

PROJECT PLANNING, MONITORING AND CONTROL

3 RESOURCE SMOOTHING



Resource smoothing

Priority: time constraints

In the same time, we distribute resources for this construction

Resource levelling

No time constraints

With given resources, we calculate the time we need for this construction



Resource smoothing

Use of float to shift start dates so as to reduce peaks and troughs
Distribution of resources

Schedule delays are not usually solved with additional resources

- It produces even more disruption and increased delays

It is needed:

- new re-scheduled programme
- Re-organisation of activities
- Study of crash time and crash cost
- incentives



Resource levelling

Study of time with constraint resources

May be better to extend the project duration:

- To reduce the waste of resources due to troughs
- To reduce costs due to overloading

Important considerations for optimisation on:

- Plant. Hiring/leasing/purchasing
- Work force



EXERCISE 1

We want to build a complete floor of 1000 m² with prefabricated hollow core slabs. Every plank covers 10 m².

We need a mobile crane to lift these planks. The complete operation for every plank needs 1/2 hour. It is required a gang of two labourers + crane driver.

1. How much time do we need for this activity considering there is not any time constraint?
2. How many planks per day can we put?
3. What would happen if we have to finish this activity in 5 working days?

Discuss both possibilities and establish solutions to re-schedule this activity.



EXERCISE 2

A tower crane is used for different lifting operations in a construction.

1. Make a list of operations that a tower crane can do during the day.
2. Explain when some peaks can happen in these operations and why.
3. Define some criteria to establish in the crane activity so that we can avoid or reduce these peaks.



EXERCISE 3

1. We are making an excavation for a road pavement. The hired hydraulic excavator has a bucket of 0.6 m^3 . Every operation of excavating and downloading lasts 30 seconds average. We are using dumpers with 30 m^3 capacity. How much time do we need to fill the dumper bed?
2. We have to dump this soil 20 Km far from the excavation site. If the velocity of the dumper is 30 Km/hour and the tipping time is 5 minutes, how much time do we need for a complete cycle of the dumper?
3. We want to optimise the excavation rate. How many dumpers do we need for the hydraulic excavator not to stop?