

BUILD AID

A CONSTRUCTION SCHEDULE OR PROGRAMME

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A CONSTRUCTION SCHEDULE OR PROGRAMME

In its simplest form, a building schedule or programme may only state a proposed starting and completion date; this is clearly meaningless in the context of planning and control and offers no help to the management of the building project.

For a programme to be useful and offer meaningful information, it must first incorporate all the required activities, listed in the sequence in which they would be implemented, known as activity sequencing. Thereafter dependencies need to be defined, relationships between two or more activities; for example, plastering a wall cannot start before the wall has been started and built; it could also require that the electrician install conduits in the wall before the plastering activity can start.

A programme further facilitates management in highlighting the relationships between resource allocation and project durations, resulting in the more efficient use of resources. And provides management with a means of exploring the alternatives available in trying to achieve the most cost effective and efficient way of completing a project.

The more time you put into developing the construction schedule or programme, the less issues you'll have when you execute the project plan, which is key to good construction management.

By following the steps below, you will be able to develop an effective construction schedule.

Get all the Information

Construction scheduling involves different types of resources, stakeholders, and participants. Begin by listing all the subcontractors involved in the project (normally many involved in a construction project).

Once you have the list, reach out to them, and ask them how much time it will take to procure materials. Once you have that information, ask them what their expected duration would be to complete their task(s) or part(s) of the project.

You also need to establish with the local authority and get a list of requirements and what inspections will be needed throughout the build, which may also include other inspections by others, like the NHBRC, or and any other professional like the structural engineer.

When it comes to budgeting the cash flow of your project, you will need to go through the process with your bank and determine when they will release funds. You need constant liquidity (cash) to keep the project moving forward, so before it starts, it's key to have an understanding with your bank and its process about paying money. Talking to the bank before scheduling gives them a big-picture view of the project and provides you with valuable insight into how to schedule around cash flow.



Note: See info Guide – How should you pay your Building Contractor – for more information.

What tools can you use to create a schedule?

A project schedule is normally expressed as a chart or by some other graphical means of representation in which the subdivision of activities is normally shown on the vertical axis and time on the horizontal axis; with each operation indicated by a bar, the length of which is governed by the duration. See example on the following page:

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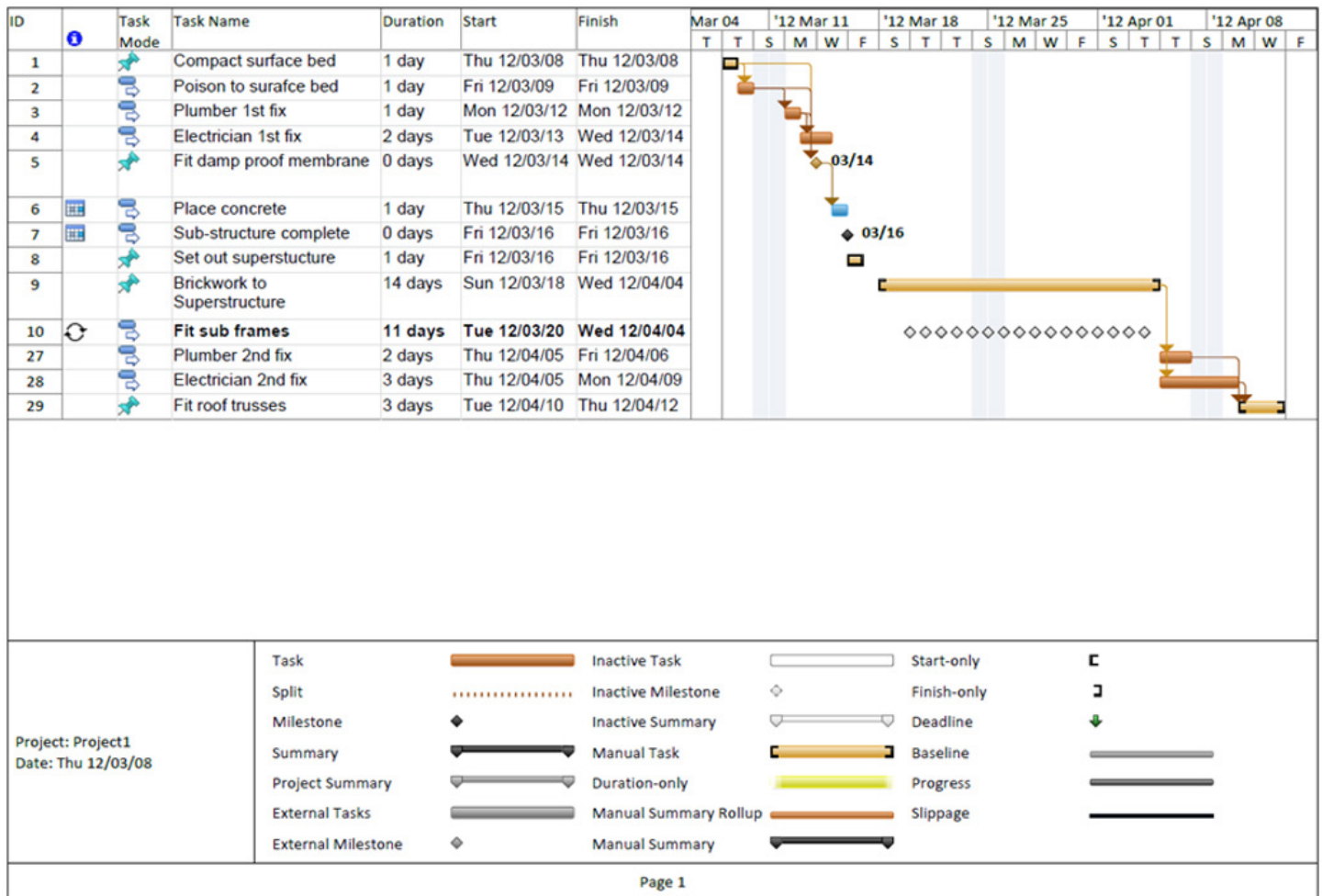
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There are many templates available on the internet that can help you get started with your construction schedule if you don't want to build your plan and schedule from scratch and usually available in an excel spreadsheet format.

