How to Prepare Recovery or Revised Schedule

Prepared by

Eng. Abdulaziz Husam Alyamani, PMP, PSP, PMI-SP

Planning Engineer at Saudico LTD.

eng.abdulaziz_alyamani@outlook.com

https://www.linkedin.com/in/abdulaziz-alyamani-pmp®-psp®-pmi-sp®-51a996b9

OVERVIEW

Preparing recovery or revised schedules is a very common task during project execution, monitoring and controlling.

When there is a slippage in the project finish forecast date or scope addition or omission or a change in the construction methodology or constructability method, the schedule baseline is no longer effective in the monitoring and controlling process.

Therefore, a recovery or revised schedule should be prepared, approved and maintained as a new baseline to monitor and control the project.

However, There is a difference between a recovery and a revised schedule as follows:

Recovery Schedule: if there is a slippage in the project finish forecast date because of one of the above mentioned factors but the project team still believes that there is a realistic chance of completing the project on time by taking additional measures, then the contractor may be requested to submit a recovery schedule.

Revised Schedule: if there is a slippage in the project forecast finish date because of one of the above mentioned factors and the slippage is so much that the project completion date is no longer realizable, the client may request, and the contractor may submit a revision of the schedule with a new, realistic completion date.

TO WHOM THIS DOCUMENT ADDRESSED:

-Planning Engineers.

-Scheduling Coordinators.

WHAT SHOULD YOU KNOW BEFORE READING THIS DOCUMENT:

before you read this document you should be familiar with the following:

-Crashing Technique: A technique used to shorten the schedule duration for the least incremental cost by adding resources. Examples of crashing include approving overtime, bringing in additional resources, or paying to expedite delivery to

ACTIVITIES ON THE CRITICAL PATH. CRASHING WORKS ONLY FOR ACTIVITIES ON THE CRITICAL PATH WHERE ADDITIONAL RESOURCES WILL SHORTEN THE ACTIVITY'S DURATION. CRASHING DOES NOT ALWAYS PRODUCE A VIABLE ALTERNATIVE AND MAY RESULT IN INCREASED RISK AND/OR COST.

-FAST TRACKING TECHNIQUE: A SCHEDULE COMPRESSION TECHNIQUE IN WHICH ACTIVITIES OR PHASES NORMALLY DONE IN SEQUENCE ARE PERFORMED IN PARALLEL FOR AT LEAST A PORTION OF THEIR DURATION. AN EXAMPLE IS CONSTRUCTING THE FOUNDATION FOR A BUILDING BEFORE COMPLETING ALL OF THE ARCHITECTURAL DRAWINGS. FAST TRACKING MAY RESULT IN REWORK AND INCREASED RISK. FAST TRACKING ONLY WORKS IF ACTIVITIES CAN BE OVERLAPPED TO SHORTEN THE PROJECT DURATION.

- **OUT OF SEQUENCE:** AN OUT-OF-SEQUENCE ACTIVITY IS ANY ACTIVITY THAT IS IN-PROGRESS OR HAS COMPLETED BEFORE ONE OR MORE OF ITS PREDECESSORS.

-PRIMAVERA USING, TYPES OF RELATIONSHIPS & IMPORTING AND EXPORTING USING MICROSOFT EXCEL.

-USING GLOBAL CHANGE.

-ACTIVITY % COMPLETE TYPES AND ITS EFFECT ON PRIMAVERA CALCULATIONS.

MAIN CONCEPT

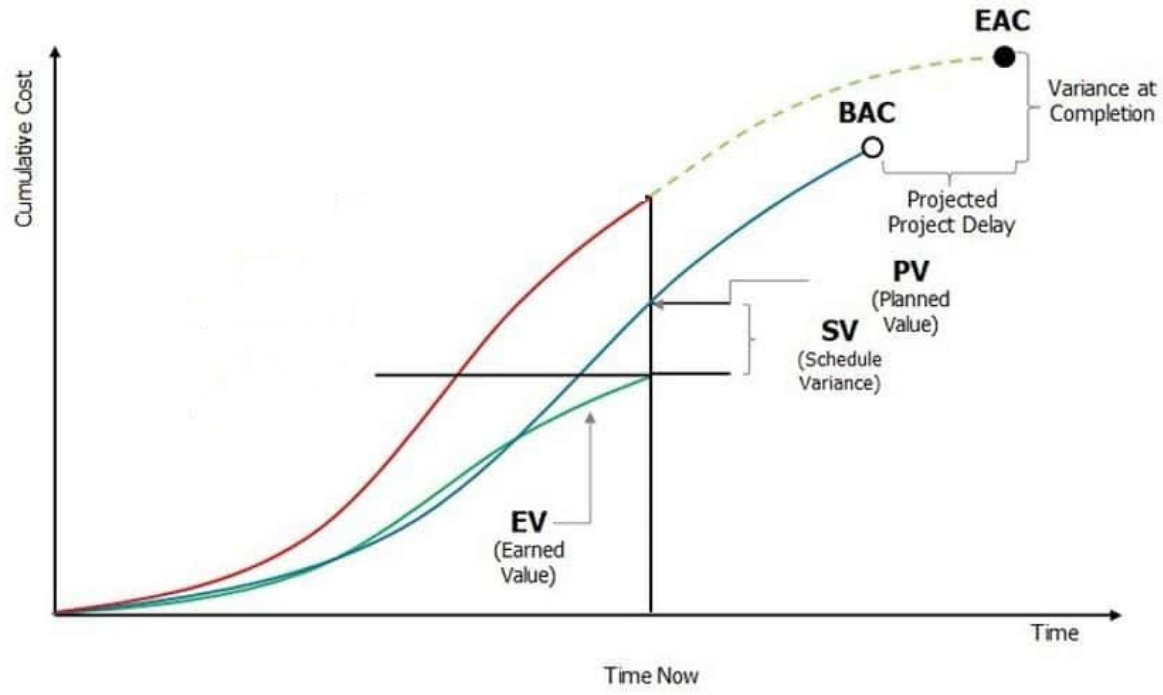


FIGURE 1

AS SHOWN IN FIGURE 1, THERE IS A VARIANCE BETWEEN THE PLANNED VALUE CURVE WHICH IS REPRESENTED IN PRIMAVERA AS SCHEDULE PERCENT COMPLETE FOR THE WHOLE PROJECT AND THE EARNED VALUE CURVE WHICH IS REPRESENTED IN THE PRIMAVERA AS THE PERFORMANCE PERCENT COMPLETE WHICH WILL RESULT IN A DELAY IN THE FORECAST FINISH DATE.

THEREFORE, IN CASE OF A RECOVERY SCHEDULE WE WILL BRING THE EV CURVE TO BE MATCH BACK WITH THE PV CURVE **WITHOUT** CHANGING THE FINISH DATE OF THE PROJECT.

BUT IN THE REVISED SCHEDULE WE WILL BRING THE EV CURVE TO BE MATCH BACK WITH THE PV CURVE **WITH** CHANGING THE FINISH DATE OF THE PROJECT.

MEANS AND METHODS OF THE RECOVERY OR REVISED SCHEDULE:

WHEN START PREPARING YOUR RECOVERY OR REVISED SCHEDULE YOUR UPDATED SCHEDULE WILL HAVE THREE TYPES OF ACTIVITIES:

-NOT STARTED ACTIVATES: WHICH WE WILL NOT PERFORM ANY GLOBAL CHANGE TO AND WILL KEEP IT AS IT IS WHILE MAKING THE RECOVERY OR REVISED SCHEDULE.

-COMPLETED ACTIVITIES: WHICH WE WILL USE A GLOBAL CHANGE TO MAKE THE PLANNED DATES AND DURATION EQUAL TO ACTUAL DATES AND DURATION.

-IN PROGRESS ACTIVITIES: WHICH WILL BE THE MAIN PROBLEM THAT WE WILL FIX USING EXCEL AND PRIMAVERA GLOBAL CHANGE, AS IN THIS CASE USUALLY THE ACTUAL DURATION OF THE ACTIVITIES IN THE UPDATED SCHEDULE IS TAKING MUCH LONGER TIME THAN THE DURATION IN THE BASELINE SCHEDULE WHICH CAUSING THE DELAY OF THE PROJECT.

TO FIX THE IN PROGRESS ACTIVITIES PROBLEM AND BRING IT BACK TO MATCH THE PLANNED THERE ARE THREE WAYS TO DO THAT.

HOWEVER, WE WILL EXPLAIN THE FIRST WAY IN DETAIL AND AFTER WE FINISH WE WILL GO THROUGH THE SECOND AND THIRD WAY IN GENERAL.

1-THE FIRST WAY

IS TO CHANGE THE ACTUAL START OF THE ACTIVITIES IN PROGRESS TO MAINTAIN THE ORIGINAL DURATION OF THE ORIGINAL BASELINE INSTEAD OF KEEPING THE ACTUAL START WHICH CAUSED THE ACTIVITY TO EXTEND ITS DURATION DURING THE UPDATE.

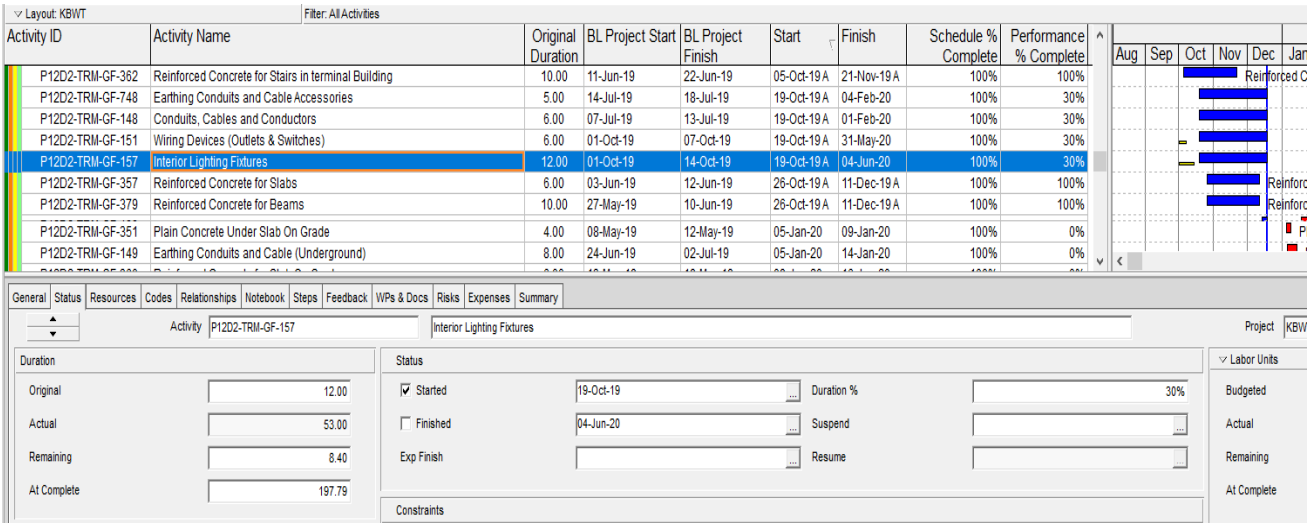


FIGURE 2

For Example, as shown in figure 2 the interior lighting fixtures activity has an original duration of 12 days, but as updated, the actual duration for it is 53 days and it still in progress which causing the planned value for it not equal to the earned value.

So using this way we will change the actual start date forward the data date using this equation and using Excel (Equation NO.1)

NEW ACTUAL START DATE = (ACTIVITY % COMPLETE * ORIGINAL DURATION) – DATA DATE.

Disadvantages:

1-The disadvantages for this way that you will lose the real actual start data for in progress activities which will affect the as built schedule for any forensic analysis or delay analysis.

2- the earned value curve will be affected if you are not keeping a record with every update because all the in progress activities actual start will be few days before the data date which causing the earned value to increase around the data date more than the actual real distribution.

3-The performance percentage complete will not match the planned percentage complete 100%.

To mitigate theses disadvantages you should do the following:

1-You can keep a record of the real actual start dates using a user defined field and when the project is finished the planned value will be equal to the earned value so you can change back new actual start dates back to the real actual start dates but it will still affect the delay analysis if you are using window or time impact analysis.

2-To mitigate the earned value curve problem you should keep a record of earned value of the schedule in an external excel sheet and update it with every update.

3-For the performance percentage complete the main reason behind this are two things, The first reason is that you have to fix the remaining duration to exclude any decimals while doing the recovery which will affect the primavera calculations.

For Example, If you have an activity with 10 days duration and 30% actual percentage so the actual duration for that activity is = 30% * 10 = 3.33 days so that the remaining duration will be 6.66 days.

HOWEVER, THESE DECIMALS WILL NOT BE SEEN UNTIL YOU VIEW THE DECIMALS IN PRIMAVERA.

SO, DURING OUR RECOVERY PROCESS WE WILL FIX ALL THE REMAINING DURATIONS TO BE EQUAL TO CORRECT NUMBERS WITHOUT DECIMALS.

