

# Project management: a managerial approach assignment

[Business](#), [Management](#)



Construction Corporation The Sharon Construction Company has been awarded a contract for the construction of a 20,000-seat stadium.

Construction works must start by February 15 and be completed within one year. A penalty clause of \$15,000 per week of delay beyond February 15 of next year is written into the contract. Jim Brown, the president of the company, called a planning meeting, where he expressed great satisfaction at obtaining the contract and revealed that the company could net as much as \$300,000 on the project.

He was confident that the project could be finished on time with an allowance made for the usual delays anticipated in such a large project.

Bonnie Green, the director of personnel, agreed that in a normal year only slight delays might develop due to a shortage of labor. However, she reminded the president that for such a large project, the company would have to use unionized employees and that the construction industry labor agreements were to expire on November 30. Past experience indicated a fifty-fifty chance of a strike. Jim Brown agreed that a strike might cause a problem.

Unfortunately, there was no way to change the contract. He inquired about the prospective length of a strike. Bonnie figured that it would last either 8 weeks (70% Chance) or possibly 12 weeks (30% chance). Jim was not too pleased with these prospects. However, before he had a chance to discuss contingency plans Jack White, the vice-president for engineering, interrupted him. Jack commented that an extremely cold December had been predicted.

This factor had not been taken into consideration during earlier estimates since previous forecasts called for milder weather.

Concrete pouring in a cold December would require in one out of three cases (depending on the temperature) special heating that cost \$500 per week. This additional information did not please Jim at all. The chances for delay were mounting. And an overhead expense of \$500 per week would be incurred in case of any delay. The technical details of the project are given in the appendix to this case. The management team was asked to consider alternatives for coping with the situation. At the end of the week 5 proposals were submitted. . Expedite the pouring of seat gallery supports. This would cost \$20, 000 and cut the duration of the activity by six weeks 2. The same as proposal 1, but in addition, put a double shift on the filling for the field. A cost of \$10, 000 would result in a five-week time reduction. 3. The roof is very important since it precedes several activities. The use of three shifts and some overtime could cut six weeks off the roofing at an additional cost of only \$9000. 4. Do nothing special until December 1.

Then, if December is indeed cold, defer the pouring of the seat gallery supports until the cold weather breaks, schedule permitting, and heat whenever necessary. If a strike occurs, wait until it is over (no other choice) and then expedite all remaining activities. In that case, the duration of any activity could be cut but to no less than one third of its normal duration. The additional cost per activity for any week, which is cut, would be \$3000. 5. Do not take any special action; that is, hope and pray that no strike and no cold December occur (no cost).

Appendix: Technical Details of the Stadium The stadium is an indoor structure with a seating capacity of 20, 000. The project begins with clearing the site, an activity that lasts 8 weeks. Once the site is clear, the work can start simultaneously on the structure itself and on the field. The work on the field involves subsurface drainage, which lasts 8 weeks, followed by filling for the playing field and track. Only with the completion of the filling (14 weeks) can the installation of the artificial playing turf take place, an activity that consumes 12 weeks.

The work on the structure itself starts with excavation followed by the pouring of concrete footings. Each of these activities takes 4 weeks. Next comes the pouring of supports for seat galleries (12 weeks), followed by erecting pre-cast galleries (13 weeks). The seats can then be poured (4 weeks) and are ready for painting. However, the painting (3 weeks) cannot begin until the dressing rooms are completed (4 weeks). The dressing rooms can be completed only after the roof is erected (8 weeks). The roof must be erected on a steel structure, which takes 4 weeks to install.

This activity can start only after the concrete footings are poured. Once the roof is erected, work can start simultaneously on the lights (5 weeks) and on the scoreboard and other facilities (4 weeks). Assume that there are 28 days in February and that February 15 falls on a Monday. Questions 1. Prepare the Critical Path Method network schedule for the project. (4 marks) What is the project duration and what is the completion date? (2 marks) Identify the critical activities. (1 mark) Work breakdown structure (WBS)

Creating a network diagram of the project Tasks: A - Clearing the site B - Subsurface drainage C - Filling for playing field and track D - Installation of artificial playing turf E - Excavation F - Pouring of concrete footings G - Erection of steel structure H - Pouring of supports for seat galleries I - Erecting pre-cast galleries J - Pouring concrete seats K - Erection of roof L - Construction of Dressing rooms M - Painting N - Installation of Lights O- Installation of Scoreboard and other facilities Activity | Precedent Activities | Duration (Weeks) | | A | - | 8 | | B | A | 8 | | C | B | 14 | | D | C | 12 | | E | A | 4 | | F | E | 4 | | G | F | 4 | | H | F | 12 | | I | H | 13 | | J | I | 4 | | K | G | 8 | | L | K | 4 | | M | J, L | 3 | | N | K | 5 | | O | K | 4 | 2. Analyze the 5 proposals and make recommendations if the risks of cold weather and labor strike must be avoided altogether. 5 marks) What will be the implications in terms of costs and profits? (3 marks) (A case by E. Turban and Jack R. Meredith, page 381-382, Project Management, A managerial approach, 3rd Edition, Meredith and Mantel) ————— Construction of Stadium Installation of artificial playing turf Erecting pre-cast galleries Pouring of supports for seat galleries Pouring of concrete footings Filling for playing field and track Excavation Subsurface Drainage Clear Site Installation of lights, scoreboard and other facilities Painting Construction of Dressing rooms Erection of roof Erection of steel structure Pouring concrete seats Field Work Structure Work