

# Contract and Construct

## User Guide

[contract-and-construct.com](http://contract-and-construct.com)



### Overview

The simulation models the management of a chemical plant construction project. The user of the simulation takes the role of project manager. The simulation is in three main phases; phase 1 comprises the selection of contractors for the project tasks; phase 2 runs the project to completion and phase 3 includes on-line feedback and reflection. During the running of the project in phase 2, several events occur; some planned, others not; the project manager must make decisions about how to deal with these events. The decisions taken will affect the quality, safety, morale, time or cost of the project and the project team, and the project manager's performance is assessed in these areas. There is a budget of £7,000k, and 91 weeks (455 working days) to complete the task.

### Aims of the simulation

The simulation provides project management experience in a safe environment with a relatively light-hearted approach. It is not intended to be technically authoritative but gives a good feel for a general management approach to project management. It aims to highlight:

- the commercial aspects of project management
- the trade-offs between cost, quality, safety, time and morale
- the practice of project planning
- some of the 'softer' elements of project management such as morale
- the necessity of living with the consequences of your decisions and strategy

### Performance assessment

Individuals/groups will be assessed on their performance relative to other participants. Performance is based on the average score for each indicator shown below, with the score relating to group strategy counting **twice**. However a score of **less than 46% in Safety or Morale** will incur omission from future invitations manage such projects! *Each group should keep a note of their key decisions and be ready to make a case for 'why they won the game' during the debriefing.*

### Objectives / Strategies

#### Strategies

Group	Strategy
Quality	It is generally known that high quality construction for plants with a long expected lifetime like this one pays off well in the end.
Safety	The project is safety-critical, both in construction and looking ahead to operation; you must maintain the highest possible standards of safety.
Morale	This is one of several plants to be constructed and the company is anxious to maintain a good atmosphere where possible, in order to foster long term contractor relationships.
Time	It is known that the deadline of 91 weeks is particularly critical since customer orders are already committed for that time.
Cost	The budget is substantial but it is not negotiable and overruns will be taken into account at your next appraisal.

## Startup

To start up, ensure you are using an Internet browser that has Style sheets, Cookies and Javascript enabled, and that allows this site to send its own pop-up windows. The connection speed is not critical, although there are some graphics that will obviously load faster with a faster connection. The screen resolution must be at least 1024x768 and preferably more, to show the multiple windows. If you have lower resolution, make the windows as large as possible and **delete any unnecessary toolbars** including the standard buttons toolbar, which you do not need for the simulation.

First, access the main site <http://www.contract-and-construct.com>. You will see instructions, help and an easy-to-use menu system that leads you into the simulation itself. Anyone can access the **demonstration version** using ID 'demo' and password 'demo', in which case a restricted set of activities and events are available, but you can gain a feel for the simulation. You will need to acquire a special login code and password to access the full simulation; see your tutor or use the contact details on the site.

Clicking **Log In** will check your ID. Then click **Start new game** to open the a new run of the simulation. During a game you can click the 'CONTROL' button to get back to the main site, then save either on your local PC (**Save local**) or on the Server computer (**Save on Server**) and load these back later; the computer will remember the state of your latest run of the simulation up to when it was last saved. **You will need to save your session if you leave the game for 20 minutes or more of inactivity.** More details below.

## Operation: Phase 1

Phase 1 is about selecting a contracting firm to deliver each of the 18 activities. Choose how many weeks you wish to spend **searching for contractors** (up to 3 weeks in total; *feature not available in 'demo' mode*). You are already assumed to know a few possible contractors, and these are listed on the separate Task Allocation Worksheet document, which you might also like to use to record details of any other contractors found. Searching for an extra week will cost £50k and will affect the project completion time, but will allow more contractors to be located, giving you greater choice. Search for another week at any time in Phase 1 by pressing the 'Search for another week' button. This will make available more contractors **for all tasks**.