THE SECOND REASON FOR THIS IS SHOWN IN FIGURE NO.3 BELOW:

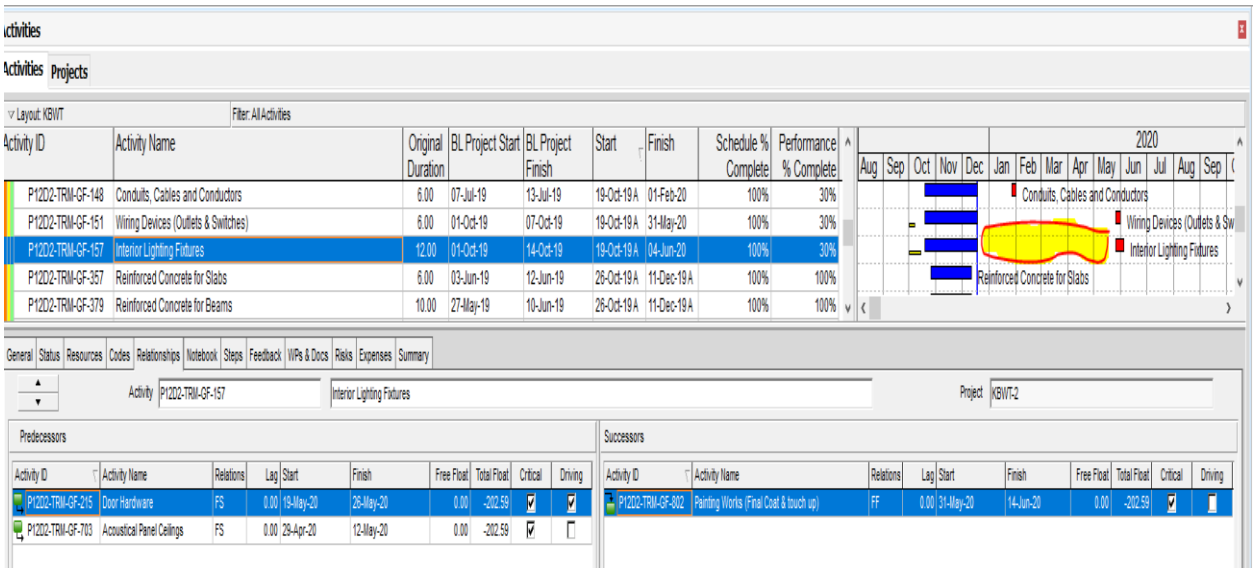


FIGURE 3

AS NOTICED IN FIGURE NO.3, INTERIOR LIGHTING FIXTURE ACTIVITY IS IN PROGRESS, BUT THERE IS A GAP HIGHLIGHTED IN YELLOW BECAUSE OF ITS RELATION WITH THE PREDECESSOR ACTIVITY (USING RETAINED LOGIC), WHICH CAUSING THE REMAINING EARLY START FOR THE ACTIVITY TO START LATER THAN 1 DAY AFTER THE DATA DATE WHICH EFFECTS THE ACTIVITY CALCULATION AS SHOWN IN FIGURE NO.4:

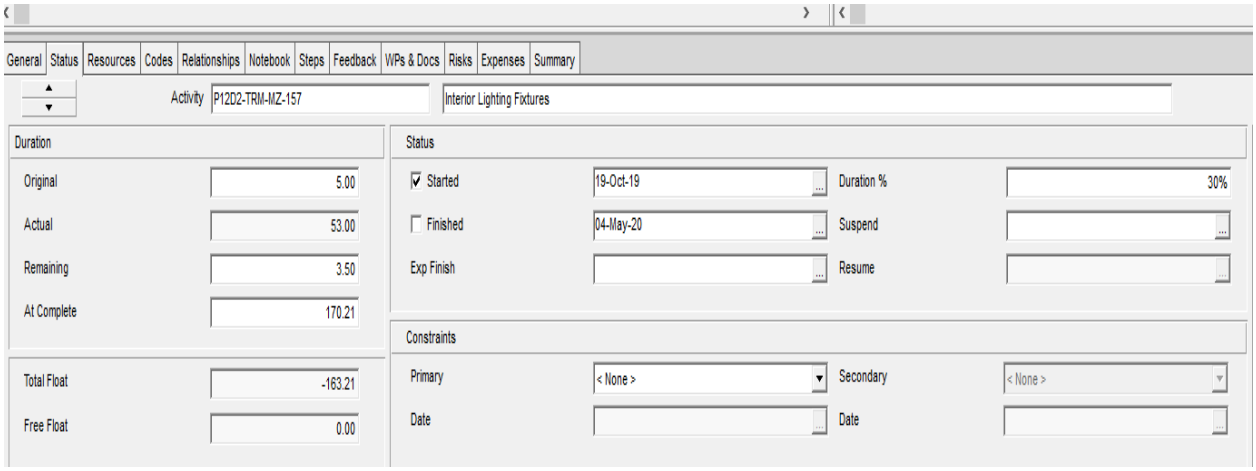


FIGURE 4

AS SHOWN IN FIGURE NO.4, THE ORIGINAL DURATION FOR THE INTERIOR LIGHTING FIXTURE ACTIVITY IS 5 DAYS, WHILE THE ACTUAL DURATION GAINED FROM THE UPDATE IS 53 DAYS, THE REMAINING DURATION IS 3.5 DAYS, BUT NOTICE THAT THE **AT COMPLETE DURATION DOESN'T EQUAL THE ACTUAL DURATION + REMAINING DURATION** WHICH WILL CAUSE A VARIANCE BETWEEN THE PLANNED PERCENTAGE AND THE EARNED PERCENTAGE.

TO MITIGATE THE ABOVE MENTIONED PROBLEM, WE WILL SHOW THE REMAINING EARLY START COLUMN IN PRIMAVERA AND CHECK THAT:

ALL ACTIVITIES REMAINING EARLY START = DATA DATE+1

AND WE WILL DO THAT BY CHANGING THE RELATIONS AS POSSIBLE. HOWEVER, IN SOME CASES WE WILL NOT HAVE THE OPTION TO CHANGE THE RELATIONSHIPS WHICH WILL KEEP A LITTLE VARIANCE BETWEEN THE PLANNED AND THE EARNED VALUES.

NOW WE WILL DO A PRACTICE EXAMPLE USING THIS METHOD TO CLEAR-OUT THE PRACTICAL WAY USING DURATION % COMPLETE:

STEPS TO MAKE RECOVERY/REVISED SCHEDULE:

1-ADD OR OMIT ANY APPROVED SCOPE CHANGES.

2-FIX OUT OF SEQUENCE ACTIVITIES.

3-FIX PROJECT AND MILESTONES DATES TO MEET THE APPROVED NEW DATES (USING CRASHING/FAST TRACKING).

4-FIX REMAINING EARLY START DATES FOR **IN PROGRESS** ACTIVITIES TO BE = DATA DATE + 1

5- COST LOADING (IF THERE IS ANY).

6- FIX THE REMAINING DURATION (GET RID OF DECIMALS).

7-FIX ACTUAL START DATES BY CALCULATING THE ACTUAL DURATION DEPENDING ON ORIGINAL DURATION.

8-PERFORM GLOBAL CHANGE FOR COMPLETED AND IN PROGRESS ACTIVITIES.

EXAMPLE:-

IN THIS EXAMPLE WE HAVE A TERMINAL BUILDING PROJECT, IT WAS SUPPOSED TO FINISH ON **30 NOV 2019**. HOWEVER, DUE TO DELAY EVENTS WE WILL MAKE A REVISED SCHEDULE AND FIX THE FINISH DATE TO BE **15 JUN 2020.**

-AS OF LATEST UPDATE THE DATA DATE IS 19 DEC 2019

-THE SCHEDULE % COMPLETE = 100%

-THE PERFORMANCE % COMPLETE = 19.45%

-PLANNED VALUE COST = 42,507,585.94

-EARNED VALUE COST = 8,269,425.07

KINDLY REFER TO FIGURE 5 TO SEE THE ABOVE MENTIONED INFORMATION TAKEN FROM PRIMAVERA.

Activity ID	Activity Name	Original Duration	BL Project Start	BL Project Finish	Start	Finish	Schedule % Complete	Performance % Complete	Planned Value Cost	Earned Value Cost
Khaled Ibn Al-Waleed Terminus		479.37	02-Feb-19	30-Nov-19	02-Feb-19 A	23-Aug-20	100%	19.45%	$42,507,585.94	$8,269,425.07
Project Milestones		479.37	02-Feb-19	30-Nov-19	02-Feb-19 A	23-Aug-20	0%	0%	$0.00	$0.00
Project Mobilization & Pre-Construction		17.00	02-Feb-19	20-Feb-19	02-Feb-19 A	28-Feb-19 A	100%	100%	$2,210,644.02	$2,210,644.02
Project Engineering		389.67	02-Feb-19	08-Oct-19	27-Feb-19 A	10-May-20	100%	51.43%	$6,376,137.89	$3,279,330.59
Shop Drawings		326.50	02-Feb-19	16-Jul-19	27-Feb-19 A	15-Mar-20	100%	55.76%	$4,250,758.59	$2,370,234.71
Material		339.67	01-Apr-19	08-Oct-19	03-Apr-19 A	10-May-20	100%	42.77%	$2,125,379.30	$909,095.88
Project Construction		430.37	13-Feb-19	02-Nov-19	23-Feb-19 A	26-Jul-20	100%	8.46%	$32,858,114.38	$2,779,450.45
Terminal Building		404.59	03-Mar-19	02-Nov-19	23-Feb-19 A	25-Jun-20	100%	9.49%	$28,527,638.47	$2,706,996.03
External Works		307.37	13-Feb-19	31-Oct-19	19-Oct-19 A	26-Jul-20	100%	1.67%	$4,330,475.91	$72,454.42
Project Testing & Commissioning and Handover		120.37	06-Jul-19	30-Nov-19	05-Apr-20	23-Aug-20	100%	0%	$1,062,689.65	$0.00
Terminal Building		39.20	21-Oct-19	30-Nov-19	08-Jun-20	23-Jul-20	100%	0%	$637,613.79	$0.00
External Works		120.37	06-Jul-19	28-Nov-19	05-Apr-20	23-Aug-20	100%	0%	$425,075.86	$0.00

FIGURE 5

STEP 1

-USING A COPY OF THE LATEST UPDATE.

1-ADD OR OMIT ANY APPROVED SCOPE CHANGES.

IN THIS EXAMPLE THERE IS NO CHANGE IN SCOPE SO IT WILL REMAIN THE SAME.

STEP 2

2-FIX OUT OF SEQUENCE ACTIVITIES.

-DITCH THE ATTACHED BASELINE.

TO DO THAT GO TO PROJECT TAB AND SELECT ASSIGN BASELINE.

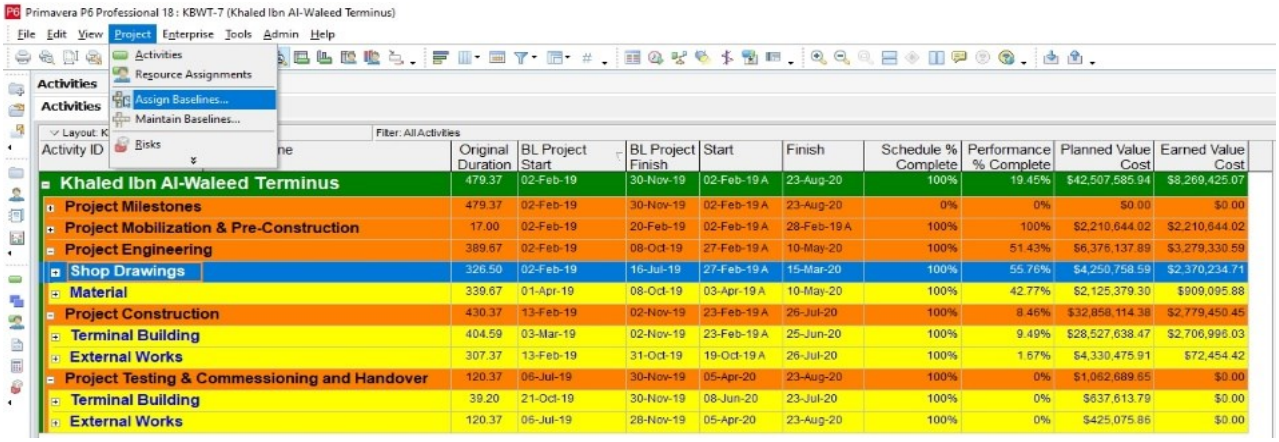


FIGURE 6

-REMOVE THE PROJECT SELECTION FROM PROJECT BASELINE AND PRIMARY AND MAKE IT CURRENT PROJECT.

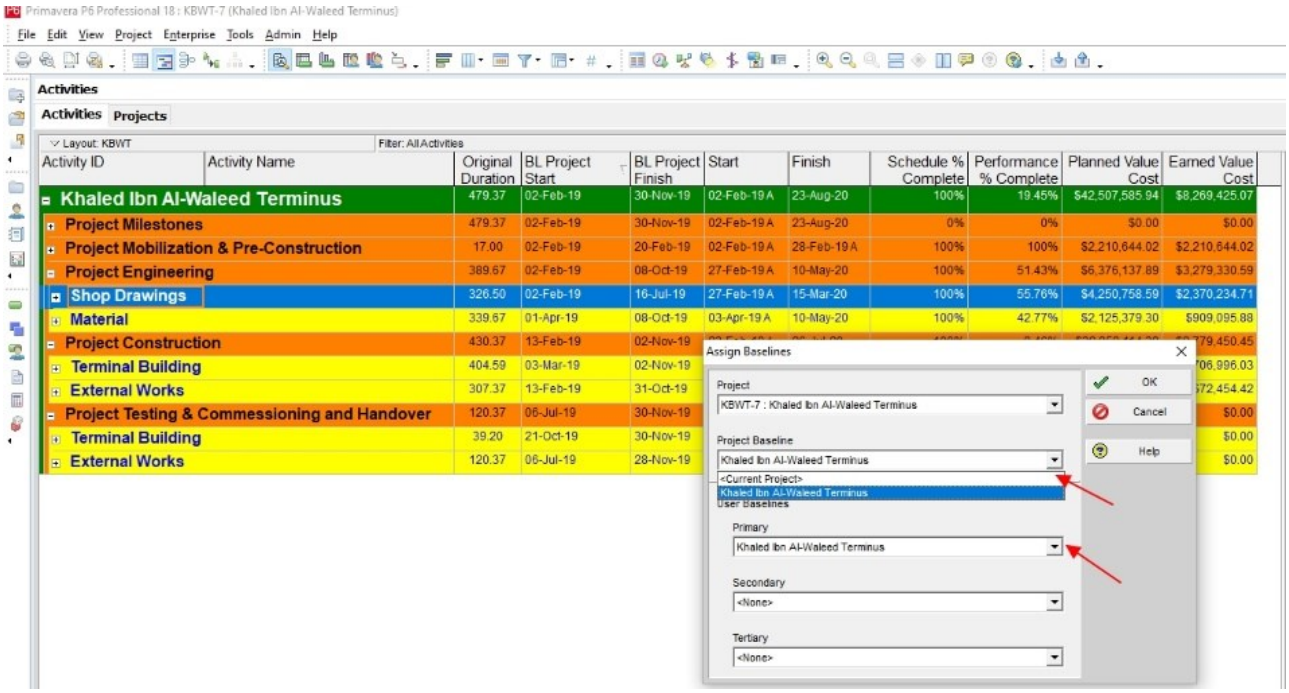


FIGURE 7

-GO TO PROJECT TAB THEN SELECT MAINTAIN BASELINE.

