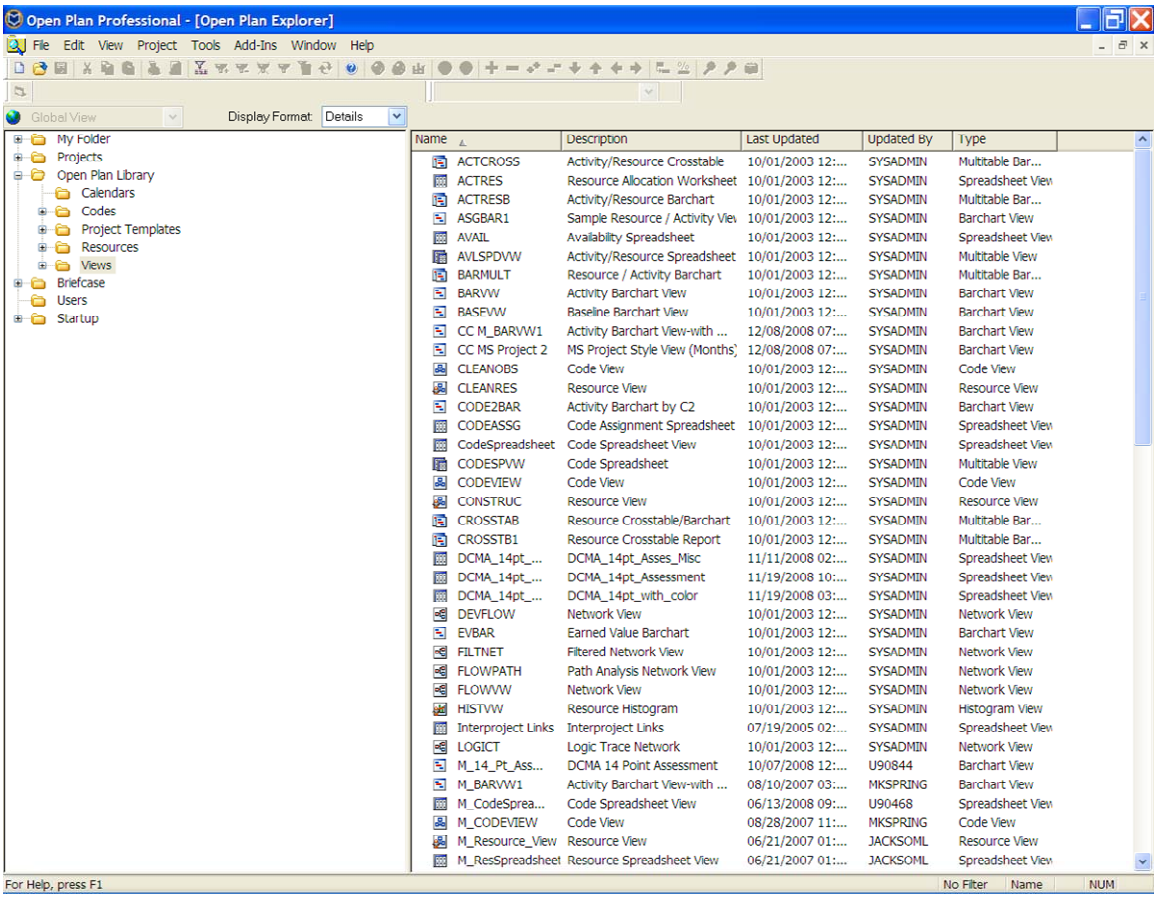


Figure 22.6.5 Deltek Open Plan

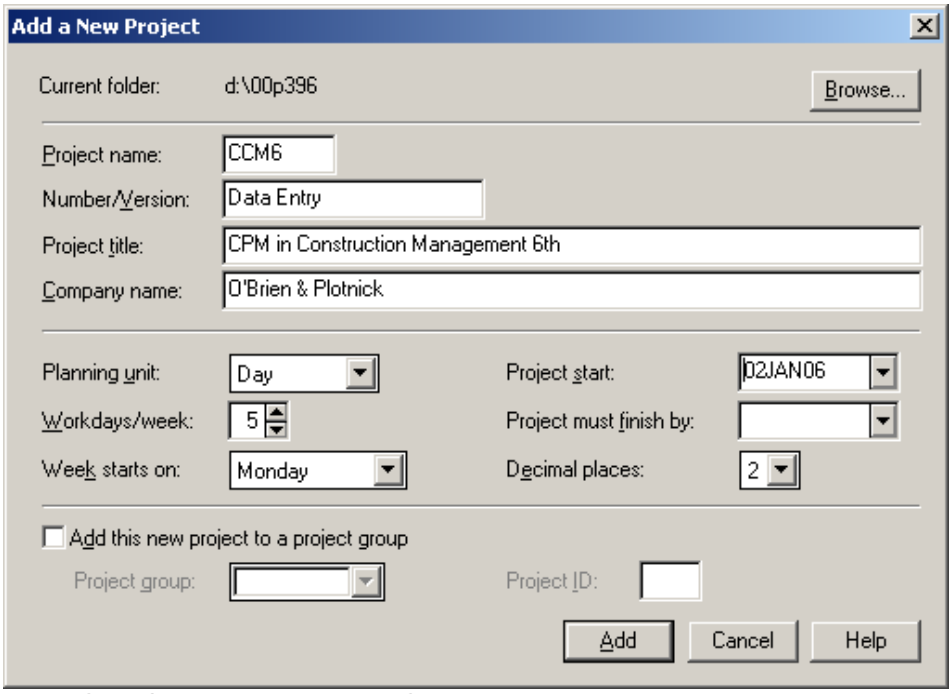


Figure 23.1.1 Opening a new project in P3

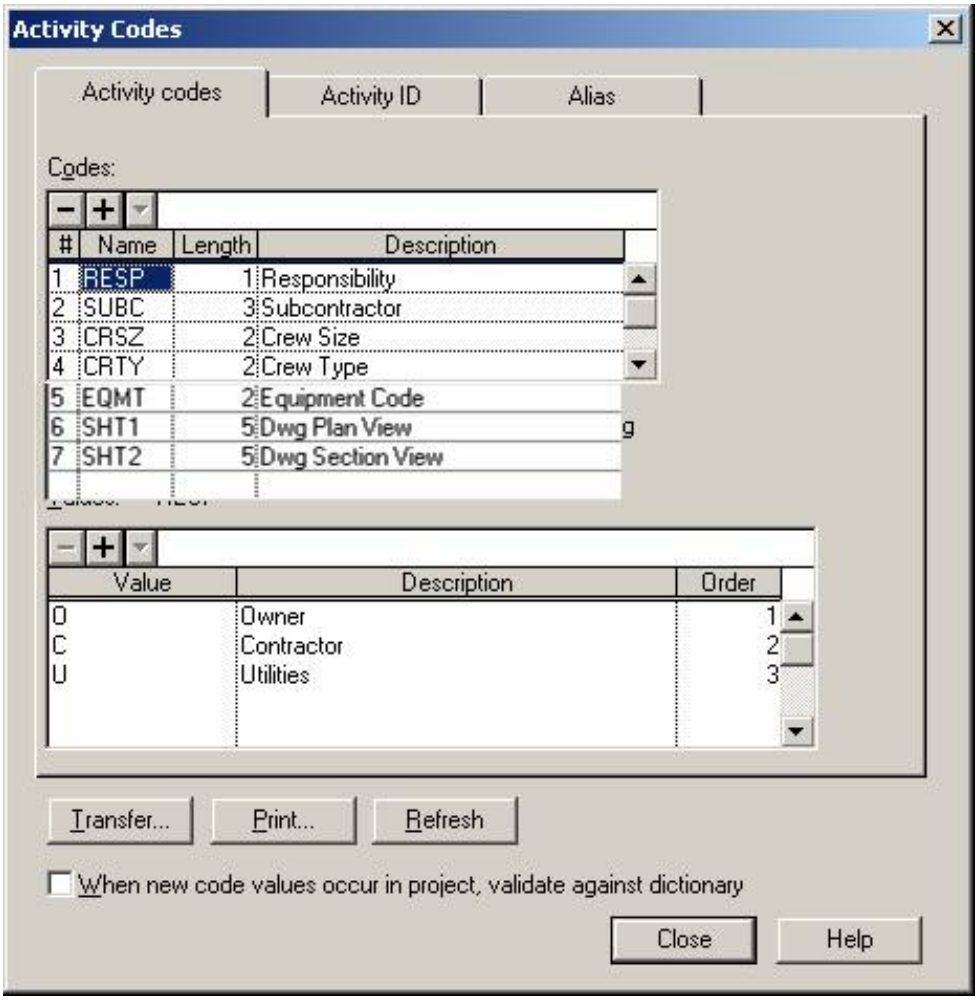


Figure 23.1.2 Adding activity codes in P3

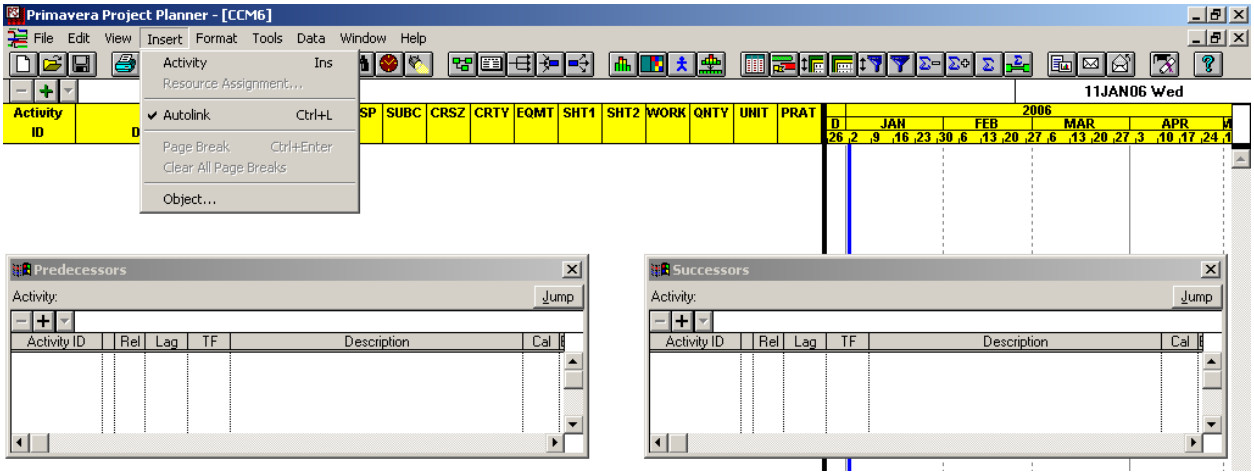


Figure 23.1.3 Autolink

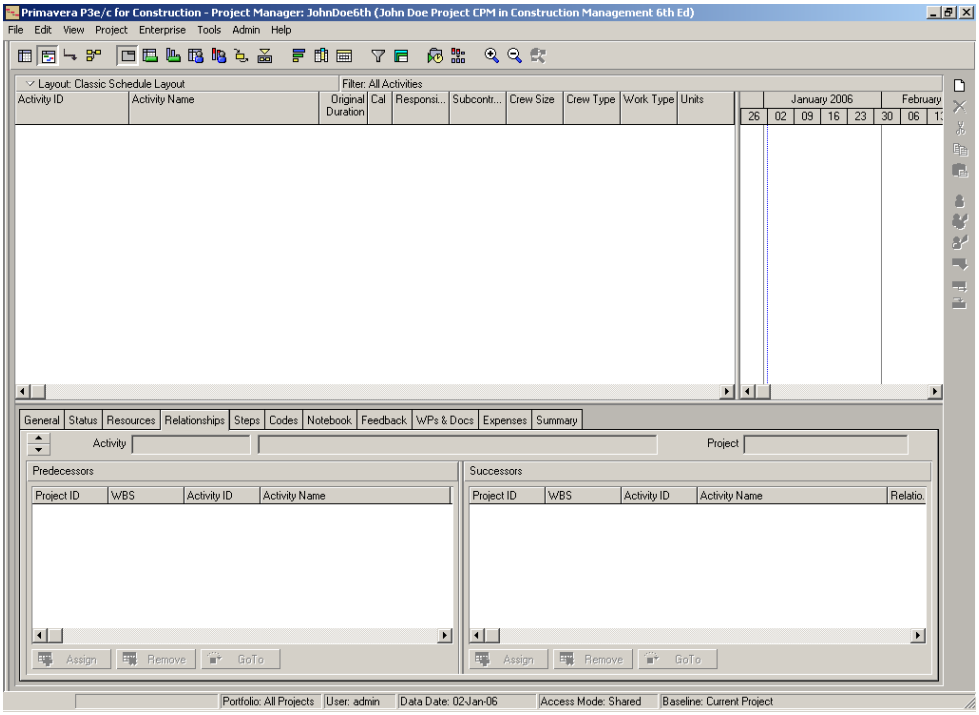


Figure 23.1.4 P6 Predecessor and Successor detail

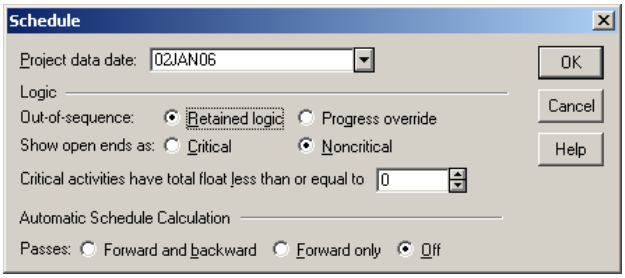


Figure 23.2.1 Setting scheduling options in SureTrak.

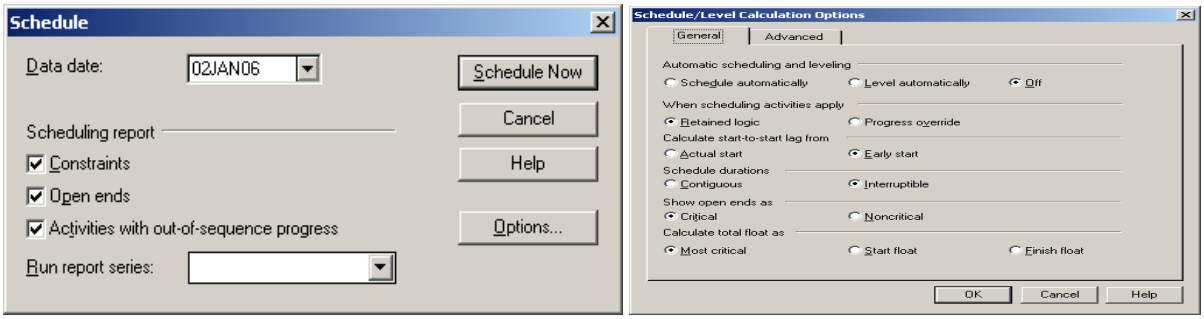


Figure 23.2.2 Setting scheduling options in P3.

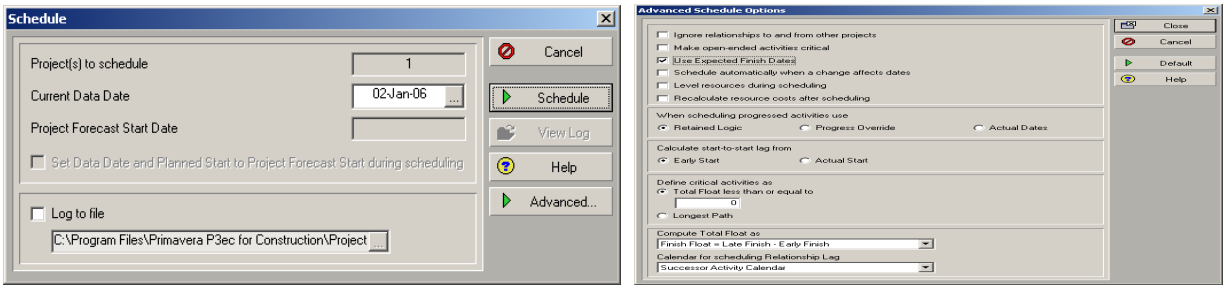


Figure 23.2.3 Setting schedule options in P6.

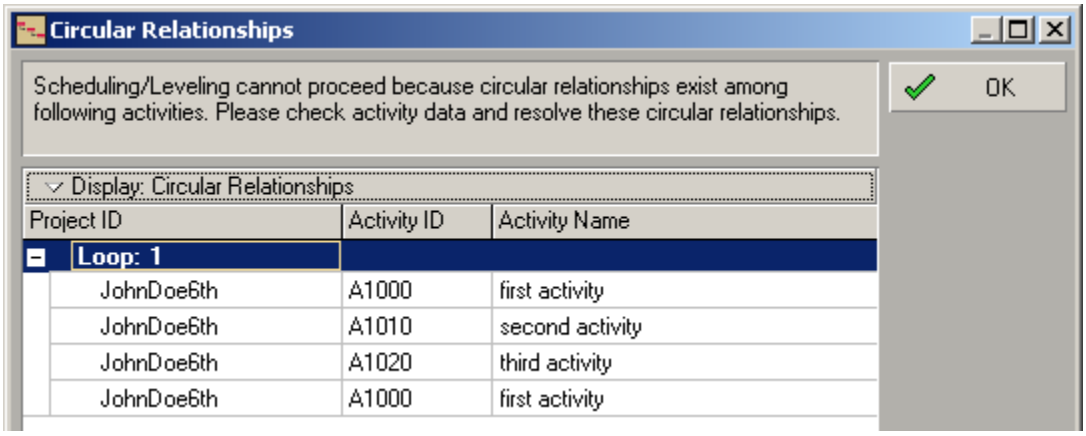


Figure 23.4.2 P6 loop error report.

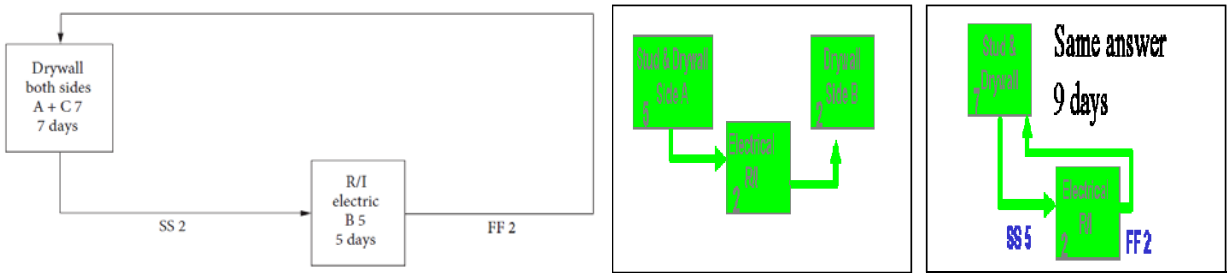


Figure 23.4.3 Erroneous loop report.

Activity ID	Activity Description	Orig Dur	Cal ID	Total Float
0	START MILESTONE	0	1	0
100	CLEAR SITE	3	1	0
135	SUBMIT PACKAGED A/C	30	1	0
1	SURVEY AND LAYOUT	2	1	0
2	ROUGH GRADE	2	1	0
3	DRILL WELL	15	1	0
4	INSTALL WELL PUMP	2	1	0
5	UNDERGROUND WATER PIPING	8	1	0
235	APPROVE PACKAGED A/C	10	1	0
8	CONNECT WATER PIPING	2	1	0
13	BUILDING LAYOUT	1	1	0
14	DRIVE AND POUR PILES	10	1	0
236	FAB/DEL PACKAGED A/C	140	2	0
15	EXCAVATE PLANT	5	1	0
16	POUR PILE CAPS P-W	5	1	0
17	FORM AND POUR GRADE	10	1	0
18	BACKFILL AND COMPACT P-W	3	1	0
19	UNDERSLAB PLUMBING P-W	5	1	0
20	UNDERSLAB CONDUIT P-W	5	1	0
22	FORM AND POUR SLABS P-W	10	1	0

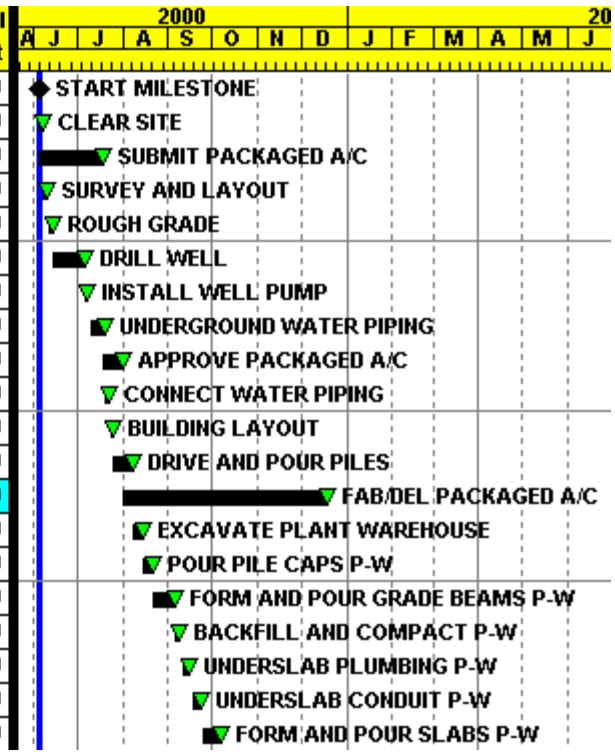


Figure 23.8.1 Two concurrent critical paths cannot be distinguished in a simple Early Start printout

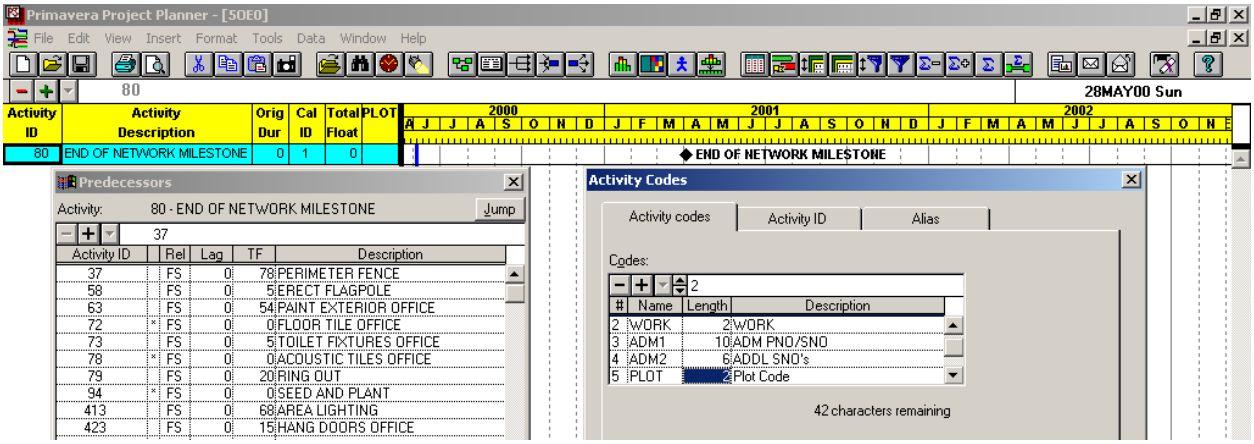


Figure 23.8.2 Use of PLOT code

Activity ID	Activity Description	Orig Dur	Cal ID	Total Float	PLOT
80	END OF NETWORK MILESTONE	0	1	0	1
72	FLOOR TILE OFFICE	10	1	0	1
71	PAINT INTERIOR OFFICE	10	1	0	1
70	WOOD TRIM OFFICE	10	1	0	1
69	DRYWALL	10	1	0	1
68	DRYWALL	5	1	0	1
67	METAL STUDS OFFICE	5	1	0	1
64	TEST PIPING OFFICE	4	1	0	1
418	INSTALL PIPING OFFICE	10	1	0	1
60	EXTERIOR MASONRY OFFICE	10	1	0	1
236	FAB/DEL PACKAGED A/C	140	2	0	1
235	APPROVE PACKAGED A/C	10	1	0	1
135	SUBMIT PACKAGED A/C	30	1	0	1
0	START MILESTONE	0	1	0	1

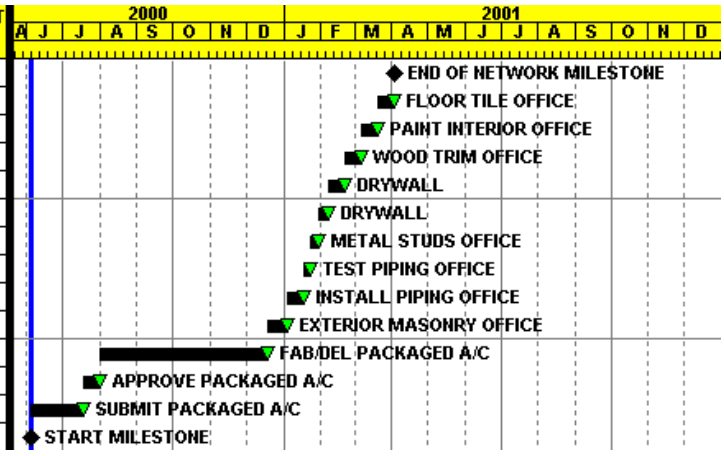


Figure 23.8.3 Backward pass of one critical path

Activity ID	Activity Description	Orig Dur	Cal ID	Total Float	PLOT
80	END OF NETWORK MILESTONE	0	1	0	1
72	FLOOR TILE OFFICE	10	1	0	1
71	PAINT INTERIOR OFFICE	10	1	0	1
70	WOOD TRIM OFFICE	10	1	0	1
69	DRYWALL	10	1	0	1
68	DRYWALL	5	1	0	1
67	METAL STUDS OFFICE	5	1	0	1
64	TEST PIPING OFFICE	4	1	0	1
418	INSTALL PIPING OFFICE	10	1	0	1
60	EXTERIOR MASONRY OFFICE	10	1	0	1
236	FAB/DEL PACKAGED A/C	140	2	0	1
235	APPROVE PACKAGED A/C	10	1	0	1
135	SUBMIT PACKAGED A/C	30	1	0	1
0	START MILESTONE	0	1	0	1
78	ACOUSTIC TILES OFFICE	10	1	0	2
94	SEED AND PLANT	5	1	0	3
415	FINE GRADE	5	1	0	3
56	ENERGIZE POWER	1	1	0	3
55	RING OUT P-W	10	1	0	3
54	TERMINATE WIRE P-W	10	1	0	3
50	INSTALL PANEL INTERNALS	5	1	0	3
49	PULL WIRE P-W	15	1	0	3
43	INSTALL BRANCH CONDUIT	15	1	0	3
38	INSTALL POWER CONDUIT P-W	20	1	0	3
300	SET ELECTRICAL LOAD	2	1	0	3
35	ERECT SIDING P-W	10	1	0	3
34	ERECT ROOF PLANKS P-W	3	1	0	3
33	ERECT BAR JOISTS P-W	3	1	0	3
31	ERECT CRANEWAY AND	5	1	0	3
30	PLUMB AND BOLT STEEL P-W	5	1	0	3
29	ERECT STRUCTURAL STEEL	10	1	0	3
22	FORM AND POUR SLABS P-W	10	1	0	3
20	UNDERSLAB CONDUIT P-W	5	1	0	3
19	UNDERSLAB PLUMBING P-W	5	1	0	3
19	UNDERSLAB PLUMBING P-W	5	1	0	3
18	BACKFILL AND COMPACT P-W	3	1	0	3
17	FORM AND POUR GRADE	10	1	0	3
16	POUR PILE CAPS P-W	5	1	0	3
15	EXCAVATE PLANT	5	1	0	3
14	DRIVE AND POUR PILES	10	1	0	3
13	BUILDING LAYOUT	1	1	0	3
8	CONNECT WATER PIPING	2	1	0	3
5	UNDERGROUND WATER PIPING	8	1	0	3
4	INSTALL WELL PUMP	2	1	0	3
3	DRILL WELL	15	1	0	3
2	ROUGH GRADE	2	1	0	3
1	SURVEY AND LAYOUT	2	1	0	3
100	CLEAR SITE	3	1	0	3
65	INSTALL CONDUIT OFFICE	10	1	0	4
419	INSTALL BACKING BOXES	4	1	0	4
58	ERECT FLAGPOLE	5	1	5	5
73	TOILET FIXTURES OFFICE	5	1	5	6
221	FAB/DEL PLANT ELECTRICAL	90	1	4	7
220	APPROVE PLANT ELECTRICAL	10	1	4	7
120	SUBMIT PLANT ELECTRICAL	20	1	4	7

