



EASTWOODHARRIS



PRINCIPLES OF PLANNING FOR BUILDING AND CONSTRUCTION




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Principles of Planning for Building and Construction

by
Eastwood Harris Pty Ltd



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Introduction

- Emergency Evacuation
- Timings
- Meals
- Mobile Phones
- Conduct of course
- Introductions:
 - Your name
 - Position
 - Experience in planning
 - Expectation from the course
- Course attendance sheet.


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Course Outline


1. Setting the Scene
2. Planning to Plan
3. Project Breakdown Structures
4. Activity definition
5. Activity Sequencing
6. Resourced Programmes
7. Finalising the Plan
8. Leading a Project with the Plan
9. Scope Changes, Hints and Tips.



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Module 1 - Setting the Scene

1. Course Overview
2. What is a Plan and Planning?
3. Fostering "One Team" Philosophy
4. What planning avoids and achieves
5. Successful and Unsuccessful Projects
6. Workshop – Successful and Unsuccessful Project Plans




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Course Overview

- The aim of this course is to demonstrate:
 - What a project plan is
 - Why projects should be planned
 - Some generic methods of planning projects
 - Why plans are used to control a project
- This course specifically excludes estimating, cost planning and the cost control of projects.


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Setting the Scene - Recap

1. Course Overview
2. What is a Plan and Planning?
3. Fostering "One Team" Philosophy
4. What planning avoids and achieves
5. Successful and Unsuccessful Projects
6. Workshop - Successful and Unsuccessful Project Plans - next




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Workshop 1 – Successful and Unsuccessful Project Plans

- In groups of four identify and discuss one example of:
 - A project which was made successful through the correct use of the planning process
 - A project that failed to meet the requirements because of poor planning
- Nominate a different person who will present each of the two cases you have discussed.


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Module 2 - Planning to Plan

1. Planning vs. Programming/Scheduling
2. Planning and Leadership
3. Plan the Plan
4. Understanding the contract
5. Project Scope Definition
6. Workshop - Elements of a Plan.




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Planning vs. Programming/Scheduling

- This course is about project planning
- A plan is not a bar chart, a bar chart is an output of the planning process
- A plan has many elements:
 - It identifies what has to be delivered to the client, the deliverables
 - The best method of delivering it, the project methodology
 - What is needed to complete the project, the resources
 - How long it is going to take, the programme
- Once these parameters are evaluated then the project may be Programmed. This is often termed as a "Schedule"
- This course will use "Programme" and not "Schedule".

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Planning Success through Leadership

- Traditionally many plans are created to meet contract requirements and are not used to manage the project
- A project plan should be the backbone of any project management system and should be working documents that are actively used to manage a project and updated regularly
- Project leaders must become actively involved in, understand, and support the planning process through leadership
- The leader should make sure the planner is given the necessary support to enable the planner to produce useable Programmes
- The leader must foster an environment in which the plan is valued by all stakeholders
- All team members must work towards one team philosophy.

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Planning to Plan

- Before developing a project plan it is important to plan and organise the planning process:
 - A plan requiring inputs from a number of people should have an Organisation Structure and Role Descriptions so every one know what they are required to do
 - Plan the requirements or output for the plan, decide what the plan is going to produce and plan to produce them
 - Select the appropriate planning methods and tools that will be able to produce the required plan outputs
 - Decide what information is required to produce the plan and ensure it is provided to the planner in a timely fashion.

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Understanding Risk Analysis and Stakeholder Analysis

- During the planning stage of a project you should conduct:
 - A Risk Analysis
 - A Stakeholder Analysis
- During the execution of a project you should conduct:
 - Risk Management
 - Stakeholder Management

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Project Breakdown Structures - recap

1. Project Scope Definition Techniques
2. Project Breakdown Structures
3. Hierarchical and Matrix Project Breakdown Structures
4. Schedule and Project Breakdown Structure Development
5. Risk and Stakeholder Analysis and Management
6. Workshop – Creating a Project Breakdown Structure

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Workshop 3 – Create a Project Breakdown Structure

- The list of trade packages is the start of a WBS
- List all the project stakeholders for the warehouse project and identify all their “Needs” and “Expectations”,
- List any Risks that you can identify and what you would do to minimise them,
- Now make a list of:
 - The approvals you would require before you start work
 - The output of the plan – the types of documents or other things that the plan would produce.