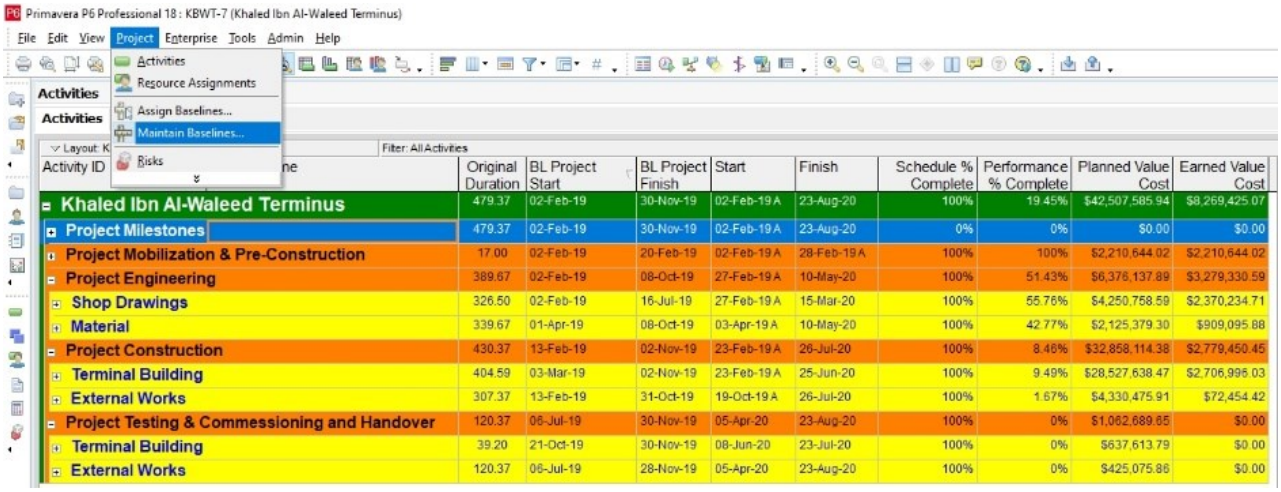


FIGURE 8

-THEN SELECT THE ASSIGNED PROJECT AND DELETE IT.

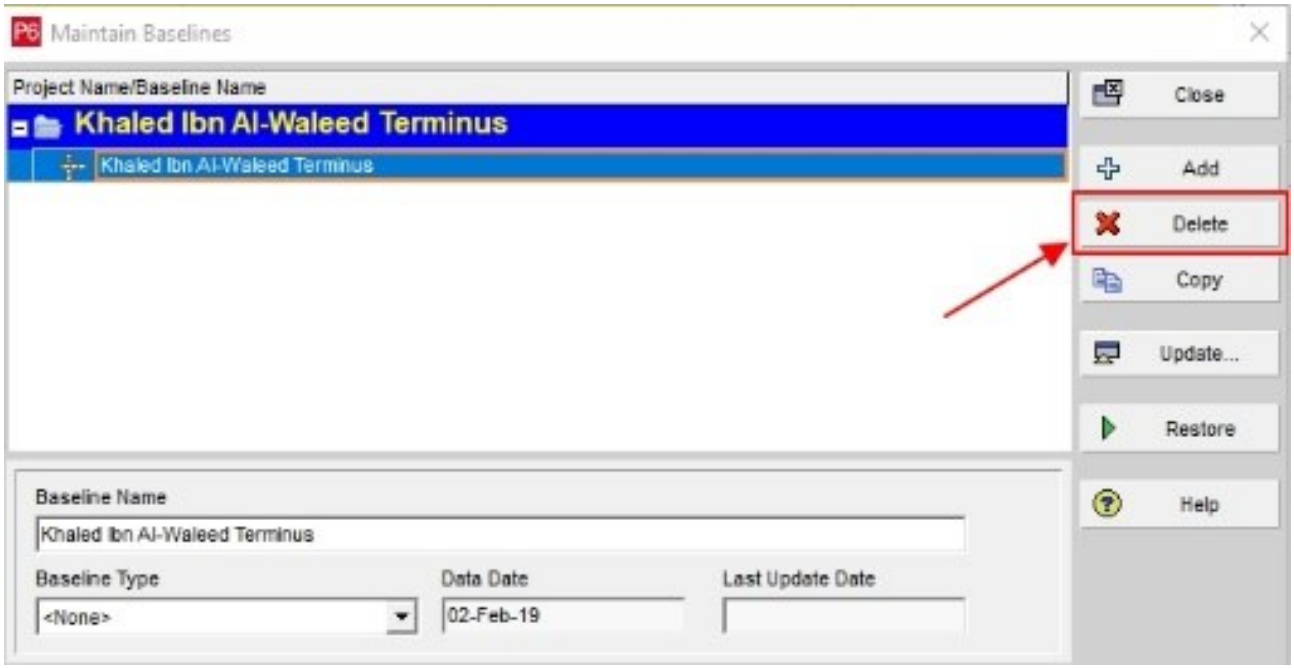


FIGURE 9

-TO DEFINE THE NUMBER AND ID'S FOR OUT OF SEQUENCE ACTIVITIES YOU HAVE GO TO TOOLS TAB AND SCHEDULE THE PROJECT THEN VIEW LOG.

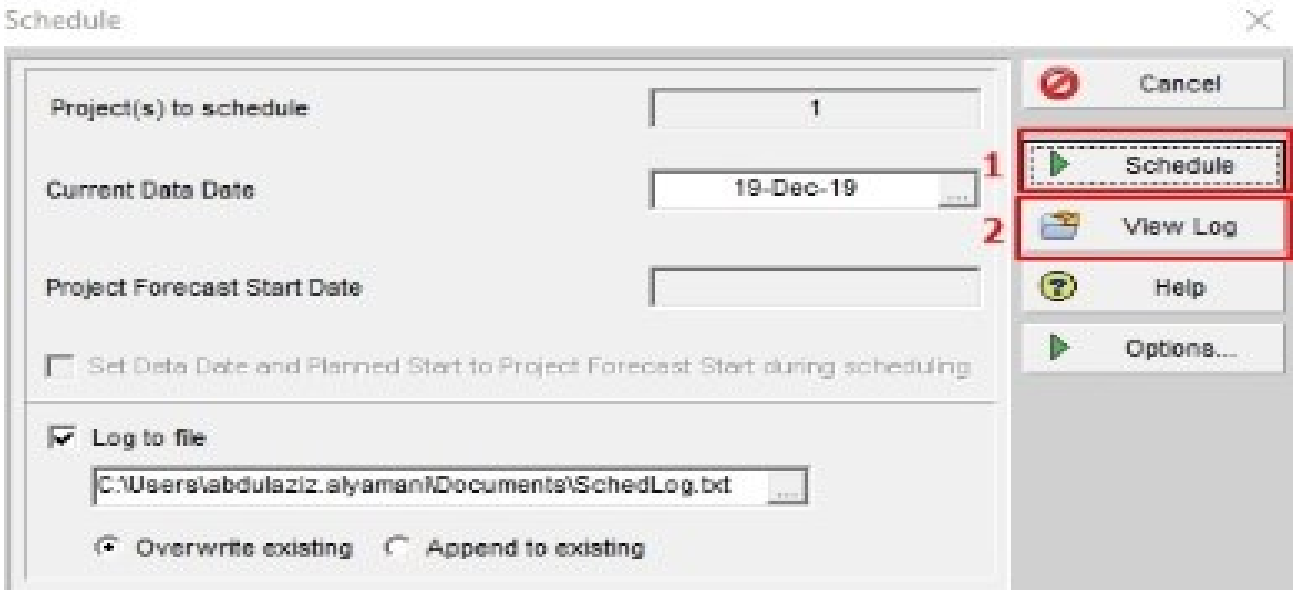


FIGURE 10

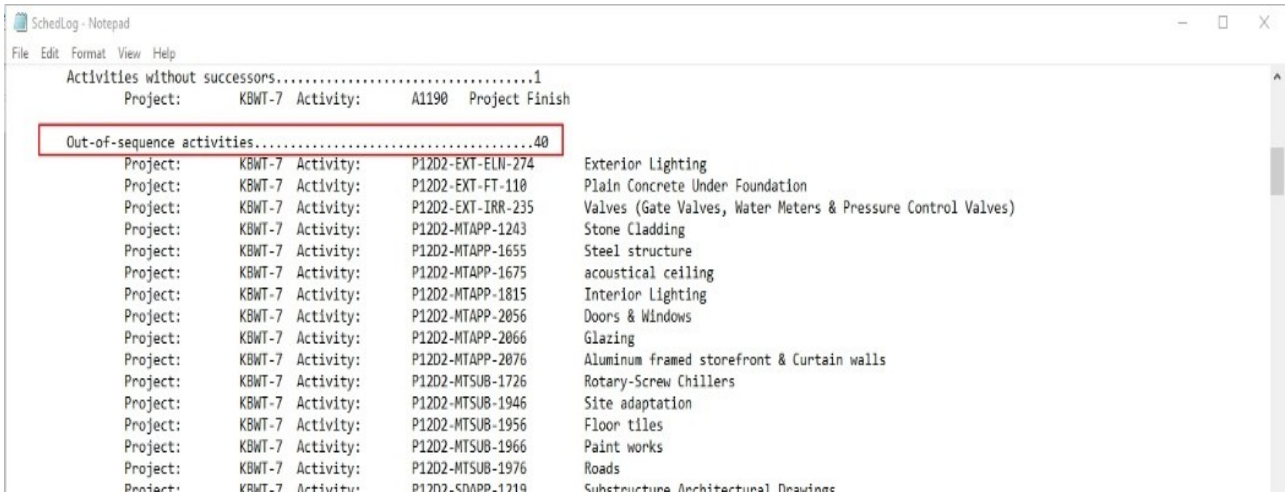


FIGURE 11

-TO FIX THE OUT OF SEQUENCE ACTIVITIES REFER TO FIGURE NO.12 BELOW.

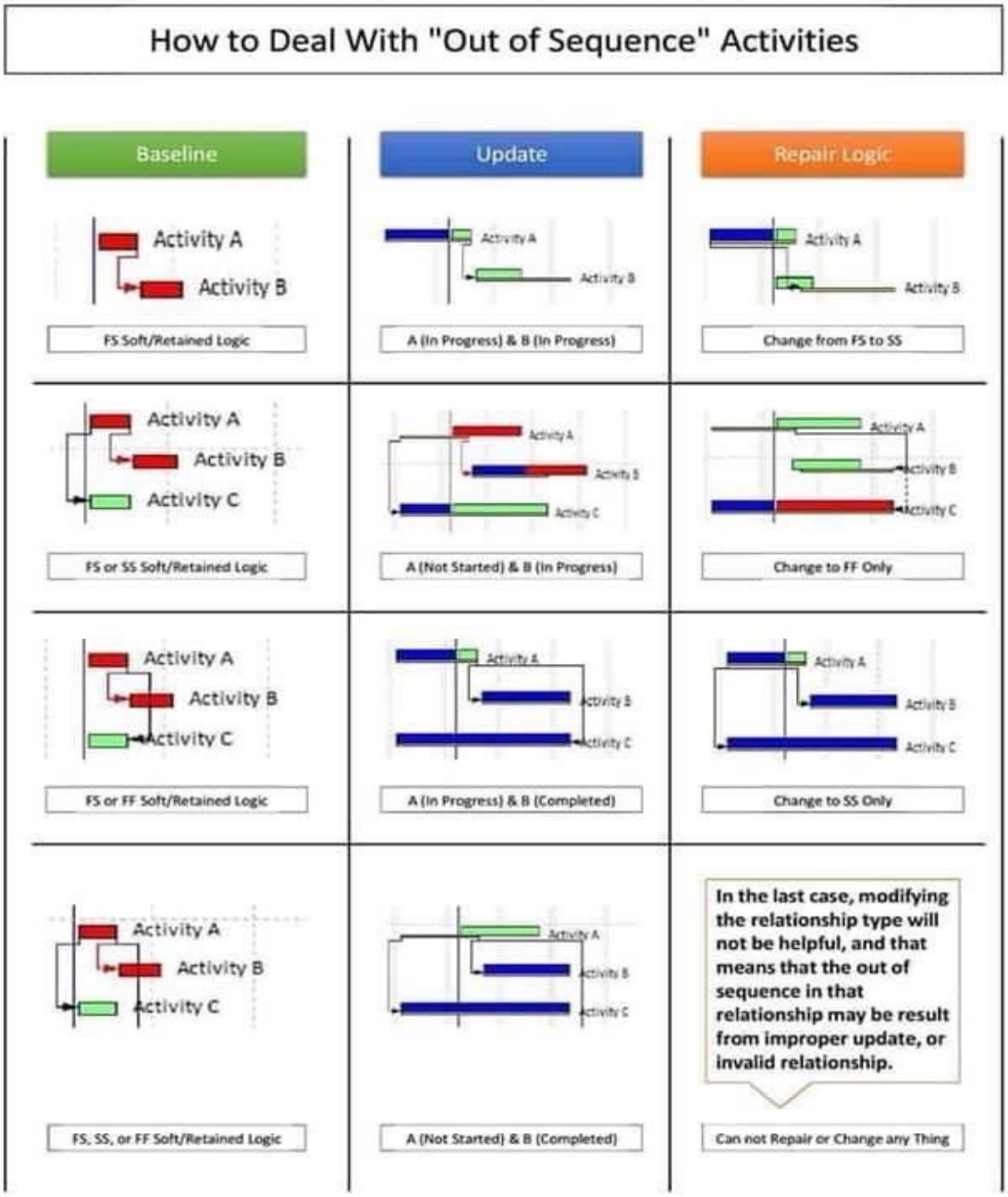


FIGURE 12

-IN THIS EXAMPLE I FIXED THE OUT OF SEQUENCE USING THE SAME CONCEPT.

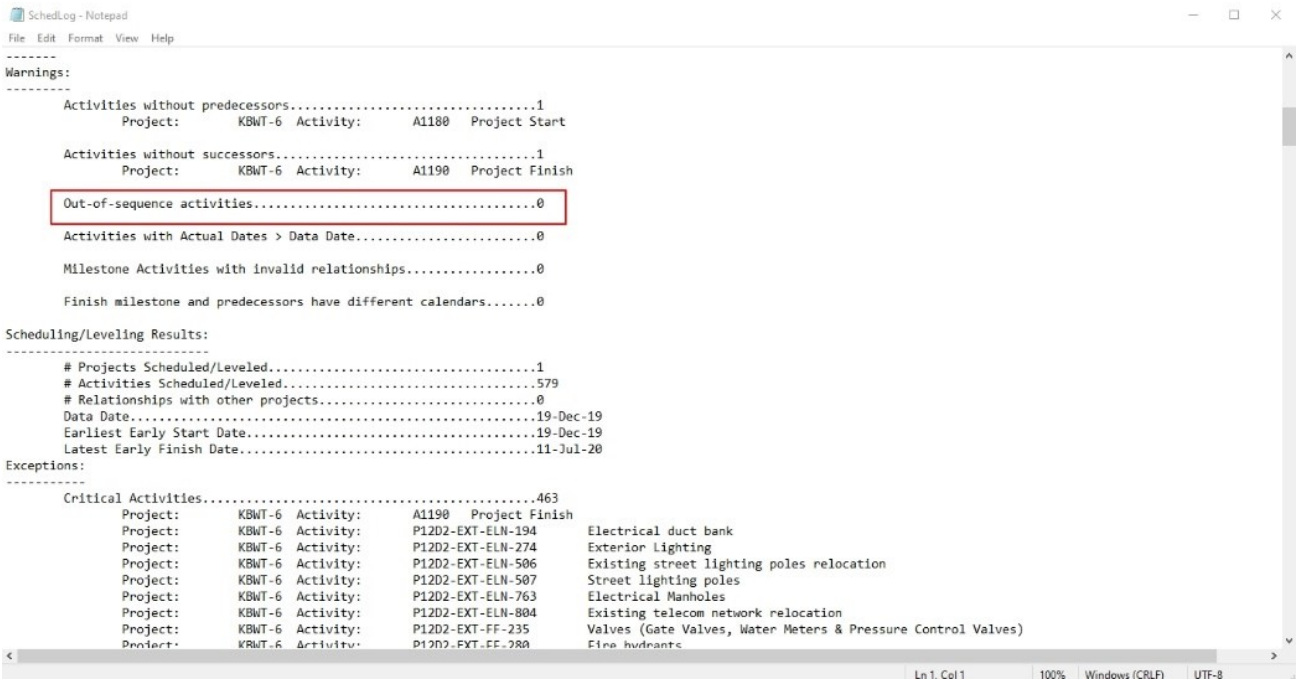


FIGURE 13

However, due to ditching the baseline and fixing the out of sequence, the planned and performance percentages will change.