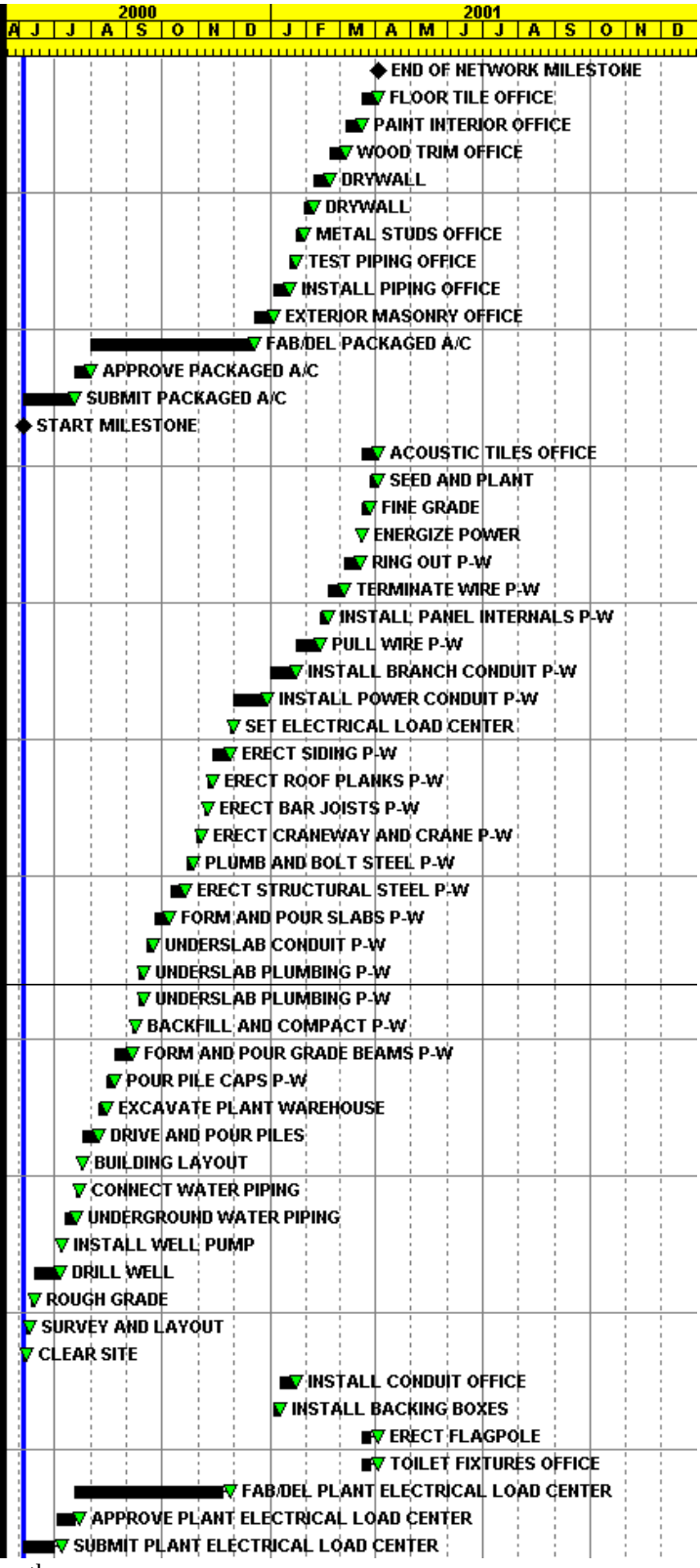


Figure 23.8.4 Backward pass of alternate critical paths

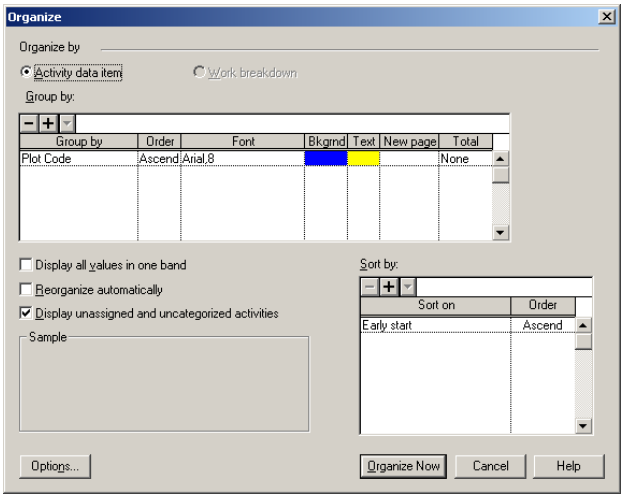
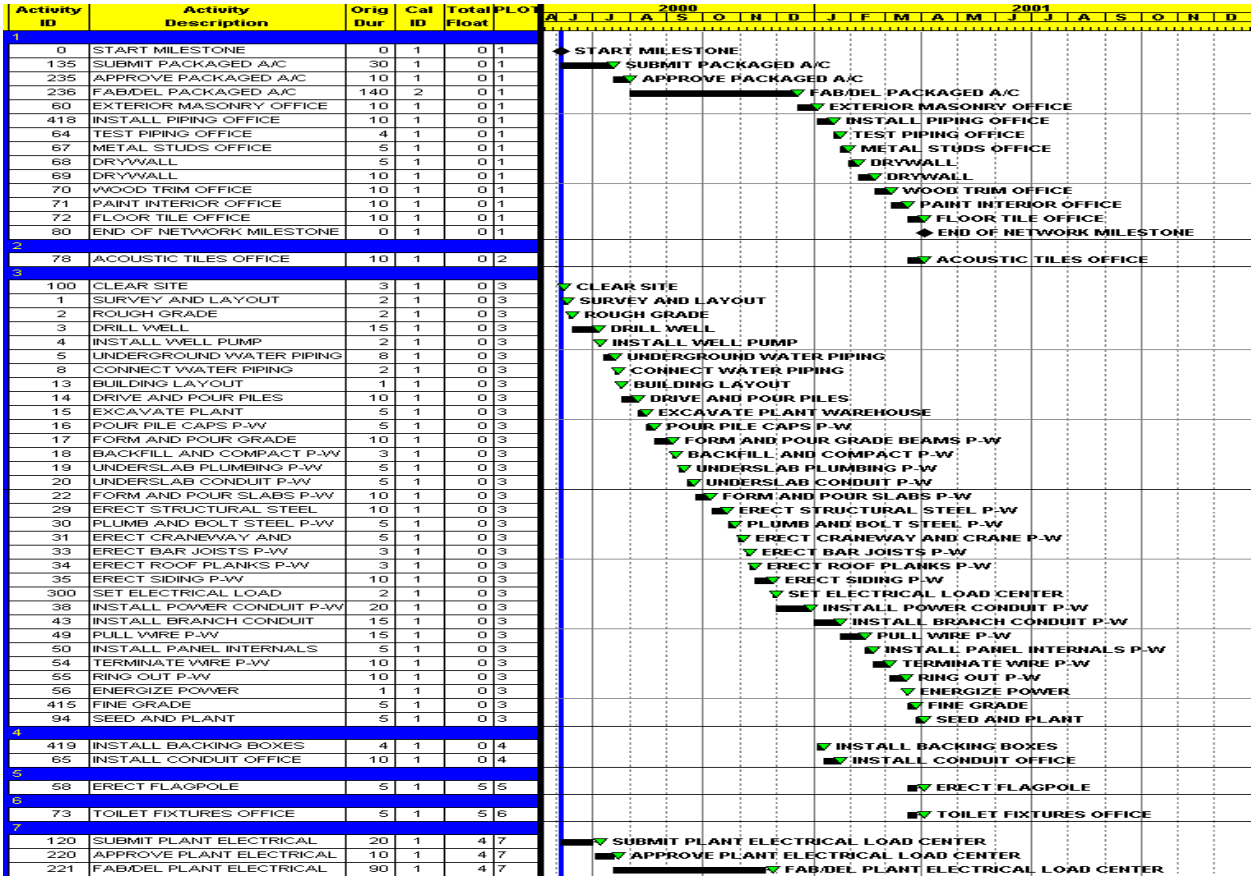


Figure 23.8.5 Grouping by PLOT code



Activity ID	Activity Description	Orig Dur	Cal ID	Total Float	PLOT
1					
0	START MILESTONE	0	1	0	1
135	SUBMIT PACKAGED A/C	30	1	0	1
235	APPROVE PACKAGED A/C	10	1	0	1
236	FAB/DEL PACKAGED A/C	140	2	0	1
60	EXTERIOR MASONRY OFFICE	10	1	0	1
418	INSTALL PIPING OFFICE	10	1	0	1
64	TEST PIPING OFFICE	4	1	0	1
67	METAL STUDS OFFICE	5	1	0	1
68	DRYWALL	5	1	0	1
69	DRYWALL	10	1	0	1
70	WOOD TRIM OFFICE	10	1	0	1
71	PAINT INTERIOR OFFICE	10	1	0	1
72	FLOOR TILE OFFICE	10	1	0	1
80	END OF NETWORK MILESTONE	0	1	0	1
2					
78	ACOUSTIC TILES OFFICE	10	1	0	2
3					
100	CLEAR SITE	3	1	0	3
1	SURVEY AND LAYOUT	2	1	0	3
2	ROUGH GRADE	2	1	0	3
3	DRILL WELL	15	1	0	3
4	INSTALL WELL PUMP	2	1	0	3
5	UNDERGROUND WATER PIPING	8	1	0	3
8	CONNECT WATER PIPING	2	1	0	3
13	BUILDING LAYOUT	1	1	0	3
14	DRIVE AND POUR PILES	10	1	0	3
15	EXCAVATE PLANT	5	1	0	3
16	POUR PILE CAPS P-W	5	1	0	3
17	FORM AND POUR GRADE	10	1	0	3
18	BACKFILL AND COMPACT P-W	3	1	0	3
19	UNDERSLAB PLUMBING P-W	5	1	0	3
20	UNDERSLAB CONDUIT P-W	5	1	0	3
22	FORM AND POUR SLABS P-W	10	1	0	3
29	ERECT STRUCTURAL STEEL	10	1	0	3
30	PLUMB AND BOLT STEEL P-W	5	1	0	3
31	ERECT CRANEWAY AND	5	1	0	3
33	ERECT BAR JOISTS P-W	3	1	0	3
34	ERECT ROOF PLANKS P-W	3	1	0	3
35	ERECT SIDING P-W	10	1	0	3
300	SET ELECTRICAL LOAD	2	1	0	3
38	INSTALL POWER CONDUIT P-W	20	1	0	3
43	INSTALL BRANCH CONDUIT	15	1	0	3
49	PULL WIRE P-W	15	1	0	3
50	INSTALL PANEL INTERNALS	5	1	0	3
54	TERMINATE WIRE P-W	10	1	0	3
55	RING OUT P-W	10	1	0	3
56	ENERGIZE POWER	1	1	0	3
415	FINE GRADE	5	1	0	3
94	SEED AND PLANT	5	1	0	3
4					
419	INSTALL BACKING BOXES	4	1	0	4
65	INSTALL CONDUIT OFFICE	10	1	0	4
5					
58	ERECT FLAGPOLE	5	1	5	5
6					
73	TOILET FIXTURES OFFICE	5	1	5	6
7					
120	SUBMIT PLANT ELECTRICAL	20	1	4	7
220	APPROVE PLANT ELECTRICAL	10	1	4	7
221	FAB/DEL PLANT ELECTRICAL	90	1	4	7

Figure 23.8.6 Intelligent report of multiple critical paths

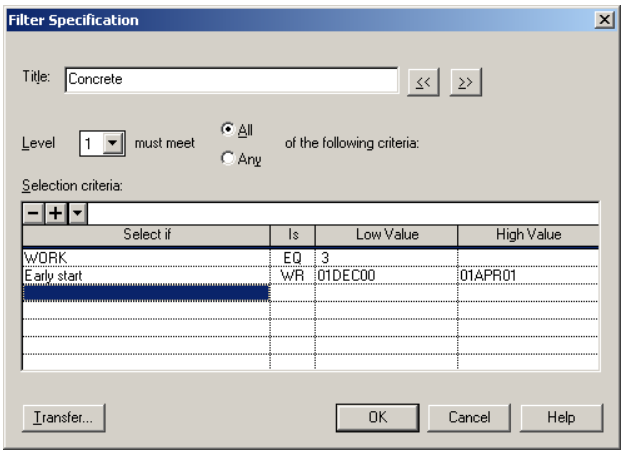
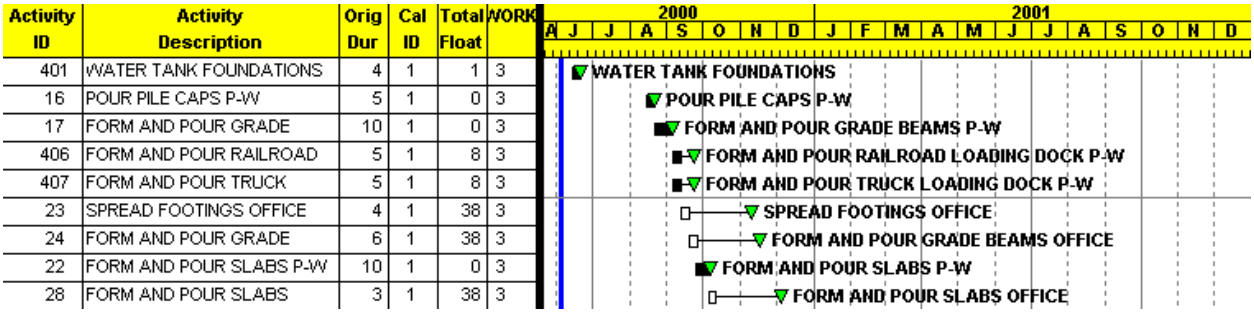


Figure 23.8.7 Filter for Winter Concrete



Activity ID	Activity Description	Orig Dur	Cal ID	Total Float	WORK
401	WATER TANK FOUNDATIONS	4	1	1	3
16	POUR PILE CAPS P-W	5	1	0	3
17	FORM AND POUR GRADE	10	1	0	3
406	FORM AND POUR RAILROAD	5	1	8	3
407	FORM AND POUR TRUCK	5	1	8	3
23	SPREAD FOOTINGS OFFICE	4	1	38	3
24	FORM AND POUR GRADE	6	1	38	3
22	FORM AND POUR SLABS P-W	10	1	0	3
28	FORM AND POUR SLABS	3	1	38	3

Figure 23.8.8 Report of Winter Concrete

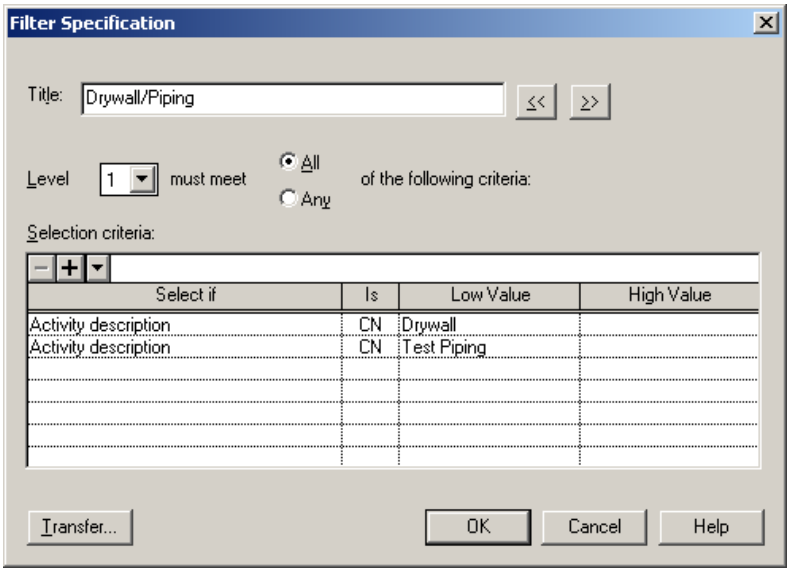


Figure 23.8.9 Filter

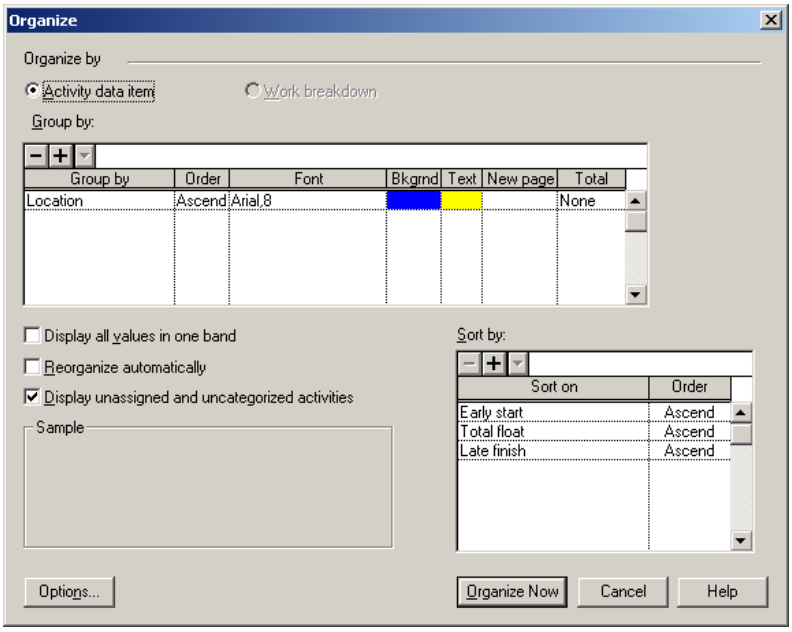


Figure 23.8.10 Organization

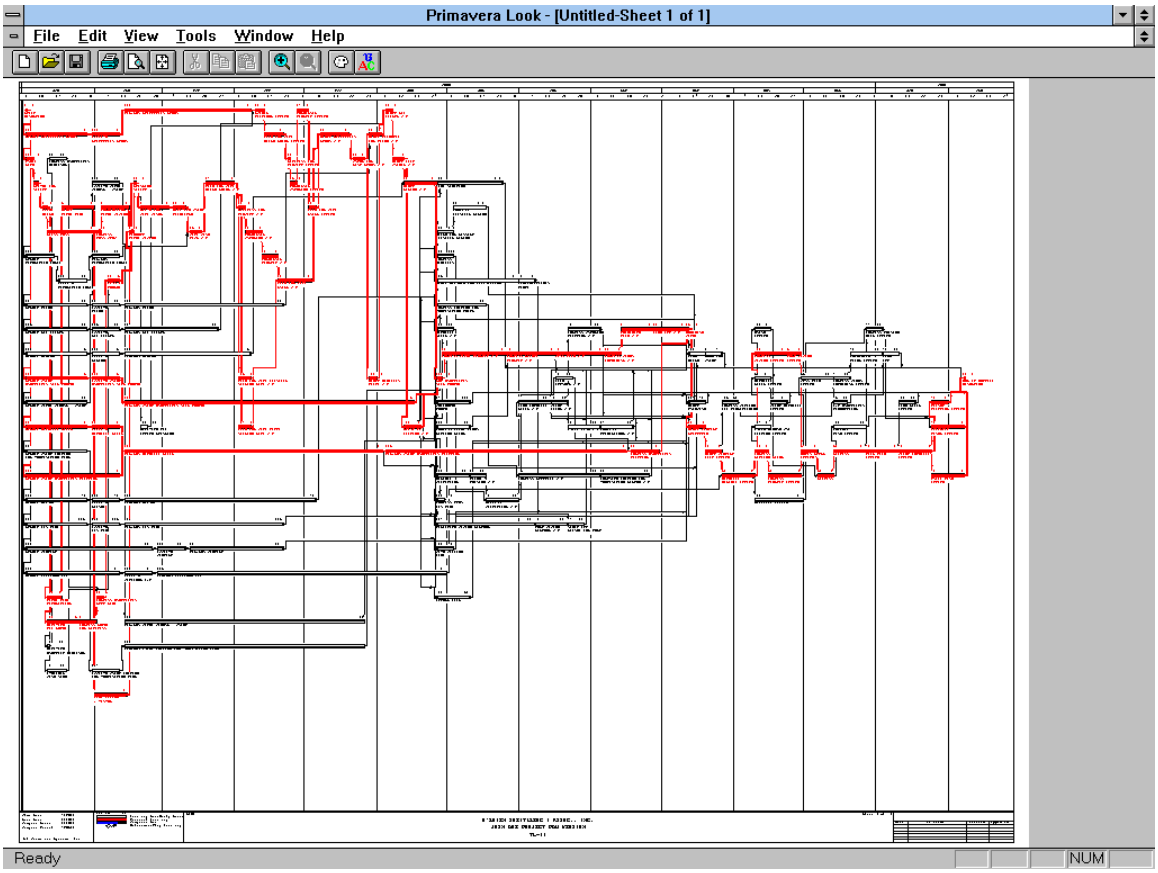


Figure 23.9.1 Timescale Logic Graphic Report, results.

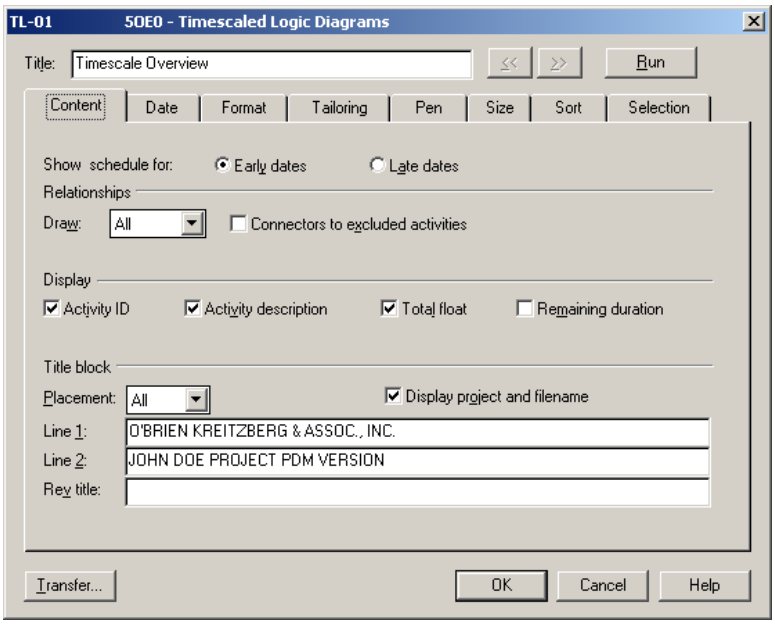


Figure 23.9.1 Timescale overview content

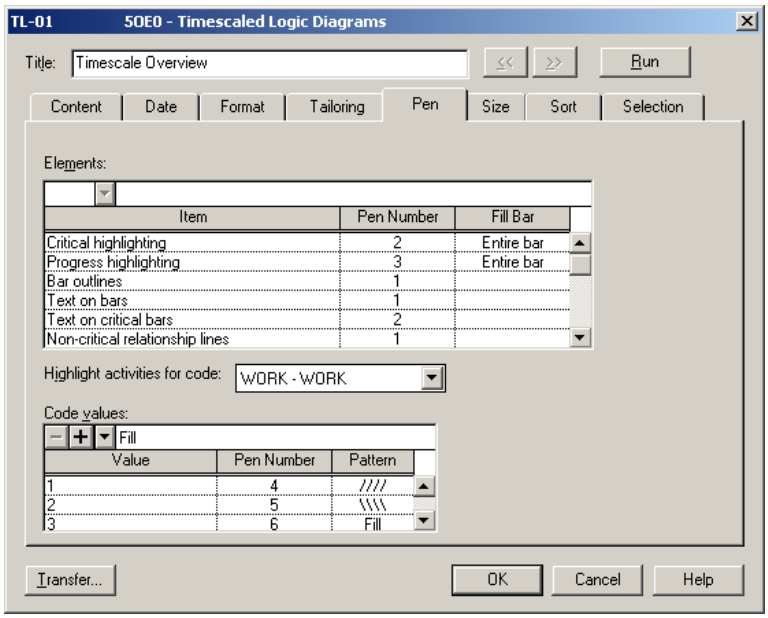


Figure 23.9.2 Timescale overview pen selection

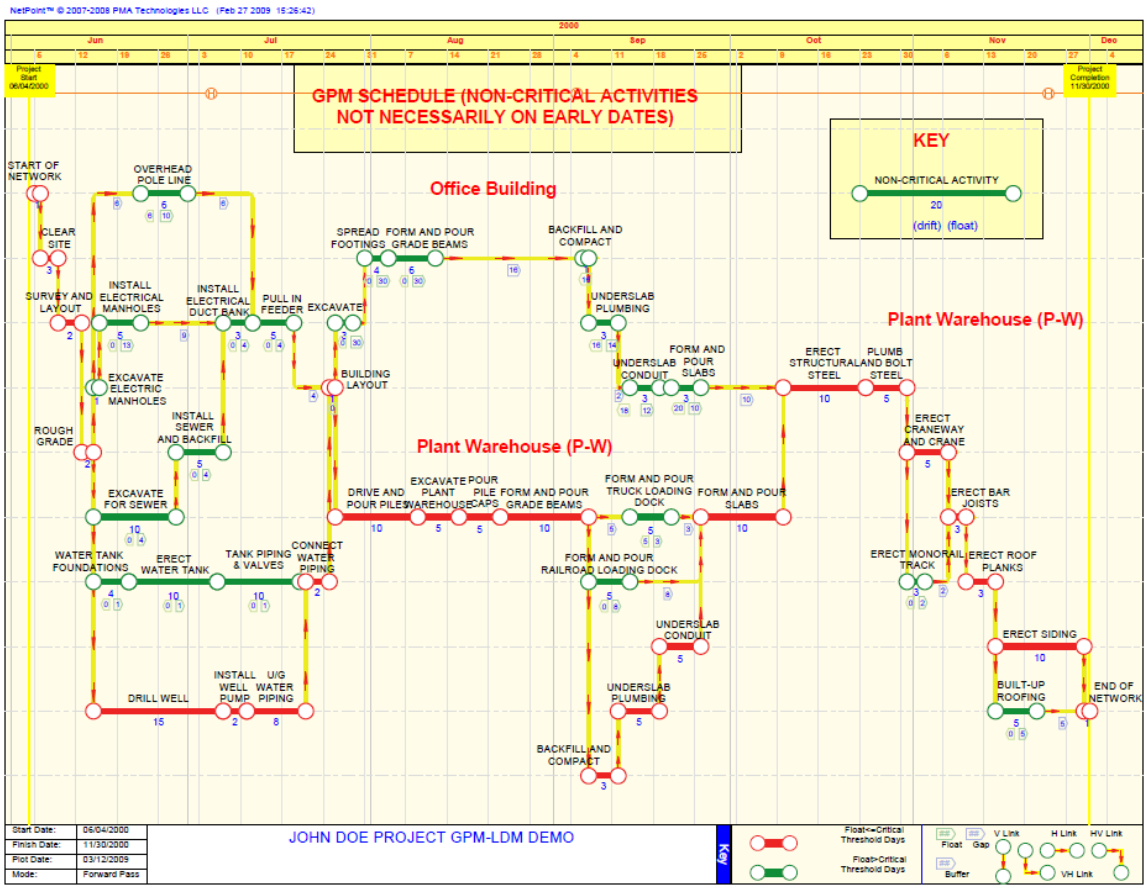


Figure 23.9.4 Time Scaled Logic Diagram of John Doe Project by Netpoint GPM software

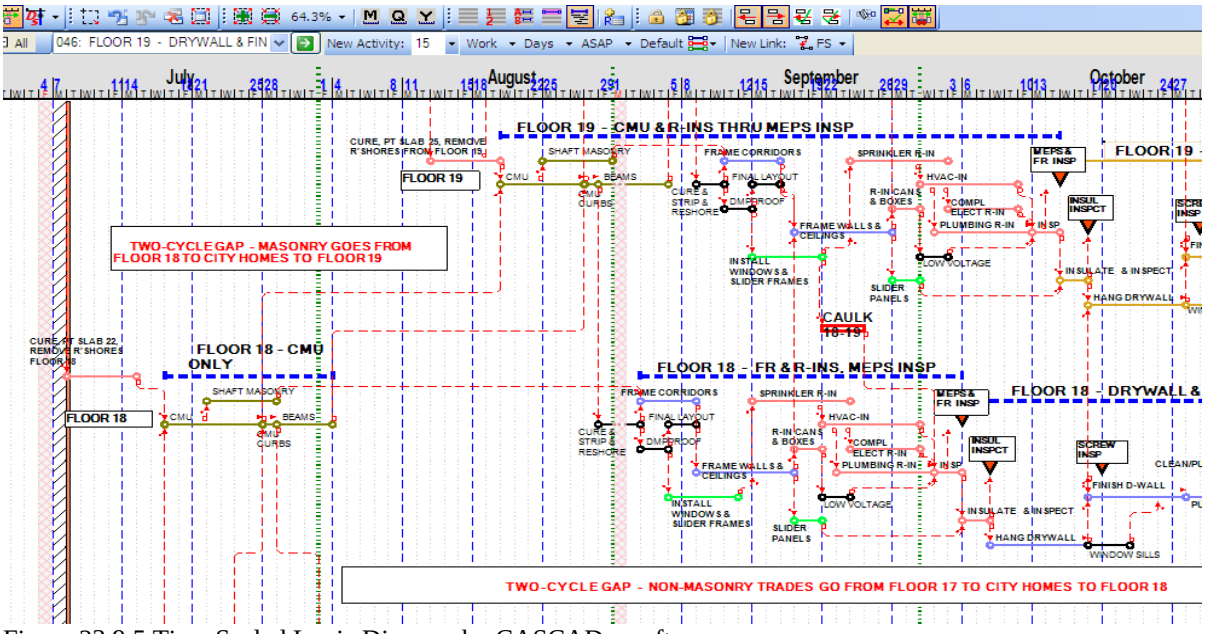


Figure 23.9.5 Time Scaled Logic Diagram by CASCAD-e software

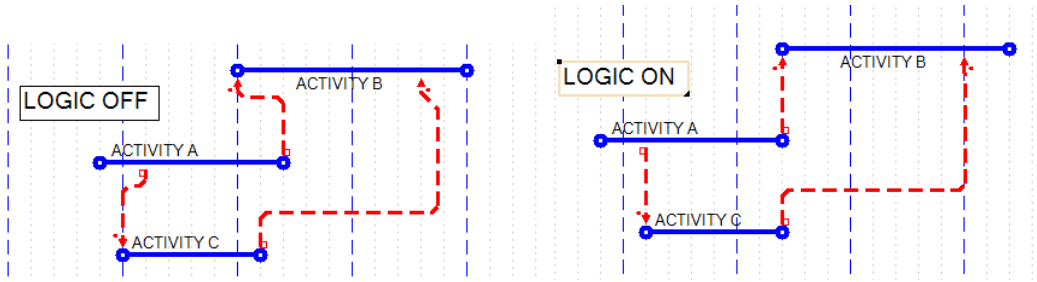


Figure 23.9.6 CASCAD-e software Logic OFF, Logic ON

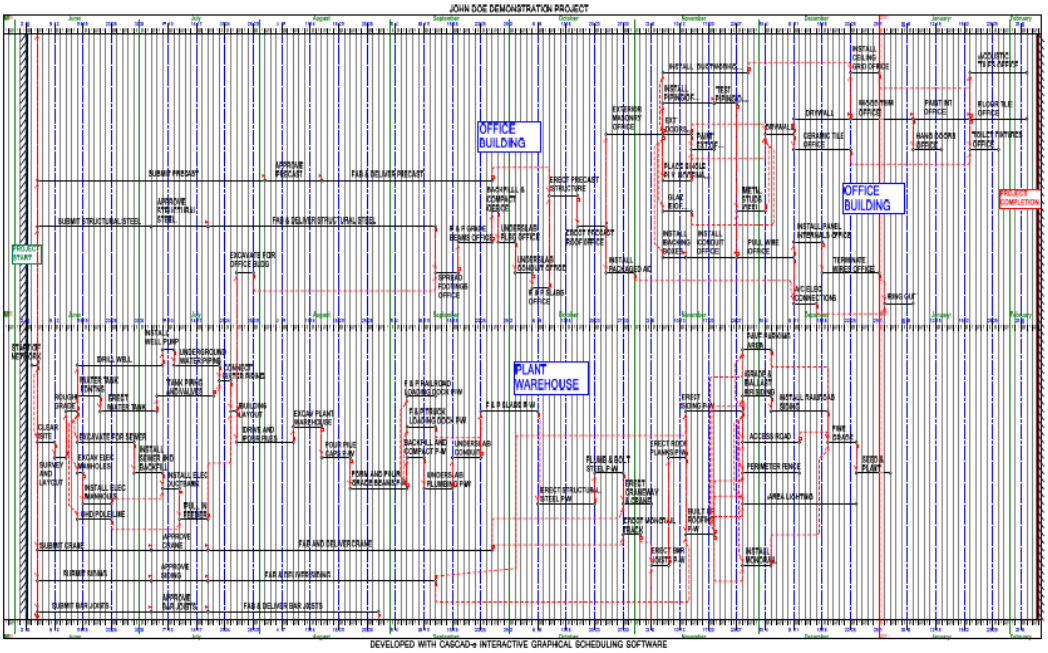


Figure 23.9.7 Time Scaled Logic Diagram of John Doe Project by CASCAD-e software

Activity ID	Activity Description	Orig Dur	Rem Dur	Cal ID	Crew Size	Crew Type	SHT1	Early Start	Early Finish	Total Float	Actual Start	Rem Dur	% Comp	Cost% Comp	Actual Finish
Ramp A&B&AB															
3306	Ramp A, B & AB - Subbase	2	2	1	6	PV	C127	09AUG05	10AUG05	9		2	0		
3308	Ramp A, B & AB - U-Drain	2	2	1	6	PV	C127	11AUG05	12AUG05	9		2	0		
3314	Ramp A, B & AB - Shoulders	2	2	1	6	PV	C127	22AUG05	23AUG05	9		2	0		
Paving Stage 1C 24' Equip															
6106	Construct SR222 - Subbase - 3160-3700 NB	3	3	5	6	PV	C134	23AUG05	25AUG05	117		3	0		
6108	Construct SR222 - U-Drain - 3160-3700 NB	2	2	5	8	PV	C134	26AUG05	29AUG05	117		2	0		
6114	Construct SR222 - Shoulders - 3160-3700 NB	2	2	5	6	PV	C134	07SEP05	08SEP05	117		2	0		
Paving Stage 1C Median															
6126	Construct SR222 - Subbase - 3160-3660 MED	2	2	5	6	PV	C135	26AUG05	29AUG05	120		2	0		
6128	Construct SR222 - U-Drain - 3160-3660 MED	2	2	5	8	PV	C134	30AUG05	31AUG05	120		2	0		
Paving Stage 1C Temporary															
6144	Construct SR222 Bypass - 3040-3157	5	5	4	6	PV		01AUG05	05AUG05	211		5	0		

