THE

CONSTRUCTION

PROJECT MANAGER'S

HANDBOOK

A Complete Guide to Planning, Scheduling, Cost Control,
Contracts, Risk, and Delivering Projects
On Time and On Budget

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PhD, Construction Management

ELIWA PROJECT CONTROLS LIMITED

Auckland, New Zealand

To Hanan,
and to Yosif, Yehya, Jasmine and Shadia -
the finest project I will ever be part of.

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Eliwa Project Controls Limited is a specialist project controls consultancy focused on planning, scheduling, project controls, delay analysis, reporting and construction management support services.

The company combines practical project delivery experience with academic research to provide reliable, data-driven project controls solutions for infrastructure, building and engineering projects.

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He is the founder of PMMilestone.org, a knowledge-sharing platform dedicated to practical project controls education, and Director of Eliwa Project Controls Limited, New Zealand.

His mission is simple:

To make professional project controls knowledge accessible, practical and immediately useful for project teams worldwide.

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Preface: Why This Book Exists

I have spent more than twenty years around construction projects, first as an engineer, then as a planner, then as the person leadership calls when a programme is slipping and nobody can explain why. In that time I have reviewed several hundred baseline schedules, sat through more claim negotiations than I care to count, and watched capable, intelligent project managers lose control of projects that were entirely recoverable six months earlier.

What struck me over those years is how rarely the failure was technical. The engineering was almost always sound. The people were almost always competent. What went wrong was quieter than that: a baseline that nobody genuinely believed, so nobody genuinely used it. A variation that was instructed verbally and priced eight months later. A risk register created for the tender and never opened again. A monthly report that told the client what the client wanted to hear.

Each of those is a small failure of process. Individually, none of them sinks a project. Collectively, they do, and they do it slowly enough that by the time the numbers are undeniable, the options for recovery have narrowed to the expensive ones.

This book is my attempt to put the countermeasures in one place.

What this book is

It is a working reference for the person actually running the job. It follows the shape of a real project, from the moment a contract is awarded through to the day the defects liability period expires, and at each stage it sets out what to do, in what order, using what documents, and what typically goes wrong.

You will find checklists, templates, worked calculations, decision tables and real examples drawn from live projects. The examples are anonymised, but the numbers and the situations are real. Where I have used illustrative figures to demonstrate a calculation, I say so.

What this book is not

It is not an academic text, and it is not a substitute for your contract. Every contract is different. Every jurisdiction has its own statutory framework for payment, health and safety, and dispute resolution. I have written this book to be useful across common construction contract families, NEC, FIDIC, JCT, AS, NZS and bespoke forms, which means that wherever a specific clause matters, you must go and read yours.

Nor is it a software manual. Primavera P6, Microsoft Project and Synchro 4D appear throughout because they are the tools most of us use, but the principles here are tool-agnostic. A good project manager with a spreadsheet will outperform a poor one with a licence for everything.

How to use it

1. **If you are new to the role**, read Parts I and II in order. They build the foundation, the role itself, delivery models, contracts, and how to set a project up so that it can be controlled at all.
2. **If you are mid-project and something is wrong**, go straight to the chapter that matches your symptom. Part III covers cost and schedule control, Part V covers delay, claims and recovery. Each chapter stands alone.
3. **If you are preparing for certification**, PMP, PMI-SP, AACE PSP or CCP, use the study notes and terminology tables. Chapter 18 maps the content of this book against each credential.
4. **If you are handing over a project**, use the checklists in Chapters 4 and 17 as your transfer agenda.

Every chapter closes the same way: key takeaways, a short set of expert tips drawn from experience, and a list of the mistakes I see most often. If you read nothing else in a chapter, read those three boxes.

A note on honesty

Project controls has a credibility problem, and we created it ourselves. Too many schedules are built to satisfy a contractual submission requirement rather than to describe how the work will actually be done. Too many reports are written to avoid a difficult conversation. A programme that shows on-time completion when the site knows otherwise is not a programme, it is a liability, and it will be read aloud in an adjudication one day.

The single most valuable habit you can build as a construction project manager is telling the truth early, in writing, with the numbers attached. Almost everything else in this book is a technique for making that easier.

Dr. Hassan Khames Eliwa
Auckland, New Zealand

PART I

Foundations

The role, the delivery models, and the contract. Everything in the rest of this book sits on top of these three things.

CHAPTER 1

The Construction Project Manager's Role

What you are actually accountable for, and what you are not.

Ask ten construction project managers to describe their job and you will get ten different answers, most of them a list of activities: run the meetings, chase the subcontractors, sign the payment claims, keep the client calm. All true, and all beside the point. Activities are what fills the day. They are not what the role is.

The role is this: you are accountable for converting a contract into a completed asset, within an agreed time and cost envelope, at an agreed standard of quality, without harming anyone. Everything else, every meeting, every report, every uncomfortable phone call, is instrumental to that.

The distinction matters because it tells you where to spend your attention. If a task does not protect time, cost, quality, safety or the contractual position, it is administration, and administration is the first thing that should be delegated when the week gets tight. I have watched project managers spend three hours reformatting a progress report while a critical-path subcontractor sat unresponsive for a fortnight. The report was beautiful. The project lost two weeks.