Then there are countless online project management software tools available, of which most unfortunately are not available for free; for the Best Project Management Tools & Software available for 2021 - see link <https://www.proofhub.com/articles/top-project-management-tools-list>

These schedules are then usually expressed using a Gantt chart which is a graphic planning and control method in which a project is broken down into separate activities or tasks (as per the example above). The activities are plotted as bars or lines on a timeline, with the starting and end dates of the activities indicated on the chart. This allows managers to monitor progress of the project by comparing actual progress with planned progress.

Another planning tool is - The Programme Evaluation and Review Technique or more commonly referred to as PERT, that uses a network to plan projects involving numerous activities and their interrelationships. The key components of PERT are activities, events, time, and the critical path. PERT also allows management to monitor progress, identify possible delays, and shift resources to keep the project on schedule

The critical path - Knowledge of the critical path in building is essential; the critical path determines the length of time it will take to complete a project. The critical path is the longest or most time-consuming sequence of events and activities in a PERT network. Remembering that any delay of an activity on the critical path will delay the project completion time.

Thus, the critical path determines the completion date. The critical path is usually determined by using a software project planning application for projects involving copious activities; it can however be done manually with projects where fewer activities are involved.

Collect and Prioritize Tasks

Now that you have the context and the tools, you need to step up to the project and break it down into the steps that will lead it from a construction plan to a completed project and these are the tasks or activities. You cannot have an accurate construction schedule until you have a thorough listing of every task that must take place to end with a successful construction project.

You can use a work breakdown structure (WBS) to get a grip on the size and scope of your project. You can think of this tool to visualize your deliverables by starting with whatever you are going to construct and then breaking down each task level by level until you're at the most basic parts.

At this point, it doesn't hurt to gather the team and the subcontractors you're going to employ and pick their brains. Remember, the more thorough your task or activity list, the more accurate your construction schedule. And don't forget that some activities are dependent on others, so you'll want to link those. And leaving out or forgetting about certain tasks or activities will derail your project and if on the critical path, delay the completion date.

Once you have your activity list as complete as possible, you need to put those activities in an order, or what one calls activity sequencing. The WBS can help with this, as it takes a complex project and boils it down to the essential parts and when they need to be worked on.