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Module 4 - Activity Definition

1. Guidelines for defining activities
2. Workshop – Defining Activities

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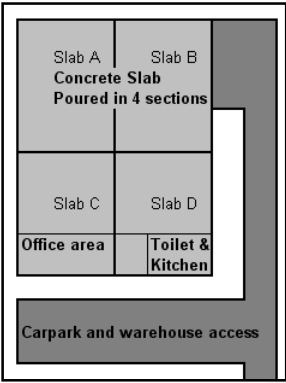
Activity Definition

- Typically each node on the Project Breakdown structure is broken down into one or more activities
- As a guide each activity should be no longer than one reporting period, the period between one programme update and the next
- Activity durations should be realistic & safe. They should then be reviewed closely:
 - Critical Path tasks should have 80% of the tasks as “Safe” and achievable no more than 20% of the activities with tight durations
- Consider using the PERT theory:
 - Activity Duration = $(1 \times \text{Min Dur} + 4 \times \text{Optimum} + 1 \times \text{Max})/6$
- Don't add too much detail too early except in Critical areas.

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Workshop 4 – Create a list of Activities for the Scenario:



- Create a list of activities for the concrete slab.
- There are services under the toilet and kitchen area.

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Activity Sequencing - recap

1. Relationship Types
2. Developing a Closed Network
3. Forward and Backward Pass
4. Total Float, Leads and Lags
5. Activity Constraints Early Start & Late Finish
6. Workshop – Creating a Network and calculating the forward and pass – next.

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Workshop 5 – Create a Network Diagram and a Gantt Chart

- On the sheets of paper supplied:
- Calculate the forward and backward pass and the total float and then,
- Prepare a Gantt chart.

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Workshop 5 - Answer

Task Name	Duration	Early Start	Early Finish	Total Slack	Predecessors
1 Level site & lay crushed rock base	2 days	1 Apr '09	2 Apr '09	0 days	
2 Underground services under Slab D	3 days	3 Apr '09	5 Apr '09	0 days	1
3 Prepare Slab B&C	5 days	3 Apr '09	7 Apr '09	1 day	1
4 Pour Slab B&C	1 day	8 Apr '09	8 Apr '09	1 day	3
5 Strip B&C	1 day	9 Apr '09	9 Apr '09	1 day	4
6 Cure B&C	2 days	10 Apr '09	11 Apr '09	3 days	5
7 Prepare Slab A & D	5 days	6 Apr '09	10 Apr '09	0 days	2
8 Pour Slab A & D	1 day	11 Apr '09	11 Apr '09	0 days	5, 7
9 Strip A & D	1 day	12 Apr '09	12 Apr '09	0 days	8
10 Cure A & D	2 days	13 Apr '09	14 Apr '09	0 days	9
11 Slab Complete	0 hrs	14 Apr '09	14 Apr '09	0 hrs	10, 8

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Module 6 - Resourced Programmes

1. Resource Planning
2. Understanding Resources
3. Histograms and Tables
4. Resource Levelling
5. Workshop 6 – Assign Resources and Level the Programme

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Resource Planning

- A resource may be defined as something or someone that is assigned to an activity and is required to complete the activity. These may include labour or crews, materials, plant, access and money
- "Resource Planning" identifies how many resources are required and when they are required
- Analysis of the resource requirements and market conditions may identify:
 - What resources are critical to the project completion
 - The peaks and troughs in the resource requirements
 - The identification of site facilities requirements such as mess huts
 - An understanding of cash flows when costs are applied to resources
- Resource problems such as maintaining crew continuity may be resolved by:
 - Replanning the project
 - Levelling the resource requirements which delays activities until the resource becomes available. Levelling may delay the end date of the project.

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Understanding Resources

- Resource planning may become very complex and it is important that a programme is created with the minimum number of resources required to meet the planning and reporting requirements
- There are many types of resources
 - Crews or Teams which may include plant and equipment
 - Trades or disciplines such as Bricklayers or Steel Fixers
 - Plant such as cranes or concrete pumps
 - Individual people by name
 - Materials
 - Money
- It is important to keep the number of resources in a programme to the minimum
- Initially try to plan only using high level resources such as crews or teams and high cost resources such as cranes
- Add more detailed resources only when the plan dictates this requirement.

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Module 8 - Leading a Project with the Plan

1. Work the Programme
2. Monitoring Progress and Updating the Plan
3. Controlling a Project
4. Corrective Action
5. Earned Value Performance Measurement
6. Workshop – Programme Compression




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Work the Programme

- The leader must ensure the work is executed in accordance with the programme
- This is achieved by distributing the programme, gaining stakeholder buy in and approving work to be executed in accordance with the programme
- If the programme is not followed then:
 - Work may not be started and therefore NOT completed on time
 - Other areas may be inconvenienced resulting in resource and material wastage
 - It may be difficult to substantiate EOTs
- If the programme may not be followed, then replan, change the programme and inform the stakeholders of the changes.

