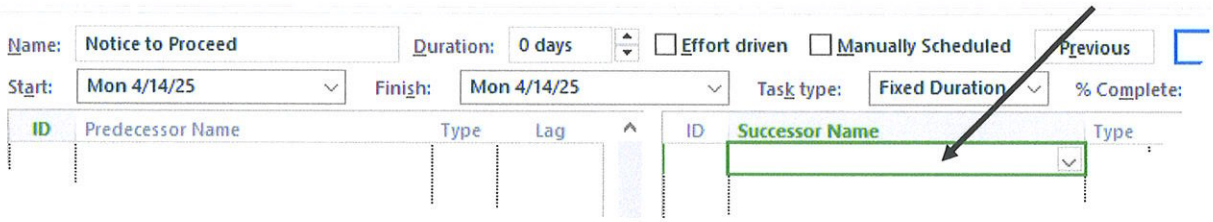
The next step is to add the logic to the schedule. Logic can be viewed from two different perspectives – predecessors or successors. A predecessor is a task that precedes another task. A successor is a task that follows (or succeeds) another task. One is equally as valid as the other. Personal preference should dictate which one to use. For this manual we will use successors.

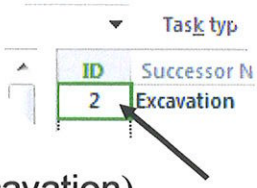
Follow these steps to input the logic of the schedule.

4. Select the **Notice to Proceed** task. Then click into the Successor Name cell of the Task Form as shown below.

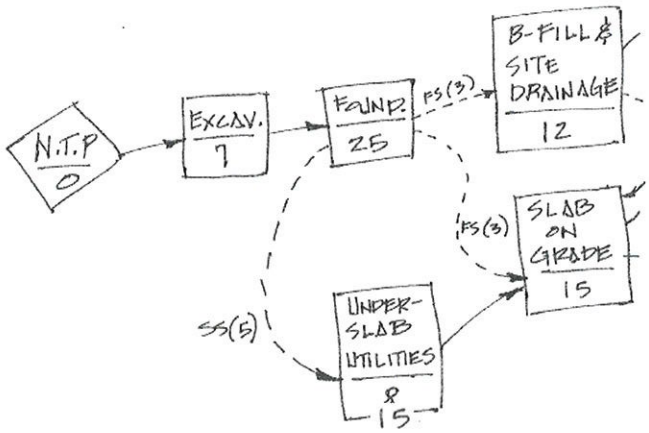


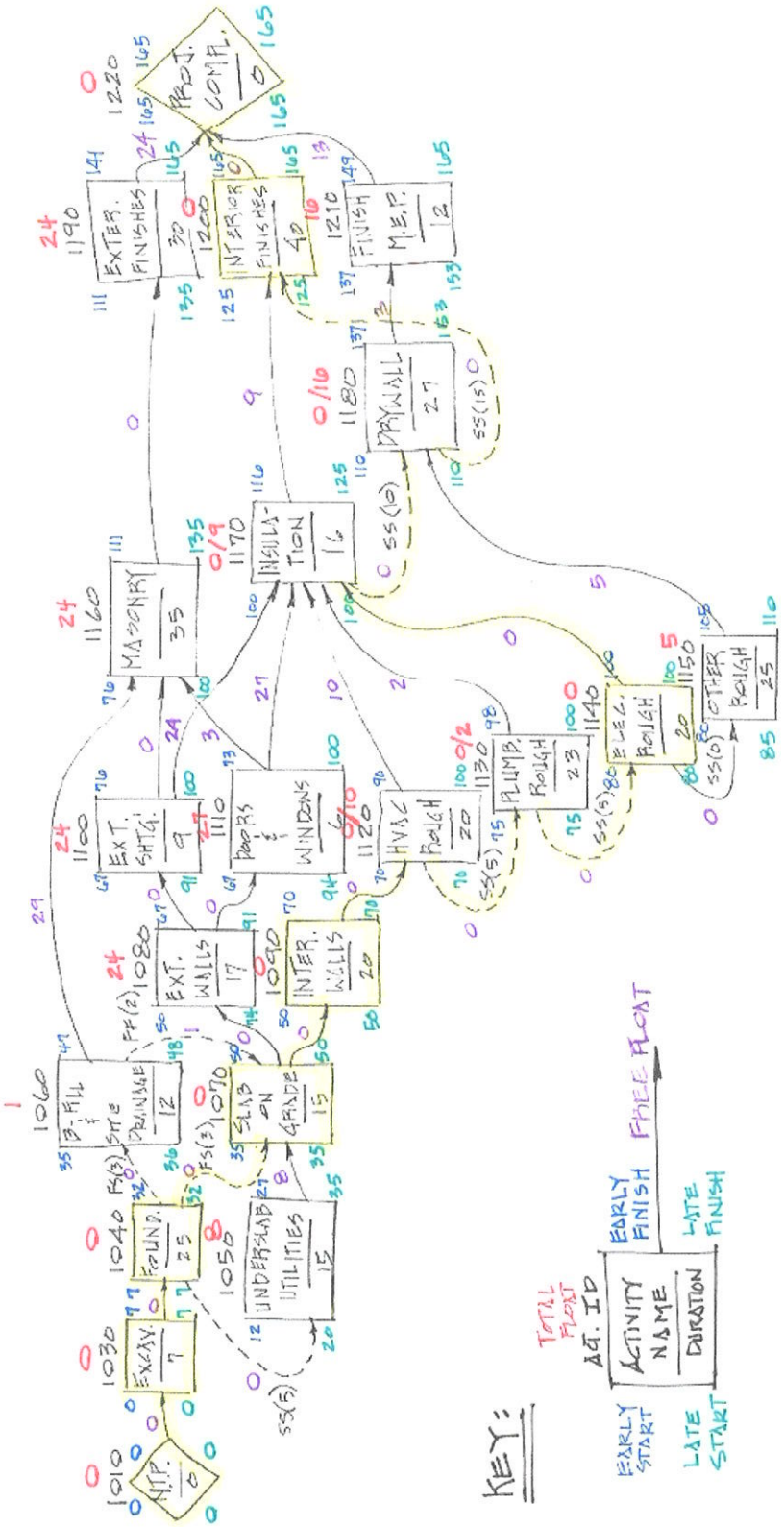
5. A partial view of the *hand-drawn* schedule is shown below. Notice that Excavation follows Notice to Proceed. Enter this logic into the schedule by using the pull-down to select the **Excavation** task as a successor to Notice to Proceed. Then, click OK .