The five accountabilities

Strip the role back and five things belong to you and nobody else. You can delegate the work; you cannot delegate the accountability.

Table 1.1, The five accountabilities of the construction project manager

Accountability	What it means in practice	The question you must be able to answer at any moment
Time	Maintaining a schedule that reflects reality and driving the critical path	"What is the completion date today, and what changed it since last month?"
Cost	Controlling committed and forecast cost against the budget	"What will this project cost at completion, and how confident am I?"
Quality	Delivering work that complies with specification first time	"What is open on the NCR register and who owns each item?"

Accountability	What it means in practice	The question you must be able to answer at any moment
Safety	Ensuring nobody is harmed by the work or the way it is planned	"What is the highest-risk activity on site this week, and what controls are in place?"
Contract	Protecting entitlement and complying with obligations	"What notices are due, and have they been served in time?"

If you cannot answer all five questions within about ten minutes, you are not in control of the project, you are reacting to it.

Notice that four of the five are measurable and one is not. Contract administration is the accountability most often neglected, because it produces nothing visible when done well. Nobody congratulates you for serving a delay notice on day four instead of day twenty-five. But that single act of discipline is frequently worth more than every efficiency you will find on site all year.

> ◆ **EXPERT TIP**
>
> Build a one-page **project control sheet** and update it every Friday before you leave: forecast completion date, forecast cost at completion, open NCRs, top three risks, notices due in the next 30 days.
>
> It takes fifteen minutes. It is the single highest-return habit in this book, and it means you can answer any question your client, your board or your lawyer asks without going looking for the answer.

Where the project manager sits

The construction project manager operates at the junction of four groups whose interests do not naturally align: the client, the design team, the supply chain, and the site team. Your authority over each is different, and confusing them is a common source of frustration for people new to the role.

Table 1.2, Authority and influence by stakeholder group

Group	Your formal authority	What actually works
Client / employer	None, you respond to instructions	Predictability. Clients tolerate bad news far better than surprises.
Design consultants	Limited, usually via the contract administrator	Deadlines tied to procurement dates, not to abstract design milestones.

Group	Your formal authority	What actually works
Subcontractors	Contractual, strong, but slow to enforce	Continuity of work, prompt payment, and a programme they helped build.
Your own site team	Direct line authority	Clarity of priority. Most site teams are not lazy; they are pulled in six directions.
Statutory bodies	None	Early engagement. Consent authorities respond to preparation, not pressure.

The practical lesson from this table is that formal authority is your weakest tool and your slowest one. Issuing a default notice to a struggling subcontractor is sometimes necessary, but it takes weeks to have effect and it damages a relationship you may still need for another eighteen months. Sequencing their work so that they can earn money efficiently usually gets the resources on site faster.

A worked example: the drainage subcontractor

On a mid-sized commercial project in Auckland, the in-ground drainage subcontractor was consistently one crew short. The site manager escalated it weekly for six weeks. The programme showed drainage on the critical path with zero float, and the project manager was preparing a formal notice of default.

Before issuing it, he went to see the subcontractor's owner. The problem turned out to be simple: our site could only give them access to two of the four drainage runs at a time because the earthworks contractor was still moving material through the area. A two-crew gang was uneconomic for them, so they were prioritising a job across town where they could run four crews.

The fix cost nothing. The earthworks sequence was reversed, the northern platform was completed first instead of the southern, which released the full drainage area three weeks earlier. The subcontractor put four crews on and recovered eleven days against a programme that had been slipping for six weeks. No notice was ever issued.

That is the job. Not the notice, the diagnosis.

> ⚠ **COMMON MISTAKE**
>
> **Escalating before diagnosing.** A contractual remedy applied to an access problem, a design problem or a payment problem will not fix it. It will simply add a dispute on top of the original issue.

> **Confusing activity with control.** Attending twelve meetings a week is not project management. Ask of every recurring meeting: what decision does this produce? If none, cancel it or shorten it to fifteen minutes.

The operating rhythm

Control is a habit, not an event. The project managers who stay ahead of their projects almost all run some version of the same cycle. The specific days matter less than the fact that the cycle never breaks, including in the weeks when everything is on fire, which are precisely the weeks it gets abandoned.

Table 1.3, A workable operating rhythm

Cycle	Activity	Output	Time
Daily	Site walk before the morning meeting	Your own eyes on progress, not a report about it	30 min
Daily	Look-ahead check with site managers	Blockers for the next 48 hours identified	15 min
Weekly	Subcontractor coordination meeting	Three-week look-ahead agreed and signed	60 min
Weekly	Progress capture and schedule update	Updated percent complete against the baseline	2 hrs
Weekly	Control sheet update	Forecast date, forecast cost, risks, notices due	15 min
Monthly	Cost report and forecast at completion	EAC, variance analysis, cash flow update	1 day
Monthly	Formal schedule update and narrative	Progress report, critical path commentary	1–2 days
Monthly	Risk register review with the team	Reassessed risks, closed items, new items	90 min
Quarterly	Baseline health check	Confirmation the baseline is still fit to measure against	1 day

Add up the fixed commitments and you get roughly four to five days a month of pure control work on a medium project. That is the price of knowing where you stand. Project managers who try to compress it below that do not save time; they simply move the discovery of problems later, when the cost of fixing them is higher.