Activity ID	Activity Name	Original Duration	BL Project Start	BL Project Finish	Start	Finish	Schedule % Complete	Performance % Complete	Planned Value Cost	Earned Value Cost
Khaled Ibn Al-Waleed Terminus		443.00	02-Feb-19	11-Jul-20	02-Feb-19 A	11-Jul-20	26.08%	19.47%	$11,087,989.93	$8,276,784.47
Project Milestones		443.00	02-Feb-19	11-Jul-20	02-Feb-19 A	11-Jul-20	0%	0%	$0.00	$0.00
Project Mobilization & Pre-Construction		17.00	02-Feb-19	20-Feb-19	02-Feb-19 A	28-Feb-19 A	100%	100%	$2,210,644.02	$2,210,644.02
Project Engineering		364.00	02-Feb-19	09-Apr-20	27-Feb-19 A	09-Apr-20	72.95%	51.43%	$4,651,567.67	$3,279,330.59
Shop Drawings		309.68	02-Feb-19	06-Feb-20	27-Feb-19 A	06-Feb-20	83.89%	55.76%	$3,565,914.15	$2,370,234.71
Material		314.00	01-Apr-19	09-Apr-20	03-Apr-19 A	09-Apr-20	51.08%	42.77%	$1,085,653.52	$909,095.88
Project Construction		394.00	03-Mar-19	13-Jun-20	23-Feb-19 A	13-Jun-20	12.86%	8.48%	$4,225,778.23	$2,786,809.85
Terminal Building		393.29	03-Mar-19	13-Jun-20	23-Feb-19 A	13-Jun-20	11.92%	9.49%	$3,399,850.96	$2,706,996.03
External Works		271.00	28-Jul-19	13-Jun-20	01-Oct-19 A	13-Jun-20	19.07%	1.84%	$825,927.27	$79,813.82
Project Testing & Commissioning and Handover		115.00	29-Feb-20	11-Jul-20	29-Feb-20	11-Jul-20	0%	0%	$0.00	$0.00
Terminal Building		35.00	31-May-20	11-Jul-20	31-May-20	11-Jul-20	0%	0%	$0.00	$0.00
External Works		115.00	29-Feb-20	11-Jul-20	29-Feb-20	11-Jul-20	0%	0%	$0.00	$0.00

FIGURE 14

STEP 3

3-FIX PROJECT AND MILESTONES DATES TO MEET THE APPROVED NEW DATES (USING CRASHING/FAST TRACKING).

-AS SHOWN IN FIGURE 14, THE PROJECT FINISH FORECAST DATE IS 11 JUL 2020. SO WE NEED TO FIX IT BY **USING THE LONGEST PATH FILTER AND CRASHING AND FAST TRACKING TECHNIQUES** TO MAKE THE PROJECT FINISH DATE EQUAL TO 15 JUN 2020 AS SHOWN IN FIGURE 15.

Activity ID	Activity Name	Original Duration	BL Project Start	BL Project Finish	Start	Finish	Schedule % Complete	Performance % Complete	Planned Value Cost	Earned Value Cost
Khaled Ibn Al-Waleed Terminus		420.25	02-Feb-19	15-Jun-20	02-Feb-19 A	15-Jun-20	26.08%	19.47%	$11,087,989.93	$8,276,784.47
Project Milestones		420.25	02-Feb-19	15-Jun-20	02-Feb-19 A	15-Jun-20	0%	0%	$0.00	$0.00
Project Mobilization & Pre-Construction		17.00	02-Feb-19	20-Feb-19	02-Feb-19 A	28-Feb-19 A	100%	100%	$2,210,644.02	$2,210,644.02
Project Engineering		364.00	02-Feb-19	09-Apr-20	27-Feb-19 A	09-Apr-20	72.95%	51.43%	$4,651,567.67	$3,279,330.59
Shop Drawings		309.68	02-Feb-19	06-Feb-20	27-Feb-19 A	06-Feb-20	83.89%	55.76%	$3,565,914.15	$2,370,234.71
Material		314.00	01-Apr-19	09-Apr-20	03-Apr-19 A	09-Apr-20	51.08%	42.77%	$1,085,653.52	$909,095.88
Project Construction		371.25	03-Mar-19	18-May-20	23-Feb-19 A	18-May-20	12.86%	8.48%	$4,225,778.23	$2,786,809.85
Terminal Building		371.25	03-Mar-19	18-May-20	23-Feb-19 A	18-May-20	11.92%	9.49%	$3,399,850.96	$2,706,996.03
External Works		248.00	28-Jul-19	17-May-20	01-Oct-19 A	17-May-20	19.07%	1.84%	$825,927.27	$79,813.82
Project Testing & Commissioning and Handover		92.25	29-Feb-20	15-Jun-20	29-Feb-20	15-Jun-20	0%	0%	$0.00	$0.00
Terminal Building		29.96	11-May-20	15-Jun-20	11-May-20	15-Jun-20	0%	0%	$0.00	$0.00
External Works		92.00	29-Feb-20	14-Jun-20	29-Feb-20	14-Jun-20	0%	0%	$0.00	$0.00

FIGURE 15

HINT: DON'T FORGET TO CHANGE THE PROJECT FINISH CONSTRAINT TO MATCH WITH YOUR NEW FINISH DATE IN CASE OF REVISED SCHEDULE.

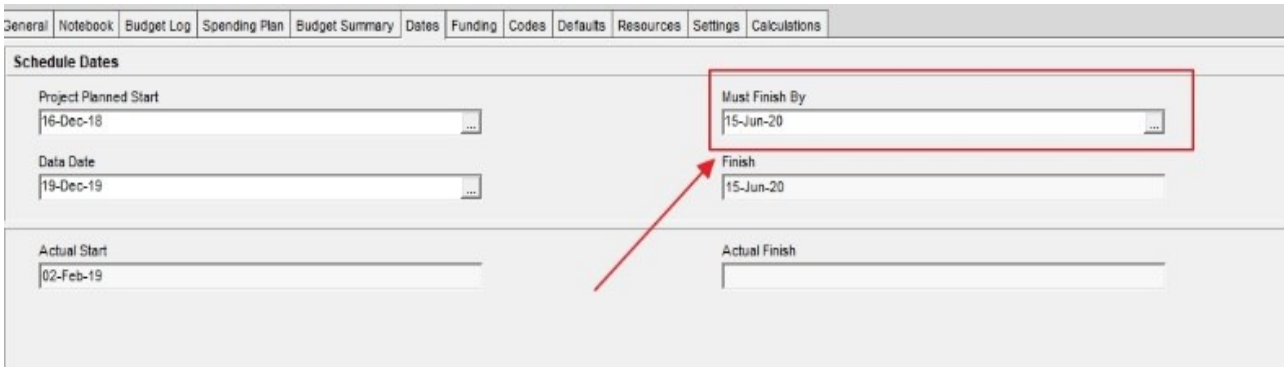


FIGURE 16

STEP 4

4-FIX REMAINING EARLY START DATES FOR **IN PROGRESS** ACTIVITIES TO BE = DATA DATE + 1

-OUR DATA DATE IN THIS EXAMPLE IS 19 DEC 2019 AND BECAUSE 20 DEC 2019 WILL NOT BE A WORKING DAY (FRIDAY) SO THE REMAINING EARLY START FOR ALL IN PROGRESS ACTIVITIES SHOULD BE 21 DEC 2019.

-SHOW THE REMAINING EARLY START COLUMN AND FILTER THE IN PROGRESS ACTIVITIES THEN USE GROUP AND SORT OPTION TO SHOW THE ACTIVATES WITHOUT THE WBS TO IDENTIFY THE ACTIVITIES THAT NEED TO BE FIXED.

-TO FIX THIS ISSUE YOU SHOULD **CHANGE THE RELATIONSHIP WITH THE PREDECESSOR ACTIVITIES (SOMETIMES YOU WILL HAVE TO NOT ONLY CHANGE THE TYPE OR LAG OF THE RELATION, BUT THE WHOLE RELATION, TO BE WITH A COMPLETED OR IN PROGRESS ACTIVITY)** AS POSSIBLE. HOWEVER, IN SOME CASES IF THERE IS NOTHING THAT WE CAN DO WITH THE RELATIONSHIP WE WILL BE FORCED TO KEEP SOME ACTIVITIES WITH A DEFERENT REMAINING EARLY START, **REFER TO FIGURE 3.**

HINT: TO FIX THIS ISSUE YOU CAN ALSO DIVIDE THE IN PROGRESS ACTIVITY THAT NEED TO BE FIXED INTO TWO ACTIVITIES, ONE IS COMPLETED WITH FIXING THE BUDGETED UNITS FOR IT TO MATCH THE DURATION % COMPLETE AND THE OTHER ONE IS NOT STARTED WITH FIXING ITS BUDGETED UNITS TOO.

Activity ID	Activity Name	Original Duration	BL Project Start	BL Project Finish	Start	Finish	Schedule % Complete	Performance % Complete	Planned Value Cost	Earned Value Cost	Activity Status	Remaining Early Start
P12D2-EXT-ELN-274	Exterior Lighting	15.00	13-Oct-19	29-Oct-19	19-Oct-19 A	14-May-20	100%	5.42%	$735,444.31	$39,836.57	In Progres	28-Apr-20
P12D2-TRM-GF-151	Wiring Devices (Outlets & Switches)	6.00	01-Oct-19	07-Oct-19	19-Oct-19 A	02-May-20	100%	30%	$173,807.49	$52,142.25	In Progres	27-Apr-20
P12D2-TRM-GF-157	Interior Lighting Fixtures	12.00	01-Oct-19	14-Oct-19	19-Oct-19 A	04-May-20	100%	30%	$105,375.23	$31,612.57	In Progres	25-Apr-20
P12D2-TRM-BF-157	Interior Lighting Fixtures	6.00	21-Sep-19	28-Sep-19	19-Oct-19 A	16-Apr-20	100%	30%	$35,125.08	$10,537.52	In Progres	12-Apr-20
P12D2-TRM-BF-151	Wiring Devices (Outlets & Switches)	6.00	21-Sep-19	28-Sep-19	19-Oct-19 A	16-Apr-20	100%	30%	$21,725.94	$6,517.78	In Progres	12-Apr-20
P12D2-TRM-MZ-157	Interior Lighting Fixtures	5.00	08-Oct-19	13-Oct-19	19-Oct-19 A	13-Apr-20	100%	30%	$210,750.46	$63,225.14	In Progres	08-Apr-20
P12D2-TRM-MZ-151	Wiring Devices (Outlets & Switches)	6.00	08-Oct-19	14-Oct-19	19-Oct-19 A	12-Apr-20	100%	30%	$21,725.94	$6,517.78	In Progres	06-Apr-20
P12D2-TRM-BF-144	Duct Accessories (Volume & Motorized Damp	6.00	29-Aug-19	04-Sep-19	19-Oct-19 A	29-Mar-20	100%	8.4%	$7,789.38	$654.52	In Progres	22-Mar-20
P12D2-EXT-IRR-235	Valves (Gate Valves, Water Meters & Pressure	6.00	28-Jul-19	03-Aug-19	19-Oct-19 A	27-Feb-20	100%	10.56%	$64,693.91	$6,828.80	In Progres	22-Feb-20
P12D2-TRM-MZ-148	Conduits, Cables and Conductors	6.00	06-Aug-19	17-Aug-19	19-Oct-19 A	17-Feb-20	100%	30%	$77,722.39	$23,316.72	In Progres	11-Feb-20
P12D2-TRM-BF-148	Conduits, Cables and Conductors	6.00	21-Aug-19	27-Aug-19	19-Oct-19 A	30-Jan-20	100%	30%	$51,814.93	$15,544.48	In Progres	26-Jan-20
P12D2-TRM-MZ-198	Masonry Block Works	6.00	27-Jun-19	03-Jul-19	14-Dec-19 A	11-Jan-20	100%	8.68%	$41,464.19	$3,599.32	In Progres	04-Jan-20
P12D2-TRM-GF-148	Conduits, Cables and Conductors	6.00	07-Jul-19	13-Jul-19	19-Oct-19 A	06-Jan-20	100%	30%	$129,537.32	$38,861.20	In Progres	01-Jan-20
P12D2-TRM-GF-748	Earthing Conduits and Cable Accessories	5.00	14-Jul-19	18-Jul-19	19-Oct-19 A	05-Jan-20	100%	30%	$22,486.63	$6,745.99	In Progres	01-Jan-20
P12D2-TRM-GF-198	Masonry Block Works	12.00	23-Jun-19	06-Jul-19	14-Dec-19 A	09-Jan-20	100%	33.45%	$69,106.98	$23,119.65	In Progres	01-Jan-20
P12D2-TRM-GF-354	Reinforced Concrete for Columns, Walls and	12.00	20-May-19	02-Jun-19	21-Jun-19 A	01-Jan-20	100%	99.98%	$156,478.82	$156,451.65	In Progres	01-Jan-20
P12D2-SDAPP-1844	Structure cabling network system Drawings (I	24.00	20-May-19	19-Jun-19	14-Jun-19 A	06-Jan-20	100%	58.62%	$70,845.98	$41,529.76	In Progres	26-Dec-19
P12D2-SDAPP-1841	Power system Drawings (Internal)	24.00	25-Mar-19	21-Apr-19	14-Jun-19 A	06-Jan-20	100%	58.62%	$70,845.98	$41,529.76	In Progres	26-Dec-19
P12D2-SDAPP-1843	Structure cabling network system Drawings (I	24.00	22-May-19	22-Jun-19	14-Jun-19 A	30-Dec-19	100%	82.86%	$70,845.98	$58,700.07	In Progres	25-Dec-19
P12D2-MTPROC-1804	Interior Lighting	30.00	03-Jul-19	06-Aug-19	20-Jun-19 A	21-Jan-20	100%	23.33%	$7,328.89	$1,710.08	In Progres	25-Dec-19
P12D2-SDAPP-1847	Fire alarm system Drawings	24.00	26-May-19	25-Jun-19	14-Jun-19 A	31-Dec-19	100%	78.18%	$70,845.98	$55,385.32	In Progres	25-Dec-19
P12D2-SDAPP-1845	Lighting system Drawings (Internal)	24.00	05-May-19	01-Jun-19	14-Jun-19 A	31-Dec-19	100%	78.18%	$70,845.98	$55,385.32	In Progres	25-Dec-19
P12D2-MTAPP-2076	Aluminum framed storefront & Curtain walls	24.00	22-Apr-19	19-May-19	03-Jun-19 A	25-Dec-19	100%	80%	$22,771.92	$18,217.54	In Progres	21-Dec-19
P12D2-MTAPP-2066	Glazing	24.00	06-May-19	02-Jun-19	03-Jun-19 A	25-Dec-19	100%	80%	$22,771.92	$18,217.54	In Progres	21-Dec-19
P12D2-MTAPP-2056	Doors & Windows	24.00	20-May-19	19-Jun-19	16-Jun-19 A	05-Jan-20	100%	44%	$22,771.92	$10,020.04	In Progres	21-Dec-19
P12D2-MTSUB-2076	Aluminum framed storefront & Curtain walls	12.00	08-Apr-19	21-Apr-19	14-Jun-19 A	21-Dec-19	100%	92.31%	$22,771.92	$21,020.54	In Progres	21-Dec-19
P12D2-MTSUB-2066	Glazing	12.00	22-Apr-19	05-May-19	14-Jun-19 A	21-Dec-19	100%	92.31%	$22,771.92	$21,020.54	In Progres	21-Dec-19
P12D2-MTSUB-2056	Doors & Windows	12.00	06-May-19	19-May-19	21-Jun-19 A	26-Dec-19	100%	50%	$22,771.92	$11,385.96	In Progres	21-Dec-19
P12D2-MTAPP-1243	Stone Cladding	24.00	22-Jun-19	18-Jul-19	09-Jun-19 A	28-Dec-19	100%	70.83%	$22,771.92	$16,130.11	In Progres	21-Dec-19
P12D2-MTSUB-1241	Stone Cladding	12.00	08-Jun-19	20-Jun-19	17-Jun-19 A	22-Dec-19	100%	83.33%	$22,771.92	$18,976.60	In Progres	21-Dec-19