Note: If you happen to enter the wrong task and want to remove it, simply click onto the task ID number as shown to the right and delete it.



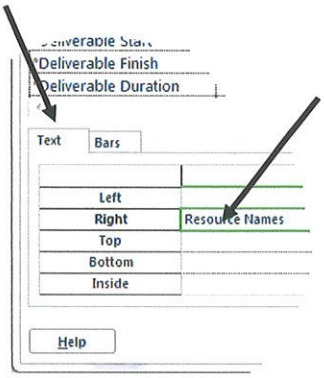
6. Click the Next button to move to the next task in line (Excavation). From the partial hand-drawn schedule, you can see that the Foundation task follows Excavation. Enter **Foundation** as a successor to Excavation. Then, click OK .



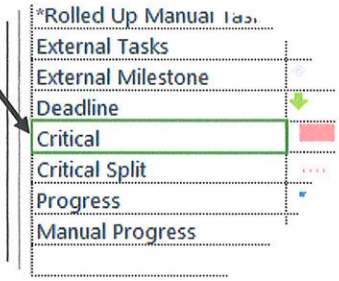


Same Schedule – Hand Drawn with Hand Calculations

2. On the lower left side of this window, select the **Text** tab as shown here to the right. Next, click in the field that currently contains Resource Names as shown to the right. Use the pull-down in this field to select **Name**. After it is selected, click OK. Notice that now, all of the *non-critical* tasks (blue bar tasks) show the Task Name to the right of each bar.

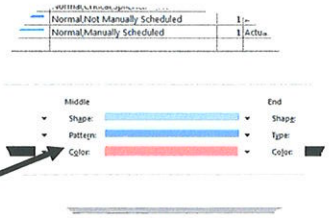


3. Repeat this same step for the *critical* tasks. To do this, open the same window; however, this time – first scroll down to the **Critical** name (fourth from the bottom) using the scroll bar on the far right side of the window, and select it as shown here below to the right.