Figure 23.13.1 Foreman's Turn-Around Document

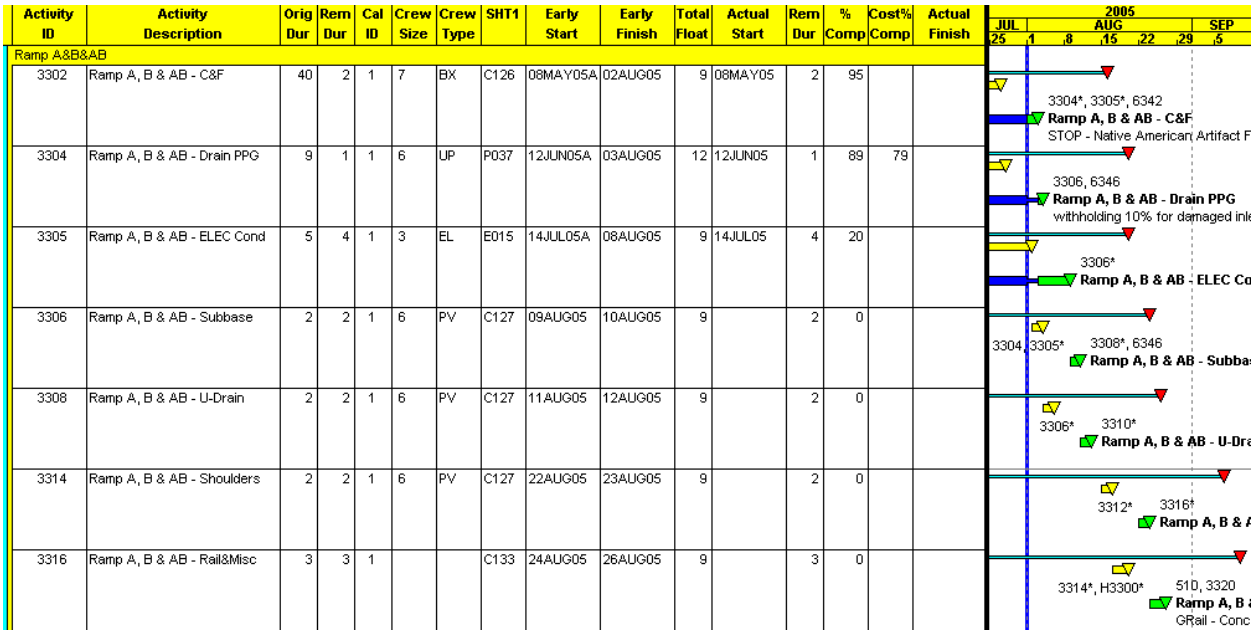


Figure 23.14-1 Superintendent's Turn-Around Document

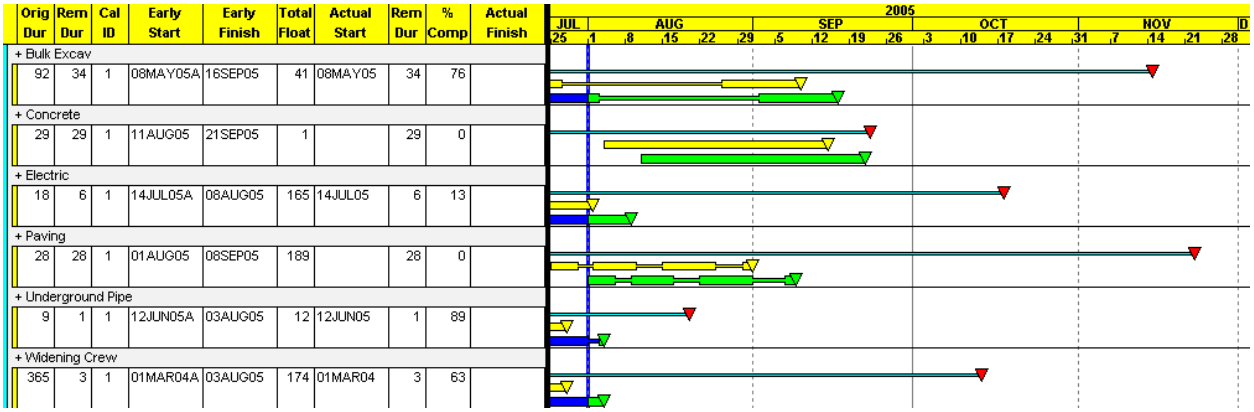


Figure 237.15.1 Summarized by Subcontract

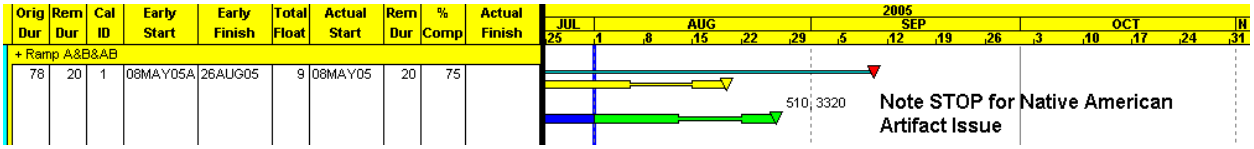


Figure 23.15.2 Summarized by Area

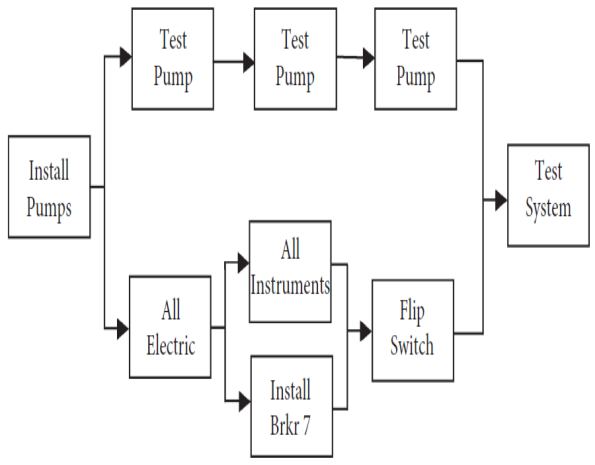


Figure 24.2.1 Descriptions not be too broad nor narrow.

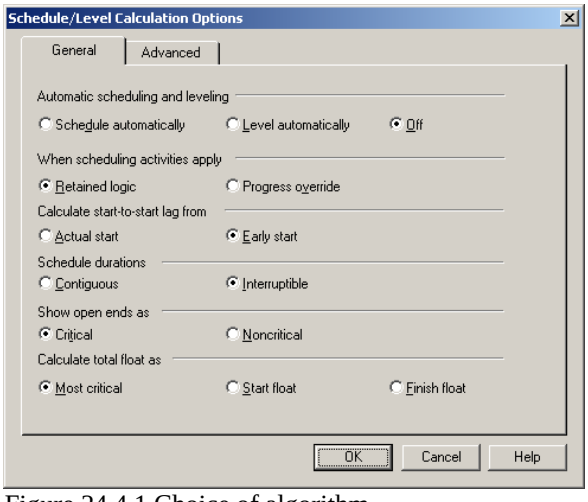


Figure 24.4.1 Choice of algorithm.

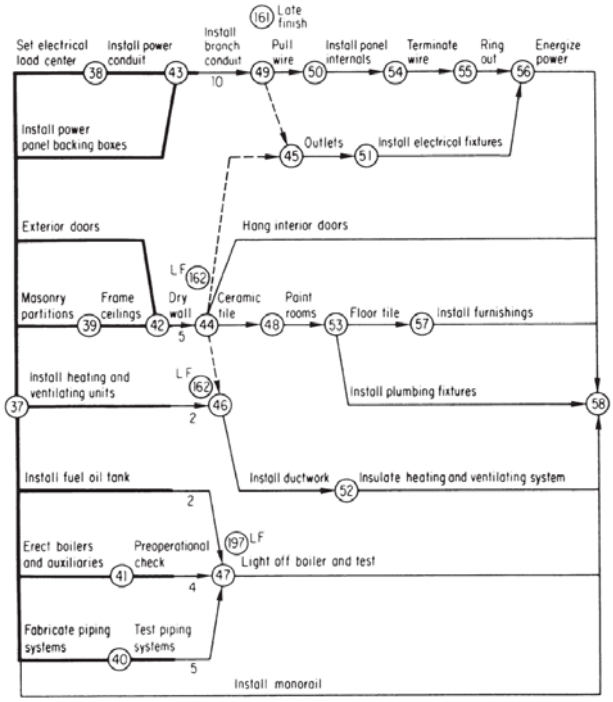


Figure 25.1.1 Plot of progress: project day 150.

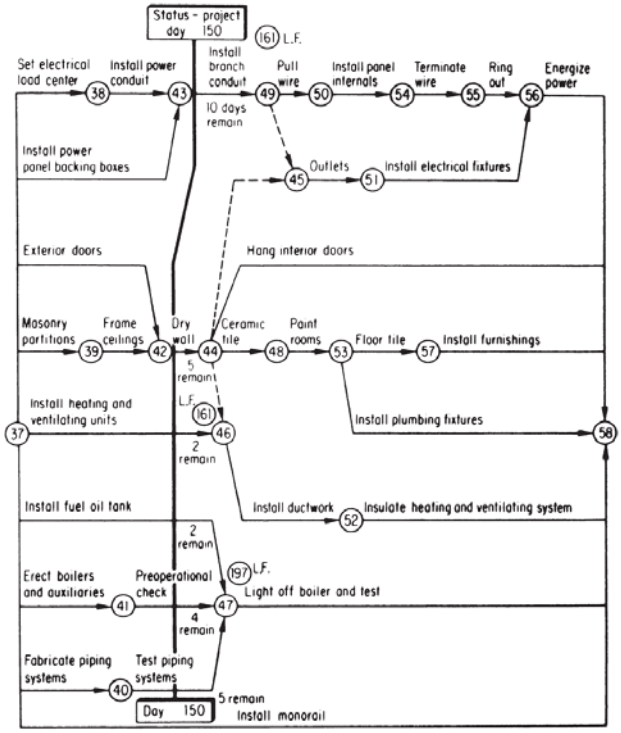
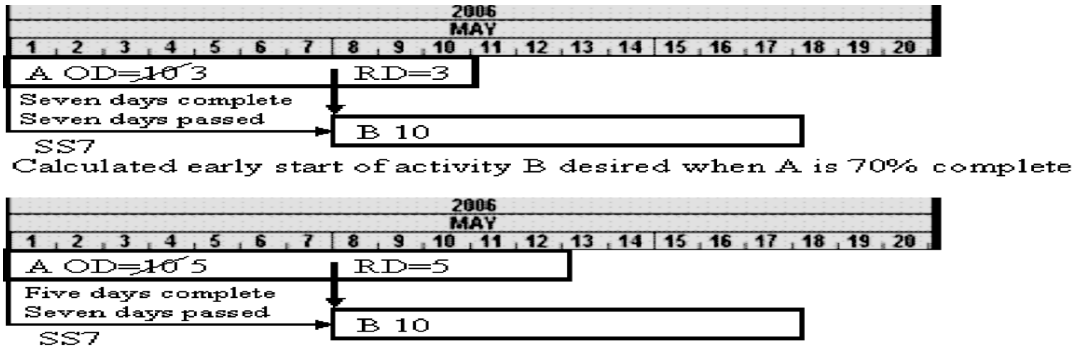


Figure 25.1.2 Quick status report: sample for day 150.



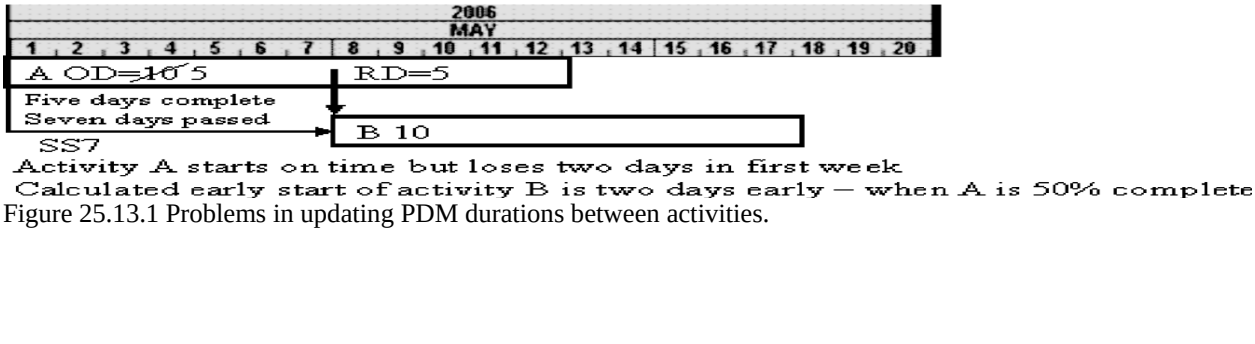


Figure 25.13.1 Problems in updating PDM durations between activities.

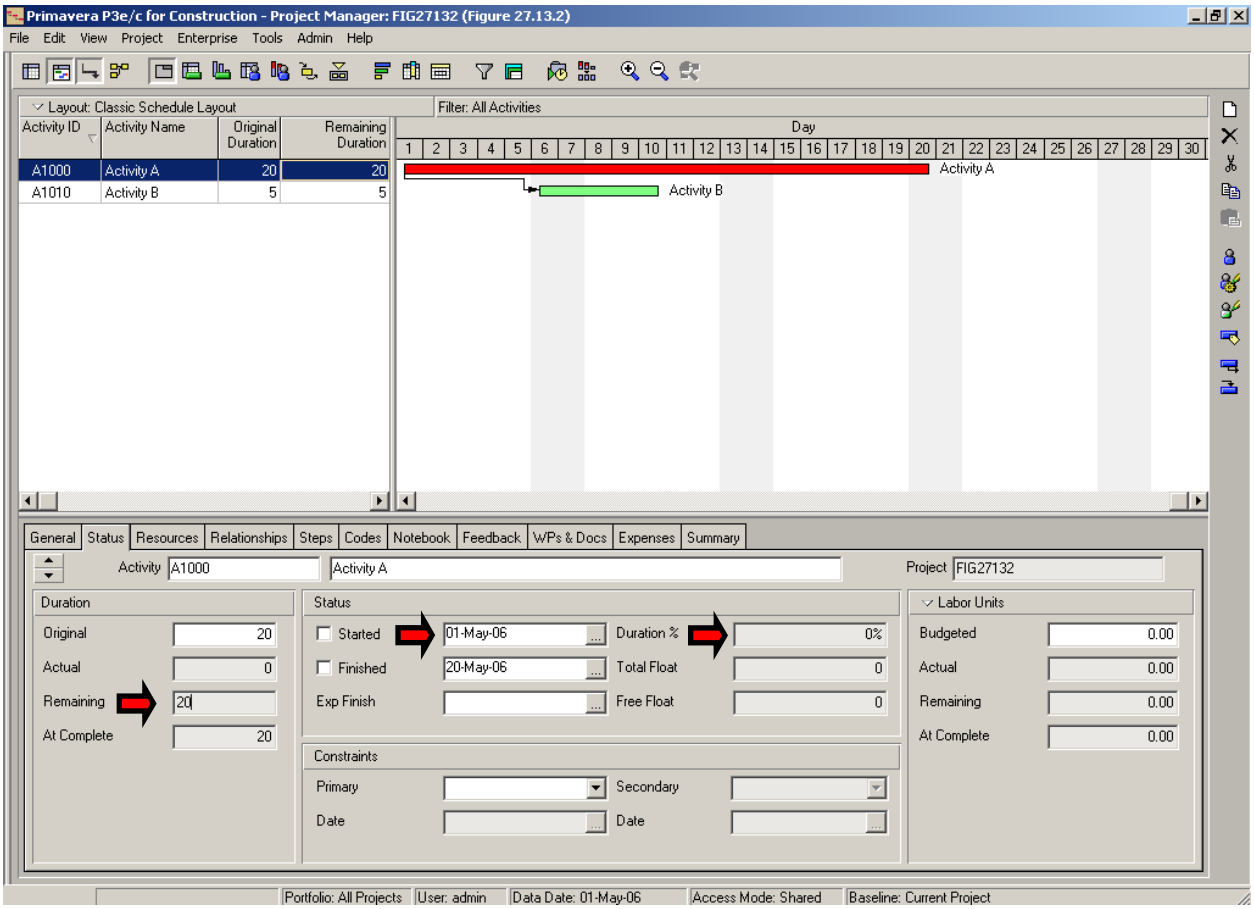
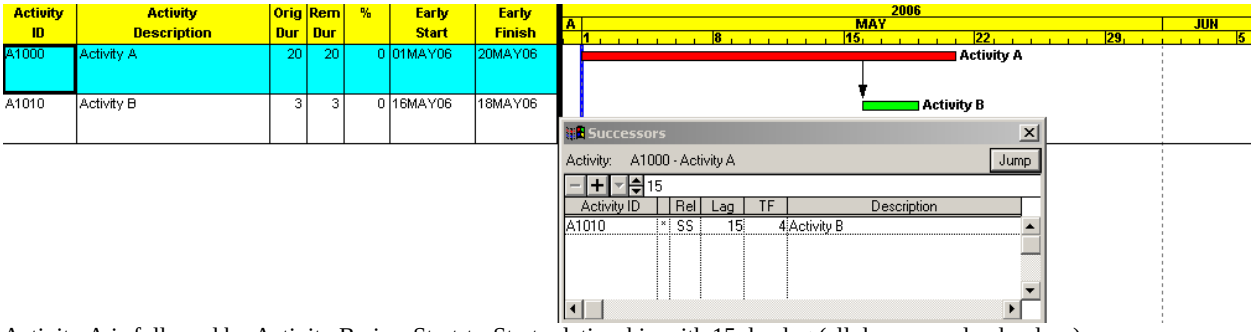
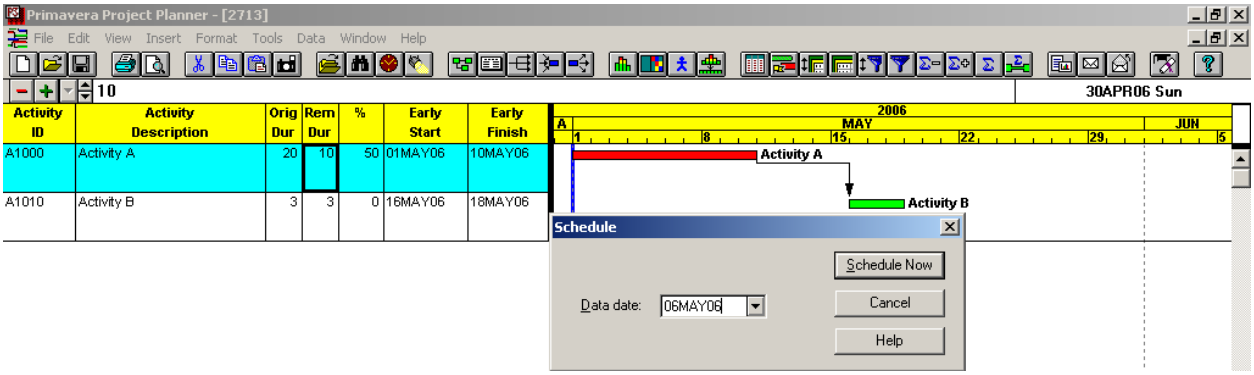


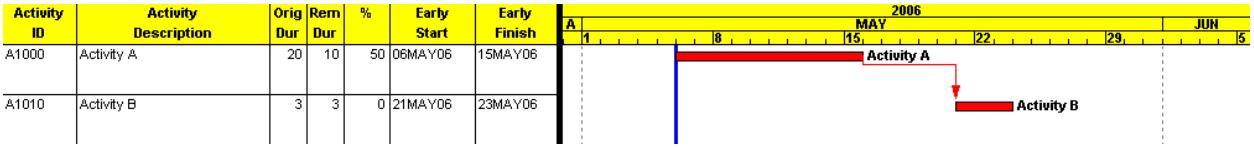
Figure 25.13.2 P6 does not allow user to status a reduced remaining duration until an actual start date is entered



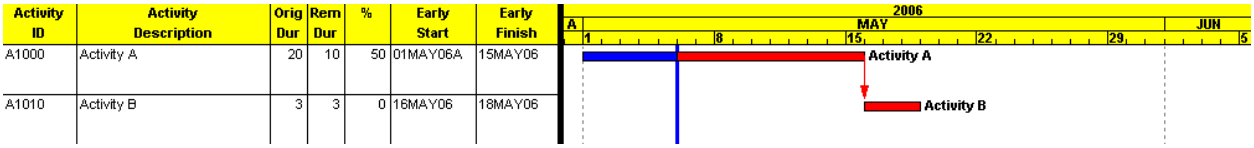
Activity A is followed by Activity B via a Start-to-Start relationship with 15 day lag (all days are calendar days)



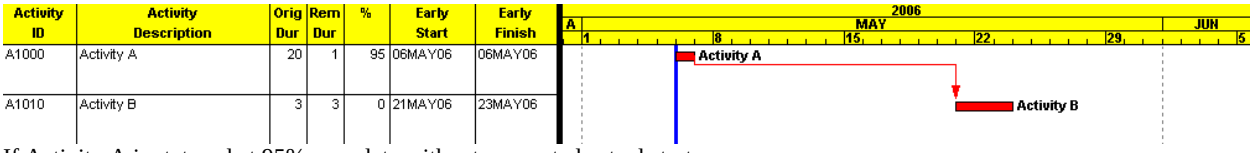
Activity A is statused to RD=10 on 06MAY06 (ahead of schedule) but actual start date is not entered



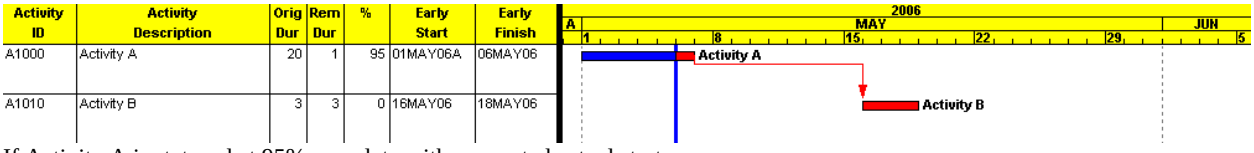
Activity B is still scheduled for 15 days after DataDate 06MAY06



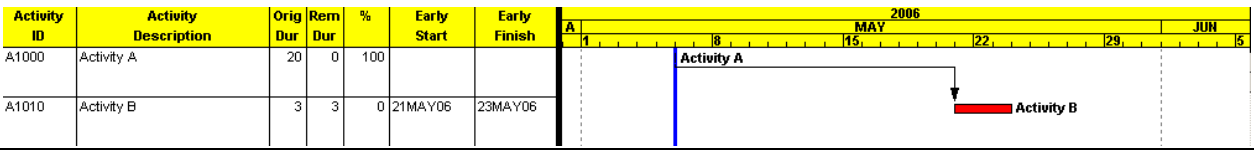
But if actual start of 01MAY06 is entered for Activity A, early start of 16MAY06 is calculated for Activity B



If Activity A is statused at 95% complete without a reported actual start,
early start of Activity B is calculated as DataDate plus 15 days

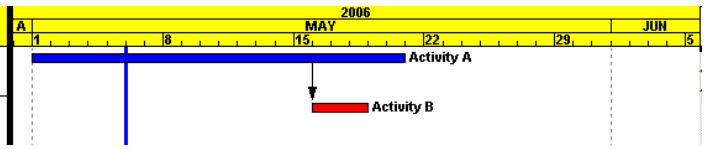


If Activity A is statused at 95% complete with a reported actual start,
early start of Activity B is calculated as actual start plus 15 days



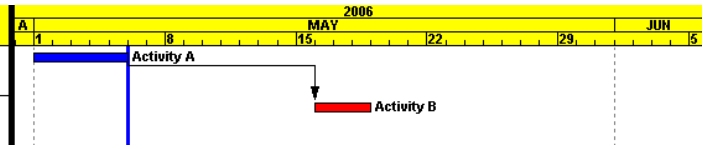
If Activity A is statused 100% complete without an actual start of finish date, early start of 21MAY06 is calculated for Activity B

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish
A1000	Activity A	20	0	100	01MAY06A	
A1010	Activity B	3	3	0	16MAY06	18MAY06



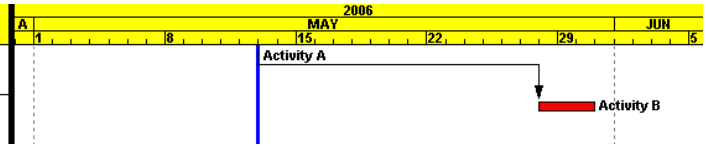
If Activity A is statused 100% complete with an actual start but not an actual finish, P3 illustrates a bar finishing the original estimated finish date but does not record that date on tabular format, and continues to calculate Activity B lag from 01MAY06

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish
A1000	Activity A	20	0	100	01MAY06A	05MAY06A
A1010	Activity B	3	3	0	16MAY06	18MAY06



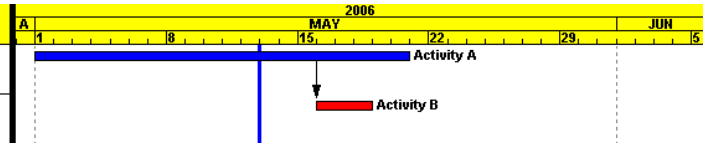
Even if Activity A is completed three weeks early, and all actual dates reported, the early start of Activity B is still calculated as 01MAY06 plus 15 days. Is this what the superintendent meant when saying "Activity A is expected to take 20 days, Activity B can start when Activity A is ¾ done"?