FIGURE 17

STEP 5

5- COST LOADING (IF THERE IS ANY).

-THERE IS NO SCOPE CHANGE IN THIS EXAMPLE. THEREFORE, THE BUDGETED COST WILL REMAIN THE SAME.

STEP 6

6- FIX THE REMAINING DURATION (GET RID OF DECIMALS).

-IF YOU SHOW THE DECIMALS IN PRIMAVERA BY GOING TO EDIT TAB THEN USER PREFERENCES, YOU WILL NOTICE THAT THE REMAINING DURATION FOR IN PROGRESS ACTIVITIES HAS DECIMALS, WHICH WILL AFFECT THE TOTAL FLOAT CALCULATIONS.

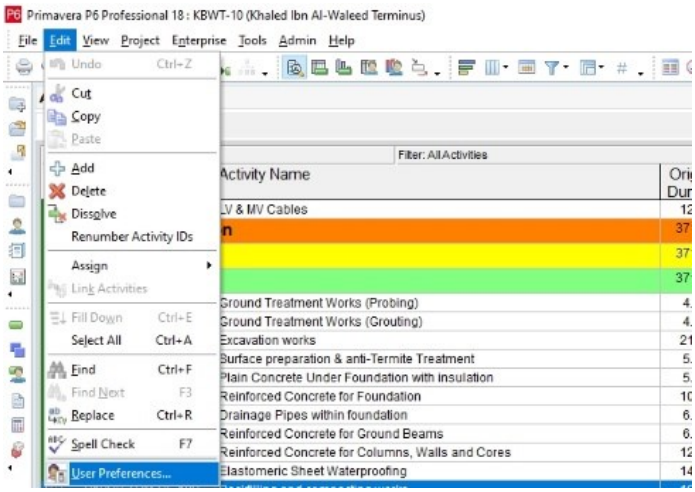


FIGURE 18

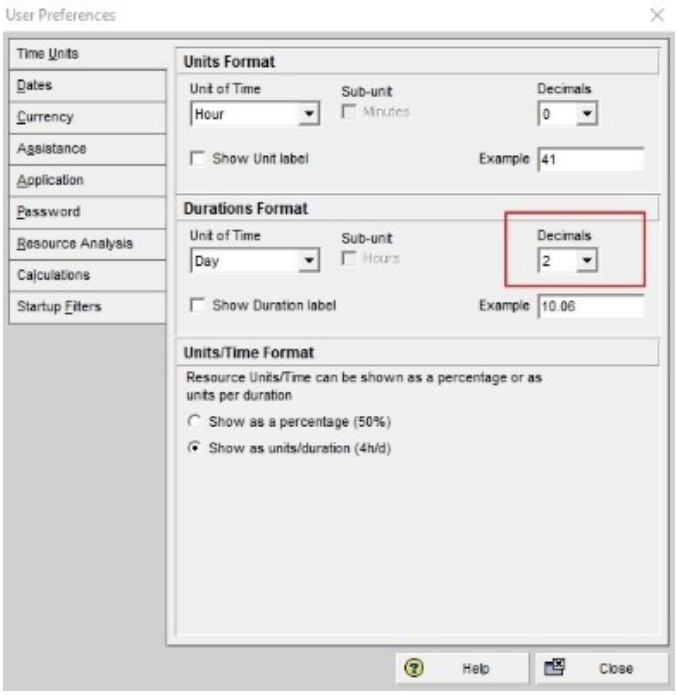


FIGURE 19

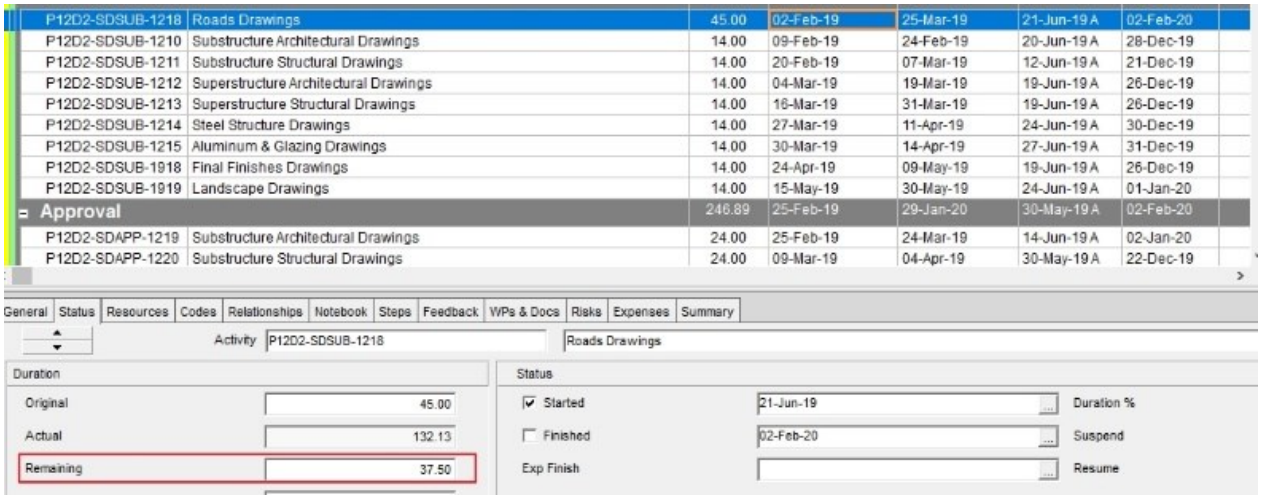


FIGURE 20

SO, WE WILL EXPORT THE REMAINING DURATION FOR **IN PROGRESS** ACTIVITIES AND ROUND IT USING EXCEL TO BE EQUAL TO CORRECT NUMBERS WITHOUT DECIMALS.

HINT: THIS STEP WILL HAS A SLIGHTLY EFFECT ON CALCULATED PERFORMANCE PERCENTAGES & IT WILL AFFECT THE FORECAST FINISH DATE SO YOU HAVE TO FIX IT AFTER YOU FINISH THIS STEP.

-GO TO FILE THEN EXPORT.

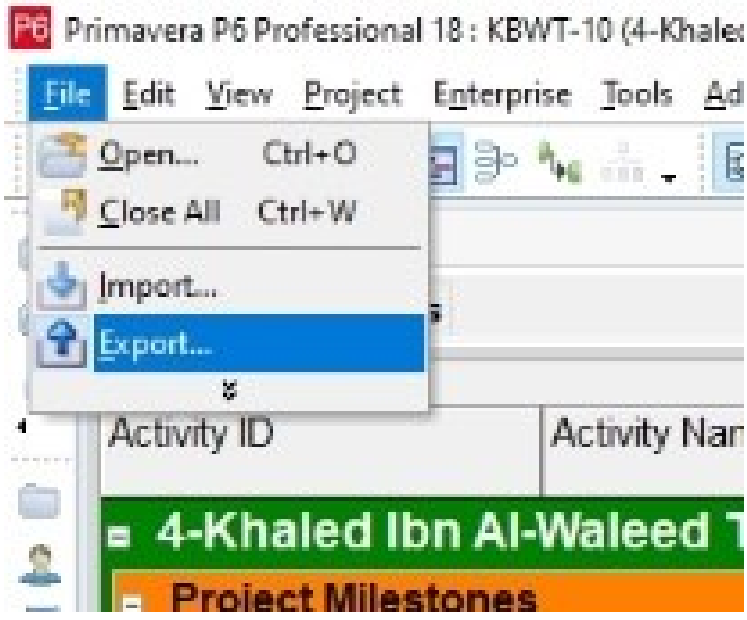


FIGURE 21

-SELECT EXPORT AS EXCEL FORMAT

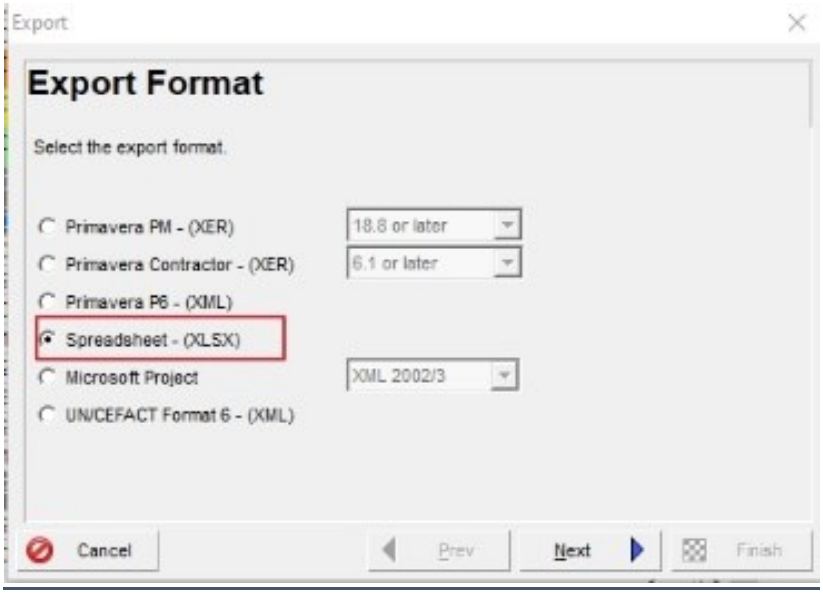


FIGURE 22

-SELECT EXPORTING THE ACTIVITIES.

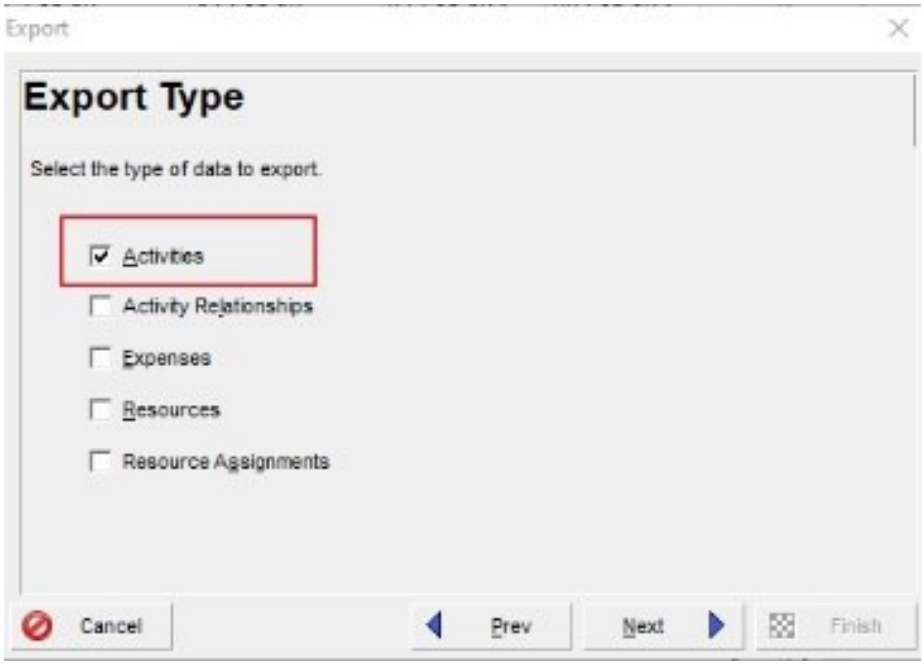


FIGURE 23

-Select your project.