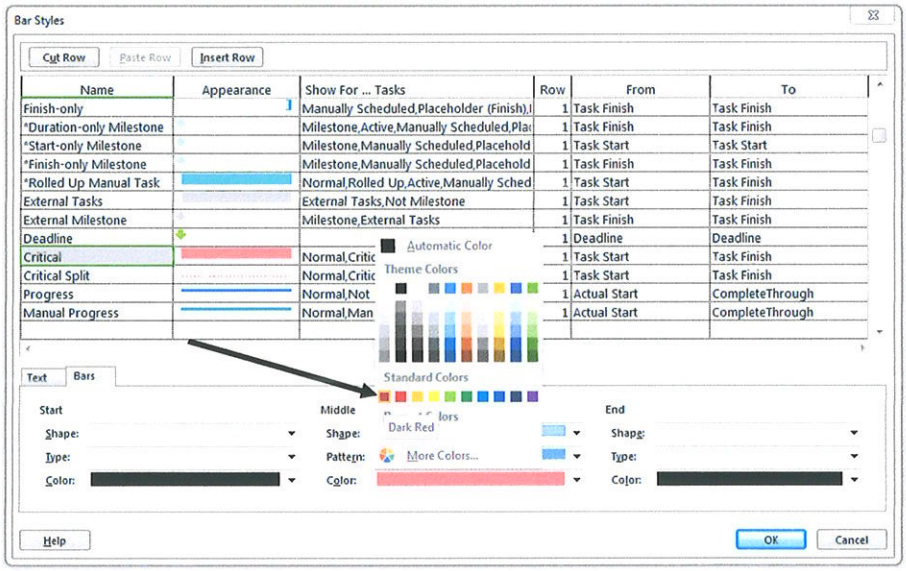


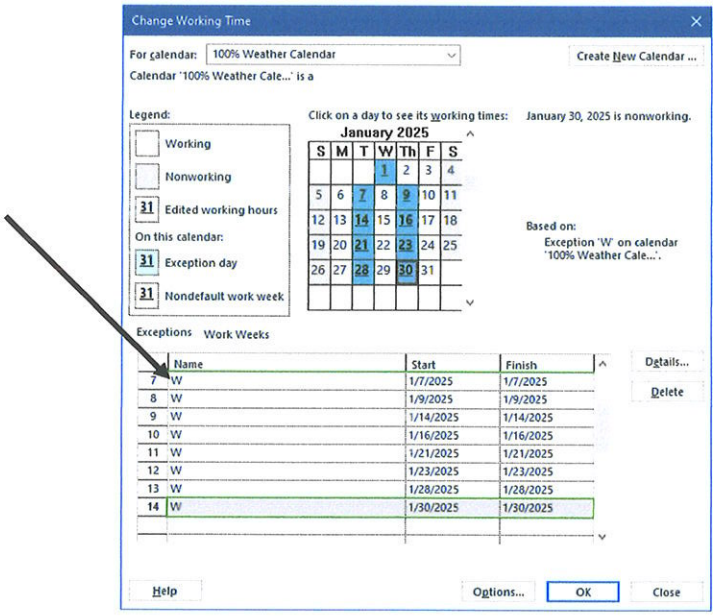
4. Again, on the lower left side of this window, select the **Text** tab. Next, click in the field that currently contains Resource Names and use the pull-down in this field to select **Name**. Then, click OK. All of the *critical* tasks (red bar tasks) should now show the Task Name to the right of each bar.

5. Next, re-open the Bar Styles window and scroll back down to select the **Critical** bar, then select the **Bars** tab in the bottom of the window. Go to the Middle section, and from there down to the Color: field as shown to the right.



6. Use the pull-down in the **Color:** field and select the color Dark Red as shown below. Then, click OK.





10. Scroll to **February 2025**. Continue placing the weather days for the remainder of the months for the year 2025 using the ***exact dates*** shown below. ***Carefully double-check to ensure accuracy***, then click OK.

January 2025

S	M	T	W	Th	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

February 2025

S	M	T	W	Th	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	

March 2025

S	M	T	W	Th	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

April 2025

S	M	T	W	Th	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

May 2025

S	M	T	W	Th	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

June 2025

S	M	T	W	Th	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

Microsoft Project 2021: *Real World* Scheduling

Schedule Analysis – Lab #3

Name _____

After completing Lab #3, answer the following questions from the (4) schedule printouts, then staple the printouts in the order you created them, with Schedule Analysis – Lab #3 on top, and turn in to your instructor.

Holidays Calendar (compared to schedule before Calendar changes):

1. Did the schedule end date change when holidays were added to the calendar ? **Yes** **No**

   If yes, what is the new end date ? _____ If no, why didn't it change ? _____

   _____

2. Did the total project duration change ? **Yes** **No.** If yes, what is the new project duration ?

   _____ If no, why didn't it change ? _____

   _____

3. Did the critical path change ? **Yes** **No** If yes, what new tasks are now critical that were not previously ? (*list by tasks IDs*) _____

Six Day Workweek Calendar (compared to Holiday Calendar):

4. Did the end date change after assigning tasks on the Six Day Workweek ? **Yes** **No**

   If yes, what is the new end date ? _____ If no, why didn't it change ? _____

   _____

5. Did the total project duration change ? **Yes** **No.** If yes, what is the new project duration ?

   _____ If no, why didn't it change ? _____

   _____

6. Did the critical path change ? **Yes** **No** If yes, what new tasks are now critical that were not previously ? (*list by tasks IDs*) _____

Weather Calendar (compared to the Six Day Workweek):

7. Did the end date change with the Weather Calendars added to the schedule ? **Yes** **No**

   If yes, what is the new end date ? _____ If no, why didn't it change ? _____

   _____

8. Did the total project duration change ? **Yes** **No.** If yes, what is the new project duration ? _____ If no, why didn't it change ? _____
9. Did the critical path change ? **Yes** **No** If yes, what new tasks are now critical that were not previously ? (*list by tasks IDs*) _____
10. When the two weather calendars were assigned to the (8) tasks, only the assignment to tasks 3, 5, and 6 effected the project end date. Explain why ? _____