Competencies that separate good from adequate

Technical knowledge gets you into the role. It is rarely what distinguishes the strongest performers. In my experience reviewing project teams, the differentiators are these:

- **Schedule literacy.** Not the ability to open the file, the ability to look at a programme and know within a few minutes whether it is credible. Chapter 6 covers the tests.
- **Commercial instinct.** Understanding, at the moment an instruction is given, whether it is a variation, and what it will cost before it is priced.
- **Written discipline.** The habit of putting agreements in writing the same day. Projects are ultimately reconstructed from documents, and the party with the better contemporaneous record almost always prevails.
- **Comfort with bad news.** The willingness to report a slip in the month it occurs rather than the month it becomes undeniable.
- **Sequencing imagination.** The ability to see three different ways to build the same thing, and to price the difference.

▶ YOUR FIRST 30 DAYS ON A PROJECT

- **Days 1–3, Read the contract.** All of it, including the appendices. Note the completion date, liquidated damages rate, notice periods, payment dates and the variation valuation mechanism. Write these on one page and keep it.
- **Days 3–5, Read the baseline programme.** Check the critical path, the total float distribution, the constraint list and the calendars. If it was built by someone else, assume nothing.
- **Days 5–8, Reconcile budget to programme.** Every significant activity should map to a cost line. Gaps here become forecasting problems within two months.
- **Days 8–12, Walk the site with each site manager individually.** Ask what worries them. Take notes; do not defend anything you inherit.
- **Days 12–18, Meet the top five subcontractors by value.** Ask what they need from you to hit their dates.
- **Days 18–25, Rebuild the risk register with the team.** An inherited register you did not build is a document, not a tool.
- **Days 25–30, Issue your first control report.** Set the standard early. It is much harder to introduce rigour in month six.

The reporting line problem

One structural issue deserves naming because it causes a disproportionate amount of trouble. On most projects the project manager reports to someone who is measured on margin, while the site team is measured on production, and the client is measured on delivery date. These three incentives conflict, and the conflict lands on your desk.

The resolution is not to pick a side. It is to make the trade-off explicit and push the decision upward with the numbers attached. "We can recover eleven days by working two Saturdays in November. Direct cost is $47,000. Liquidated damages exposure over the same period is $88,000. I recommend we proceed, please confirm." That email takes four minutes to write and it moves the decision to the person whose decision it actually is.

Project managers who absorb these trade-offs silently end up carrying blame for outcomes they did not have the authority to determine. Do not do this. Present options, recommend one, record the answer.

> ◆ **EXPERT TIP**
>
> Keep a **decision log**, date, decision required, options presented, decision made, who made it. One line each.
>
> On a two-year project it will run to perhaps eighty entries, take a few minutes a week, and it is the most useful document you will own if the project ever becomes contentious.

> ★ **KEY TAKEAWAYS**
>
> - The role is accountability for time, cost, quality, safety and contract, not the activities that fill the day.
> - Formal authority is your slowest tool. Diagnose the cause before reaching for a contractual remedy.
> - Control is a rhythm. Budget four to five days a month for it and protect that time in the difficult months especially.
> - Write agreements down the same day. Projects are reconstructed from documents, not from memory.
> - Escalate trade-offs with numbers attached and record the answer. Never absorb a decision that belongs to someone else.

CHAPTER 2

The Project Lifecycle and Delivery Models

Where you join the project determines what you can still change.

Two projects can have identical scope, identical value and identical duration, and be almost completely different jobs to manage. The difference is the delivery model, who designed it, who carries which risk, and how the money moves. Understanding this before you start is not academic. It tells you which battles you can win.

This chapter covers two related things: the phases every construction project passes through, and the contractual models used to deliver them. Get these clear and a great deal of otherwise confusing behaviour from clients, designers and subcontractors becomes predictable.

The lifecycle in practice

Textbooks describe five or six neat phases with clean boundaries. Real projects overlap them heavily, procurement runs into construction, design changes arrive in month fourteen, and commissioning starts before the last concrete is poured. The phases are still worth knowing, because each one has a different dominant failure mode.

Table 2.1, Lifecycle phases and where each one typically fails

Phase	Primary purpose	Dominant failure mode	Your main lever
Concept & feasibility	Establish whether the project is viable	Optimism bias in the initial estimate and duration	Benchmark against completed comparables
Definition & design	Fix scope and produce buildable information	Late or incomplete design released to site	Information required schedule tied to procurement dates
Procurement	Secure price, capacity and terms	Awarding on price without checking capacity	Resource verification during tender assessment
Construction	Convert design into physical works	Loss of schedule control through unmanaged change	Weekly progress discipline and change control
Commissioning	Prove the asset performs	Underestimating duration; treating it as a punch list	Commissioning programme built at baseline, not at the end

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