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish
A1000	Activity A	20	0	100		
A1010	Activity B	3	3	0	28MAY06	30MAY06



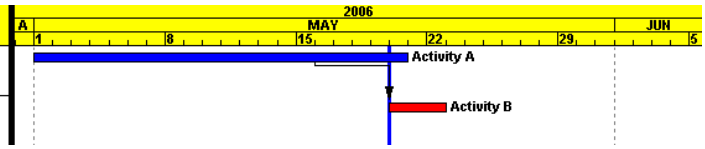
Updating without an actual start date does not reduce the remaining lag

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish
A1000	Activity A	20	0	100	01MAY06A	
A1010	Activity B	3	3	0	16MAY06	18MAY06



Now that an actual start, but not finish, has been reported, updating reduces the remaining lag

Activity ID	Activity Description	Orig Dur	Rem Dur	%	Early Start	Early Finish
A1000	Activity A	20	0	100	01MAY06A	
A1010	Activity B	3	3	0	20MAY06	22MAY06



Continued updating with an actual start but without actual finish eventually allows next activity to start

Figure 25.13.3 Problems with reporting status for durations of activities and durations between activities

Activity ID	Activity Description	Orig Dur	Rem Dur	Cal ID	Crew Size	Crew Type	SHT1	Early Start	Early Finish	Total Float	Actual Start	Rem Dur	% Comp	Cost% Comp	Actual Finish
Ramp A&B&AB															
3306	Ramp A, B & AB - Subbase	2	2	1	6	PV	C127	09AUG05	10AUG05	9	8/10	2	0		8/10
3308	Ramp A, B & AB - U-Drain	2	2	1	6	PV	C127	11AUG05	12AUG05	9	8/11	2	0	80%	8/13
3314	Ramp A, B & AB - Shoulders	2	2	1	6	PV	C127	22AUG05	23AUG05	9		2	0		
Paving Stage 1C 24' Equip															
6106	Construct SR222 - Subbase - 3160-3700 NB	3	3	5	6	PV	C134	23AUG05	25AUG05	117		3	0		
6108	Construct SR222 - U-Drain - 3160-3700 NB	2	2	5	8	PV	C134	26AUG05	29AUG05	117		2	0		
6114	Construct SR222 - Shoulders - 3160-3700 NB	2	2	5	6	PV	C134	07SEP05	08SEP05	117		2	0		
Paving Stage 1C Median															
6126	Construct SR222 - Subbase - 3160-3660 MED	2	2	5	6	PV	C135	26AUG05	29AUG05	120		2	0		
6128	Construct SR222 - U-Drain - 3160-3660 MED	2	2	5	8	PV	C134	30AUG05	31AUG05	120		2	0		
Paving Stage 1C Temporary															
6144	Construct SR222 Bypass - 3040-3157	5	5	4	6	PV		01AUG05	05AUG05	211		5	0		

Figure 29.15.1 Input for Update of 15AUG05

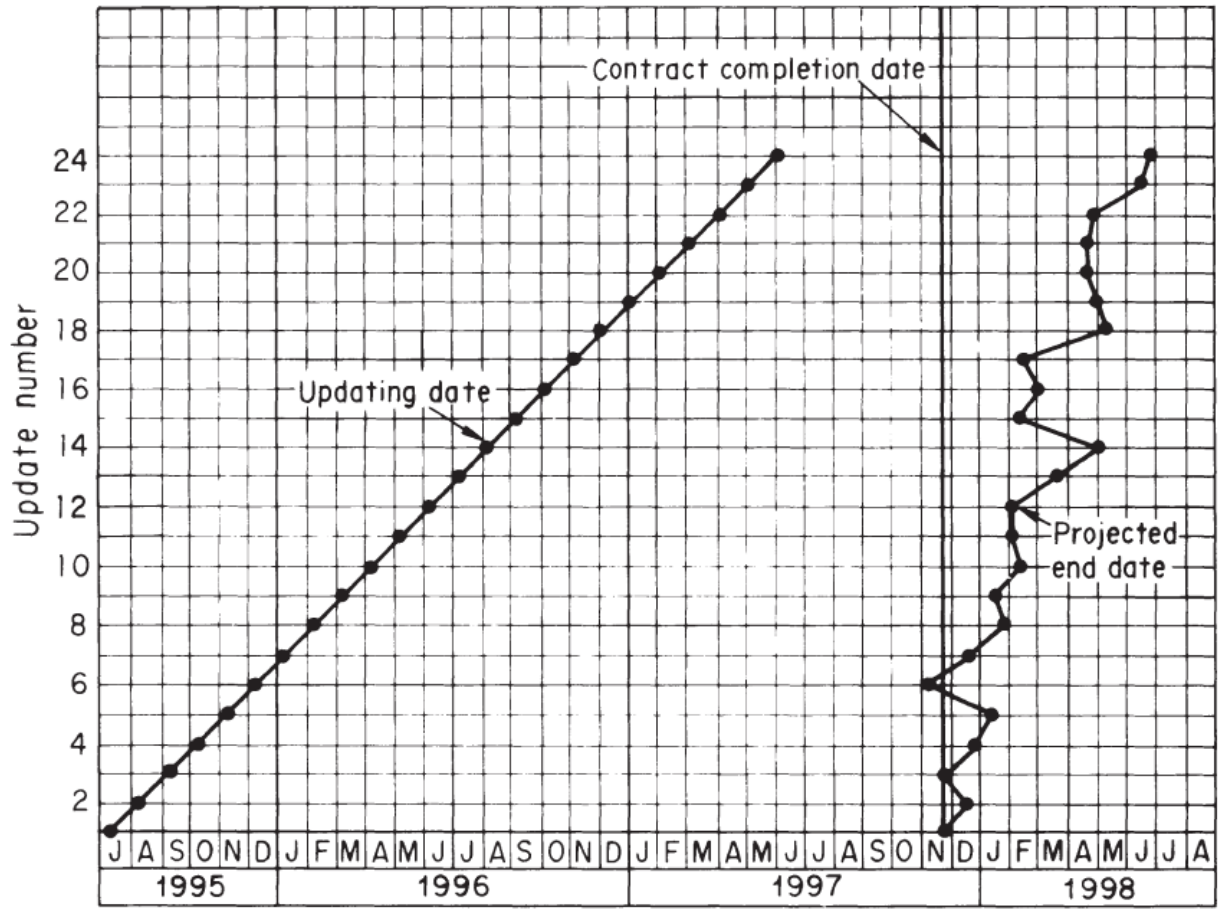


Figure 25.21.1 End date projections by update.

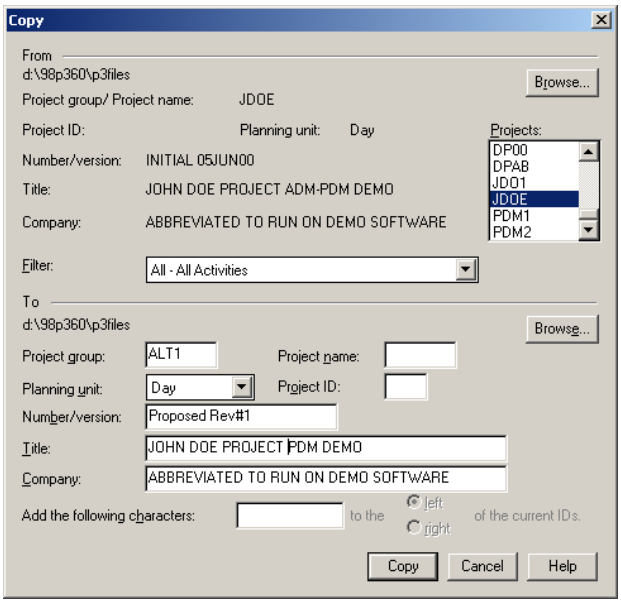


Figure 26.1.1 Project copy files command

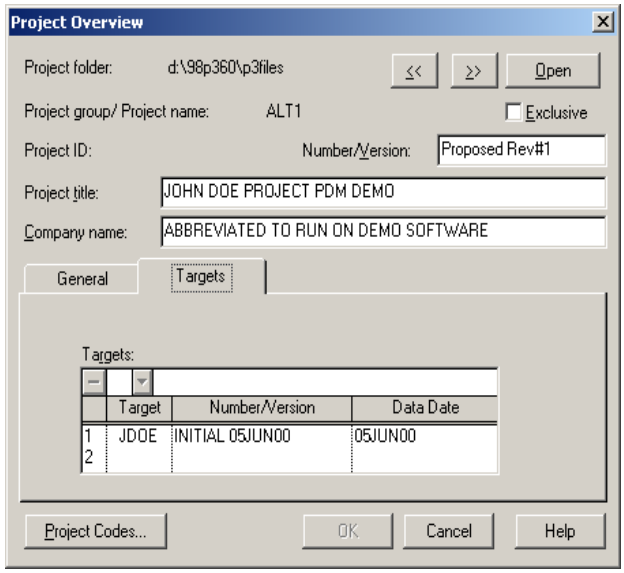


Figure 26.1.2 Project Overview – rename version

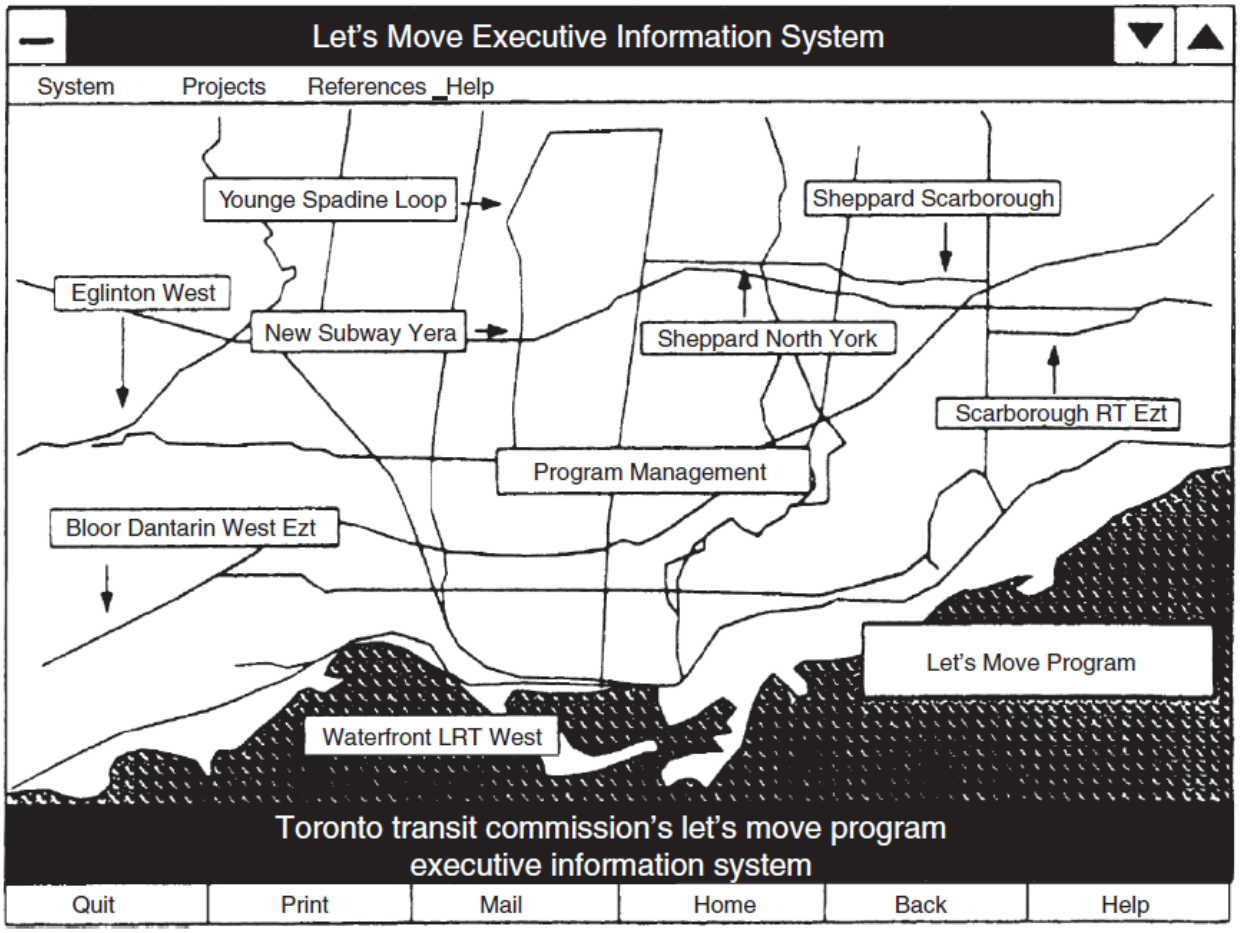


Figure 28.11.1 Opening screen. System Project Eglinton West Element Engineering.

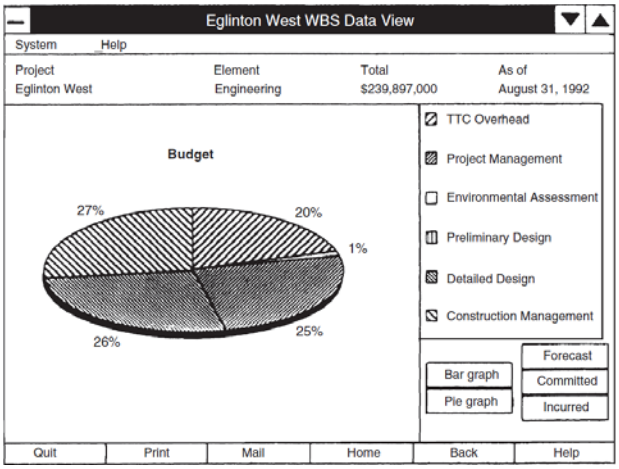


Figure 28.11.2 Cost graphic.

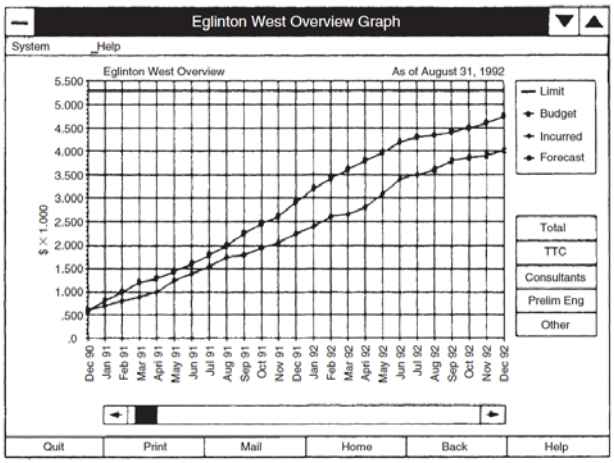


Figure 28.11.3 Time-scaled cost graphic.

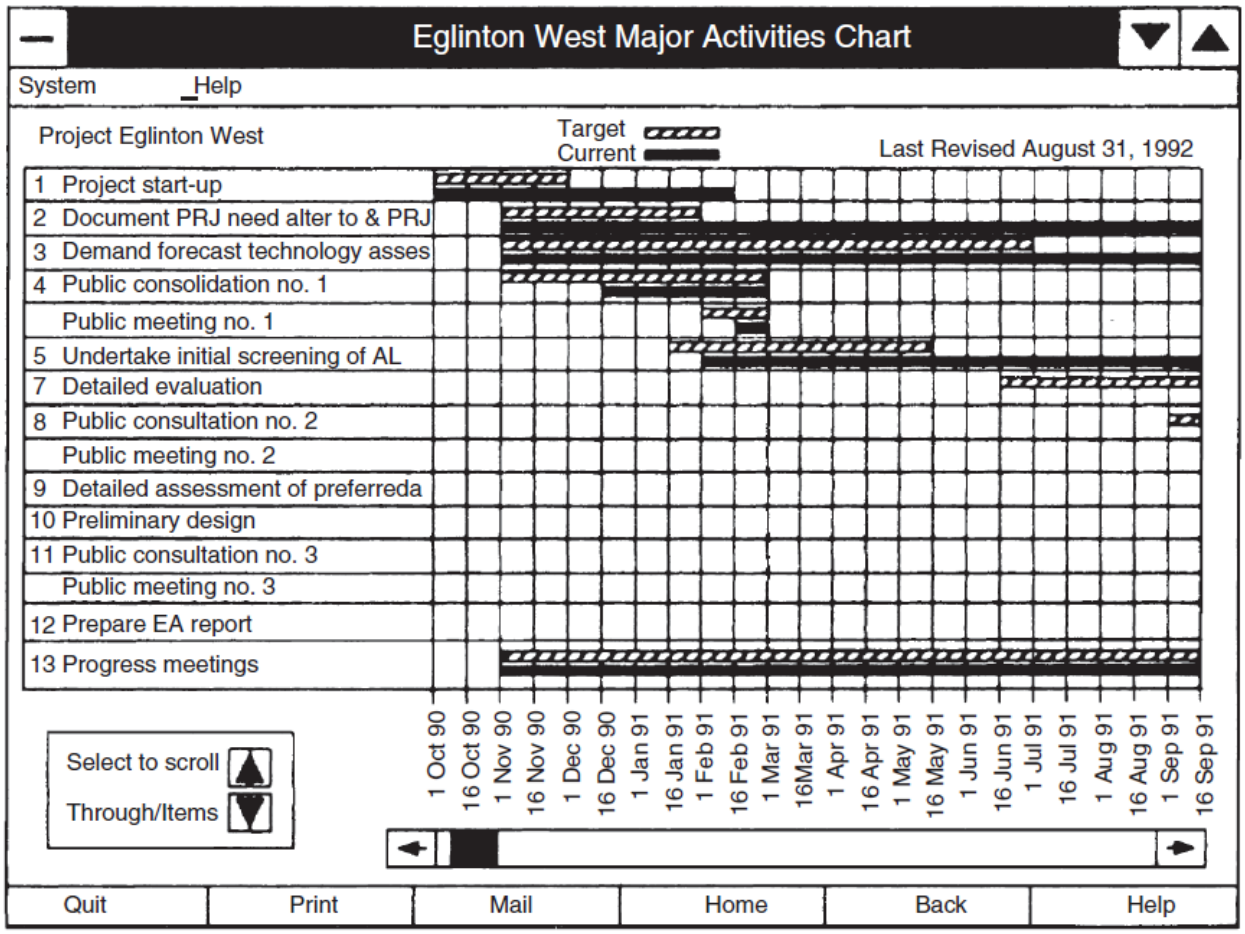


Figure 28.11.4 Time-scaled schedule graphic.

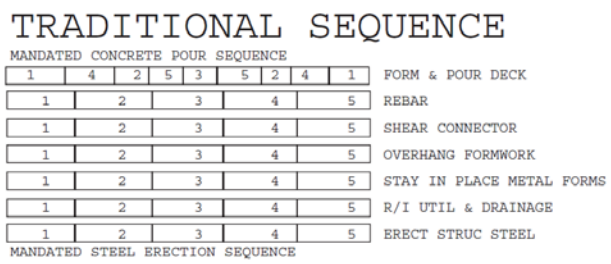


Figure 28.12.1 The traditional sequence.

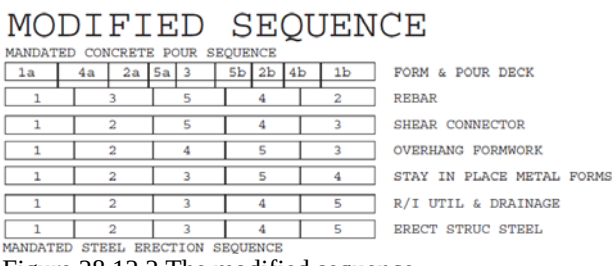


Figure 28.12.2 The modified sequence.

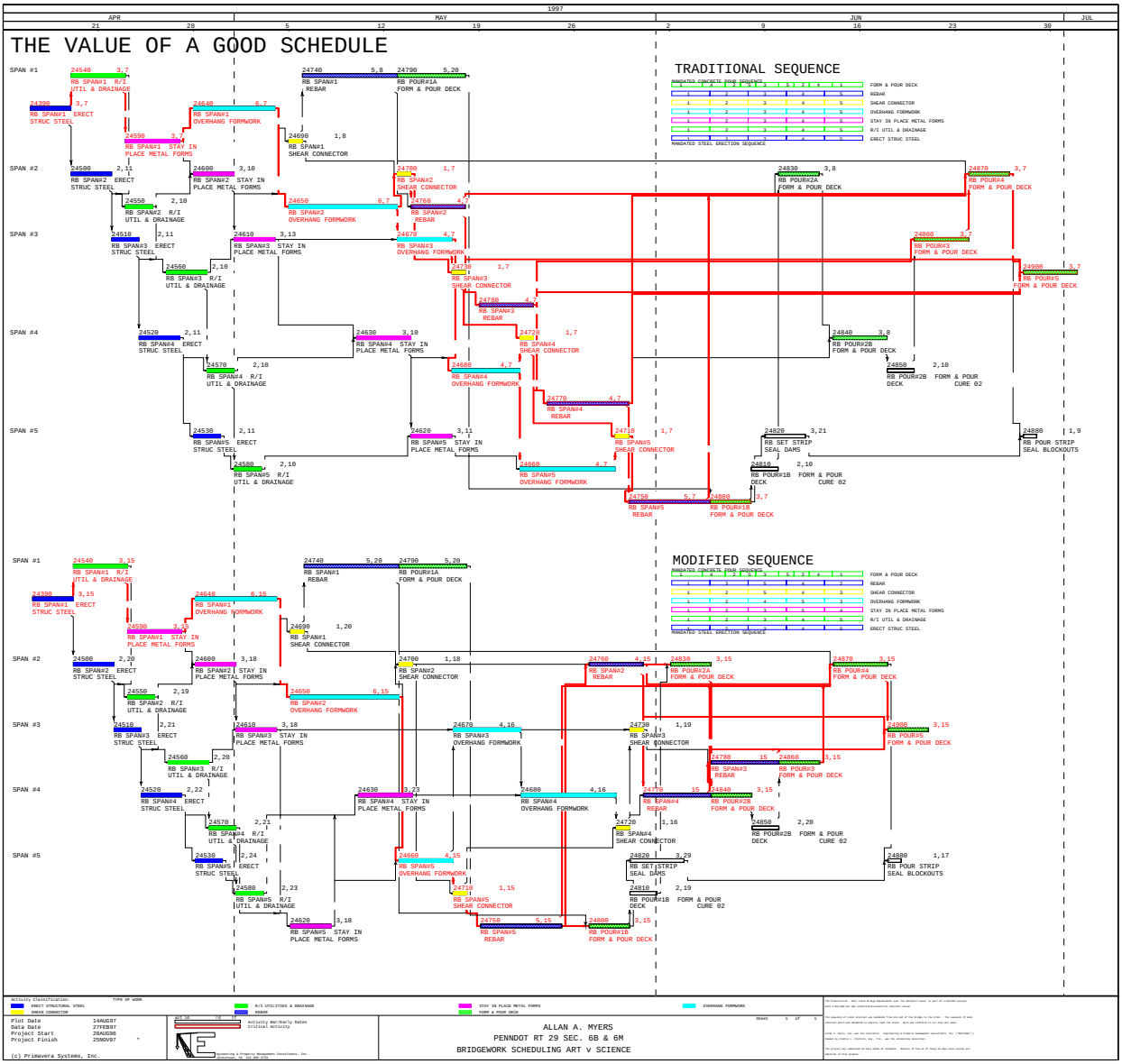


Figure 28.12.3 Impact of the modified sequence upon the traditional approach

Activity ID	Activity Description	Orig Dur	WHOM	Free Float
551020	551 IMMED RCOV INSTALL STUDS	3	GEMH2	0
551022	551 IMMED RCOV INSTALL DRYWALL	3	GEMH2	0
551024	551 IMMED RCOV TAPE DRYWALL	3	GEMH2	0
551030	551 IMMED RCOV CEILING GRID	1	DUGAN	0
551034	551 IMMED RCOV CEILING LIGHTING	1	FORD	0
551038	551 IMMED RCOV REGISTERS GRILLS DIFFUSERS	1	GERNGR	9
551026	551 IMMED RCOV FLOORING	1	COMMER	0
551028	551 IMMED RCOV WALL FINISH	1	EDI	0
551060	551 IMMED RCOV CASEWORK	4	GREEN	0
551050	551 IMMED RCOV WALL FIXTURES	0		7
551062	551 IMMED RCOV CASEWORK EQUIP & ELECTRIC	2	FORD	0
551070	551 IMMED RCOV PLUMBING FIXTURES	2	GERNGR	1
551082	551 IMMED RCOV ELECTRIC TRIM	1	FORD	0
551090	551 IMMED RCOV ROOM PUNCHLIST	1	LOTZ	21

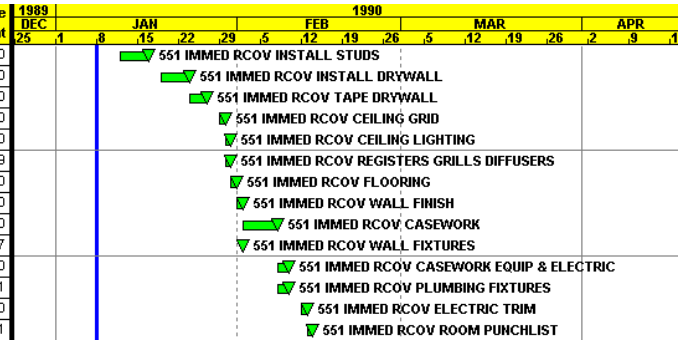


Figure 28.13.1 Sequence of work in Room 551

Activity ID	Activity Description	Orig Dur	WHOM	Free Float
INSTALL STUDS				
257020	257 QUIET ROOM INSTALL STUDS	1	GEMH2	0
259020	259 CORRIDOR INSTALL STUDS	2	GEMH2	0
263020	263 TREATMENT INSTALL STUDS	1	GEMH2	0
264020	264 PAT TOILET INSTALL STUDS	1	GEMH2	0
203020	203 INTERVIEW INSTALL STUDS	2	GEMH2	0
202020	202 WAITING INSTALL STUDS	2	GEMH2	0
+ INSTALL DRYWALL				
		10	GEMH2	0
+ TAPE DRYWALL				
		24	GEMH2	0
+ FLOOR COVERING				
		31		0
+ WALL COVERING				
		30		0
+ CEILING GRID				
		28	DUGAN	0
+ CEILING PANELS				
		32	DUGAN	0
+ CEILING LIGHTING				
		30	FORD	0
+ REGISTER GRILLS DEVICES				
		28	GERNGR	0
+ WALL FIXTURES				
		29		0
+ CASEWORK				
		30	GREEN	0
+ 062				
		27	FORD	0
+ PLUMBING				
		28	GERNGR	0
+ ELECTRIC TRIM				
		36	FORD	0
+ ROOM PUNCHLIST				
		33	LOTZ	0

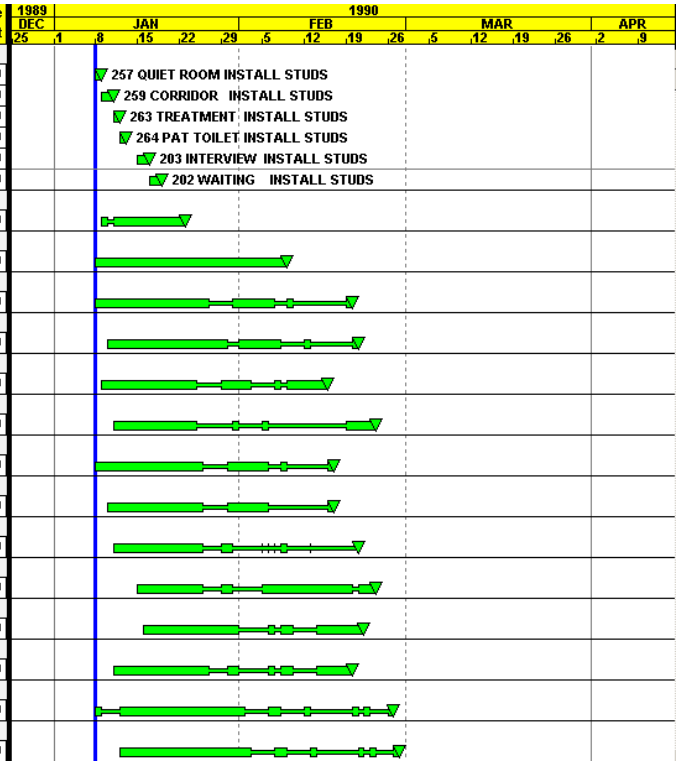
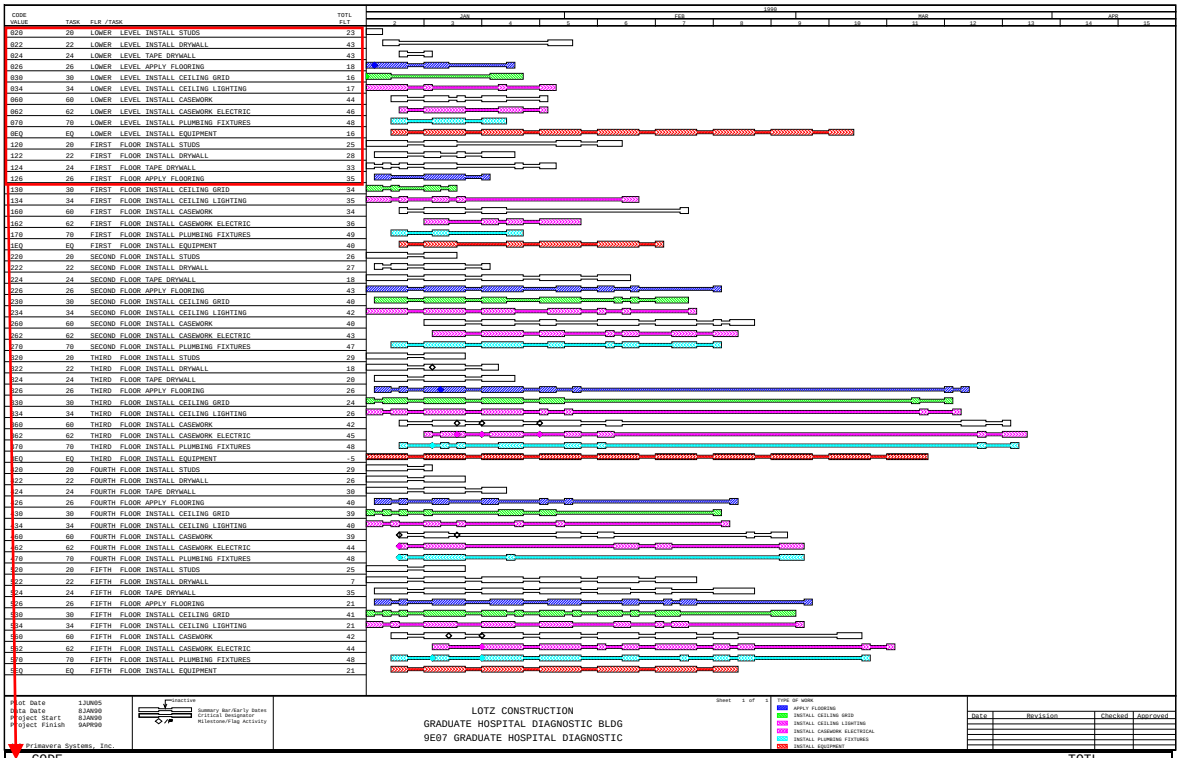
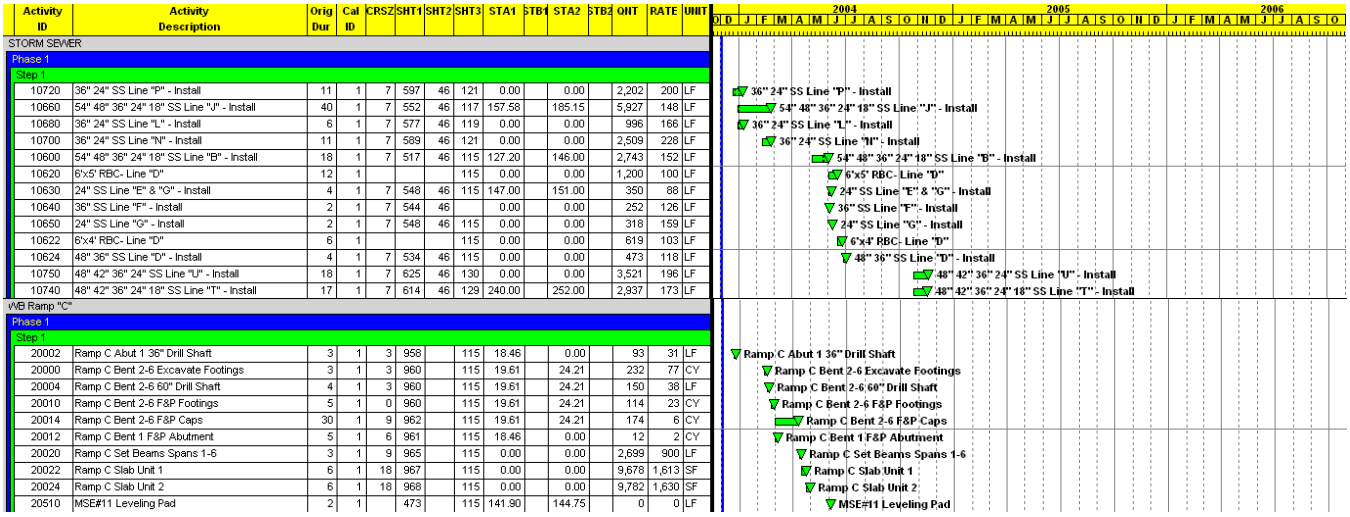