_____

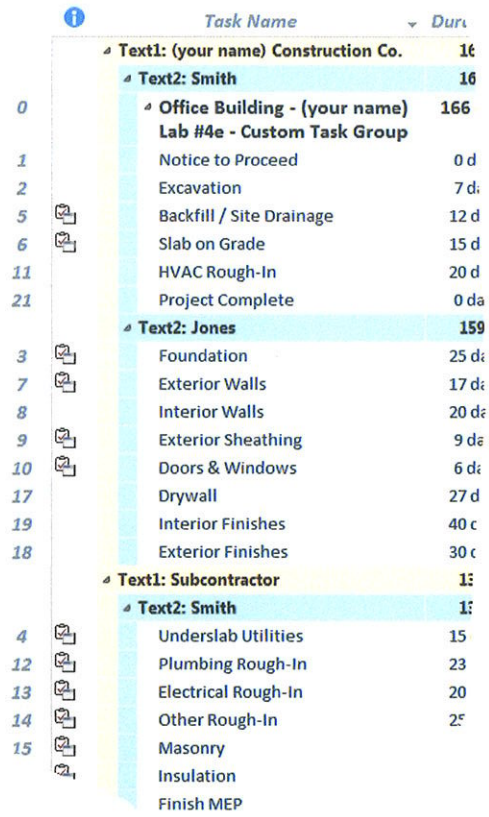
Your contract with the owner has Incentive Clauses that stipulate that the owner will pay you a ***bonus*** of $5000 per workday for every workday the project is finished prior to its scheduled December 5, 2021 end date – *and* – that you will have to pay the owner a $5000 per workday ***penalty*** for every workday that the project goes beyond this same scheduled end date. Based on that information, answer the following two questions using the **Weather Calendar** schedule.

11. Your boss was told by your Interior Finishes subcontractor that they could accelerate the completion of the interior finishes task by 8 workdays to finish on *November 25th* if your company would agree to pay their crew time-and-a-half (1.5 x normal rate) for overtime for the last 28 days of that work. The normal rate for their crew is $2700/day. Your boss has asked you to determine if this would gain or lose money for your company, and by how much ? **Gain** **Lose** (circle one) By how much ? **$**_____ .
12. After that same contractor had begun their work, they said that if you rent a specialized piece of equipment for one week (must be rented for a (5) day minimum rental at $1900/day) they could accelerate the completion of their work an additional (3) days. If your company would pay for the rental, determine if your company would gain or lose money? (***Note:*** Calculate this gain or loss using their ***new finish date of November 25th*** resulting from the overtime question above). **Gain** **Lose** If a gain, how much gain ? **$**_____ . If a loss, how much loss ? **$**_____ , and explain the loss ? _____

_____

22. A partial view of the schedule to the left shows the Contractor | Responsibility custom task group. Notice that the label of each group has either Text1: or Text2: in the description. These serve no purpose, look bad, and are easily removed.

    We will now remove these labels from the task group headings.



Working with Custom Fields

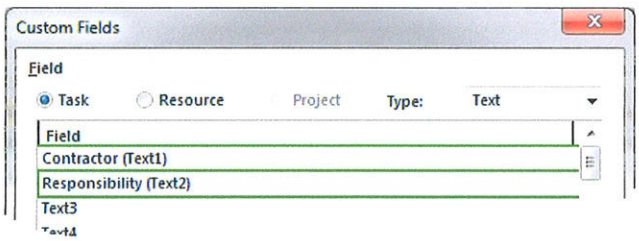
Follow the directions below to learn how to work with Custom Fields and to remove the Text1: or Text2: labels from the task group headings.

23. Go to **Gantt Chart Format**, then to the Columns area and select the Custom Fields button to open the Custom Fields window.

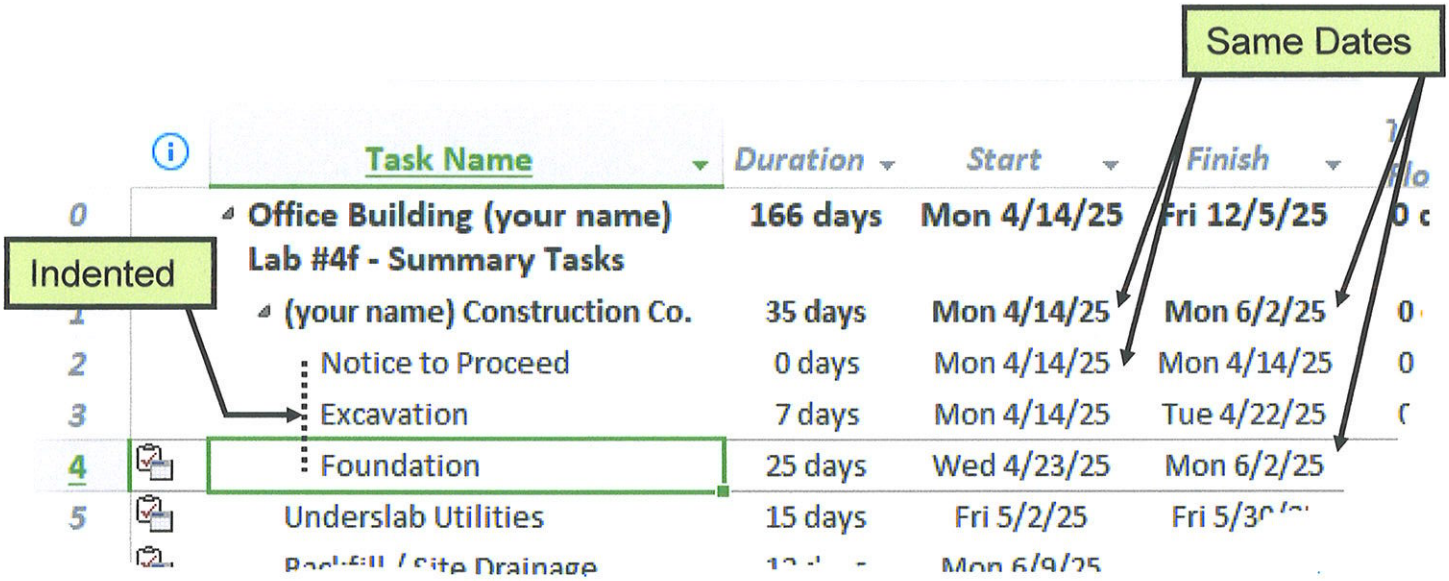
24. If it is not already highlighted, select **Text1**. Click the Rename... button to open the Rename Field window. Type in **Contractor** into the New name for 'Text1': field as shown to the right. Then click OK.