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Monitoring Progress and Updating a Plan

- Monitoring Progress records at a point in time the status of the project this information is normally entered into the programme
- The point in time is normally called the Data Date
- The frequency that the programme is updated is part of project planning. Programmes are usually updated between 10 and 20 times in a project life, with a minimum of one a month for long projects and typically every two weeks for shorter projects
- Monitoring progress records and enters into the program:
 - **Completed activities** - the Actual Start date, Actual Finish date and the hours, quantities or cost consumed to complete the work
 - **In-progress activities** - the Actual Start, Percent Complete and Remaining Duration required to complete the activity from the Data Date, plus the hours, quantities or cost consumed to date and an estimate of the hours, quantities or cost required to complete the activity based on productivity to date.

continued...

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Monitoring Progress and Updating the Plan - continued

- Next review the **Unstarted activities** and if necessary amend them based on:
 - The productivity to date of similar activities and
 - Any other information relevant information
- This process:
 - Confirms that the required deliverables are being produced on time, with the planned resources
 - The latest information is used to create an updated programme which should have a more realistic calculated finish date
 - In the case of slippage provide the leader with the necessary information to make informed decisions to bring the project back on track
- It is important to monitor progress more often at the start of a project as delays at the start of a project are very hard to recover.

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Controlling a Project

- The leader should compare the project's progress with the Baseline and:
 - Review and document the reasons for slippage and take the necessary actions to prevent a reoccurrence
 - Forecast problems and take corrective action as early as possible to minimise their effect on the project
 - Review the plan to ensure it is still valid, and if it is not valid then replan the project
 - Review profit and margin
- This process should also record:
 - Historical data for use in assisting in planning and pricing future projects
 - Obtain data required for preparing extension of time claims and for dispute resolution.

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Corrective Action

- At this point it may be necessary to further optimize the Programme to bring the project back on track. Possible options:
 - Reduce the contingent time allowance
 - Change relationships to allow activities to be executed in parallel
 - Reduce the durations of activities. In a resourced Programme this could be achieved by increasing the number of resources assigned to an activity
 - Work longer hours per day or days per week by working overtime, double shifts, or working weekends
 - Reduce the scope and delete activities
 - Change the method of execution and the plan.

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Basic Definitions continued

- **Estimate to Complete (ETC)**, a revised estimate of the remaining work,
- **Estimate at Completion (EAC)** = AC + ETC,
- **Variance at Completion (VAC)** = BAC – EAC
- **Schedule Variance (SV)** = EV – PV, or BCWP – BCWS, + ahead of plan & - behind plan,
- **Cost Variance (CV)** = EV – AC, or BCWP – ACWP, + below costs & - above cost,
- **Cost Performance Index (CPI)** EV /AC. 1 indicates on plan, over is overspending and under 1 indicates is spending,
- **The Schedule Performance Index (SPI)** EV/PV. 1 indicates to plan, <1 indicates behind plan and >1 ahead of plan,
- **NOTE: CPI & SPI** allows projects of different values to be compared.

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Leading a Project with the Plan – recap

1. Work the Programme
2. Monitoring Progress and Updating the Plan
3. Controlling a Project
4. Corrective Action
5. Earned Value Performance Measurement
6. Workshop – Programme Compression - next.

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Workshop 7 – Programme Compression

- What are your options to reduce the duration of your sample project?

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Module 9 - Scope Changes, Hints and Tips

1. Recording and Evaluating
2. Preparing for Dispute Resolution
3. Hints & Tips for Preparing a Plan
4. SMART+KU
5. Important Programming Issues
6. Follow On Actions after this Course

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Recording and Evaluating Changes

- When a change is requested it must be logged in the appropriate place, the "Change Request Log"
- When a change has an effect on the programme then this effect should be evaluated and this may result in an EOT
- To evaluate a change you may wish to:
 - Take an appropriate copy of the programme with a new name and save in a scope change directory,
 - Set a new Baseline which will establish the "Before Change" status,
 - Add the change as a new activities with the change number recorded in a field associated with the activity. Do not extend existing activities as this "hides" the change,
 - Compare the revised programme against the Baseline to evaluate the effect.

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Preparing for Dispute Resolution

- Dispute resolution is expensive and often much time is wasted in preparing for this process because the site personnel have not recorded site events or lost the evidence
- There are a few guidelines that you should consider in preparation for Dispute resolution:
 - Ensure accurate site records are maintained by every one
 - Keep the programme updated and accurately maintained
 - Every piece of data entered into a programme must have physical evidence to back it up, photos, daily reports etc
 - Keep an electronic copy of each schedule update
 - Keep copies of all correspondence and transmittals
 - Ensure there is an order for all work performed by contractors
 - Ensure all site instructions are received in writing and instructions to contractors are also in writing.

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