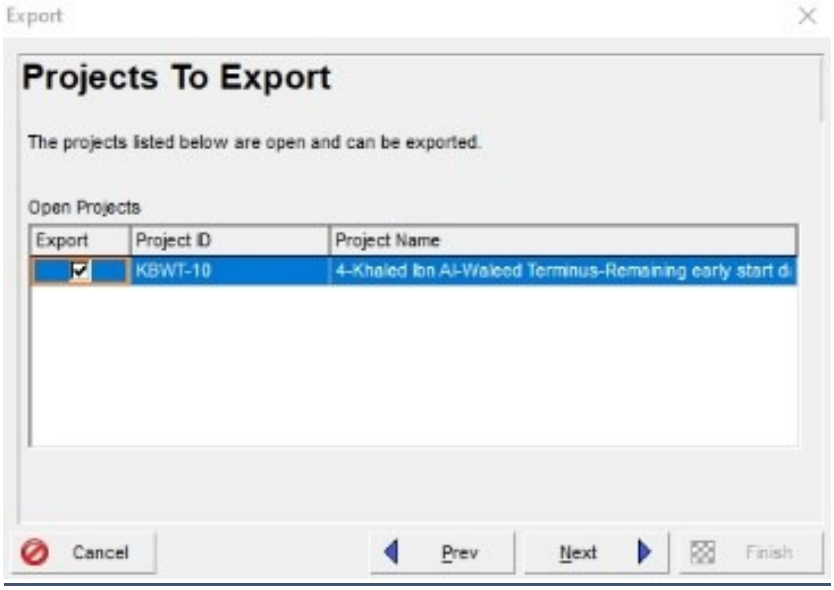


FIGURE 24

-Select the right template.

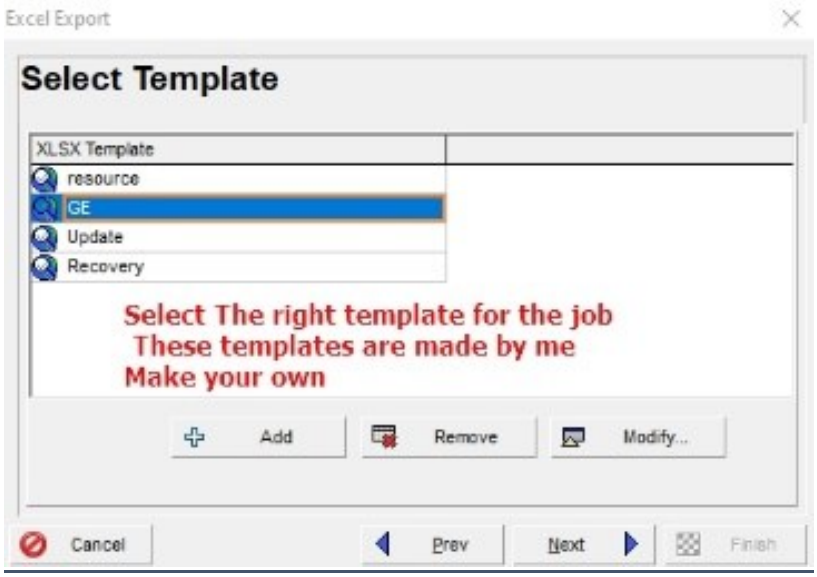


FIGURE 25

- Don’t forget to export the remaining duration

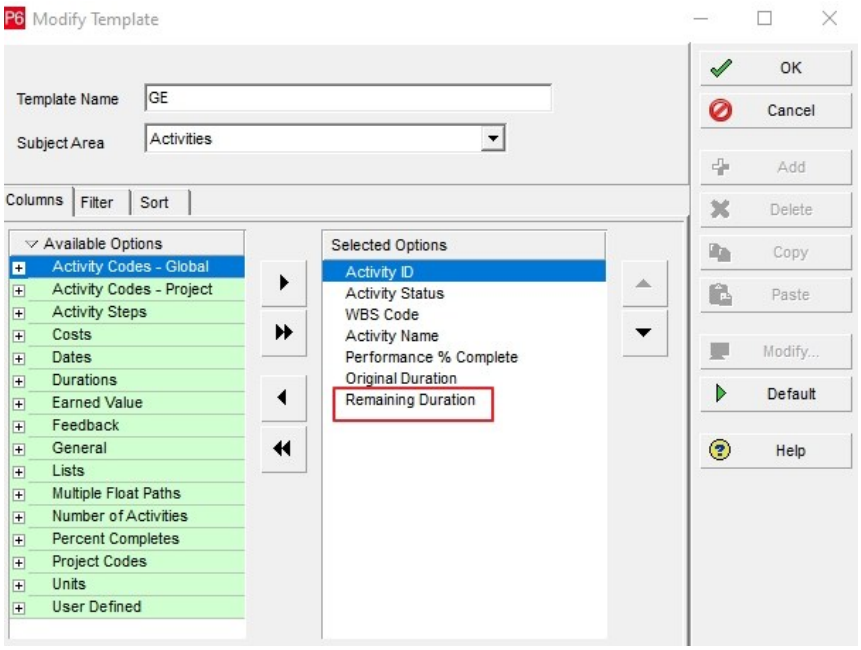


FIGURE 26

-Select the location to save the exported file to.

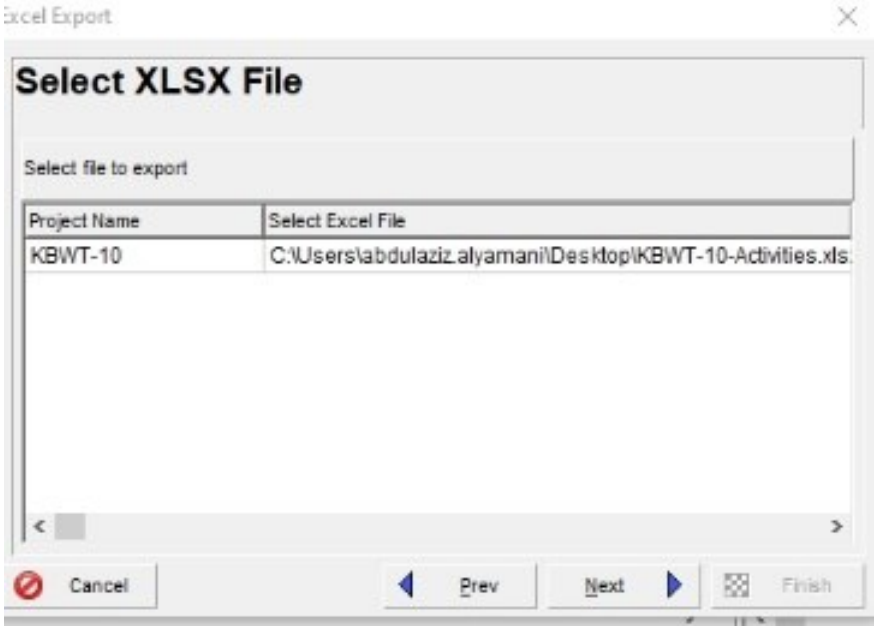


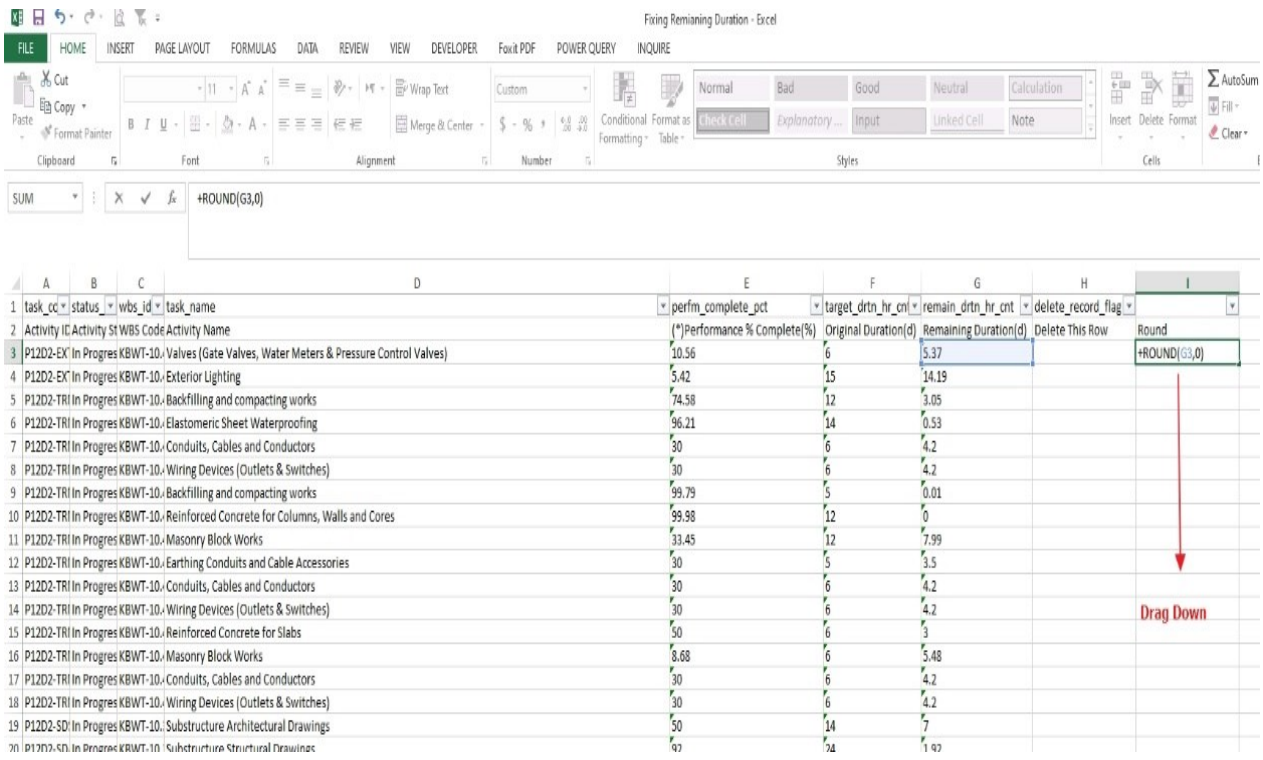
FIGURE 27

-Use the round equation in excel to get rid of the decimals of the remaining duration.

Hint: after rounding the remaining duration you have to check the following:

-Some activities with a very high performance complete may have a very low remaining duration (Less than 0.5) that will be rounded to zero, which is wrong, because an in progress activity can't have zero remaining duration, so you have to fix it to 1 manually.

-Some activities with a very low performance % complete may have a high remaining duration that will be rounded to equal the original duration, which is wrong, because an in progress activity can't have a remaining duration equal to original duration, so you have to fix it manually to equal **(Original duration-1)**



	A	B	C	D	E	F	G	H	I
1	task_co	status_	wbs_id	task_name	perfm_complete_pct	target_drtn_hr_cn	remain_drtn_hr_cnt	delete_record_flag	
2	Activity ID	Activity St	WBS Code	Activity Name	(*)Performance % Complete(%)	Original Duration(d)	Remaining Duration(d)	Delete This Row	Round
3	P12D2-EX	In Progres	KBWT-10.	Valves (Gate Valves, Water Meters & Pressure Control Valves)	10.56	6	5.37		+ROUND(G3,0)
4	P12D2-EX	In Progres	KBWT-10.	Exterior Lighting	5.42	15	14.19		
5	P12D2-TR	In Progres	KBWT-10.	Backfilling and compacting works	74.58	12	3.05		
6	P12D2-TR	In Progres	KBWT-10.	Elastomeric Sheet Waterproofing	96.21	14	0.53		
7	P12D2-TR	In Progres	KBWT-10.	Conduits, Cables and Conductors	30	6	4.2		
8	P12D2-TR	In Progres	KBWT-10.	Wiring Devices (Outlets & Switches)	30	6	4.2		
9	P12D2-TR	In Progres	KBWT-10.	Backfilling and compacting works	99.79	5	0.01		
10	P12D2-TR	In Progres	KBWT-10.	Reinforced Concrete for Columns, Walls and Cores	99.98	12	0		
11	P12D2-TR	In Progres	KBWT-10.	Masonry Block Works	33.45	12	7.99		
12	P12D2-TR	In Progres	KBWT-10.	Earthing Conduits and Cable Accessories	30	5	3.5		
13	P12D2-TR	In Progres	KBWT-10.	Conduits, Cables and Conductors	30	6	4.2		
14	P12D2-TR	In Progres	KBWT-10.	Wiring Devices (Outlets & Switches)	30	6	4.2		
15	P12D2-TR	In Progres	KBWT-10.	Reinforced Concrete for Slabs	50	6	3		
16	P12D2-TR	In Progres	KBWT-10.	Masonry Block Works	8.68	6	5.48		
17	P12D2-TR	In Progres	KBWT-10.	Conduits, Cables and Conductors	30	6	4.2		
18	P12D2-TR	In Progres	KBWT-10.	Wiring Devices (Outlets & Switches)	30	6	4.2		
19	P12D2-SD	In Progres	KBWT-10.	Substructure Architectural Drawings	50	14	7		
20	P12D2-SD	In Progres	KBWT-10.	Substructure Structural Drawings	92	24	1.92		

FIGURE 28

STEP 7

7-FIX ACTUAL START DATES BY CALCULATING THE ACTUAL DURATION DEPENDING ON ORIGINAL DURATION.

IN ORDER TO FIX THE ACTUAL START DATES FOR IN PROGRESS ACTIVITIES WE WILL DO IT USING EXCEL AND THEN IMPORT IT BACK TO PRIMAVERA.

TO KNOW THE NEW ACTUAL START DATE WE WILL MULTIPLY THE PERFORMANCE PERCENTAGE COMPLETE BY THE ORIGINAL DURATION THEN WE WILL ROUND THE FIGURES TO GET RID OF ANY DECIMALS AND SUBTRACT IT FROM THE PROJECT DATA DATE. (REFER TO EQUATION 1)

HINT: WE WILL **ADD 1** TO THE ORIGINAL DURATION TO MATCH THE CALCULATION OF DAYS BETWEEN PRIMAVERA AND EXCEL, AND DO NOT FORGET TO USE THE **(WORKDAY.INT)** EQUATION IN THE CALCULATION OF THE NEW ACTUAL START DATE TO EXCLUDE THE NONWORKING DAYS.

-EXPORT THE IN PROGRESS ACTIVITIES AND SHOW THE COLUMNS IN FIGURE 29 WHILE EXPORTING.