25. Next, select **Text2** and Rename... it to **Responsibility** and click OK.

26. Verify that the Custom Fields window matches the partial window shown here, then click OK to see the results.



27. If nothing changes, go back to the Group by: pull-down field and re-select Contractor | Responsibility task group.

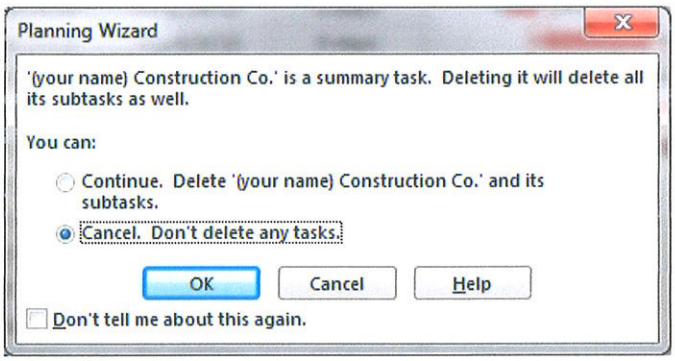


(FYI) "Outdenting" a Subtask

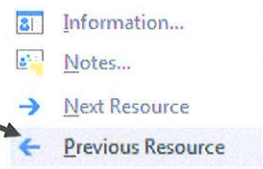
If you want to remove a subtask from a summary task, you can "***outdent***" it. You do this by selecting the task or tasks that you want to remove as subtasks, then click the **Outdent Task** button which is located in the Schedule section of the Task ribbon. Those tasks will then outdent one outline level to the left.

(FYI) Deleting a Summary Task (Be Careful)

Deleting a summary task can be ***very dangerous*** – particularly if you do not want to delete any of the subtasks beneath it. You must be careful. Because, when you delete a summary task, ***every subtask directly beneath it also gets deleted as well***. The following warning comes up. If you wanted to keep (save) any of the subtasks, you would click Cancel. Don't delete any tasks. and then click OK as shown below.



10. Select the ← Previous Resource as seen to the right to view the Carpenter resource graph as shown below.

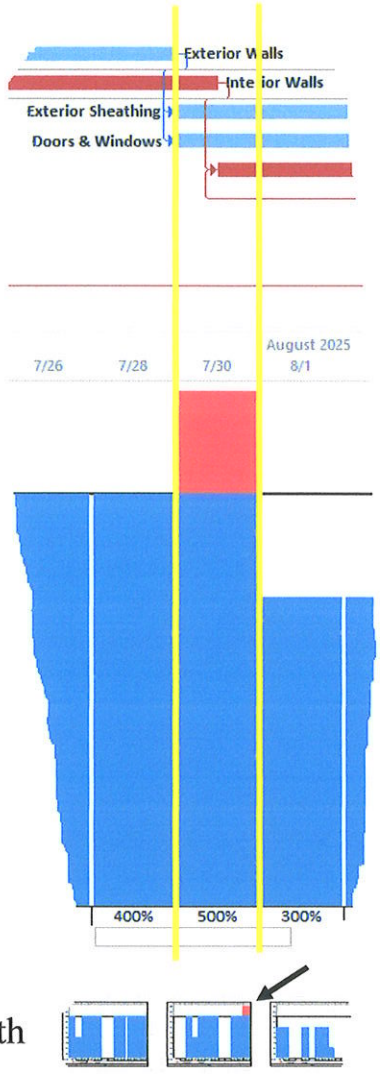


11. Analyze the carpenter resource graph. We now know that the most carpenters we will need for the entire project is **5**, based on the **500%** histogram indicator (tallest vertical bar on the graph). We also know that we will only need this many carpenters sometime in the month of **July**. Based on the resource legend, we know that the red section of the histogram bar indicates an **over-allocation** of carpenters.

    Since we have an over-allocation of a resource, your company will definitely want to know what day, or what days that occurs. So the next step is to zoom the schedule in far enough to see the histogram on a daily level.