Figure 28.13.2 Summary of work on 2nd floor with partial detail shown



CODE VALUE	TASK	FLR /TASK	TOTL FLT
020	20	LOWER LEVEL INSTALL STUDS	23
022	22	LOWER LEVEL INSTALL DRYWALL	43
024	24	LOWER LEVEL TAPE DRYWALL	43
026	26	LOWER LEVEL APPLY FLOORING	18
030	30	LOWER LEVEL INSTALL CEILING GRID	16
034	34	LOWER LEVEL INSTALL CEILING LIGHTING	17
060	60	LOWER LEVEL INSTALL CASEWORK	44
062	62	LOWER LEVEL INSTALL CASEWORK ELECTRIC	46
070	70	LOWER LEVEL INSTALL PLUMBING FIXTURES	48
0EQ	EQ	LOWER LEVEL INSTALL EQUIPMENT	16
120	20	FIRST FLOOR INSTALL STUDS	25
122	22	FIRST FLOOR INSTALL DRYWALL	28
124	24	FIRST FLOOR TAPE DRYWALL	33
126	26	FIRST FLOOR APPLY FLOORING	35

Figure 28.13.3 The network has 3503 detail activities, but the owner see only 58 summary activities



Activity ID	Activity Description	Orig Dur	Cal ID	CRSZ	SHT1	SHT2	SHT3	STA1	STB1	STA2	STB2	QNT	RATE	UNIT
STORM SEWER														
Phase 1														
Step 1														
10720	36" 24" SS Line "P" - Install	11	1	7	597	46	121	0.00		0.00		2,202	200	LF
10660	54" 48" 36" 24" 18" SS Line "J" - Install	40	1	7	552	46	117	157.58		185.15		5,927	148	LF
10680	36" 24" SS Line "L" - Install	6	1	7	577	46	119	0.00		0.00		996	166	LF
10700	36" 24" SS Line "N" - Install	11	1	7	589	46	121	0.00		0.00		2,509	228	LF
10600	54" 48" 36" 24" 18" SS Line "B" - Install	18	1	7	517	46	115	127.20		146.00		2,743	152	LF
10620	6'x5' RBC- Line "D"	12	1				115	0.00		0.00		1,200	100	LF
10630	24" SS Line "E" & "G" - Install	4	1	7	548	46	115	147.00		151.00		350	88	LF
10640	36" SS Line "F" - Install	2	1	7	544	46		0.00		0.00		252	126	LF
10650	24" SS Line "G" - Install	2	1	7	548	46	115	0.00		0.00		318	159	LF
10622	6'x4' RBC- Line "D"	6	1				115	0.00		0.00		619	103	LF
10624	48" 36" SS Line "D" - Install	4	1	7	534	46	115	0.00		0.00		473	118	LF
10750	48" 42" 36" 24" SS Line "U" - Install	18	1	7	625	46	130	0.00		0.00		3,521	196	LF
10740	48" 42" 36" 24" 18" SS Line "T" - Install	17	1	7	614	46	129	240.00		252.00		2,937	173	LF
WB Ramp "C"														
Phase 1														
Step 1														
20002	Ramp C Abut 1 36" Drill Shaft	3	1	3	958		115	18.46		0.00		93	31	LF
20000	Ramp C Bent 2-6 Excavate Footings	3	1	3	960		115	19.61		24.21		232	77	CY
20004	Ramp C Bent 2-6 60" Drill Shaft	4	1	3	960		115	19.61		24.21		150	38	LF
20010	Ramp C Bent 2-6 F&P Footings	5	1	0	960		115	19.61		24.21		114	23	CY
20014	Ramp C Bent 2-6 F&P Caps	30	1	9	962		115	19.61		24.21		174	6	CY
20012	Ramp C Bent 1 F&P Abutment	5	1	6	961		115	18.46		0.00		12	2	CY
20020	Ramp C Set Beams Spans 1-6	3	1	9	965		115	0.00		0.00		2,699	900	LF
20022	Ramp C Slab Unit 1	6	1	18	967		115	0.00		0.00		9,678	1,813	SF
20024	Ramp C Slab Unit 2	6	1	18	968		115	0.00		0.00		9,782	1,630	SF
20510	MSE#11 Leveling Pad	2	1		473		115	141.90		144.75		0	0	LF

Figure 28.17.1 Use of User Defined Activity Codes

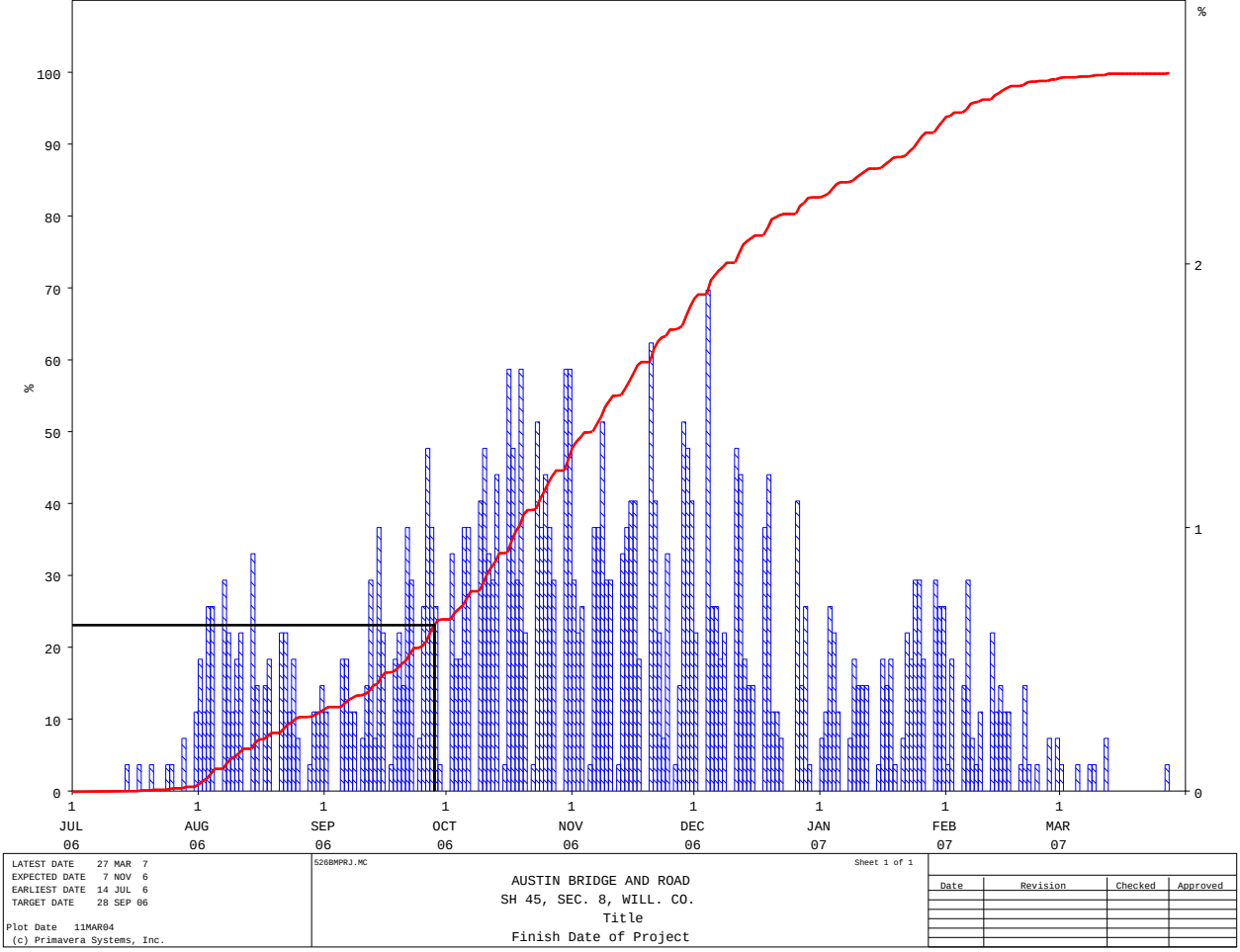
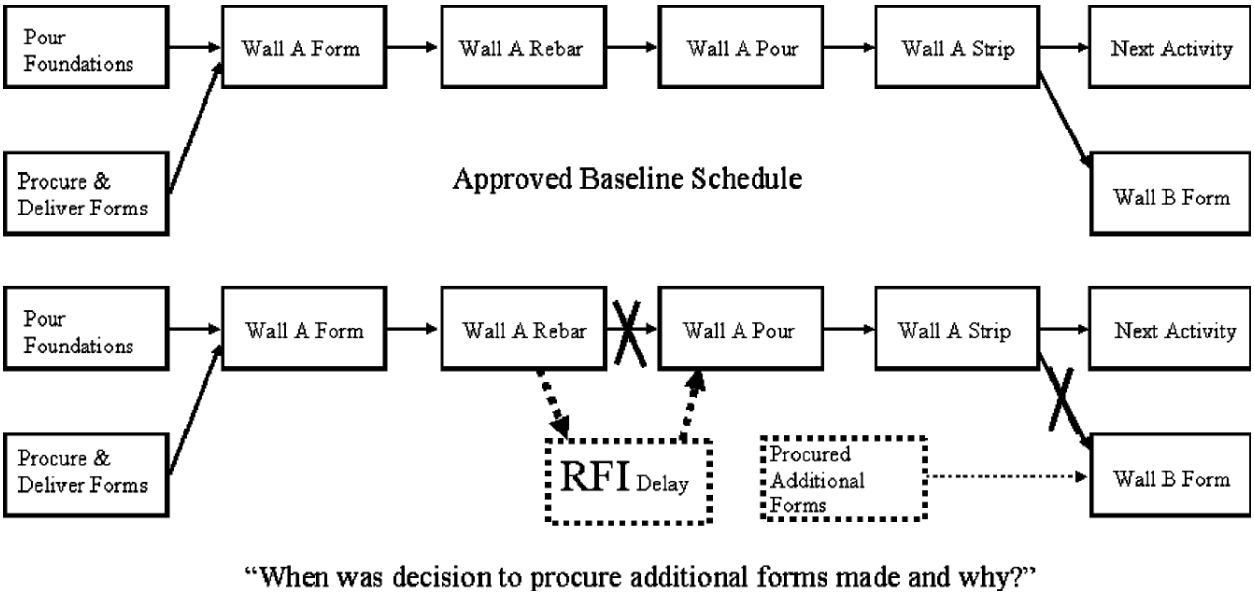


Figure 28.17.2 Monte Carlo risk analysis indicates 22% likelihood of meeting 28SEP06 deadline.



"When was decision to procure additional forms made and why?"

Figure 33.9.1 As-built logic network.

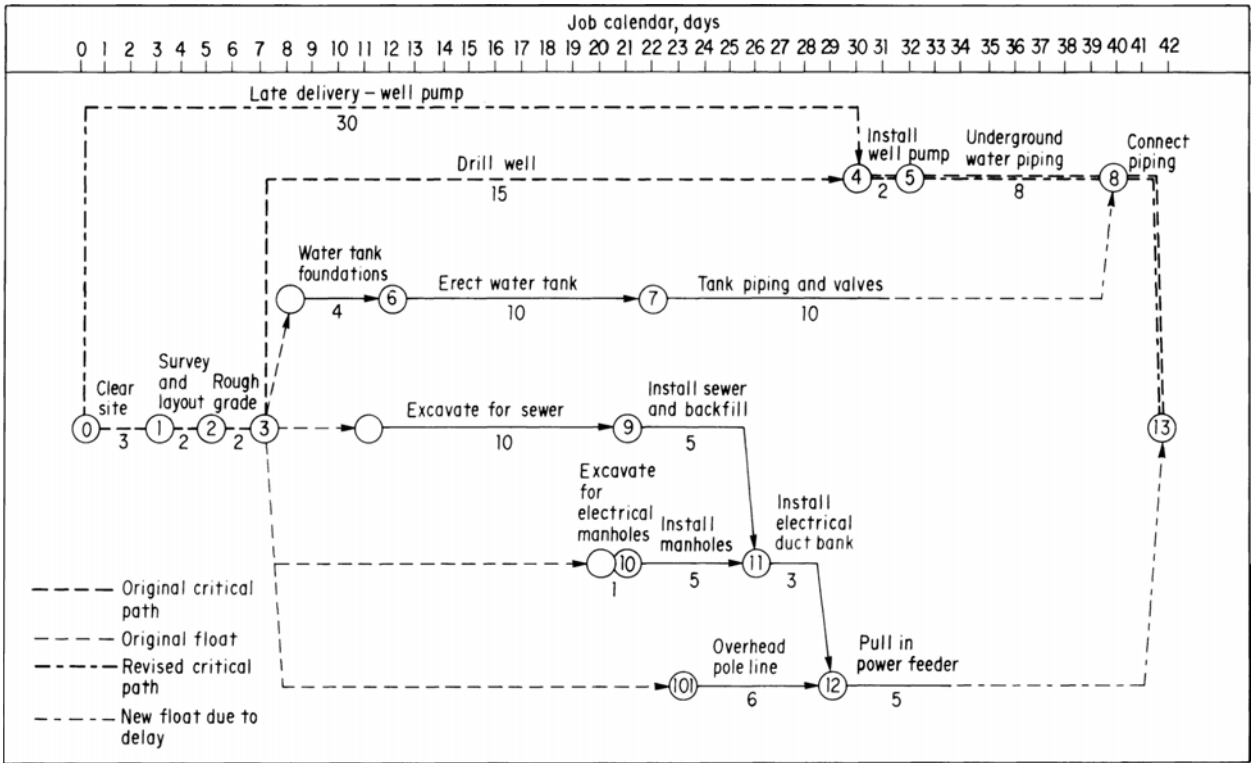
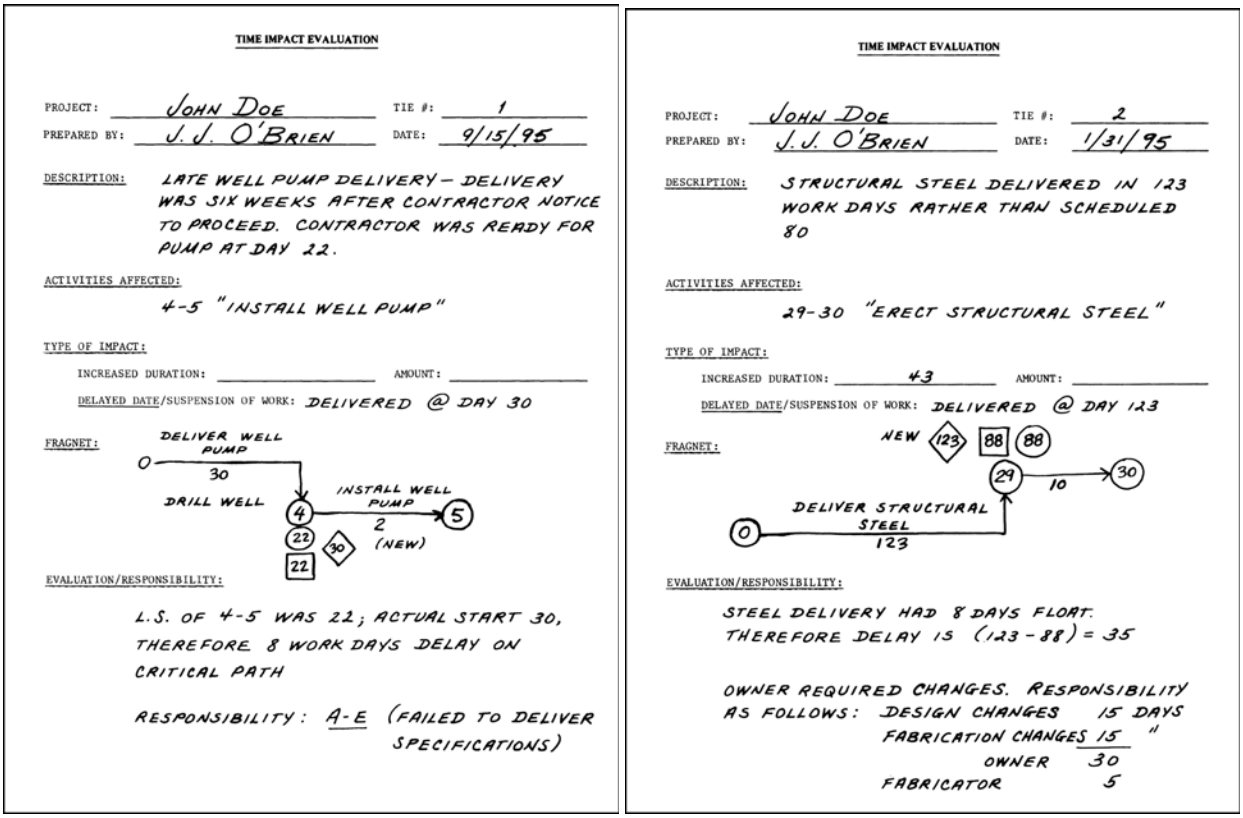


Figure 33.17.1 Time-scaled network showing late delivery of well pump delay.



TIME IMPACT EVALUATION

PROJECT: JOHN DOE TIE #: 1
PREPARED BY: J. J. O'BRIEN DATE: 9/15/95

DESCRIPTION: LATE WELL PUMP DELIVERY – DELIVERY WAS SIX WEEKS AFTER CONTRACTOR NOTICE TO PROCEED. CONTRACTOR WAS READY FOR PUMP AT DAY 22.

ACTIVITIES AFFECTED:
4-5 "INSTALL WELL PUMP"

TYPE OF IMPACT:
INCREASED DURATION: _____ AMOUNT: _____
DELAYED DATE/SUSPENSION OF WORK: DELIVERED @ DAY 30

FRAGNET:
DELIVER WELL PUMP
0
30
DRILL WELL
4
INSTALL WELL PUMP
2
5
(NEW)
22
30
22

EVALUATION/RESPONSIBILITY:
L.S. OF 4-5 WAS 22; ACTUAL START 30, THEREFORE 8 WORK DAYS DELAY ON CRITICAL PATH

RESPONSIBILITY: A-E (FAILED TO DELIVER SPECIFICATIONS)

TIME IMPACT EVALUATION

PROJECT: JOHN DOE TIE #: 2
PREPARED BY: J. J. O'BRIEN DATE: 1/31/95

DESCRIPTION: STRUCTURAL STEEL DELIVERED IN 123 WORK DAYS RATHER THAN SCHEDULED 80

ACTIVITIES AFFECTED:
29-30 "ERECT STRUCTURAL STEEL"

TYPE OF IMPACT:
INCREASED DURATION: 43 AMOUNT: _____
DELAYED DATE/SUSPENSION OF WORK: DELIVERED @ DAY 123

FRAGNET:
NEW
123
88
88
29
10
30
DELIVER STRUCTURAL STEEL
0
123

EVALUATION/RESPONSIBILITY:
STEEL DELIVERY HAD 8 DAYS FLOAT. THEREFORE DELAY IS (123 - 88) = 35

OWNER REQUIRED CHANGES. RESPONSIBILITY AS FOLLOWS: DESIGN CHANGES 15 DAYS
FABRICATION CHANGES 15 "
OWNER 30
FABRICATOR 5

Figure 33.17.2 and 33.17.3 Time impact evaluations (TIE) describing delay of well pump and structural steel.

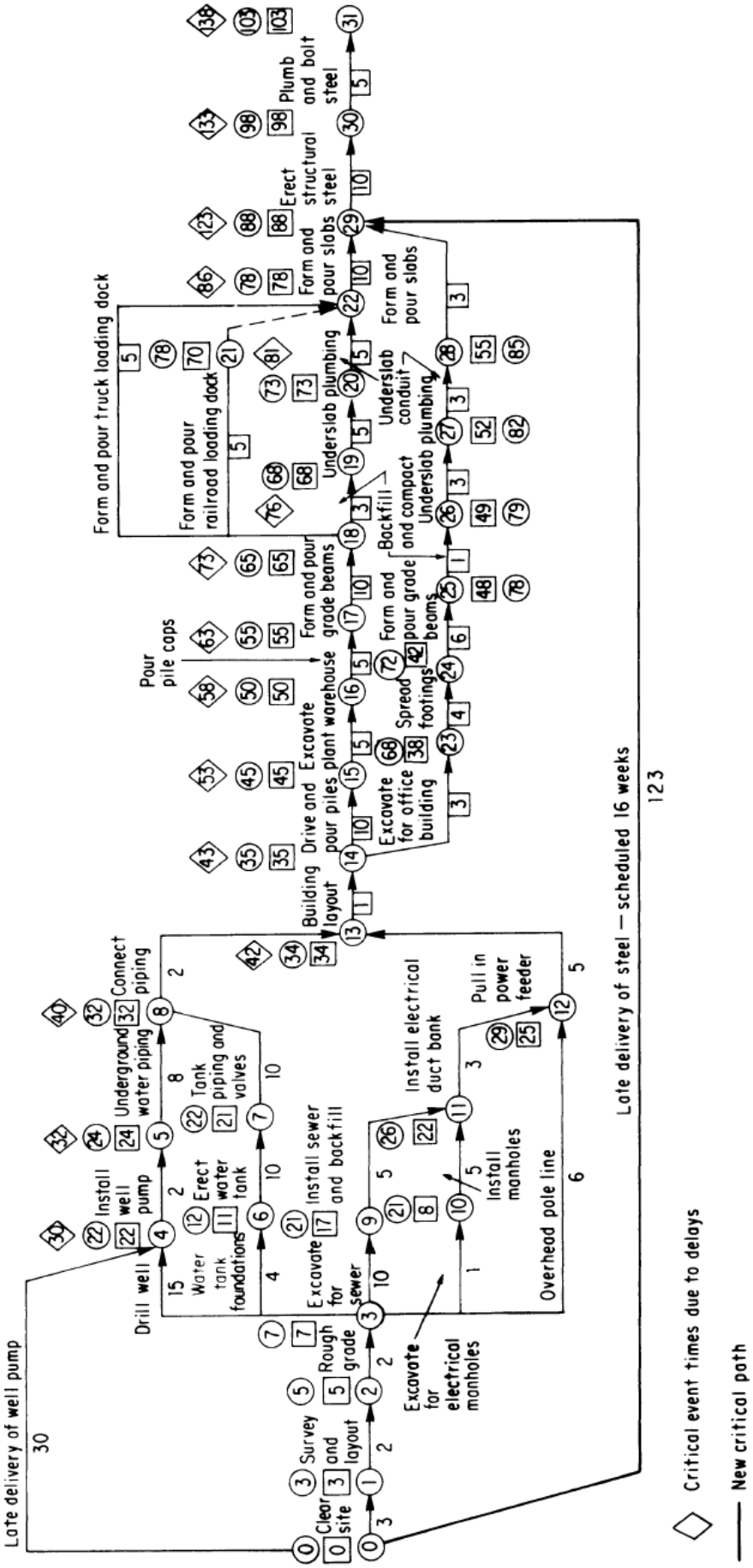


Figure 33.17.4 Time-scaled network showing steel delay.

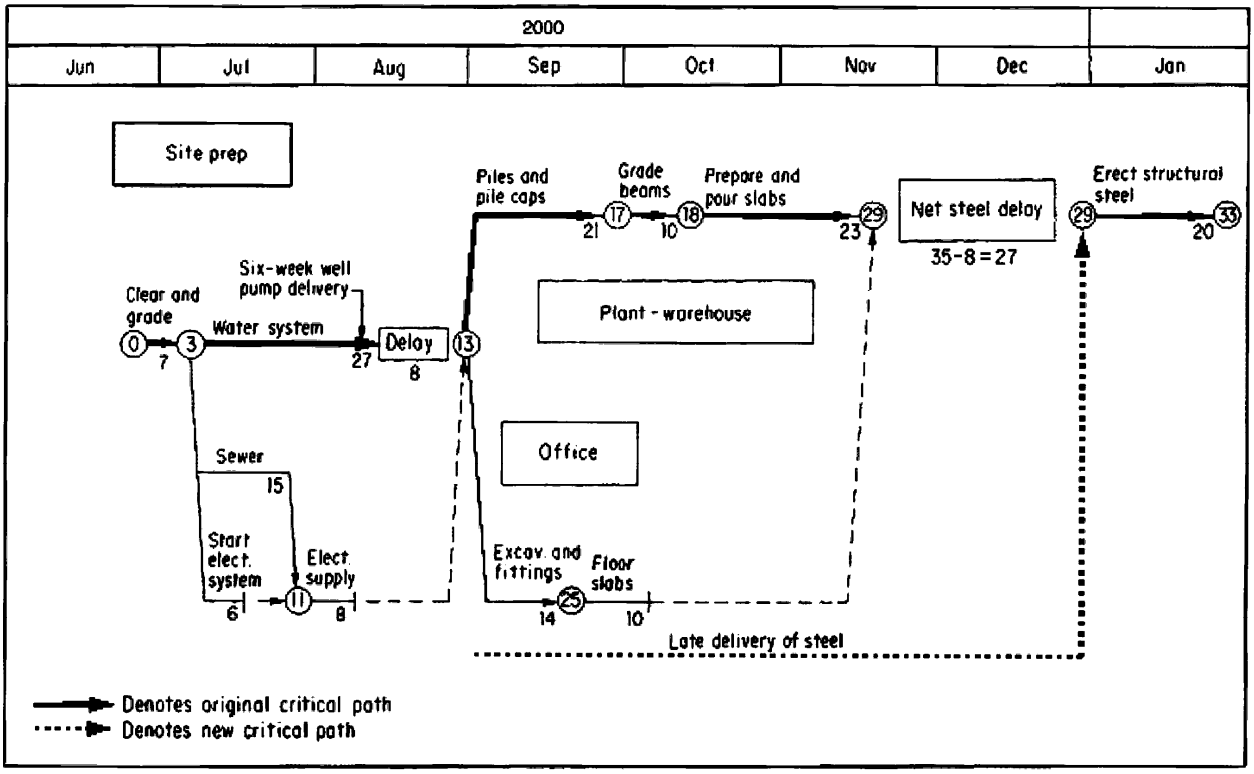


Figure 33.20.1 Overview of relative float created in sitework because of late deliveries.