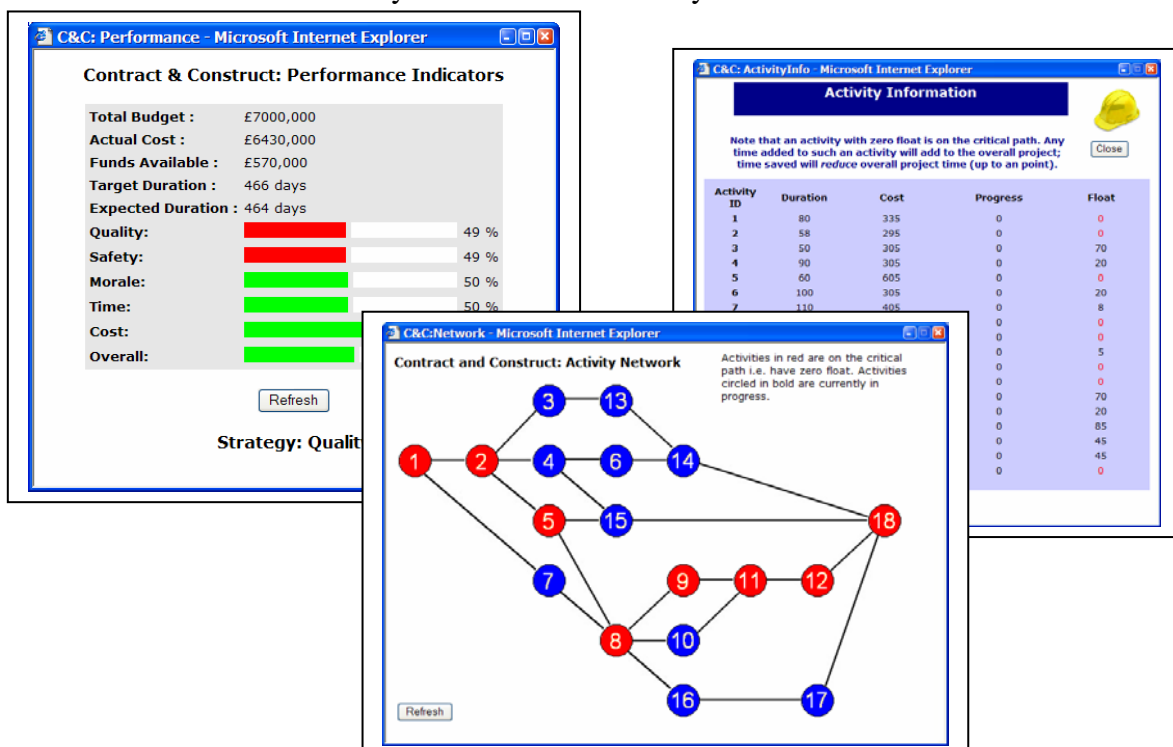
The screenshot displays the 'Contract and Construct' simulation interface. At the top, the browser window title is 'C&C:Phase 1 - Microsoft Internet Explorer'. The page header includes the site name and a yellow hard hat icon. The main heading is 'Phase 1 of 2: Plan' with the sub-heading 'Allocate a contractor to each of the 18 tasks in the project'. A 'CONTROL' button is located in the top right corner. The central area contains a list of 18 tasks, each with a radio button and a contractor name or 'Unassigned'. The tasks are: 01. Earthworks and excavations (U G Co.), 02. Lay foundations for buildings (Jay C. Bee), 03. Connect main power supply (Unassigned), 04. Construct warehouses (Unassigned), 05. Construct and install on-site crane (Unassigned), 06. Construct control buildings (Unassigned), 07. Lay the pipe network (Unassigned), 08. Install water and fuel storage tanks (Unassigned), 09. Test water pipe network (Unassigned), 10. Test fuel pipe network (Unassigned), 11. Insulate pipe network (Unassigned), 12. Secure pipe network (Unassigned), 13. Install electro-mechanical pumps (Unassigned), 14. Install auxiliary equipment (Dodd and Gee Ltd), 15. Install backup power generators (Unassigned), 16. Install waste removal system (Unassigned), 17. Environmental test of waste removal (Unassigned), and 18. Final test and commissioning (Unassigned). An 'Assign Contractor' button is at the bottom of the list. On the right side, there are three sections: 'Can't find the right men for the job?' with a 'Find more Contractors' button, 'Allocate all tasks to a default choice:' with a 'Quick Select' button, and 'Move on to Phase 2 when satisfied with your selections' with a 'Sign Contracts' button. The bottom navigation bar contains four buttons: 'Performance Data', 'Network Diagram', 'Activity Information', and 'History'.