12. The schedule's Zoom feature, shown here  , is located in the bottom right-hand corner of your schedule.. Notice that the (—) and the (+) signs may be dark as shown above, which means that you cannot zoom. To "light up" the signs and allow you to zoom the schedule in and

working that day as shown between the yellow bracketed lines. And notice of the three, that the only critical task is Interior Walls. As stated earlier, the sum of carpenters working on those three tasks is 5, an overallocation of (1) carpenter.



19. Turn the Resource Graph off by going to View and in the Split View area, ***un-check the Details box***, then click the Entire Project button

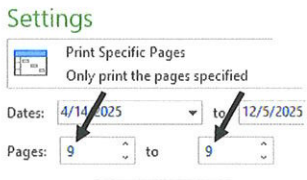
20. Go to **File**, then **Save**, or click to save.

Follow these instructions to view and print out the Resource Graph.

21. From the **Task** command use the Gantt Chart pull-down to select the Resource Graph. In the pane to the left, ***right click*** to select ← Previous Resource until you reach the **Carpenter** resource. Scroll to the right until you come to Wednesday, July 30th to see the over-allocation.

22. Next, go to the print preview and select the page with the over-allocation as seen here and on the next page.

23. To print this singular page, in the Settings section of the print preview, select that page as shown here to the right.



24. Print out the resource graph by clicking the Print button. Turn this schedule in with the others that you print throughout this lab – in the order they were created – all stapled together beneath the Schedule Analysis.

25. Click the tab to return and un-check the Details box, then use the Gantt Chart pull-down and select Gantt Chart to return to the Gantt chart.

26. Save the project by going to **File**, then **Save**, or click the button.

Microsoft Project 2021: *Real World* Scheduling

Schedule Analysis – Lab #5

Name _____

After completing Lab #5, answer the following questions from Resource Loading, Cost Resources, and Accelerated schedules in the software and from the printouts for this lab and turn the Schedule Analysis – Lab #5 in to your instructor stapled on top of the printouts.

Resource Loading:

1. What is the crew cost, not including additional costs, of the Exterior Walls crew ?

   Cost per day _____ Cost per hour _____

2. What is the average cost per hour, ***per crew member*** of the Foundation task crew ? _____
3. There is an over-allocation of 1 carpenter for 1 day on Wednesday, July 30th, between the Interior Walls, Exterior Sheathing, and Doors & Windows tasks. How would you recommend solving this shortage of 1 carpenter ? _____

   _____
4. There is an over-allocation of resources with the Interior and Exterior Finishes tasks. Describe what resource or resources are over-allocated, list how many of each additional resource(s) are needed, and list when are they needed (from when to when) ? _____

   _____

   _____
5. How would you recommend solving this over-allocation of the Interior and Exterior Finishes tasks? _____

   _____

   _____

Cost Resources:

6. What is the cost per day rate of the Insulation subcontractor ? _____
7. The Foundation task's total cost is $131,600. Factoring in duration, crew mix, cost rates, and other additional costs, write the calculation that equals $131,600 ? _____

   _____

Schedule Analysis – Lab #5 (con'td)

8. You are thinking about having your drywall crew work (7) days per week from the Drywall start date on Friday, September 19th, through their completion, at a cost that is 50% above their standard rate for the weekend days during this period. Based on the crew cost per day (***not*** including additional costs for materials, etc...), what would be the total additional cost incurred for working weekends ? $ _____
9. In the question above, how many weekend days would have been worked ? _____

Accelerated Schedule (compared to the non-accelerated Cost Resource schedule):

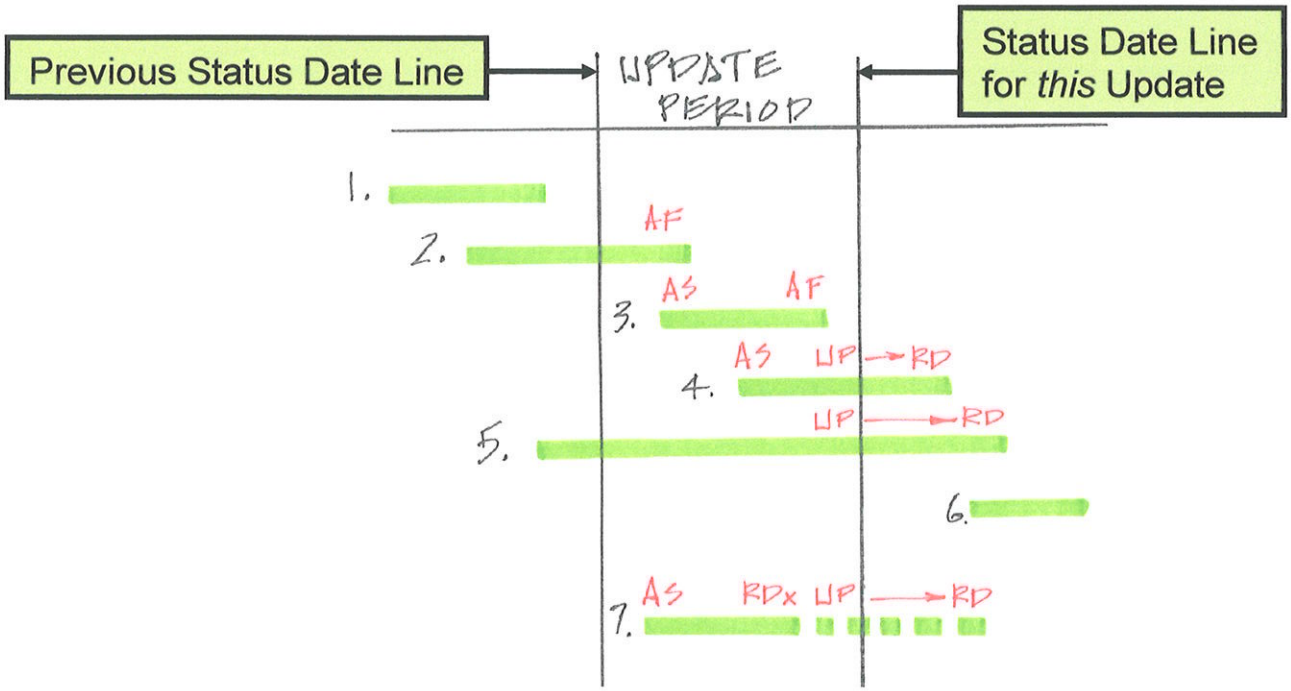
Inserting the Weather Calendars into the project schedule caused the project end date to slip from 11/26/25 to 12/5/25. Your company is trying to avoid paying a liquidated damage penalty clause to the owner of $100 ***per weekday*** delay for this slippage. For that reason the schedule was accelerated to remove the slippage. Answer the questions below about this acceleration.