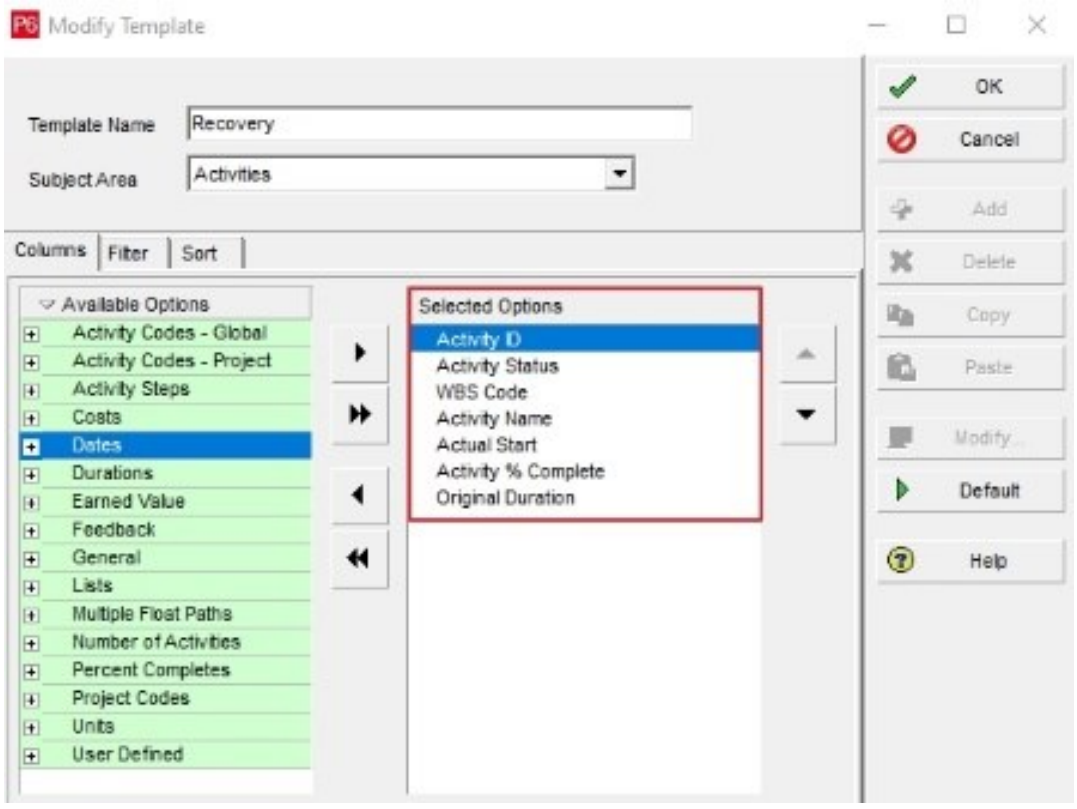
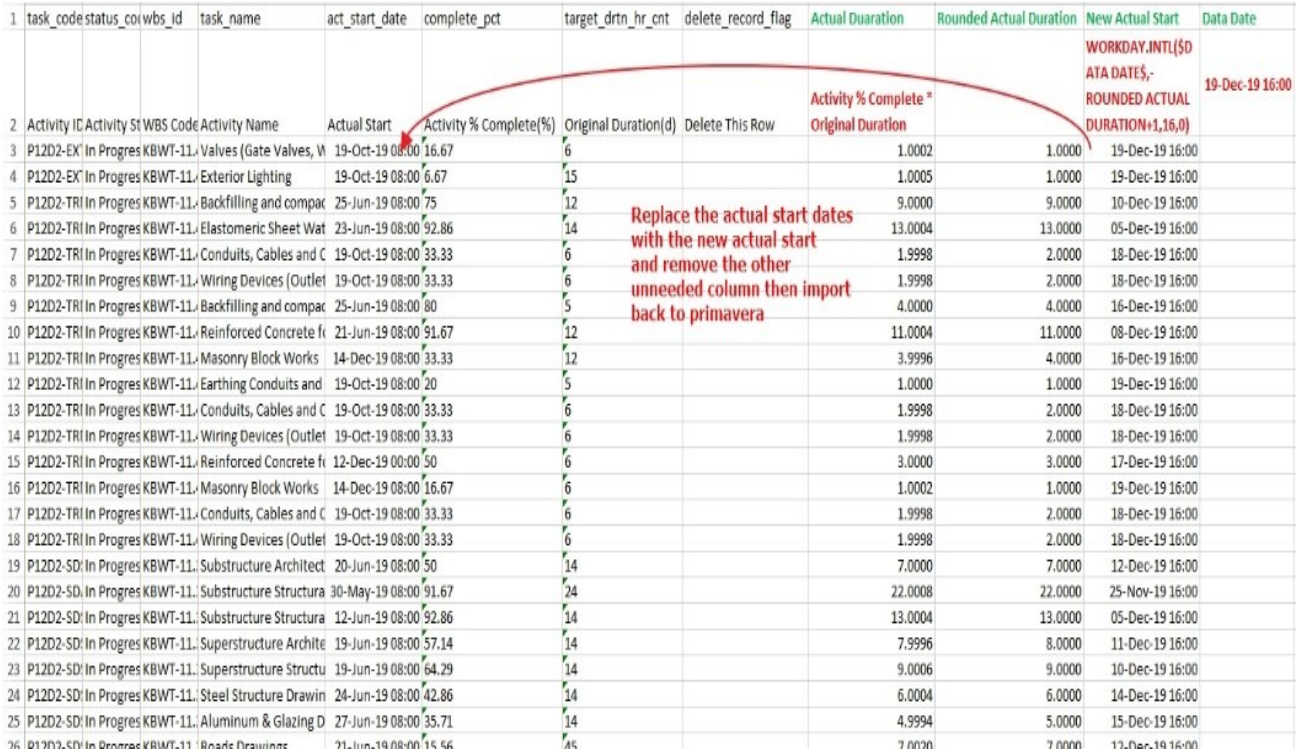


FIGURE 29

-Replace the actual start dates with the new actual start dates and don't forget to fix the actual start hours to be in the beginning of the day, I fixed them after taking the screen shot.



1	task_code	status_co	wbs_id	task_name	act_start_date	complete_pct	target_drtn_hr_cnt	delete_record_flag	Actual Duaration	Rounded Actual Duration	New Actual Start	Data Date
2	Activity ID	Activity St	WBS Code	Activity Name	Actual Start	Activity % Complete(%)	Original Duration(d)	Delete This Row	Activity % Complete * Original Duration		WORKDAY.INTL($DATA DATE$,-ROUNDED ACTUAL DURATION+1,16,0)	19-Dec-19 16:00
3	P12D2-EX	In Progres	KBWT-11.4	Valves (Gate Valves, V	19-Oct-19 08:00	16.67	6		1.0002	1.0000	19-Dec-19 16:00	
4	P12D2-EX	In Progres	KBWT-11.4	Exterior Lighting	19-Oct-19 08:00	6.67	15		1.0005	1.0000	19-Dec-19 16:00	
5	P12D2-TRI	In Progres	KBWT-11.4	Backfilling and compac	25-Jun-19 08:00	75	12		9.0000	9.0000	10-Dec-19 16:00	
6	P12D2-TRI	In Progres	KBWT-11.4	Elastomeric Sheet Wat	23-Jun-19 08:00	92.86	14		13.0004	13.0000	05-Dec-19 16:00	
7	P12D2-TRI	In Progres	KBWT-11.4	Conduits, Cables and C	19-Oct-19 08:00	33.33	6		1.9998	2.0000	18-Dec-19 16:00	
8	P12D2-TRI	In Progres	KBWT-11.4	Wiring Devices (Outlet	19-Oct-19 08:00	33.33	6		1.9998	2.0000	18-Dec-19 16:00	
9	P12D2-TRI	In Progres	KBWT-11.4	Backfilling and compac	25-Jun-19 08:00	80	5		4.0000	4.0000	16-Dec-19 16:00	
10	P12D2-TRI	In Progres	KBWT-11.4	Reinforced Concrete fo	21-Jun-19 08:00	91.67	12		11.0004	11.0000	08-Dec-19 16:00	
11	P12D2-TRI	In Progres	KBWT-11.4	Masonry Block Works	14-Dec-19 08:00	33.33	12		3.9996	4.0000	16-Dec-19 16:00	
12	P12D2-TRI	In Progres	KBWT-11.4	Earthing Conduits and	19-Oct-19 08:00	20	5		1.0000	1.0000	19-Dec-19 16:00	
13	P12D2-TRI	In Progres	KBWT-11.4	Conduits, Cables and C	19-Oct-19 08:00	33.33	6		1.9998	2.0000	18-Dec-19 16:00	
14	P12D2-TRI	In Progres	KBWT-11.4	Wiring Devices (Outlet	19-Oct-19 08:00	33.33	6		1.9998	2.0000	18-Dec-19 16:00	
15	P12D2-TRI	In Progres	KBWT-11.4	Reinforced Concrete fo	12-Dec-19 00:00	50	6		3.0000	3.0000	17-Dec-19 16:00	
16	P12D2-TRI	In Progres	KBWT-11.4	Masonry Block Works	14-Dec-19 08:00	16.67	6		1.0002	1.0000	19-Dec-19 16:00	
17	P12D2-TRI	In Progres	KBWT-11.4	Conduits, Cables and C	19-Oct-19 08:00	33.33	6		1.9998	2.0000	18-Dec-19 16:00	
18	P12D2-TRI	In Progres	KBWT-11.4	Wiring Devices (Outlet	19-Oct-19 08:00	33.33	6		1.9998	2.0000	18-Dec-19 16:00	
19	P12D2-SD	In Progres	KBWT-11..	Substructure Architect	20-Jun-19 08:00	50	14		7.0000	7.0000	12-Dec-19 16:00	
20	P12D2-SD	In Progres	KBWT-11..	Substructure Structura	30-May-19 08:00	91.67	24		22.0008	22.0000	25-Nov-19 16:00	
21	P12D2-SD	In Progres	KBWT-11..	Substructure Structura	12-Jun-19 08:00	92.86	14		13.0004	13.0000	05-Dec-19 16:00	
22	P12D2-SD	In Progres	KBWT-11..	Superstructure Archite	19-Jun-19 08:00	57.14	14		7.9996	8.0000	11-Dec-19 16:00	
23	P12D2-SD	In Progres	KBWT-11..	Superstructure Structu	19-Jun-19 08:00	64.29	14		9.0006	9.0000	10-Dec-19 16:00	
24	P12D2-SD	In Progres	KBWT-11..	Steel Structure Drawin	24-Jun-19 08:00	42.86	14		6.0004	6.0000	14-Dec-19 16:00	
25	P12D2-SD	In Progres	KBWT-11..	Aluminum & Glazing D	27-Jun-19 08:00	35.71	14		4.9994	5.0000	15-Dec-19 16:00	
26	P12D2-SD	In Progres	KBWT-11	Roads Drawings	21-Jun-19 08:00	15.56	45		7.0020	7.0000	12-Dec-19 16:00	

Replace the actual start dates with the new actual start and remove the other unneeded column then import back to primavera

FIGURE 30

Hint:

-In some cases if there is a very low activity percentage and the calculated actual duration result is less than **0.5** it will be rounded to zero, so you have to check if there is any zero after rounding the result and make it 1.

-In other cases if there is a very high activity percentage the calculated actual duration will be rounded to equal the original duration, so you have to subtract 1 from the result.

-After you finish you have to check that

Rounded actual duration + Remaining Duration = Original Duration.

-After you import **if the forecast finish date of the project is changed** its usually because the remaining early start dates have been changed so fix them again to bring back your forecast finish date to the date required.

STEP 8

8-PERFORM GLOBAL CHANGE FOR COMPLETED AND IN PROGRESS ACTIVITIES.

THE LAST STEP IS TO PERFORM 3 GLOBAL CHANGES, 2 OF THEM FOR COMPLETED ACTIVITIES AND THE LAST 1 IS FOR THE IN PROGRESS ACTIVITIES TO MAKE THE PLANNED DATED EQUAL TO ACTUAL DATES. THEREFORE, THE SCHEDULED PERCENTAGE WILL BE EQUAL TO PERFORMANCE PERCENTAGE.

-GLOBAL CHANGE 1 (FOR COMPLETED ACTIVITIES)

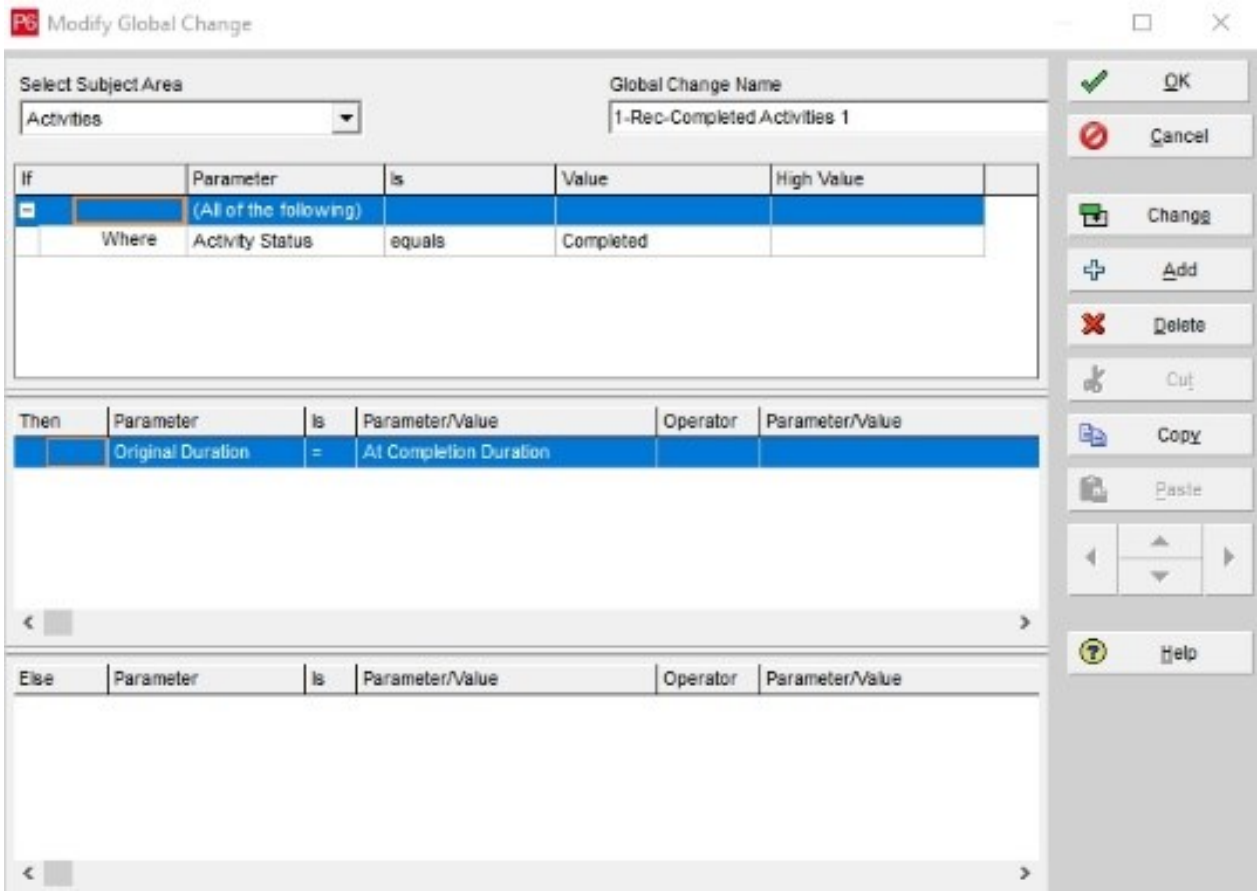


FIGURE 31

-GLOBAL CHANGE 2 (FOR COMPLETED ACTIVITIES)