Click on each task in turn and press the 'Assign Contractor' button to select from the list shown. Press the Previous / Next buttons to scroll through the choices, and 'Select' when the appropriate contractor is displayed. You can search for more contractors at any stage in phase 1. You can **change to another contractor** at any time in phase 1 until you have 'signed contracts'.

### Notes

- You should expect phase 1 to take around one hour for the full version, or 15 minutes for the demo version.
- Click on the 'CONTROL' button to move back to the contract-and-construct control window to see help, save or reset the session.
- Click the 'Quick Select' button to allocate a random initial contractor for each activity.
- Click on the Performance Data, button to see your performance to date, the Network Diagram button to see the Project network and critical path, Activity information button to see details of each activity, or History button to review your choices and gain feedback, at any time (see figures below). It is recommended to keep them visible; they should be automatically updated after each decision.
- **Tasks are initially given only average time and cost figures** - this gives you a rough but not final view until all tasks are allocated to contractors. You may wish to review these figures after selecting contractors, giving you a chance to adjust your selections before proceeding.
- Note that the **Morale score does not change until Phase 2**.
- You should take general notice of the contractor names and comments, but your own judgement is final. Do not agonise for *too* long over your decisions!

**To end Phase 1**, make a final review of contractors, then when you are happy with your selection for each activity click the 'Sign contracts' button. Phase 1 will be saved automatically on your machine at this point. You will see the 'Start Managing' screen; proceed from here to Phase 2 when you are ready. Meantime you may quit your session but it will be saved on cookies for you to continue later if you wish.



## Operation: Phase 2

The project has started with your selected contractors, and you must now manage it through to completion. You now see a main control panel which shows the current day, and details of the first event that has happened and is demanding your attention. You can still use the **performance and network windows** in order to help you make optimal decisions. Note that the network window highlights the activities in progress with a slightly bolder border.



For each event there are one or more alternative responses. Scroll **carefully** through these using the control buttons. When you are sure about your response, ensure this response is shown, and **only then press the DO IT! button**. The next event, whenever it happens, will be automatically presented to you - wait for this and **do not click DO IT! again until you have considered the next event** and the browser is fully refreshed. You cannot go back, in phase 2! Don't forget to monitor your performance and progress using the cost and project status information; you will be given occasional reminders to do this.