10. Did the schedule acceleration change the critical path ? **Yes No**
11. Based on the overtime rates, what is the ***additional*** cost ***per day*** to work 10-hour days for each of these tasks ? Interior Finishes $ _____ Drywall $ _____
12. How many workdays were saved by going to 10-hour days for Interior Finishes? _____
13. Calculate the additional cost for the Interior Finishes task to work on the 10-hour workday schedule $ _____ and calculate resulting potential savings in the penalty clause liquidated damages if they avoid the slippage $ _____
14. Considering everything, do you think your company should accelerate the project ?

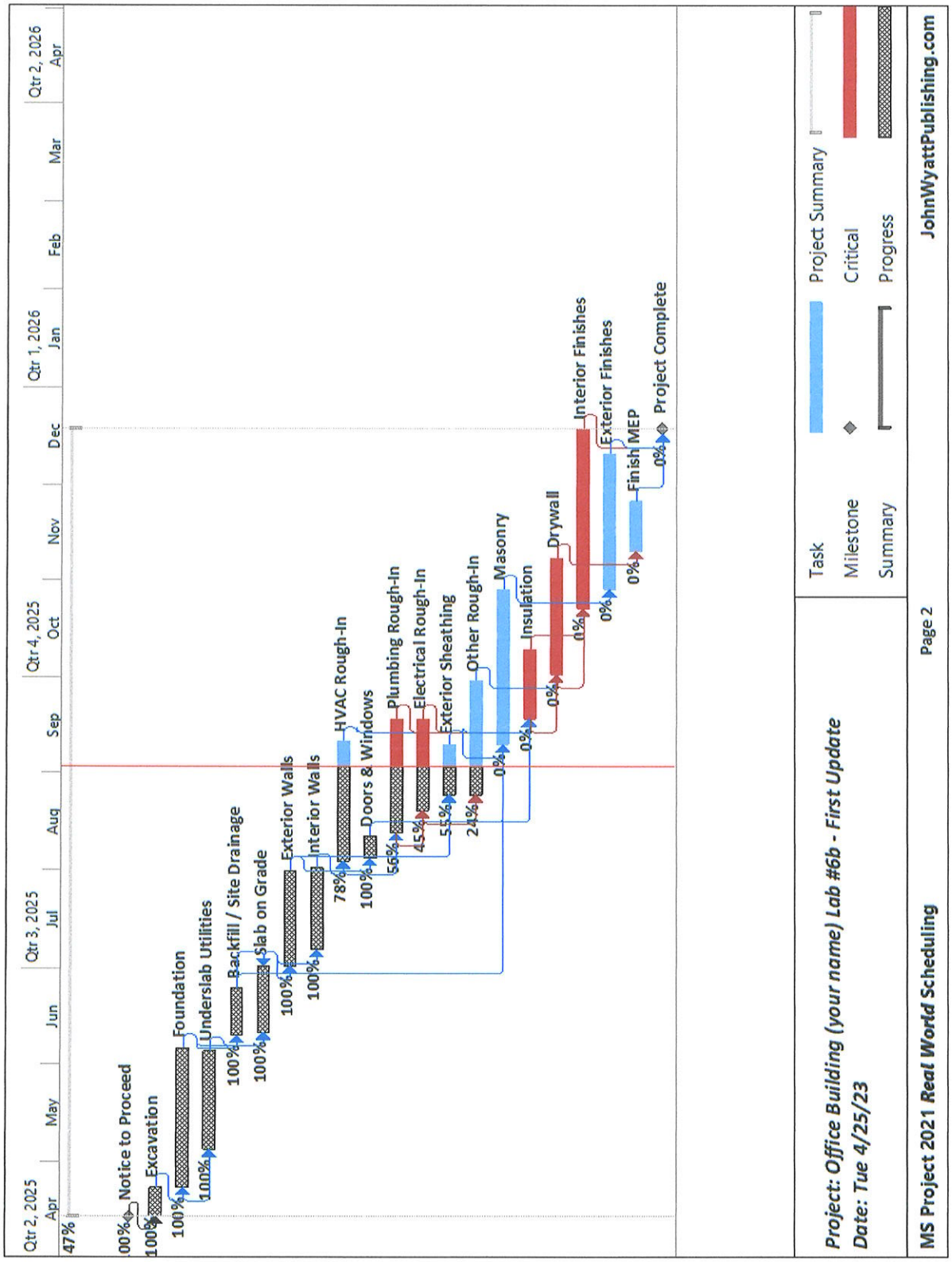
_____

_____

_____



1. **Task is already complete** ↔ Nothing should be entered for the task.
2. **Task had already started before the update period and finished during the update period** ↔ Enter the **Actual Finish** date of the task.
3. **Task started and finished during the update period** ↔ Enter the **Actual Start** and **Actual Finish** date of the task, ***unless it is a milestone task*** (see instructions for updating milestone tasks – ***never*** enter an actual finish for milestone task).
4. **Task started during the update period – the bar extends beyond the status line – and the task is still in progress** ↔ Enter in this exact order, the **Actual Start** date of the task, click **Update Project** for the Selected tasks, then enter your estimate of the task's **Remaining Duration**.
5. **Task had already started before the update period – the bar extends beyond the status line – and the task is still in progress** ↔ Click **Update Project** for Selected tasks, then enter your estimate of the task's **Remaining Duration**.
6. **Task has not started yet** ↔ Nothing should be entered for the task yet.
7. **The *"special case"* occurs when the task bar *does not* extend beyond the status date line – and the task is still in progress** ↔ Enter in this exact order, the **Actual Start** date of the task, then **Increase Remaining Duration** by (**x**) amount until the task bar passes the status date line, click **Update Project** for the Selected tasks, then enter your estimate of the task's ***real*** **Remaining Duration**.



Office Building Schedule – After the First Update (page two)

Microsoft Project 2021: *Real World* Scheduling

Schedule Analysis – Lab #6

Name _____

After completing Lab #6, answer the following questions from the Baseline and First Update schedules in the software and from the printouts for this lab and turn the Schedule Analysis – Lab #6 in to your instructor stapled on top of the printouts.

Baseline Schedule:

1. Once you start the update, which set(s) of dates can potentially change ? (circle all that apply)