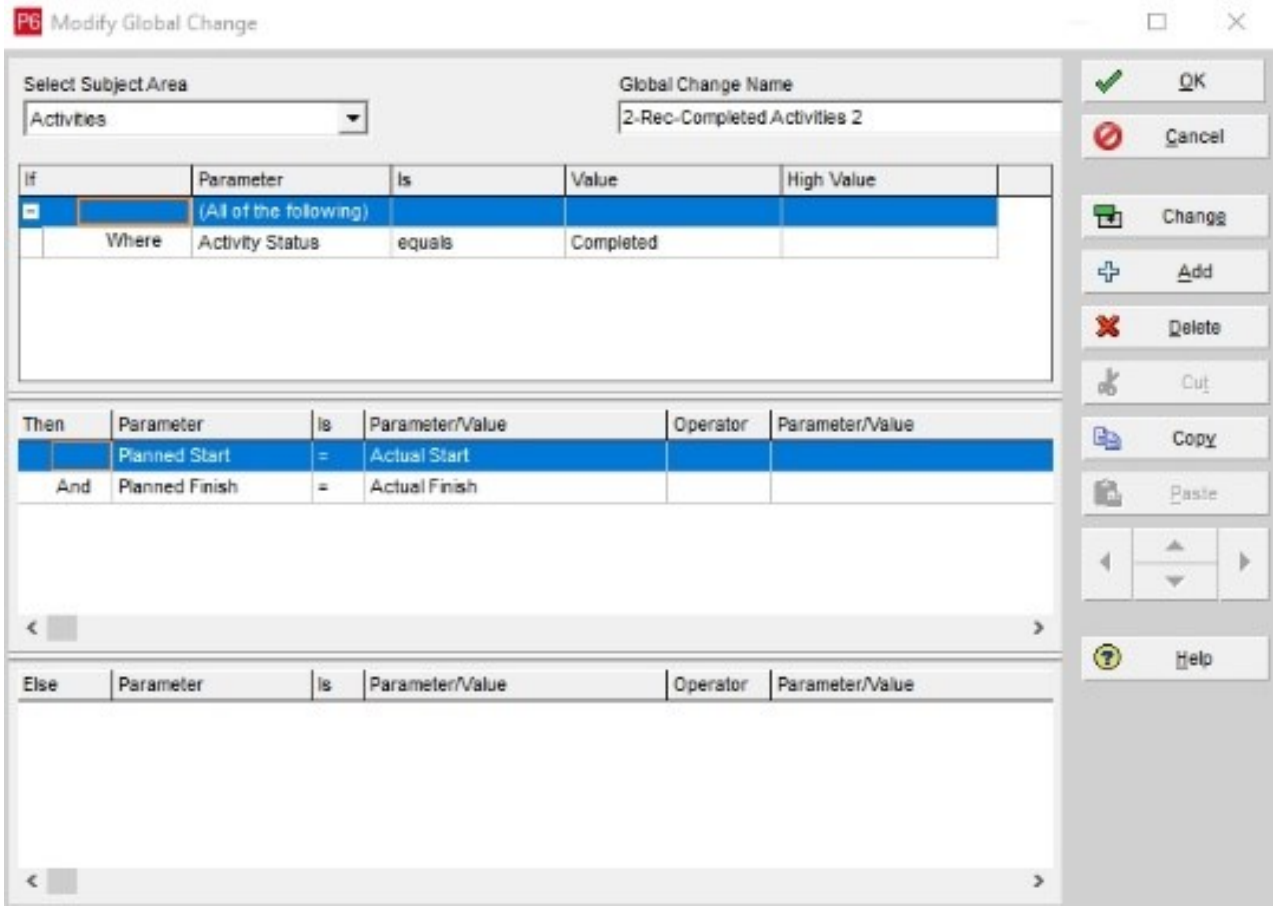


FIGURE 32

-Global Change 3 (For in progress activities)

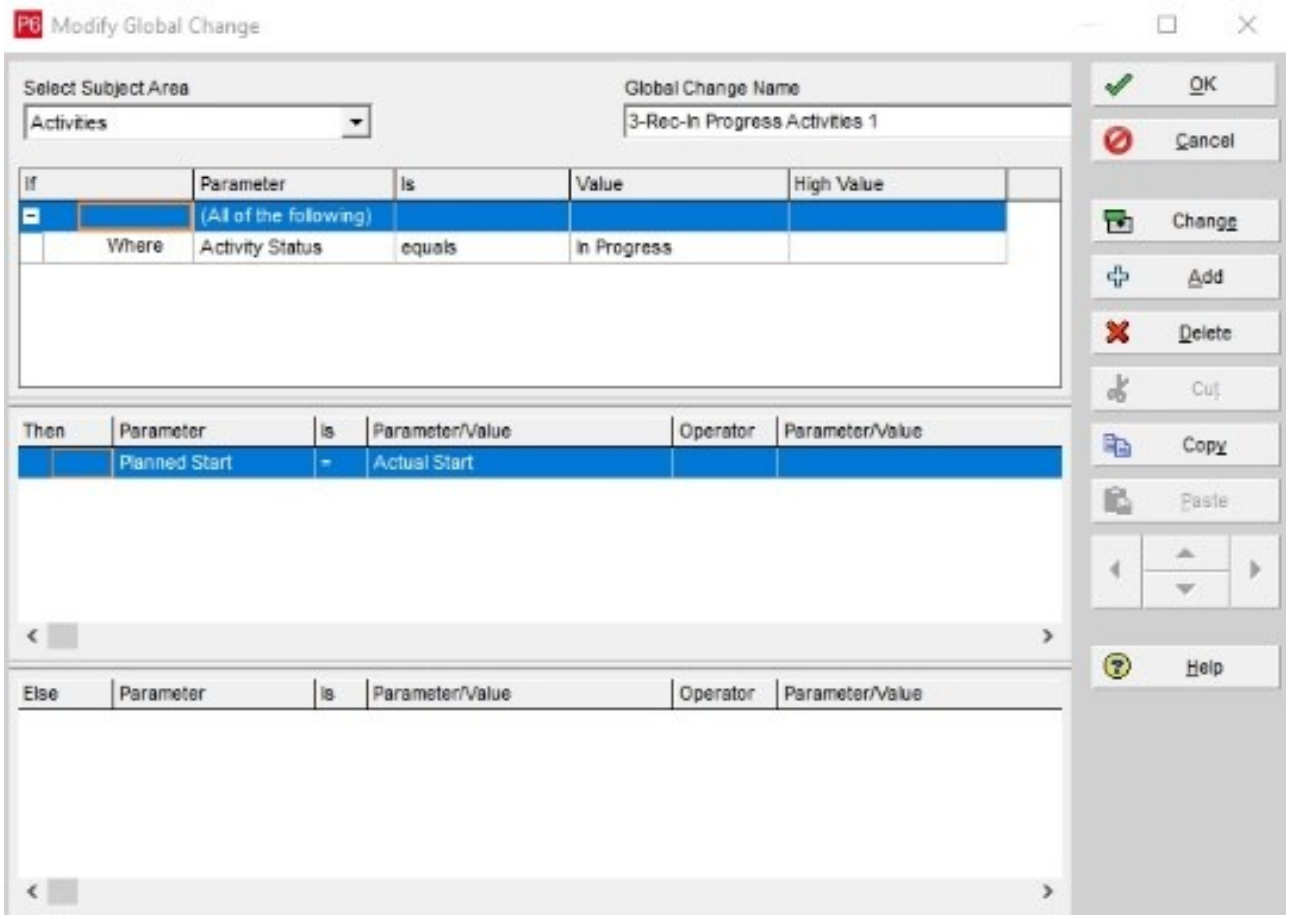


Figure 33

-Now after performing the global changes we have done our revised schedule and the performance percentage is equal to the scheduled percentage (19.37%) with only 0.08% change in the performance percentage when we started (19.45%) and the new forecast finish date for the project is 15th Jun 2020.

Start	Finish	Schedule % Complete	Performance % Complete	Planned Value Cost	Earned Value Cost
02-Feb-19 08:00 AM A	15-Jun-20 04:00 PM	19.37%	19.37%	$8,234,177.68	$8,234,177.68

Figure 34

When we started this paper we mentioned that there are 3 ways to do this operation and we explained the first one in detail. Now we will speak generally about the other two ways.

2-The second way

Is to change the performance % percentage for the activities to be equal to the scheduled percentage using global change.

using this way you will keep the actual start dates un touched but the performance percentage complete will be unrealistic.

However, If you decided to take this approach you will have to go through steps 1 to 6 as mentioned above and then to use the following global changes.

-For completed activities you will make the same global changes in figure 31 & figure 32.

-For in progress activities you will make 2 global changes which are in figure 35 and after that make the one in figure 33

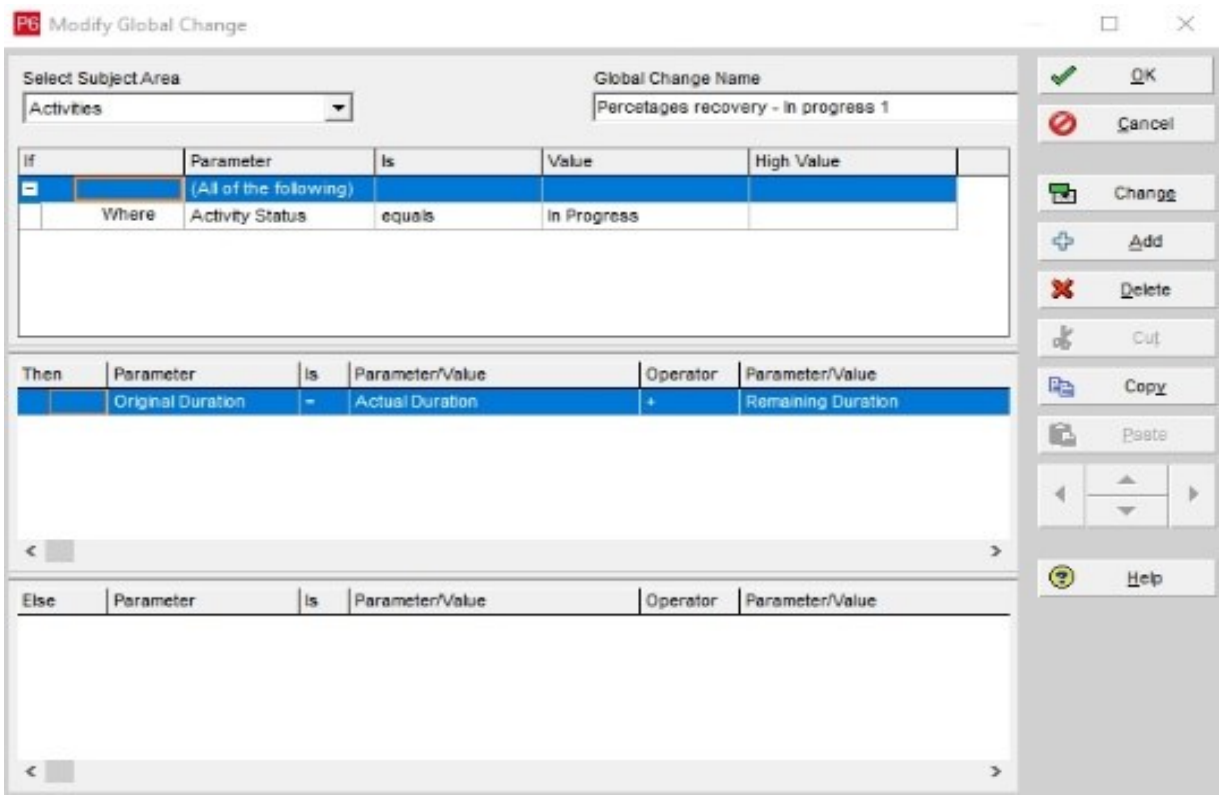


Figure 35

I performed this way to the same project in the example, so notice the below result.

Finish	Schedule % Complete	Performance % Complete	Planned Value Cost	Earned Value Cost
15-Jun-20 04:00 PM	24.43%	24.43%	$10,385,936.05	$10,385,936.05

FIGURE 36

Notice how the performance percentage complete increased dramatically.

3-THE THIRD WAY

IS TO SEPARATE ALL THE IN PROGRESS ACTIVITIES TO TWO ACTIVITIES, ONE OF THEM IS COMPLETED AND THE OTHER ONE IS NOT STARTED WITH A FINISH TO START RELATIONSHIP BETWEEN THEM.

USING THIS WAY YOU WILL HAVE ONLY 2 TYPES OF ACTIVITIES IN YOUR SCHEDULE (COMPLETED) & (NOT STARTED) PRESERVING THE SAME PERFORMANCE PERCENTAGE COMPLETE AND WITHOUT CHANGING THE ACTUAL START DATES WHICH I PERSONALLY BELIEVE IT'S THE BEST APPROACH. HOWEVER, YOU WILL FACE A PROBLEM IF YOU HAVE A DATA LOADING BECAUSE YOU WILL NEED A LOT OF EFFORT TO FIX YOUR DATA LOADING TO MATCH WITH THE NEW ADDED ACTIVITIES.

TO USE THIS WAY YOU HAVE TO SEPARATE THE COST & RESOURCES FOR THE IN PROGRESS ACTIVITY AND CALCULATE THE AMOUNT OF COST AND RESOURCES THAT WILL BE LOADED TO THE COMPLETED PART OF THE ACTIVITY USING THE BUDGETED QUANTITIES AND ACTIVITY PERCENTAGE COMPLETE TO MATCH THE ACTUAL STATUS OF THE ACTIVITY AS THE FIRST PART OF THE ACTIVITY WILL BE COMPLETED WITH 100% PERCENTAGE COMPLETE.

AFTER THAT YOU WILL USE THE SAME GLOBAL CHANGES FOR COMPLETED ACTIVITIES MENTIONED ABOVE TO MATCH THE PLANNED WITH THE ACTUAL BUT YOU WILL NOT USE THE IN PROGRESS GLOBAL CHANGES SINCE YOU WILL NOT HAVE ANY.

I HOPE THIS PAPER WAS AN ADDED VALUE TO YOU AND I HOPE YOU SHARE IT WITH ANYBODY IN NEED.

THANK YOU