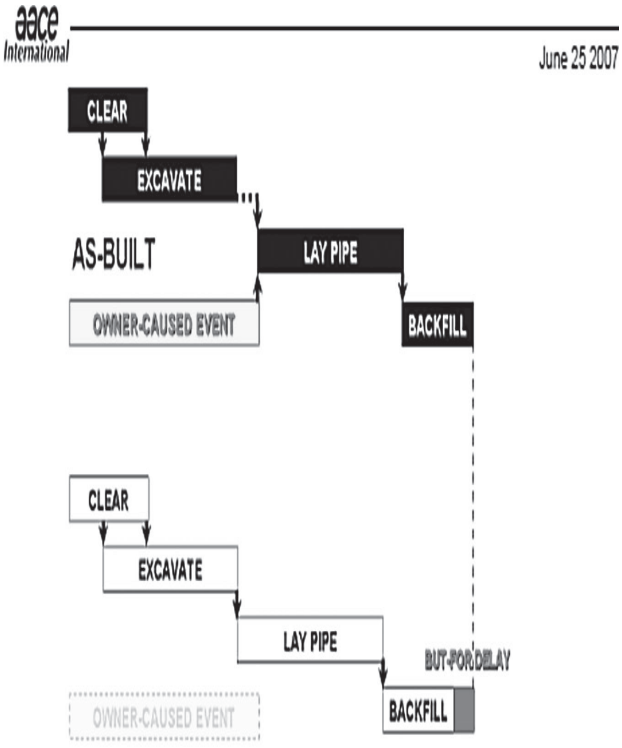


Figure 35.2.6 29RP-03 collapsed as-built

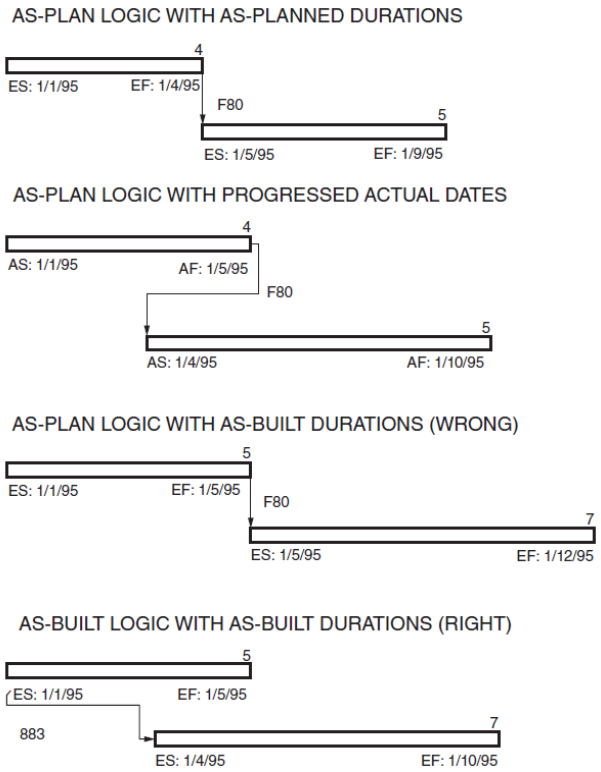


Figure 35.2.7 29RP-03 Conversion of as-planned to as-built

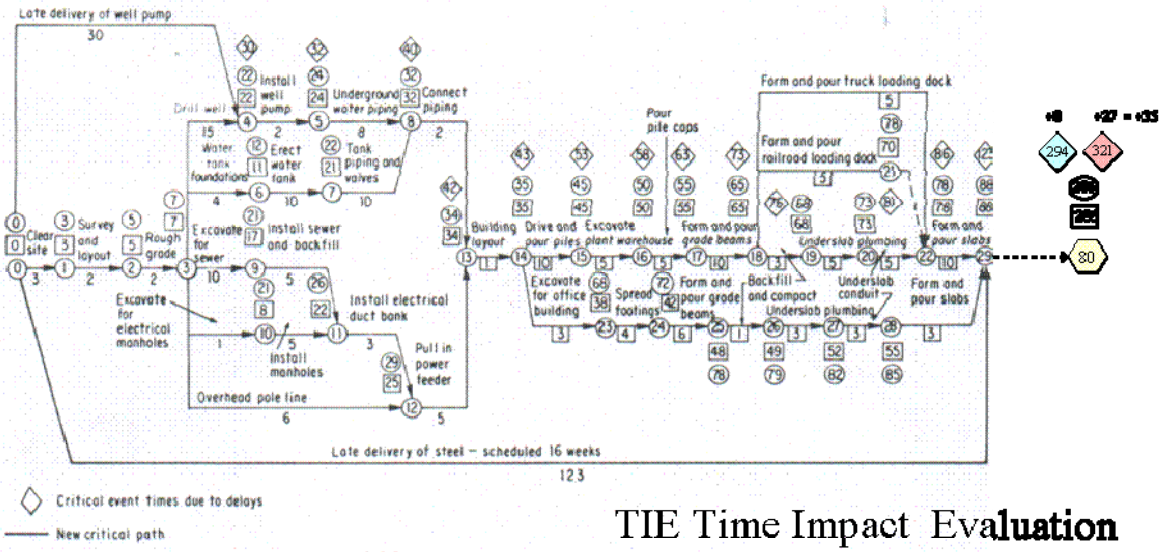


Figure 35.3.1 Time-scaled network drawing showing steel delay, TIE analysis.

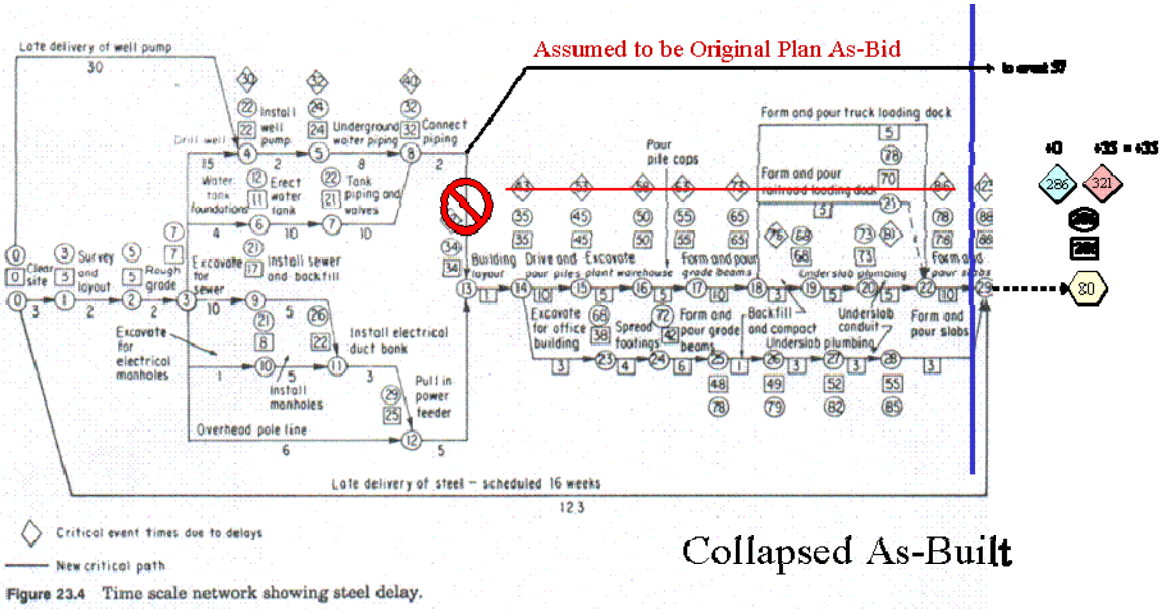


Figure 23.4 Time scale network showing steel delay.

Figure 35.3.2 Collapsed as-built (but-for) analysis.

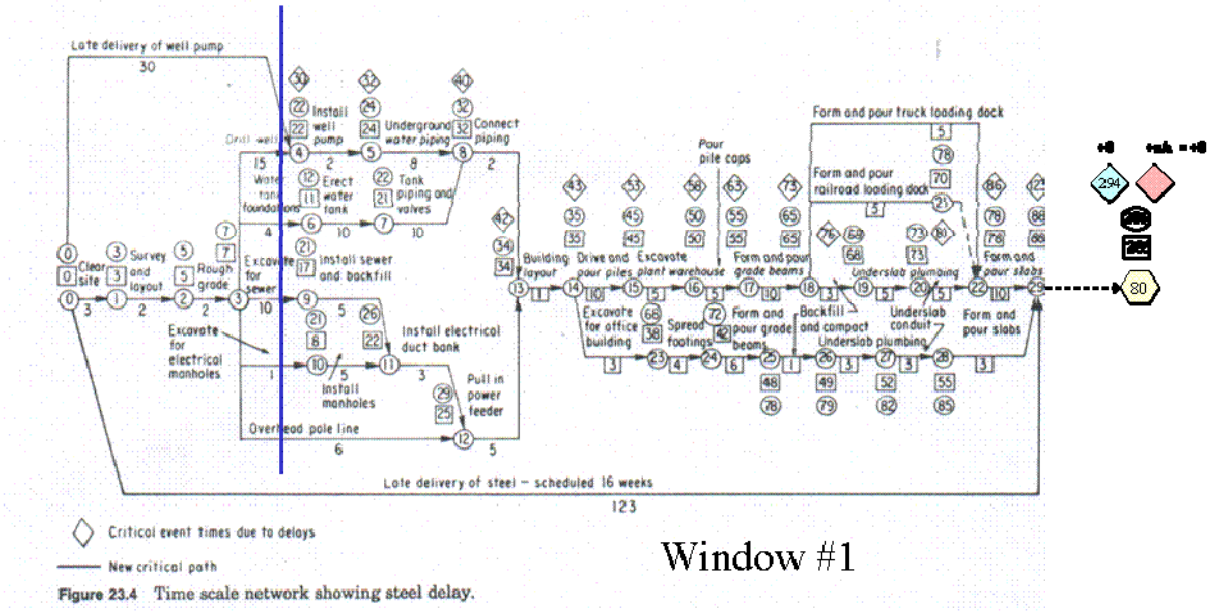


Figure 23.4 Time scale network showing steel delay.

Figure 35.3.3 Window analysis, Window 1.

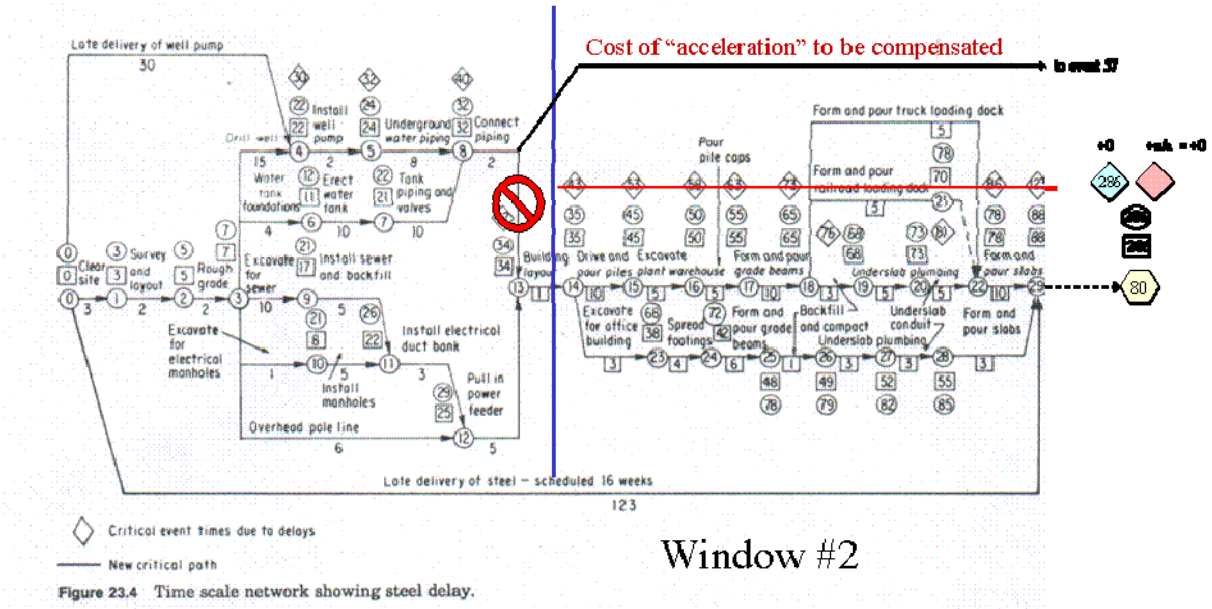


Figure 23.4 Time scale network showing steel delay.

Figure 35.3.4 Windows Analysis Window #2

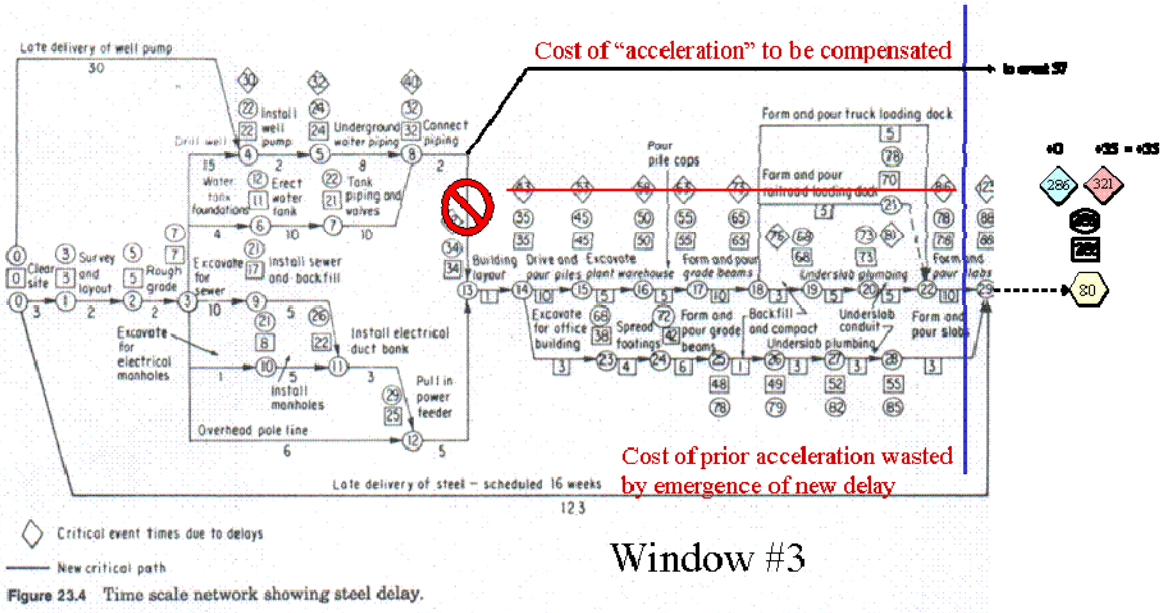


Figure 23.4 Time scale network showing steel delay.

Figure 35.3.5 Windows Analysis Window #3

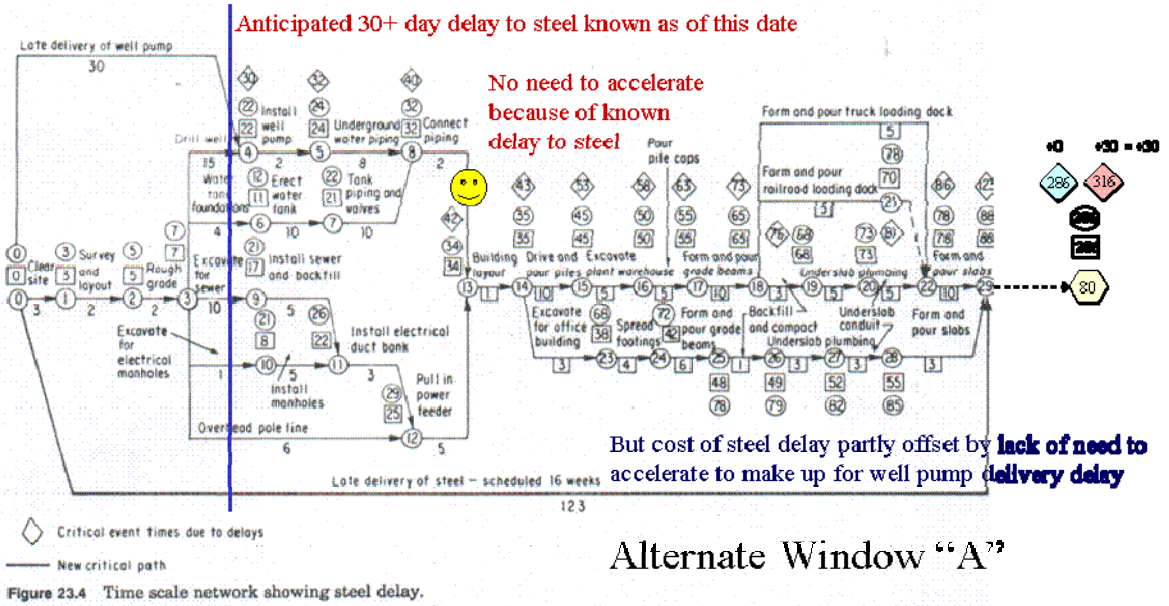


Figure 23.4 Time scale network showing steel delay.

Figure 35.3.6 Windows Analysis Window #1 Alternate "A"

end of 8th edition

CHAPTER 14.1 of the CD-ROM (Primavera Project Planner P3 Demo folder; Primavera P3 HowTo.pdf file)
Note references to Chapter 24 are from previous placement in 6th edition

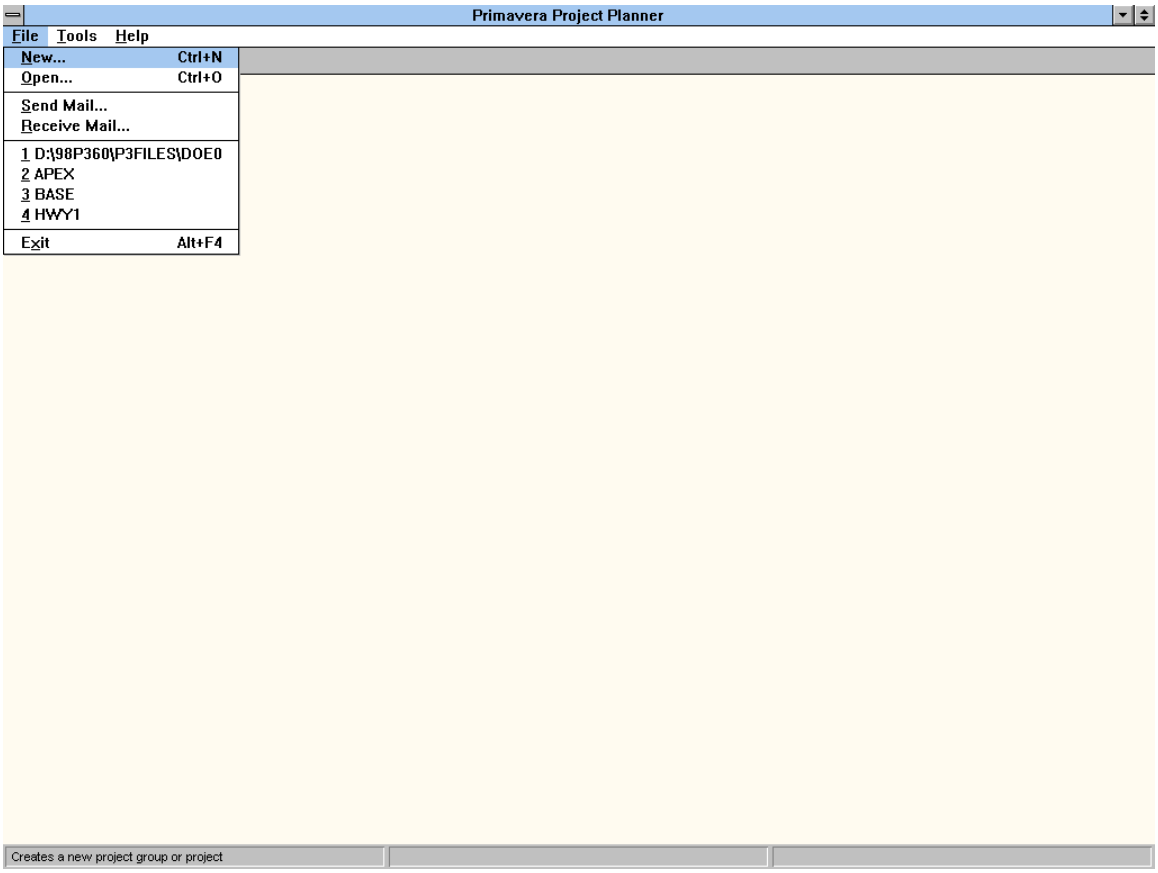


Figure 24.1.1 Primavera Opening Screen

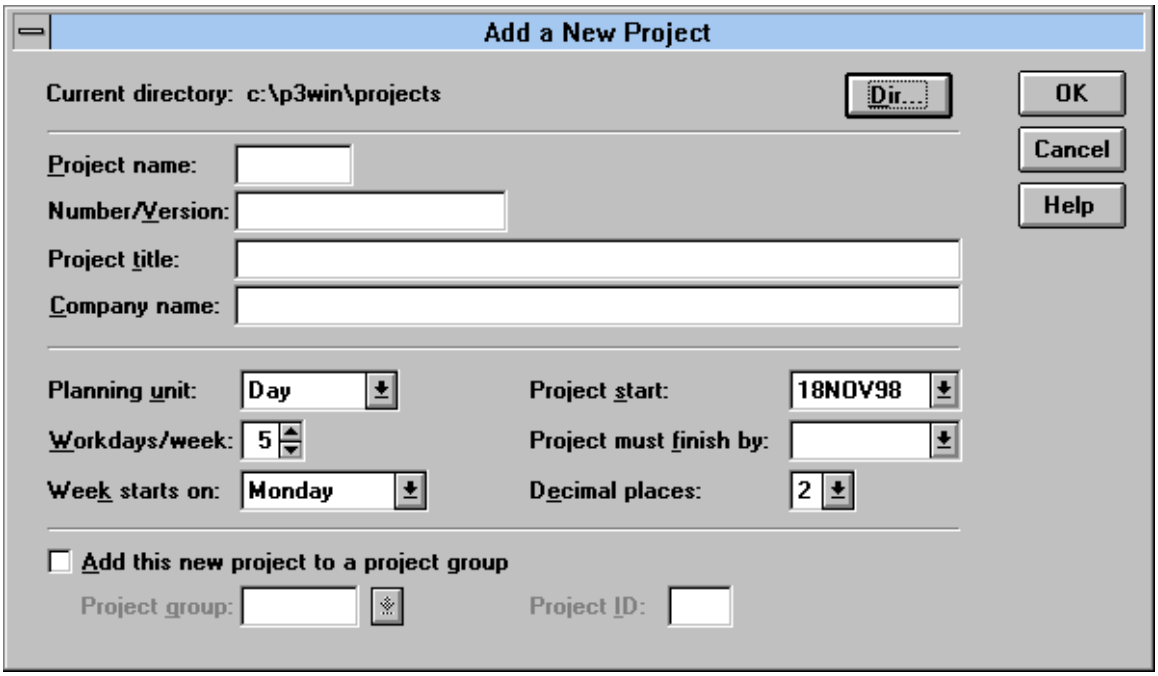


Figure 24.1.2 Primavera Add A New Project Screen

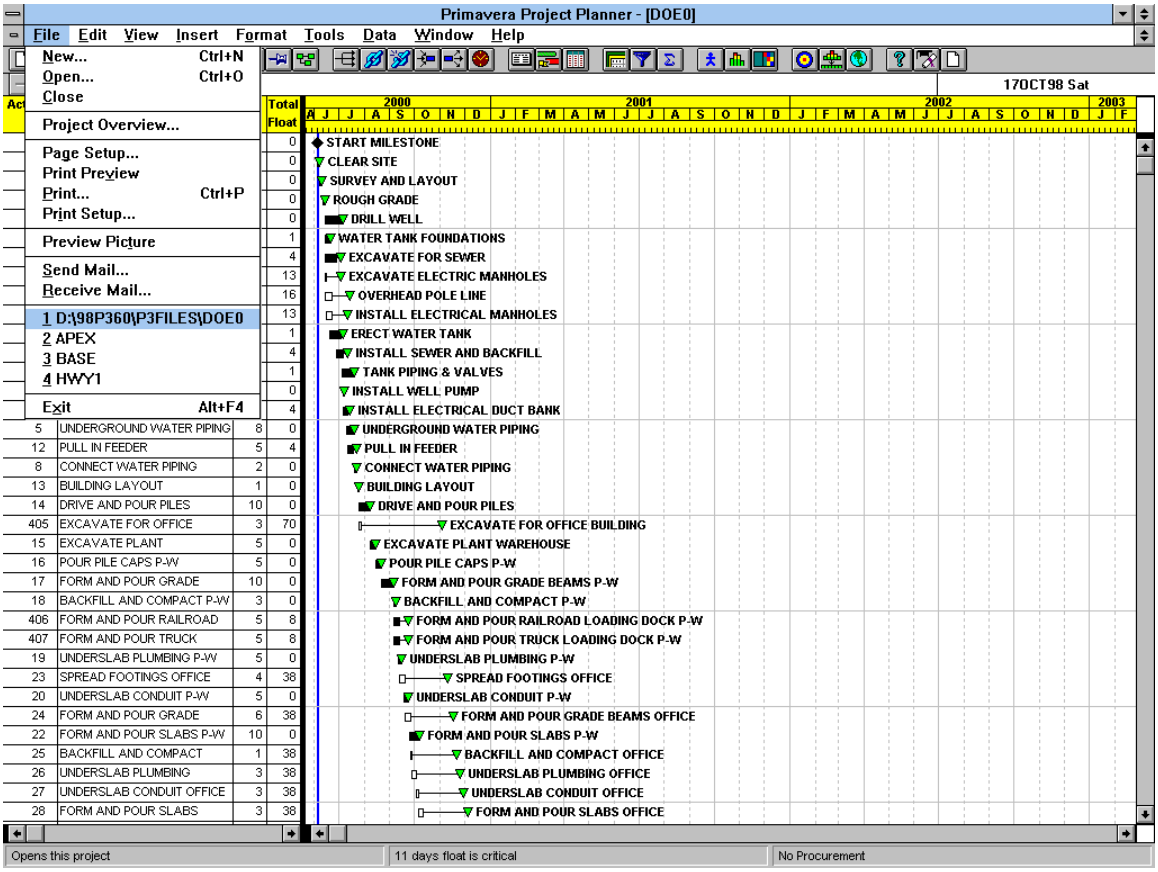


Figure 24.1.3 Primavera Quick Open An Existing Project Screen

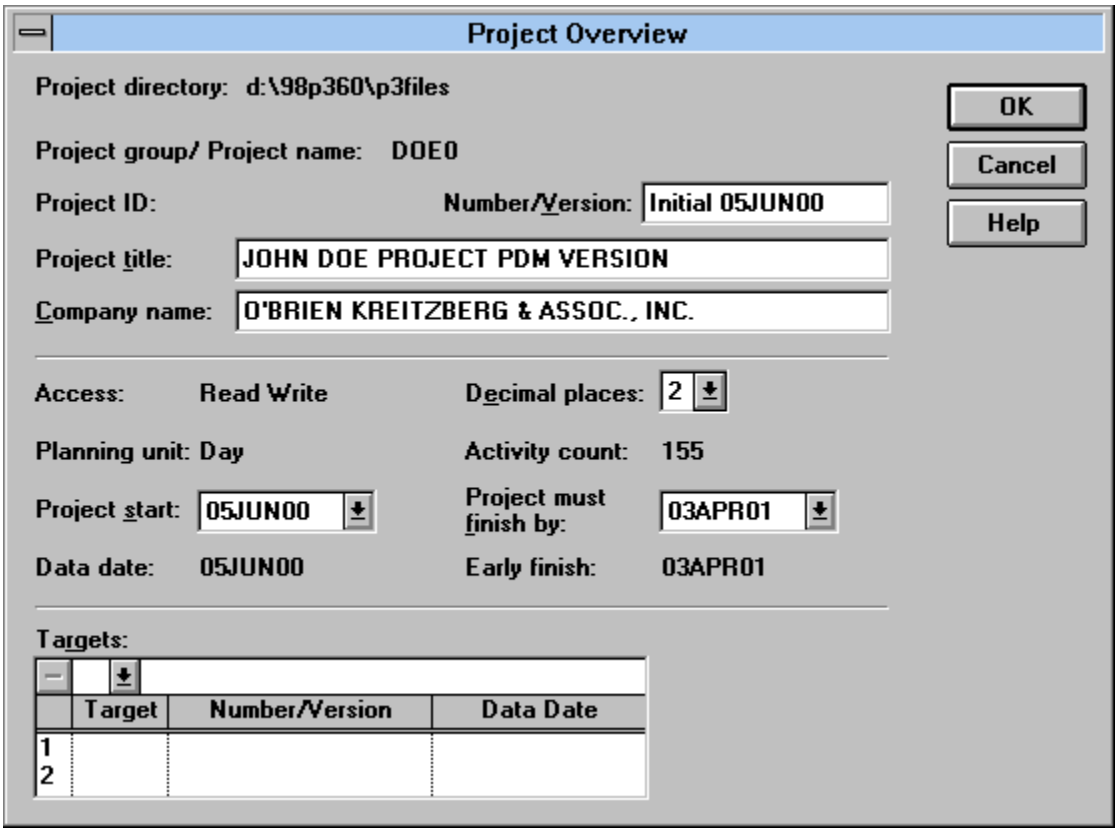


Figure 24.1.4 Setting a Project Finish Date will cause a project completing earlier to show a positive, non-zero total float for the critical path.

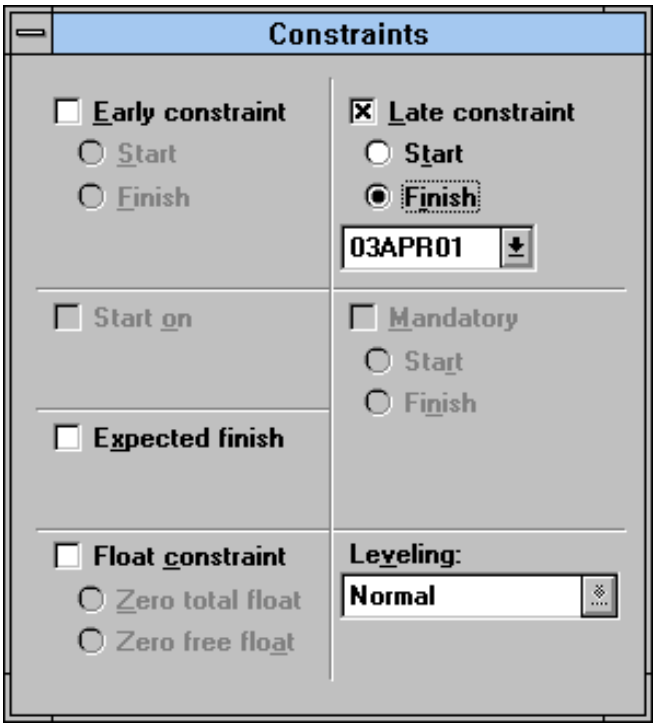


Figure 24.1.5 Setting a FNLT constraint upon the last activity will cause a project completing earlier to show a zero total float critical path.