   All Baseline Dates **All Start/Finish Dates** **Only Start Dates** **Only Finish Dates**

2. Once you start the update, which duration(s) can potentially change ? (circle all that apply)

   Baseline Duration (Bas Dur) **Duration (Dur)** **Remaining Duration (Rem Dur)**

3. Prior to the first update, could Baseline and Baseline 1 be different ? **Yes** or **No**
4. Which schedule stays "locked in" forever ? **Baseline** or **Baseline 1** (circle one)

First Update Schedule:

5. Did the project end date change from the Baseline to the 1st Update ? **Yes** or **No**. If yes, from what date _____ (Baseline End Date) to what date _____ (1st Update End Date), and by how many workdays _____ ?
6. The Foundation task started on time on 4/23/25 and was supposed to take 25 workdays to complete and end on 5/28/25. However, it ended on June 5th. Explain why it ended (8) calendar days later, but only took (6) extra workdays to complete ? _____

   _____

7. The Underground Utilities task's Baseline finish was on 5/20/25, but it actually finished on 6/4/25, (15) ***calendar*** days late. How many of those days were delayed due to the following causes ?

   Foundation task delay _____ **Started late** _____ **Weekends** _____

   Holidays _____ **Low productivity** _____

Schedule Analysis – Lab #6 (con'td)

8. Based on the actual finish date of the Foundation and schedule logic, did Slab on Grade start as early as it could have ? **Yes** or **No** If no, how many workdays later did it start?_____
9. What is the earliest date that Insulation can start ? _____ Which task(s) is planned to end on the previous workday ? _____
10. The Doors & Windows task's Baseline finish was on 7/25/25, but it actually did not even start until 8/5/25, (11) calendar days later. How many workdays was its start delayed ? _____
11. Considering the calendar that the Electrical Rough-In task is assigned to, verify and explain that the remaining duration of 11 days which was calculated by the software, is accurate ?

    _____

    _____

    _____

12. The finish date of the Exterior Sheathing task has slipped (28) workdays, from 7/30/25 to the planned finish date of 9/9/25. Before the update, this task had (24) days of total float. After the update, even though it had slipped (28) days, it **still has (6) days** of total float left !! You would have expected it to have pushed the critical path out (4) days (*28 workday delay – 24 workdays of total float = 4 days*). Explain why it still has (6) days of total float left ? _____

    _____

    _____

    _____

13. What do the three icons that may appear in the Indicator column represent ?

     _____

     _____

     _____