Milestones – a milestone is a point in the project that marks the end of some large phase, for example the completion of the concrete floor slabs or the erection of the roof trusses complete with roof coverings. Accurately assessing all the different tasks and milestones that make up your project is critical for effective construction scheduling and determines the completion date.

Adding the durations

Once the activities have been determined, durations need to be applied to these activities, by giving them a start and finish date, which will then create a bar chart on the Gantt that represents the duration of the task.

Durations are typically expressed in workdays and exclude holidays and other non-working periods. Duration estimation should only be left to the experienced, using the following points as a guide:

- Subjective methods – expert opinion, where previous experience is used; the more the experience the more accurate the estimate will be.
- Comparable methods – Rules of thumb; similar activities are likely to have similar durations.
- Detailed methods – divide the activity into sub-tasks or (WBS), then estimate each sub-task and combine the totals.

These determinations must be realistic. A don't forget a construction schedule is impacted by weather conditions like rain, especially with longer term projects. Therefore, look at historical data about the expected rainfall to get an estimation of how the weather might impact activities of the project.

And don't neglect non-task related scheduling, such as procurement, delivery and other resources that are crucial to the project. You need to have a clear picture of what to order and by when and be aware if any materials that are possibly in short supply. It's as important as the build.

So is scheduling in any inspections, so there's time in your schedule to respond and rectify any issues. And lastly you need to calculate into your construction schedule, public holidays, other vacation days for employees and the annual December shutdown.



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Allocate and execute

In a nutshell, construction scheduling is about activities or tasks and resources. Allocating these tasks to teams can get confusing in your construction schedule when you have so many subcontractors to keep track of. By color-coding tasks, you can easily distinguish the different teams and work. Now you can pinpoint who is working on what once the project execution phase begins.

You should have already made estimations on the durations from your teams and have a detailed profile of their skills and experience to assign them appropriately. After allocating your resources, a project management tool can send alerts when new tasks are assigned, and deadlines are due.

Planning

The plans discussed here are operational plans and the basis of effective planning is programming or scheduling. Operational plans are narrowly focused and have relatively short periods (monthly, weekly, and day-to-day). For example, the site agent or foreman will formulate a weekly operational plan ensuring all the required subcontractors are available for the following weeks planned activities.

A project plan is formulated to guide a project and should clearly define the following objectives:

- The scope of work
- The projected duration of the project
- The budgeted costs allowed for the project
- The required level of quality

Objectives or goals form an integral part of planning; coordination of project goals is of vital importance if all the goals are to move the project in the same direction. Thus, the primary objective of planning is to find the most suitable way of coordinating activities with available resources, for the overall success of the project.

With proper planning, the following can be achieved:

- Highlights what information is required before it is needed, ensuring uninterrupted progress.
- Acts as tool for the efficient allocation of resources

- When site personnel, assist in the planning process the attendant responsibility for the decisions taken increases overall productivity and motivation.
- Enables management to review actual progress achieved and overall project performance and provides a means of taking corrective action when things are not going as planned.
- When time is gained, it can be re-programmed to advance the completion date.

Progress review

Construction scheduling is complex and requires permanent monitoring. No construction schedule is written in stone, at least none that will succeed. Things change, and if you're not monitoring and reviewing throughout the project, those changes will send you off-track.

Therefore, you need to examine the construction schedule throughout all phases of the project to make sure your actual progress is in line with your plan. Look at your schedule daily and depending on your time, update the schedule frequently.

This is a matter of time management. If you find that a daily update is taking you away from other project issues and responsibilities, then maybe you need to set aside time each week to respond to the changes you've noted daily and apply them to the schedule. It's up to you but monitoring and adjusting your construction schedule as on- and off-site issues arise is perhaps the most important aspect of keeping your project on schedule.

An important closing note on construction schedules

It's important to make the construction schedule or programme realistic. You or your client might want it done by a certain date, but to achieve that goal, will you have to cut corners and sacrifice quality. Is this what you or your client wants?

So, be honest with all parties involved and give everything enough time in the construction schedule to be completed properly and with the quality that is desired – no rush job ever ends well, especially when you have trades working over each other...it can then actually take longer to complete the project, as you'll end up having to re-do things!!

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