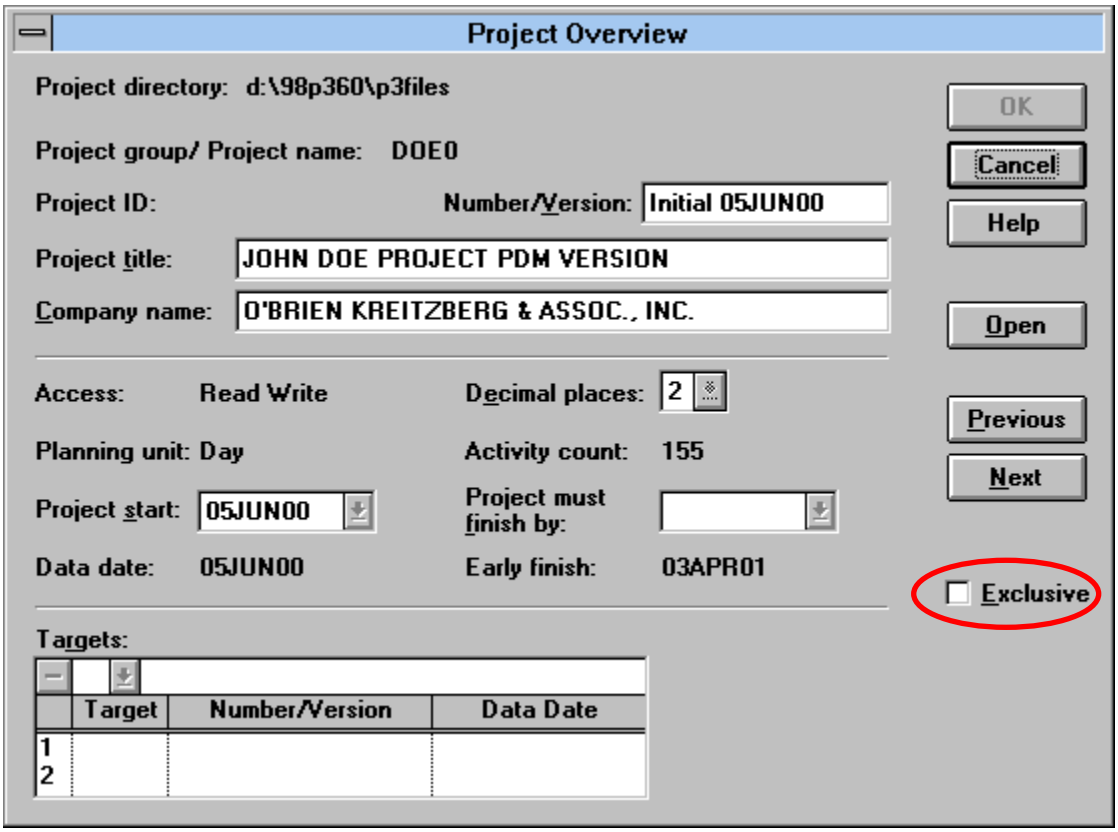


Figure 24.1.6 Checking the exclusive box permits changing Activity ID's.

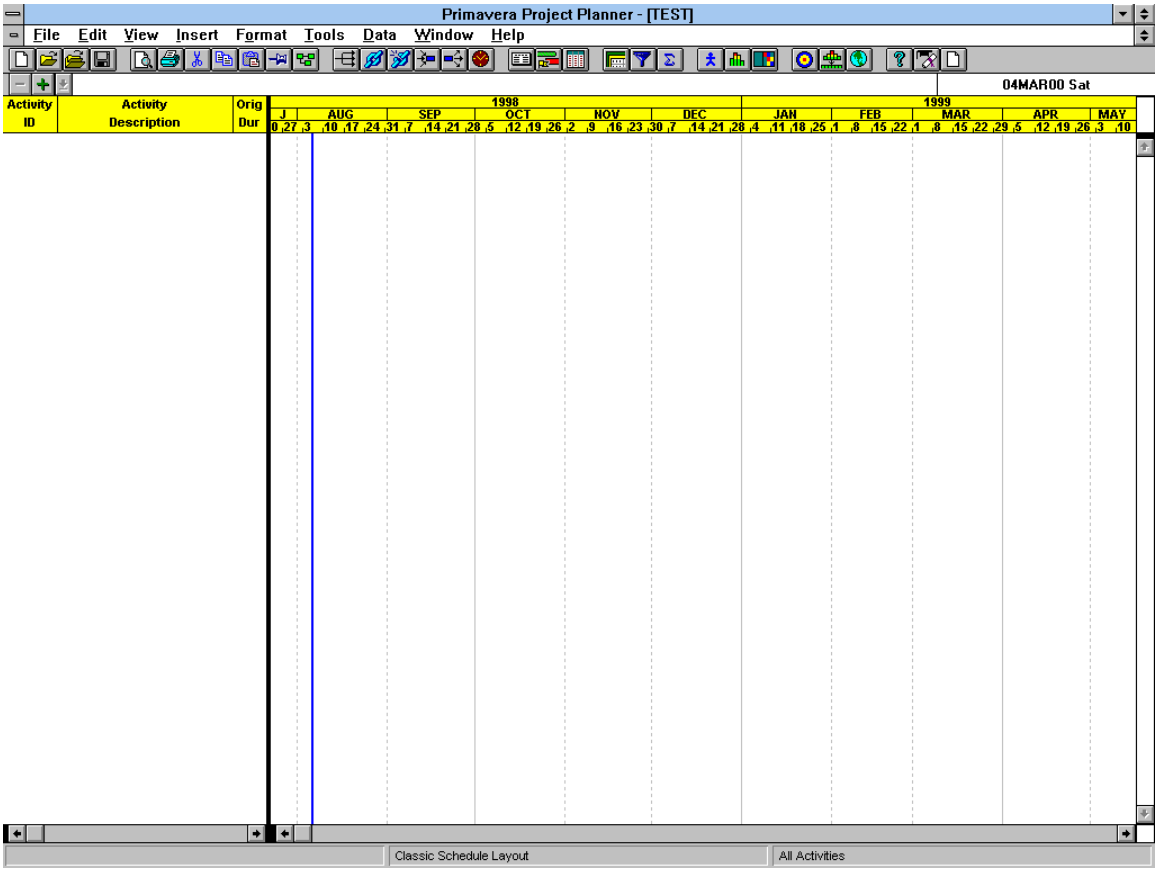


Figure 24.1.7 Opening Screen for a New Project

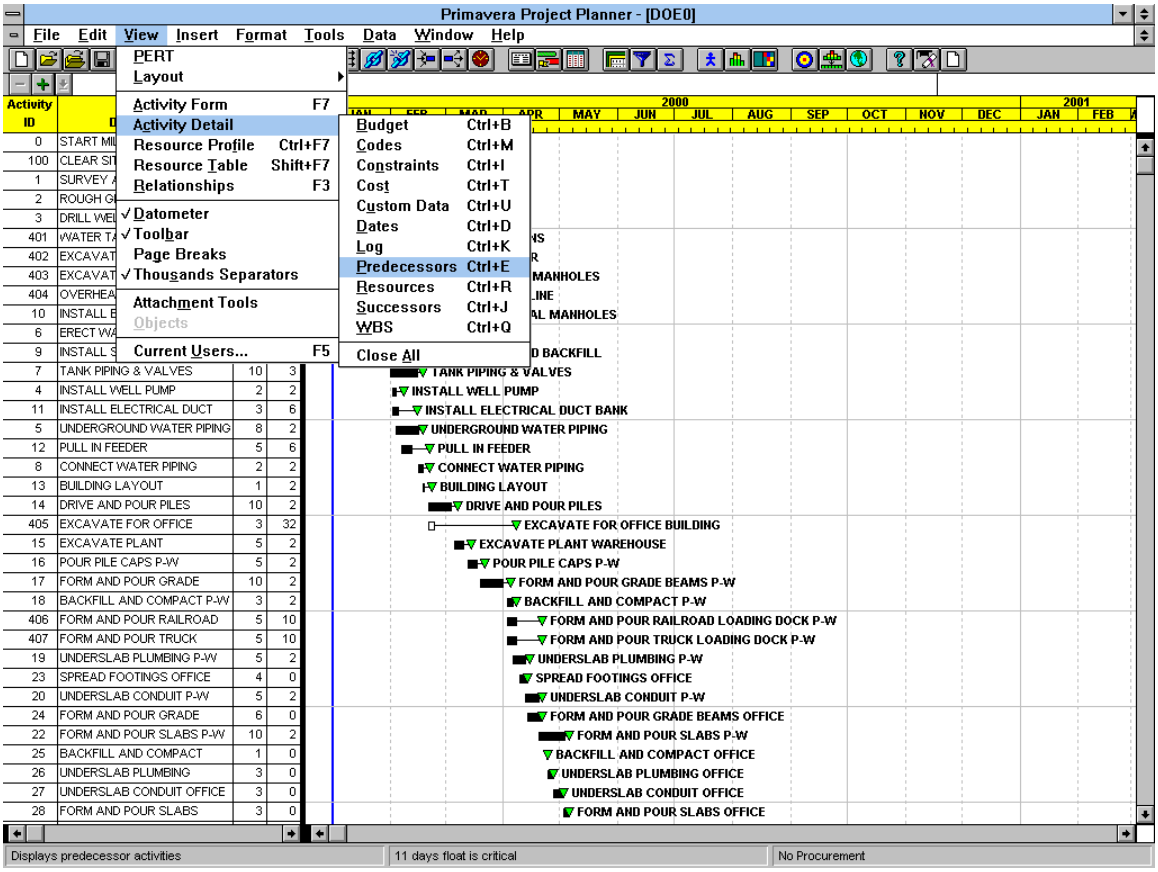


Figure 24.1.8 Point & Click vs. <ALT> keys vs. <CTRL> hot keys.

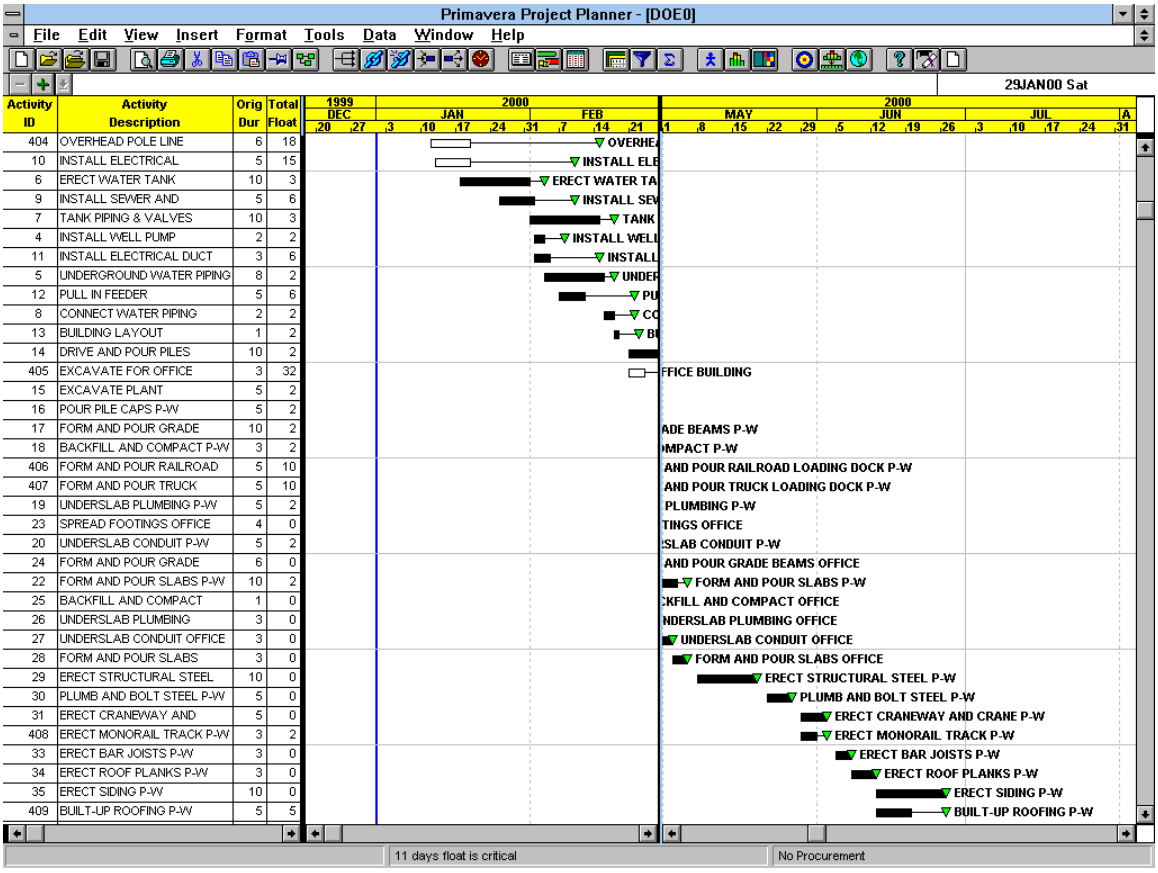


Figure 24.1.9 Barchart portion of screen split vertically.

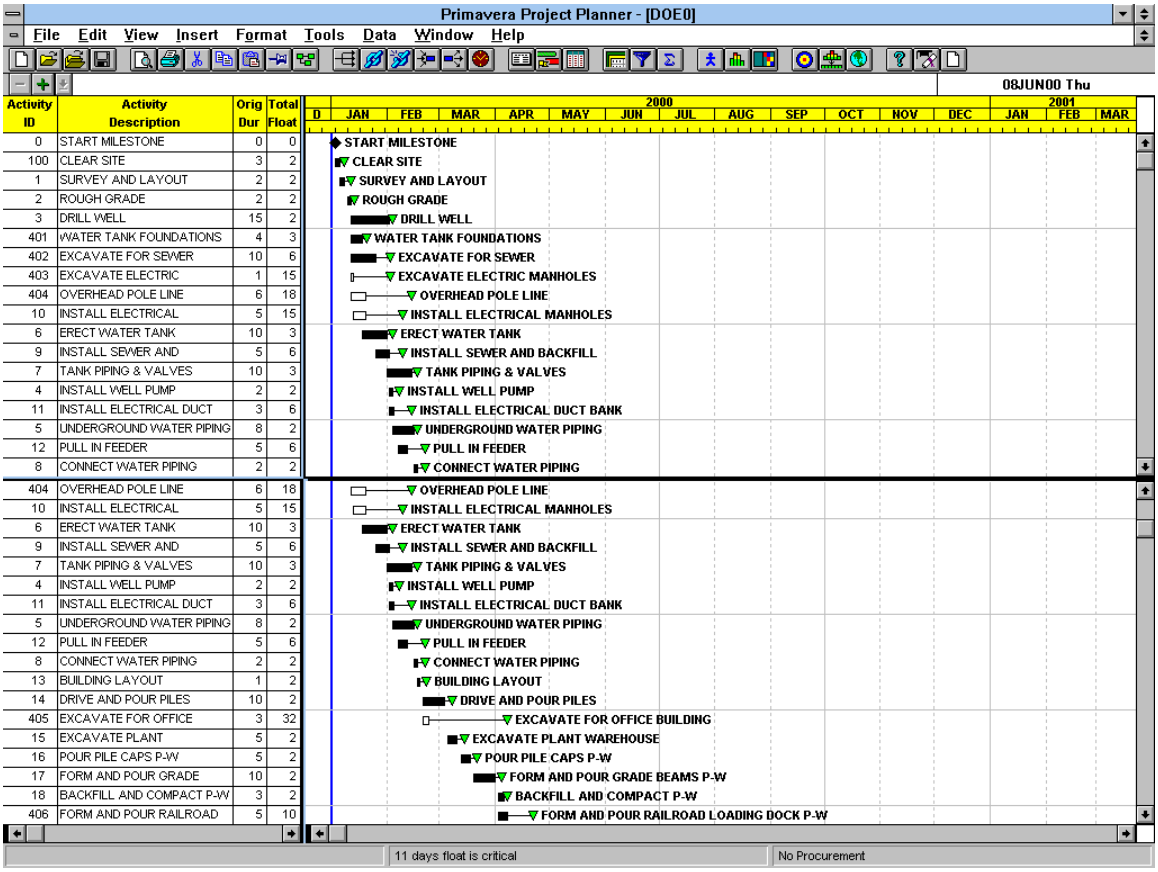


Figure 24.1.10 Barchart portion of screen split horizontally.

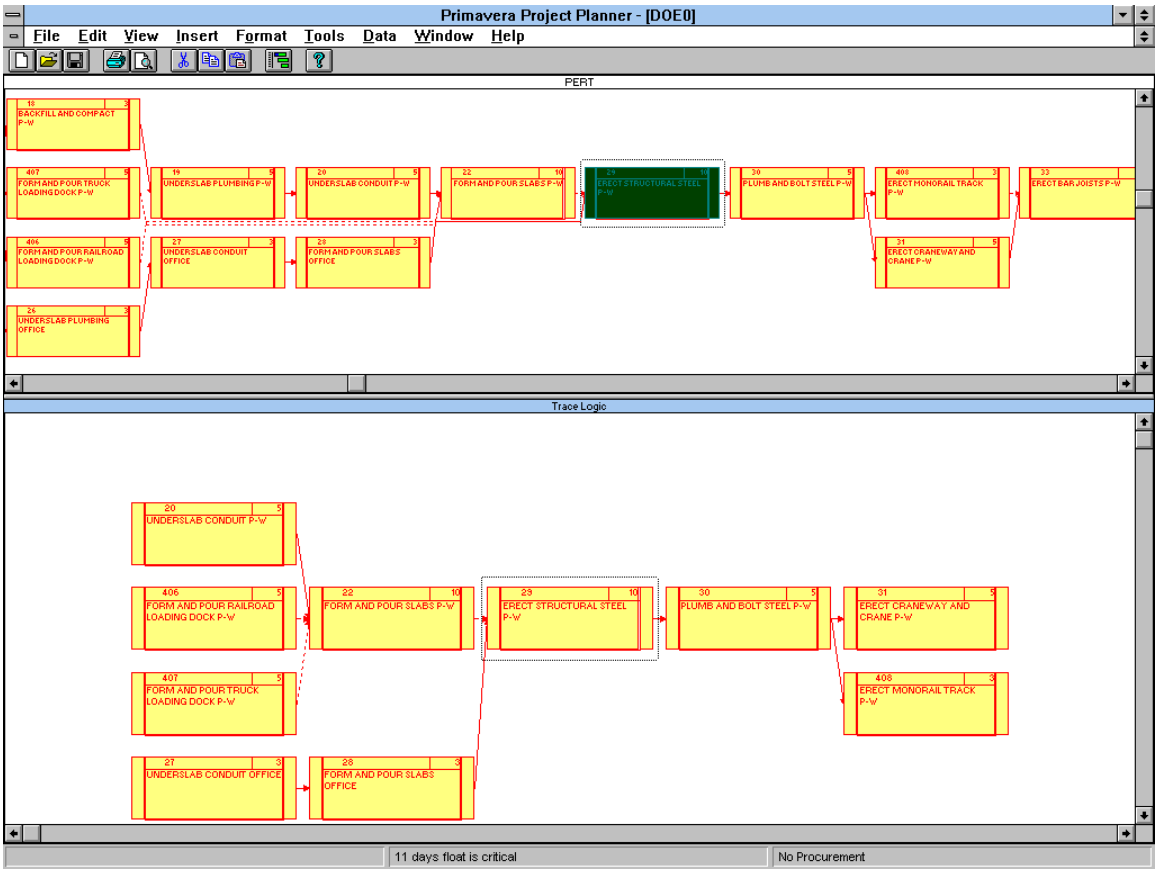


Figure 24.1.11 Pure Logic or “PERT” view of network with Primavera’s Trace Logic highlighted with two generations shown.

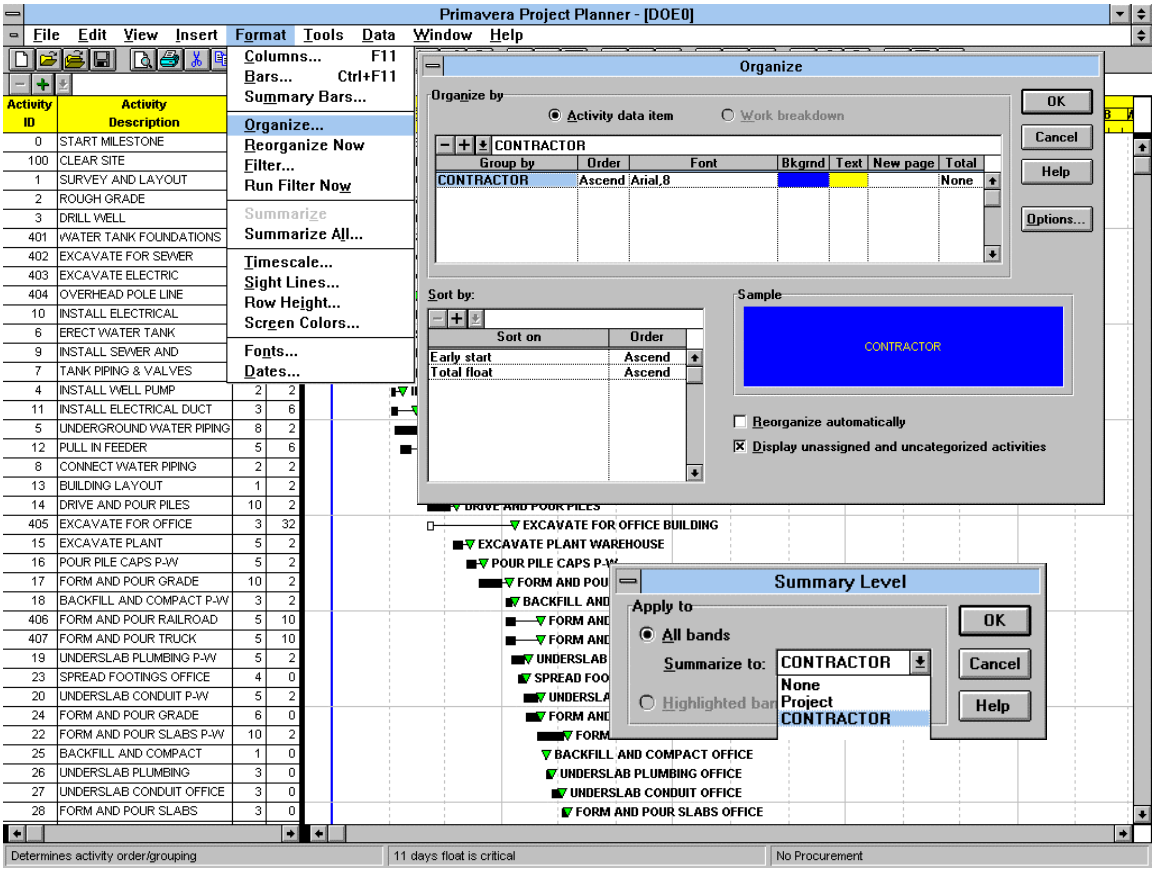


Figure 24.6.1 Sample Mixed Summary & Detail Screen from point & click exercise, setup.

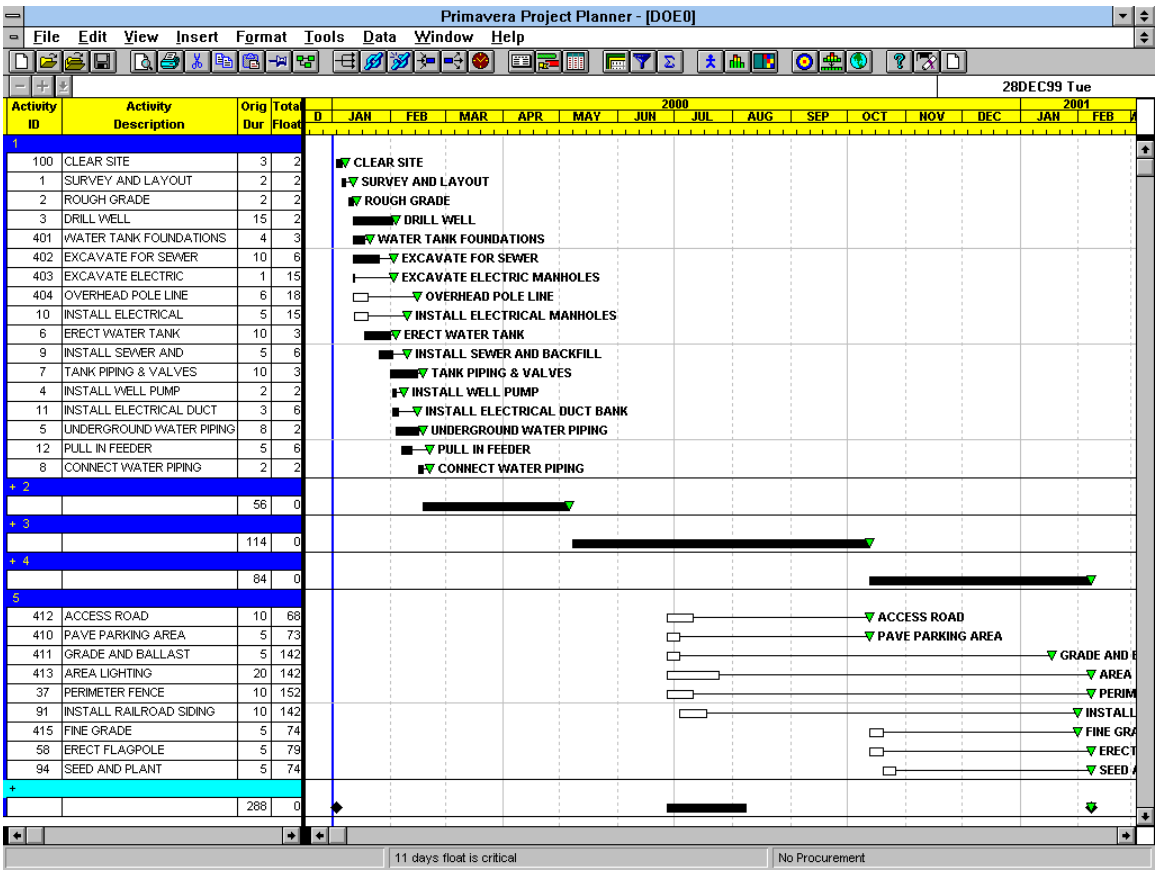


Figure 24.6.2 Sample Mixed Summary & Detail Screen from point & click exercise, results.

