WIND STUDY | Wind Study is intended for grades 5-8 and 8-11
Questions posted on: Monday Answers posted on: Friday
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2021A11   (RATES, TIMELINES)

Level 1: If there are 5 workdays per week and 4 weeks per month, we can say there are 20 workdays per month. In 4 months, we will have 80 workdays.

Next, we need to determine the number of workdays that each foundation takes.

$$\frac{Days}{Foundation} = \frac{50\ days}{3\ foundations}$$

$$\frac{Days}{Foundation} = 16.67\ days/foundation$$

Now we will divide the workdays available by the days per foundation to determine the number of foundations that can be completed.

$$Foundations\ Completed = \frac{Days\ Available}{Days/Foundation}$$

$$Foundations\ Completed = \frac{80\ Days\ Available}{16.67\ Days/Foundation}$$

$$Foundations\ Completed = 4.80$$

Because the fifth foundation is only 8 tenths of the way done, we cannot say it has been completed. The civil crew completed 4 foundations in 4 months.

Level 2: The Civil crew will have to complete the 3-turbine project before the other two projects can begin. This will take 65 days.

$$Civil\ 3 - Project\ Time = 20\ Base\ Days + 3\ Turbines * 15\frac{days}{turbine}$$

$$Civil\ 3 - Project\ Time = 65\ Days$$

Both Erection and Electrical crews will start on the 3-turbine project once Civil has completed. Civil will begin work on the 2-turbine project.

$$Civil\ 2 - Project\ Time = 20\ Base\ Days + 2\ Turbines * 15\frac{days}{turbine}$$

$$Civil\ 2 - Project\ Time = 50\ Days$$

The Civil crew will have all of their work completed after 115 days.

The Erection crew will take 60 days to complete their work on the 3-turbine project.

$$Erection\ 3 - Project\ Time = 30\ Base\ Days + 3\ Turbines * 10\frac{days}{turbine}$$

$$Erection\ 3 - Project\ Time = 60\ days$$

After 125 days, the Civil and Erection work will be complete on the 3-Turbine project.

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The Electrical crew will also begin work on the 3-turbine project at the same time as the Erection crew. The Electrical crew will finish in 40 days.

$$Electrical\ 3 - Project\ Time = 10\ Base\ Days + 3\ Turbines * 10\frac{days}{turbine}$$

$$Electrical\ 3 - Project\ Time = 40\ days$$

This means that Electrical and Civil work will be finished after 105 days, meaning the 3-turbine project will be fully complete after 125 days. The Electrical crew will have to wait until Civil has finished their work on the 2-turbine project, which is after 115 total days have passed. The Electrical crew will take 30 days to finish their work on the 2-turbine project.

$$Electrical\ 2 - Project\ Time = 10\ Base\ Days + 2\ Turbines * 10\frac{days}{turbine}$$

$$Electrical\ 2 - Project\ Time = 30\ days$$

The Civil and Electrical work for the 2-turbine project will be completed after 145 days.

The Erection crew will not be able to begin work on the 2-turbine project until they have completed their work on the 3-turbine project, which occurs after 125 total days. The Erection crew will take 50 days to complete their portion of the 2-turbine project.

$$Erection\ 2 - Project\ Time = 30\ Base\ Days + 2\ Turbines * 10\frac{days}{turbine}$$

$$Erection\ 2 - Project\ Time = 50\ days$$

This means that all components of the 2-turbine project will be complete after 175 days, giving the total time to complete both projects.

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The interior electrical cabinets of the turbine are installed.