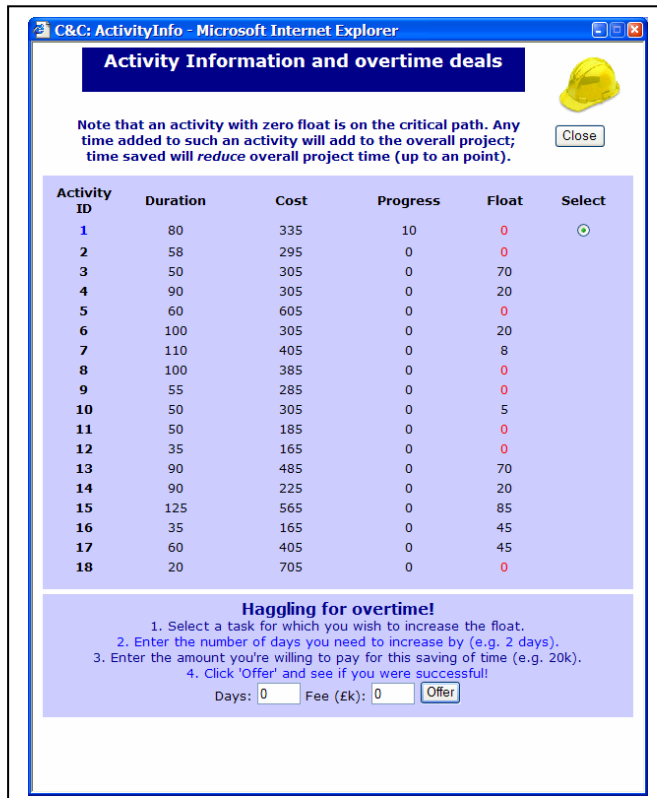
**P.T.O.**

## Saving

It is a good idea to save from time to time 'just in case'. Use the Control page; if you go to the Control page then you *must* save or you will lose your position. Saving to your local PC is straightforward - choose 'Save local'. If you cannot return to your local machine you can use the option of saving for up to a week on the server. In this case you will be asked for a User Name; this can be any name of your choice, as long as it is not in use. It does not have to be your Login ID, but **you must remember it in order to load back later**, so write it down!

## Offering 'Overtime'

At any time you have the option to try to negotiate overtime with the contractors on active tasks, offering them bonus payments to shorten the duration of the task. To do this, **click the Activity Progress and Overtime** button, select an activity, choose how many days you would like to save, and make a reasonable offer. The contractors may reject your offer; there is a higher chance of acceptance of larger offers; if they reject, you can offer more. You may haggle at any time while the task is active, unless it is very close to completion, and for time savings up to a maximum of 20% of the task duration.



**Activity Information and overtime deals**

Note that an activity with zero float is on the critical path. Any time added to such an activity will add to the overall project; time saved will reduce overall project time (up to a point).

Activity ID	Duration	Cost	Progress	Float	Select
1	80	335	10	0	<input type="radio"/>
2	58	295	0	0	<input type="radio"/>
3	50	305	0	70	<input type="radio"/>
4	90	305	0	20	<input type="radio"/>
5	60	605	0	0	<input type="radio"/>
6	100	305	0	20	<input type="radio"/>
7	110	405	0	8	<input type="radio"/>
8	100	385	0	0	<input type="radio"/>
9	55	285	0	0	<input type="radio"/>
10	50	305	0	5	<input type="radio"/>
11	50	185	0	0	<input type="radio"/>
12	35	165	0	0	<input type="radio"/>
13	90	485	0	70	<input type="radio"/>
14	90	225	0	20	<input type="radio"/>
15	125	565	0	85	<input type="radio"/>
16	35	165	0	45	<input type="radio"/>
17	60	405	0	45	<input type="radio"/>
18	20	705	0	0	<input type="radio"/>

**Haggling for overtime!**

1. Select a task for which you wish to increase the float.
2. Enter the number of days you need to increase by (e.g. 2 days).
3. Enter the amount you're willing to pay for this saving of time (e.g. 20k).
4. Click 'Offer' and see if you were successful!

Days:  Fee (£k):

## General

If nothing appears to happen as a result of a decision it may simply mean 'you got away with it this time' - or it may mean the consequence will be later! Note that, as in real life, there is a random element to some events, so even your best made plans do not always work out as expected!

You should expect phase 2 to take around one hour for the full version, or about 10 minutes for the demo; upon completion you will be shown your final scores including your overall score, weighted by your strategy. A weighted average score of 50-59 constitutes satisfactory performance (depending on strategy); 61+ is very good; below 50 is poor.

**At the end, refresh the final screen to confirm your final score.**

**Then consider:**

- what was your strategy for playing the game?
- how successfully did you implement that strategy in phases 1 and 2?
- what major events occurred and how did you deal with them?
- what surprises did you encounter?
- why should you or your group gain an award for your performance?

Take the opportunity presented on the final screen to **review your history of decisions** and gain some feedback.

### **Troubleshooting**

If you get an error message on the screen, try pressing Refresh.

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