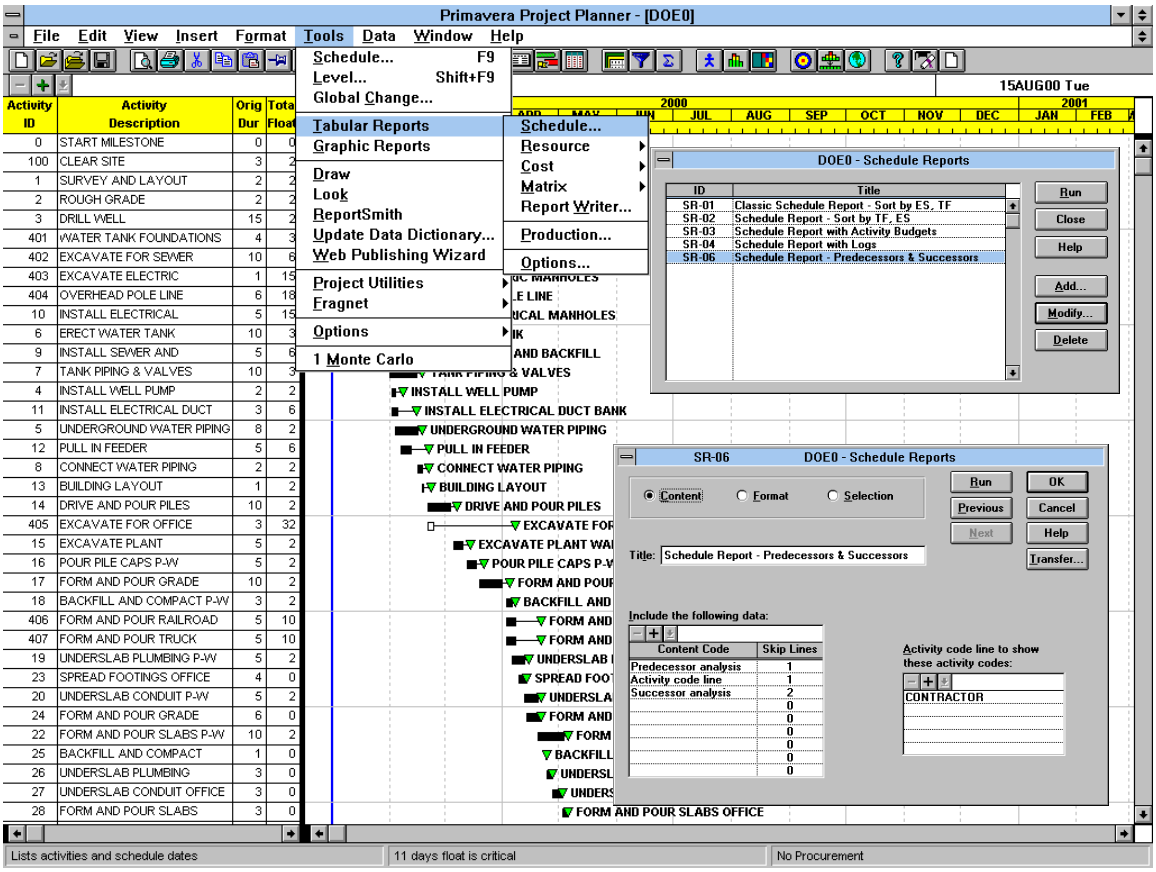


Figure 24.7.1 Standard Report SR-06 setup screens

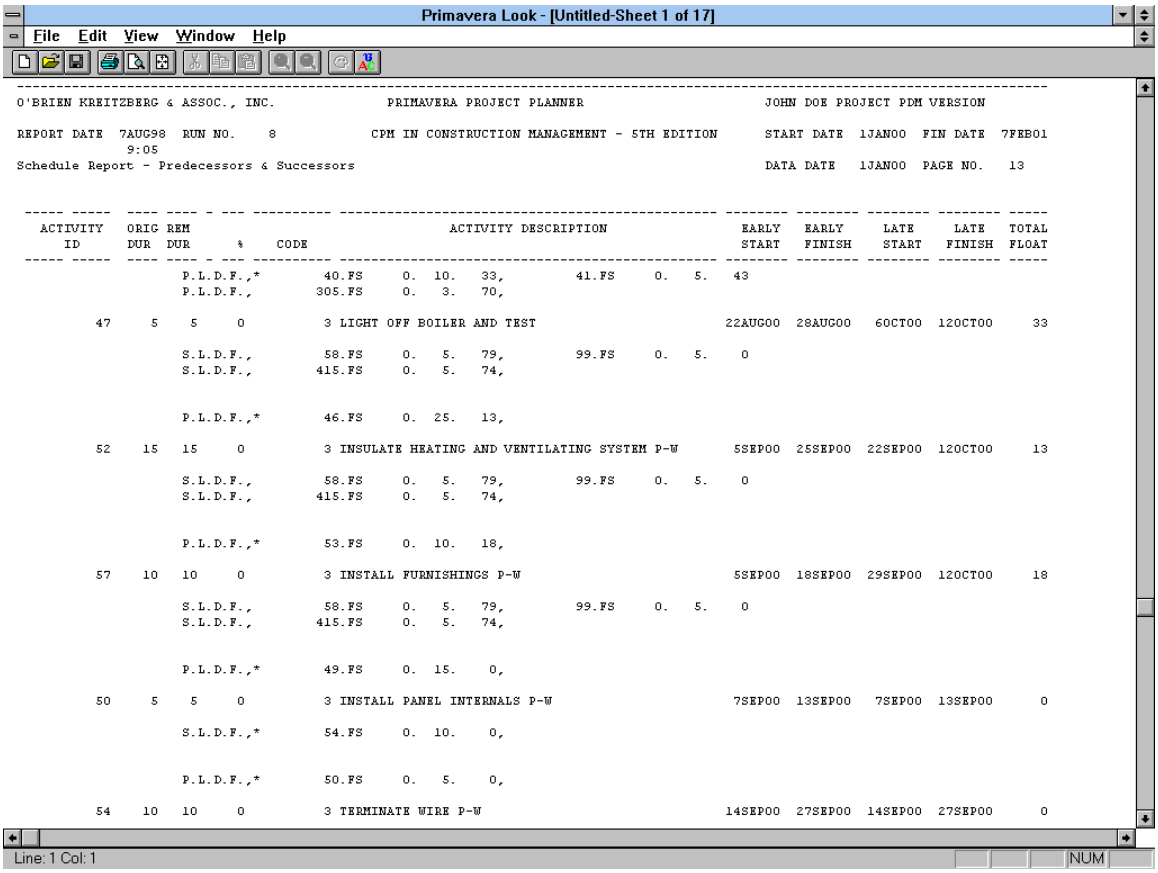


Figure 24.7.2 Sample page from Standard Report SR-06

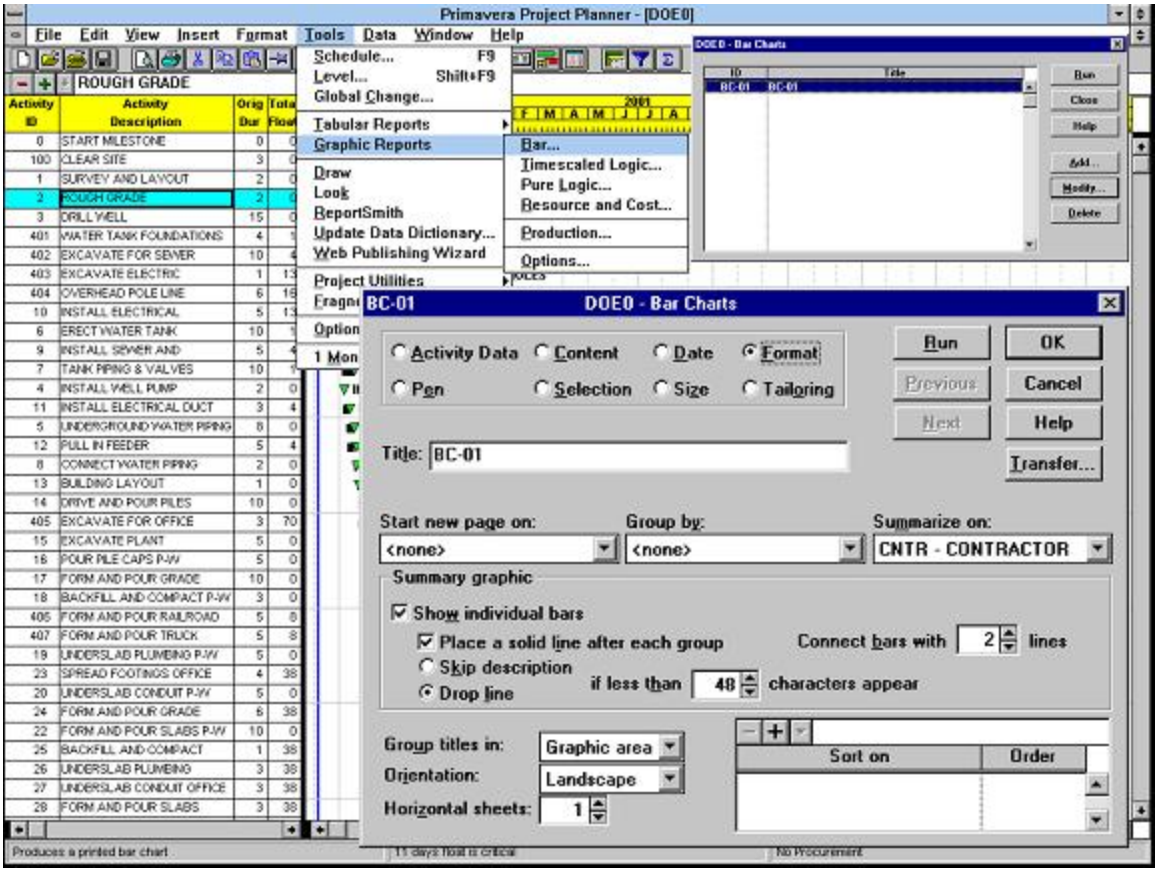


Figure 24.8.1 Summary Barchart with Detail Provided, setup and dialog boxes.

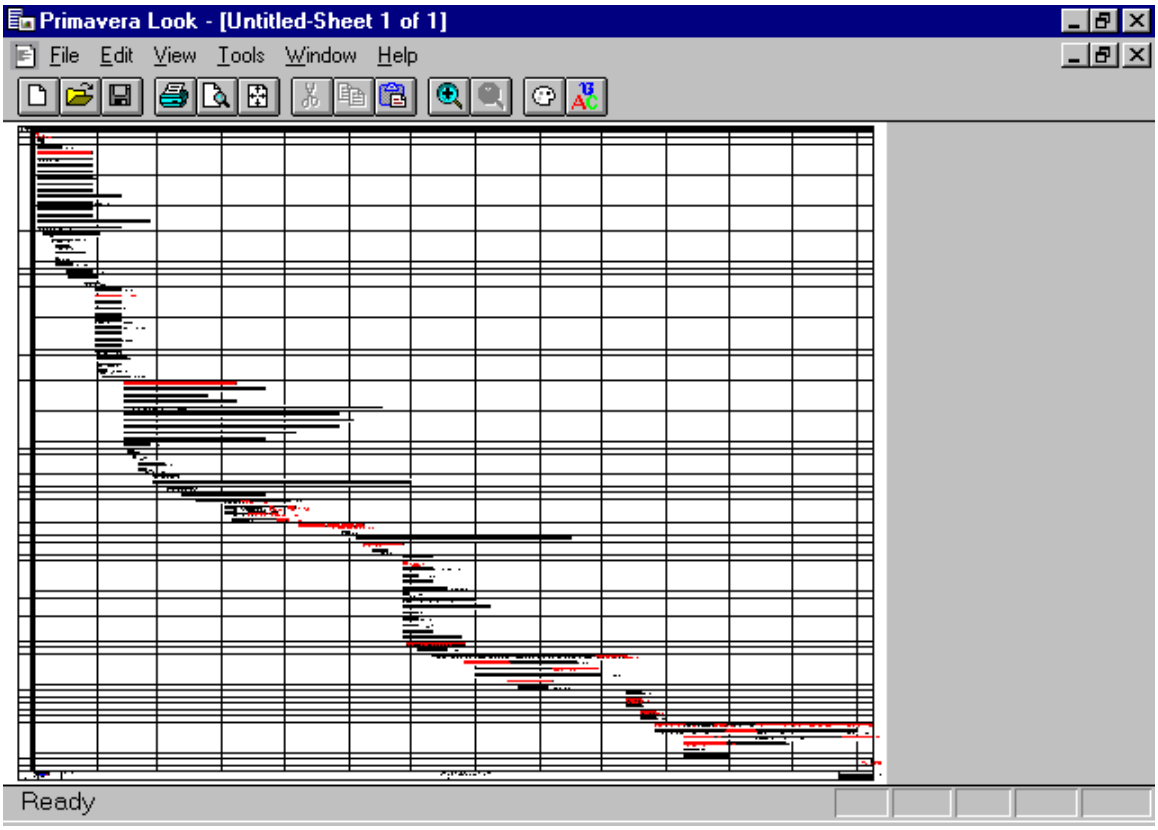


Figure 24.8.2 Summary Barchart with Detail Provided

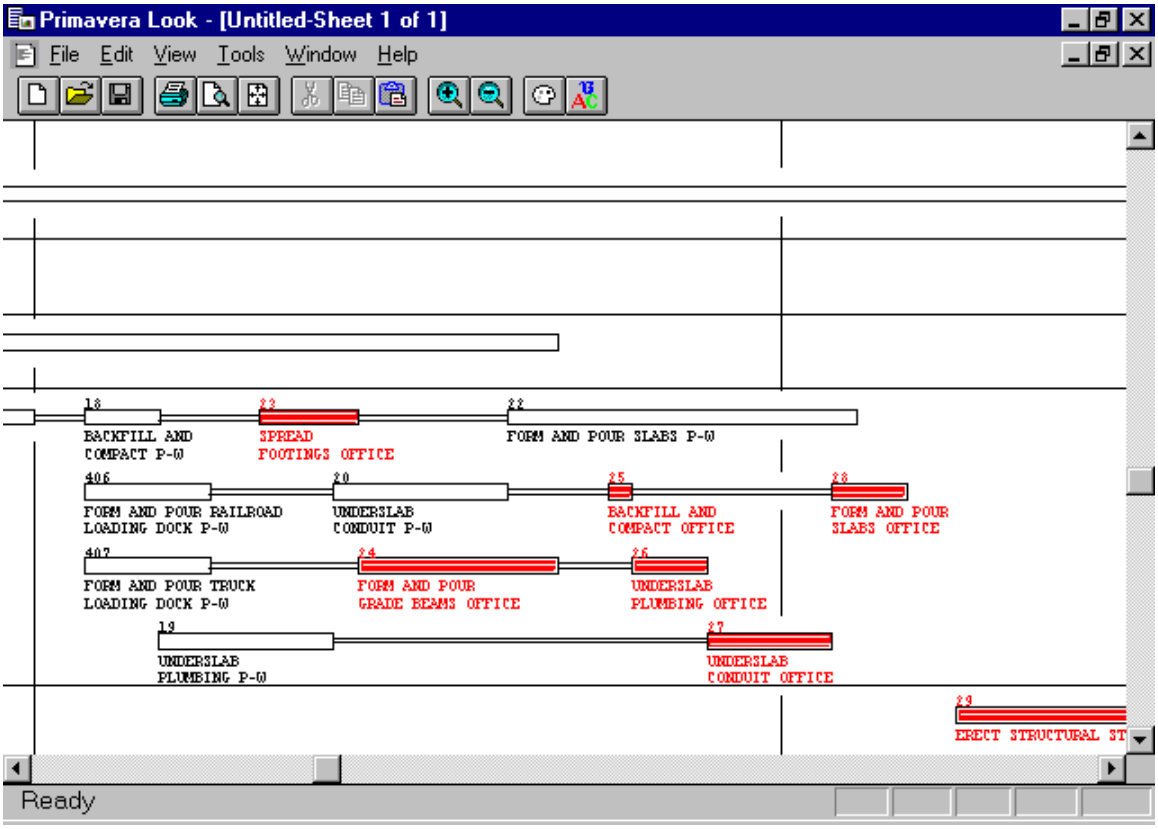


Figure 24.8.3 Blowup of Section of Summary Barchart with Detail Provided.

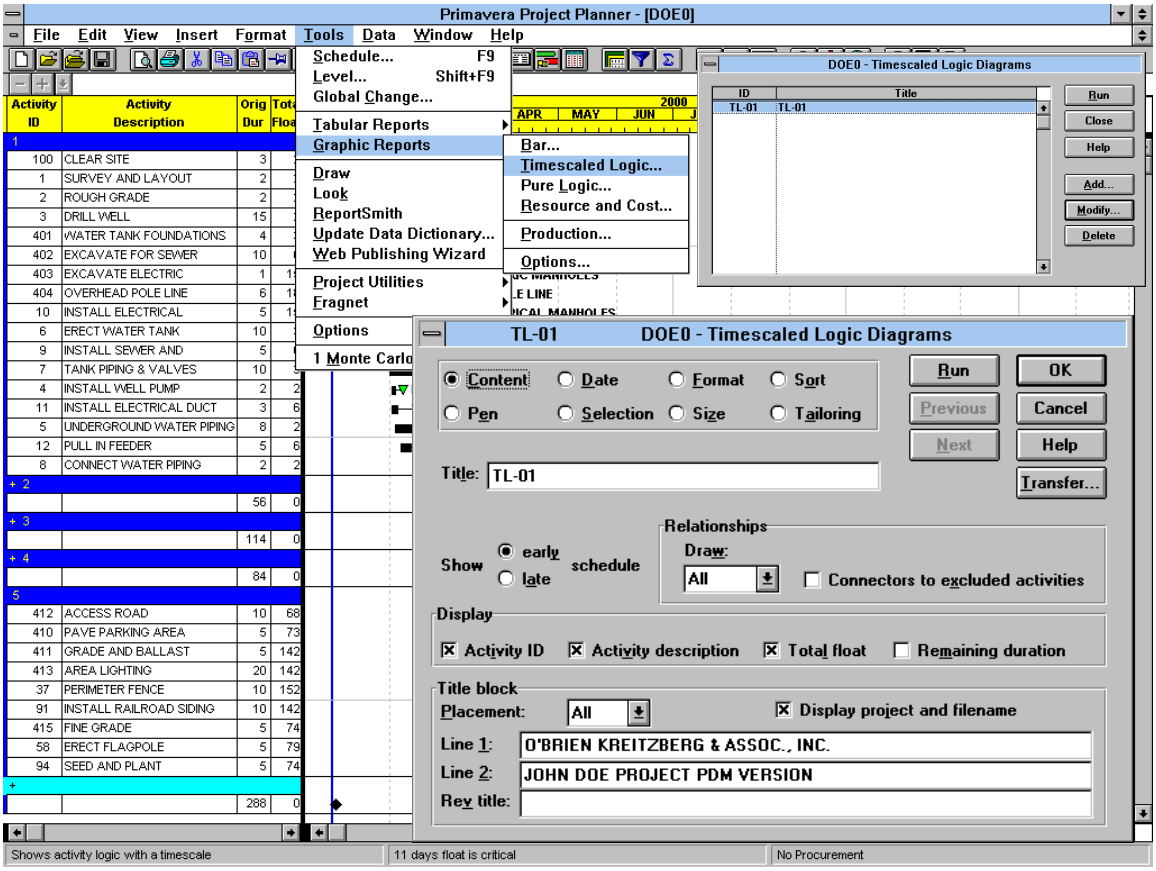


Figure 24.8.4 Timescale Logic Graphic Report, setup.

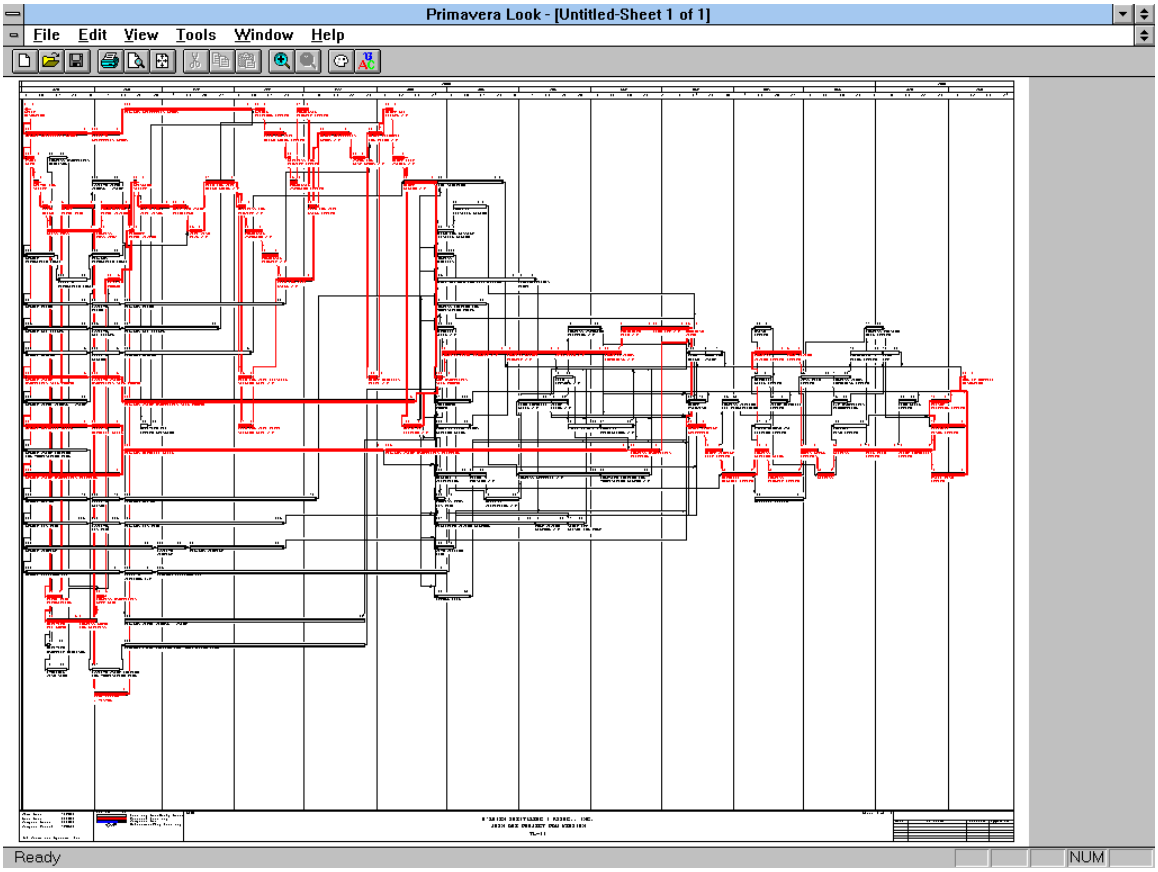


Figure 24.8.5 Timescale Logic Graphic Report, results.

ADDITIONAL GRAPHICS FROM PAST EDITIONS

FROM 5TH EDITION – CHAPTER 20 – UPDATES TO JOHN DOE PROJECT

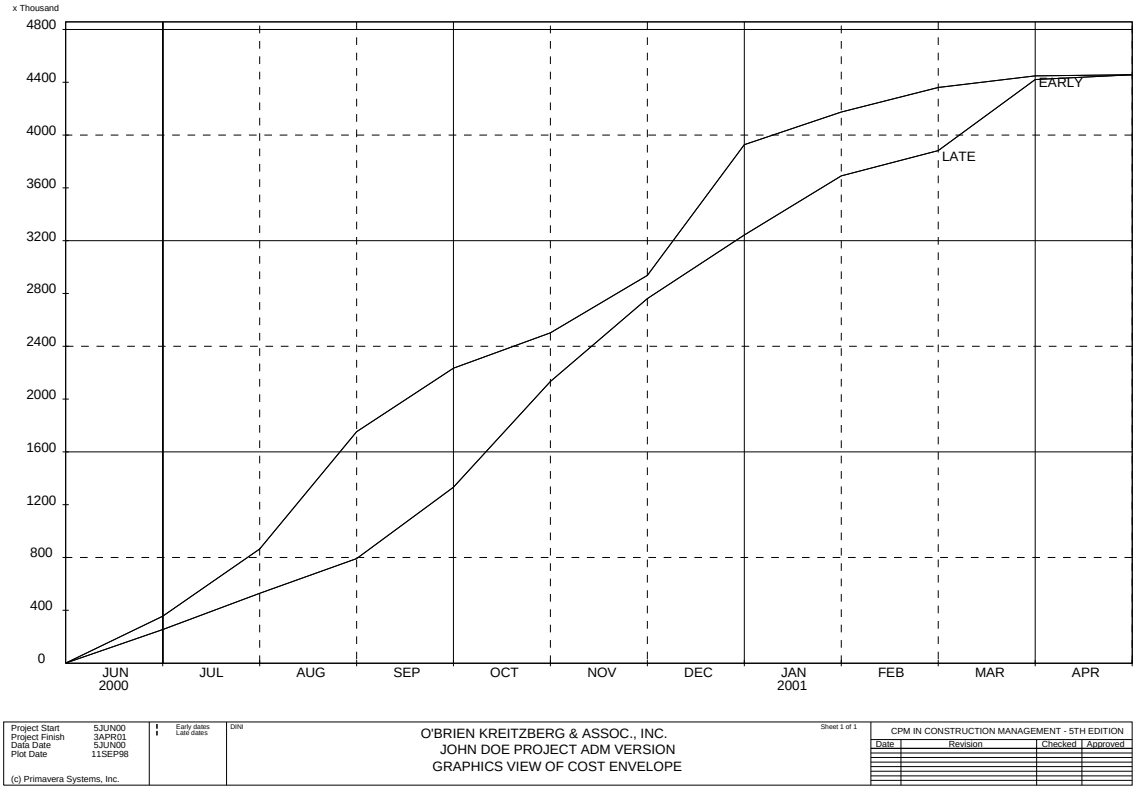


Figure 20.3

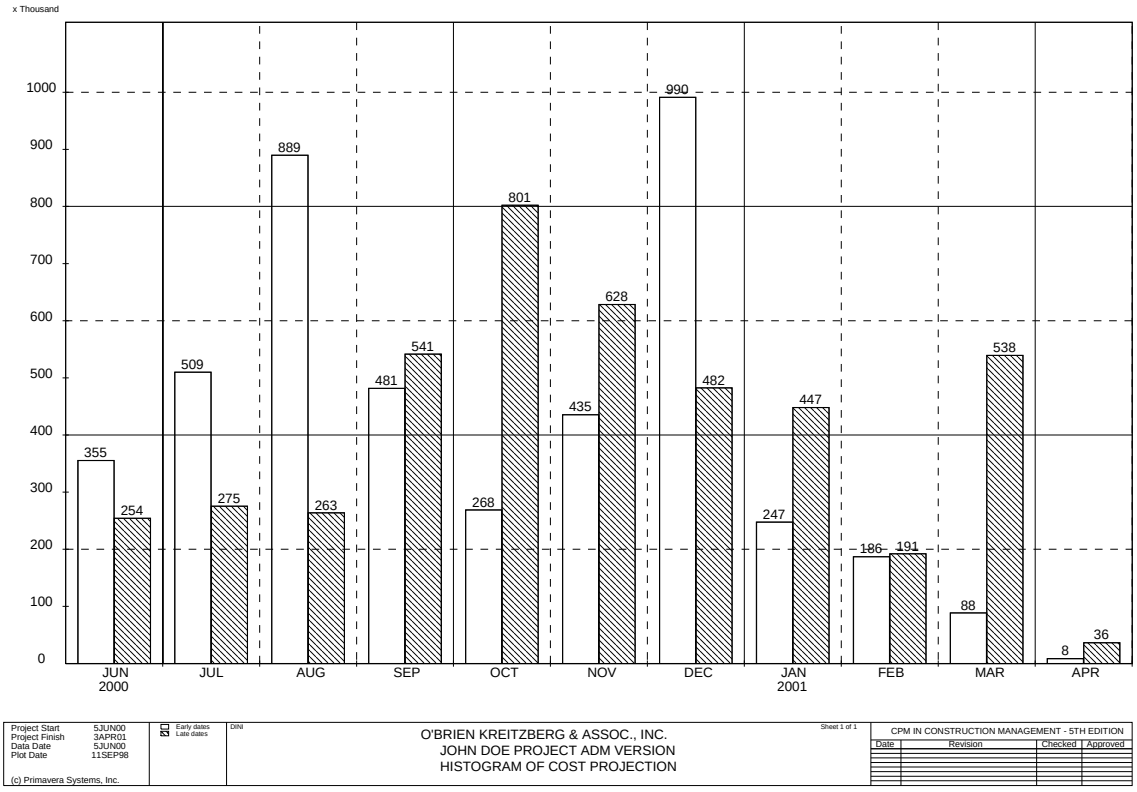


Figure 20.4

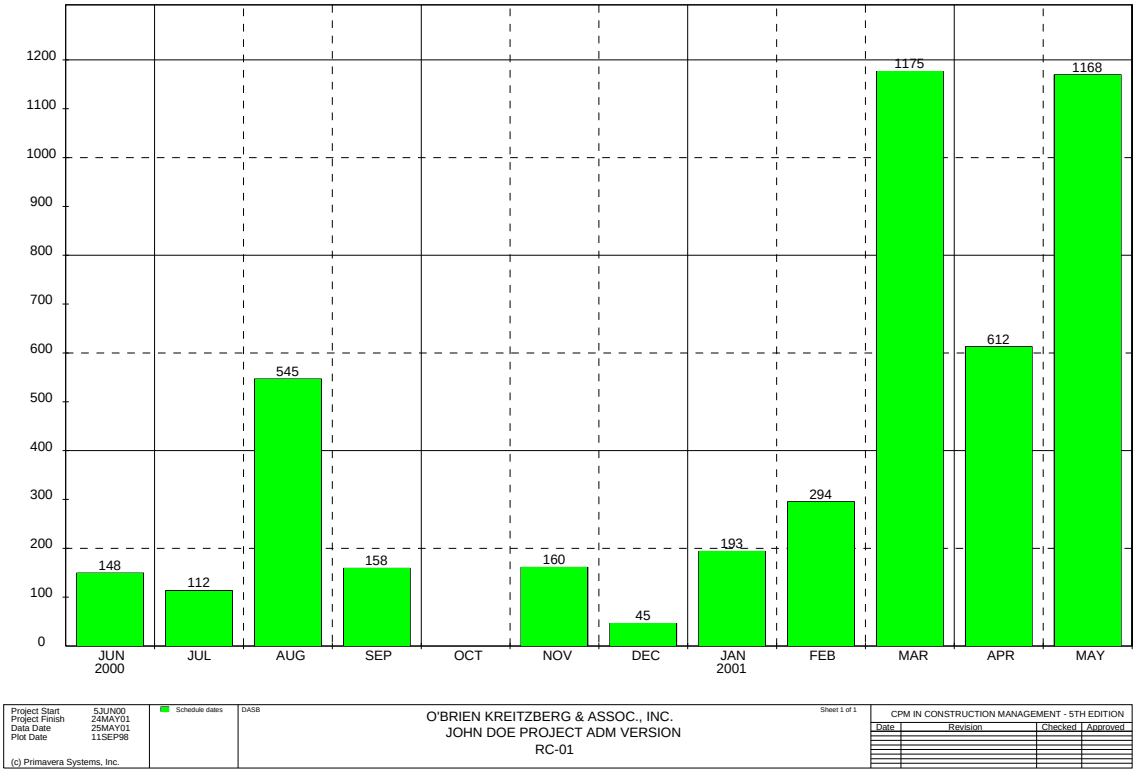


Figure 20.17

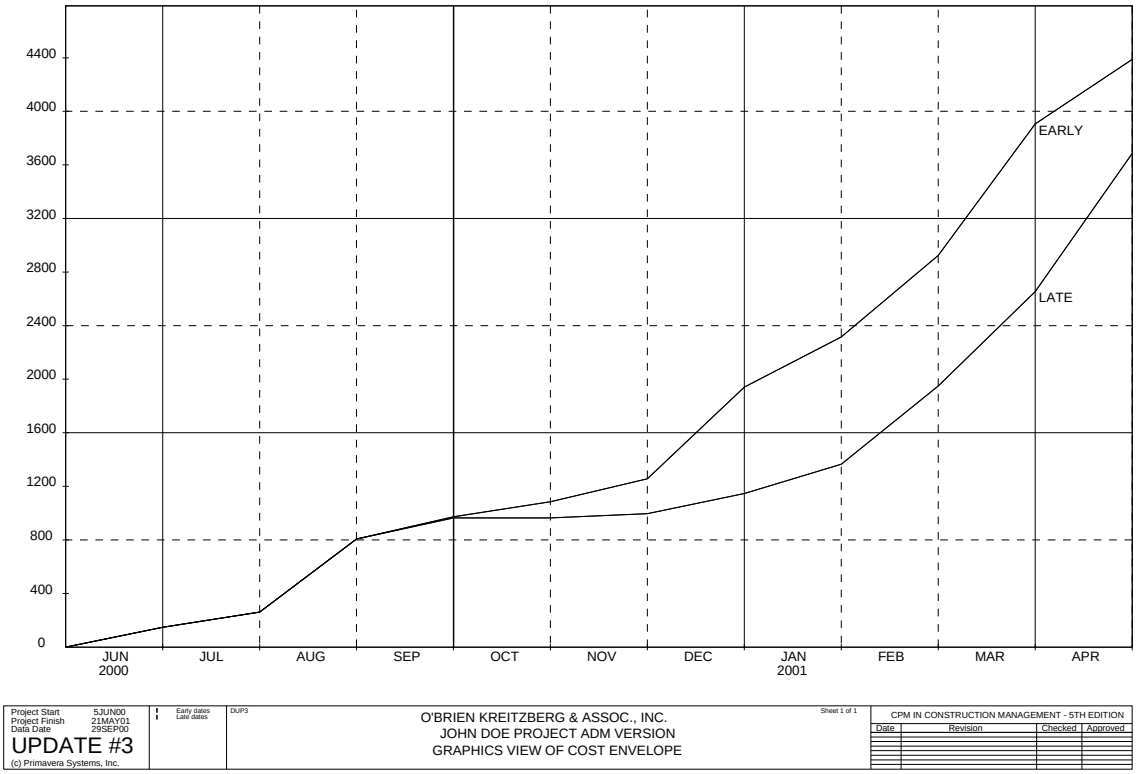


Figure 20.8