The Critical Path

THE CRITICAL PATH

A Business Novel About Schedules, Claims and Telling the Truth

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Eliwa Project Controls L

The Critical Path: A Business Novel About Schedules, Claims and Telling the Truth

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

And for every planner who was asked to hold the dates, and didn't

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Author's Note

I have spent more than twenty years on the planning side of construction: building programmes, updating them, defending them, and, too often, reading them years later in the middle of a dispute. In that time I've seen very few projects fail because nobody knew how to use the software. I've seen many fail because someone, somewhere, decided that the programme should say what people wanted to hear.

This book is my attempt to teach project controls the way I wish I'd been taught them: through the pressure of a real project, with real people, where every concept arrives exactly when it's needed. Critical path and float, baselines, progress measurement, earned value, delay analysis, extensions of time and recovery planning are all here, inside a story about a planner who is asked to keep a number and decides to find the truth instead.

Each chapter ends with a page from Malcolm's notebook: a short summary of what the chapter teaches. You can read the novel straight through and ignore them, or come back to them later as a field guide. At the back you'll find a glossary, an index of lessons by chapter, and three tools you can use on Monday morning: a one-page summary template, an Engineer's programme-review checklist and a list of lessons learned.

The project, the companies and the people are invented. The problems are not. If you have worked in this industry for long, you will recognise some of them, and perhaps some of the people too.

Dr. Hassan Khames Eliwa
Auckland, 2026

Cast of Characters

Roles only, no outcomes.

Character	Who they are
Castellan Gulf Contracting (the Contractor)	
Nadia Farouk	Senior planner, sent from head office; the narrator
Craig Holloway	Project Director and Contractor's Representative
Henrik Vos	Regional Managing Director
Priya Nair	Commercial Manager
Joseph Mensah	MEP Manager
Rajesh "Raj" Pillai	General Foreman
Eng. Hamad Al Suwaidi	Authority liaison engineer
Marco Bellini	Testing and commissioning manager
Vikram	IT administrator
Sunil and Grace	Quantity surveyors
Rania Khoury	In-house legal counsel
Alan	Chairman
Arjun Mehta	Former planner on the project
Tom Ashby	The project's first planner
Coastal Health Development Company (CHDC) (the Employer)	
Eng. Khalid Al Mazrouei	Project Director
Dr Mariam Al Falasi	Board member, consultant physician
Fiona Grant	CHDC's external lawyer
Sørvik Partners (the Engineer)	
Dr Ingrid Solberg	Engineer's Representative
Omar Saleh	Lead planner
Others	
Malcolm Reid	Retired forensic delay expert, living on a boat in Dubai Marina
Ana Tupou	Programme controls lead on an Auckland rail project; Nadia's first boss
Meera	Arjun's sister, in Sharjah
Layla Al Hashimi	Graduate planner

PROLOGUE

Hold the Dates

Month 7

THE AIR CONDITIONER IN Site Cabin 3 had two settings: off, and too loud to think. At eleven at night Arjun Mehta had it on too loud. The other choice was forty-one degrees and the kind of humidity that made paper go soft.

He had been looking at the same Gantt chart for an hour. Update 6, data date the last day of the month. Every month he ran the schedule, and every month the completion milestone moved a little further to the right of the red line that marked the contract date. This month it had moved thirty-one days.

He heard the cabin door open before he saw who it was. Craig Holloway didn't knock on doors he paid for.

"Still here?" Holloway dropped into the chair next to him, close enough that Arjun could smell the day on him: sunscreen, diesel, and the cologne he wore to client meetings. "Show me."

Arjun showed him. He scrolled down the longest path the way he had been taught. Piling, basement slab, podium, tower cores. Then the long chain of mechanical and electrical rough-in, floor by floor, into ceilings, finishes, testing and commissioning. At the bottom sat the diamond of the completion milestone, a month after the date it was supposed to be.

"Thirty-one days," Arjun said. "Mostly the dewatering in the basement. We gave notice on that one, so some of it should come back to us as time. But the MEP durations on the upper floors are-"

"Optimistic. I know." Holloway leaned back. "And if I send that to Sørvik tomorrow, what happens?"

Arjun knew it wasn't really a question. He answered it anyway. "They'd ask for a recovery programme."

"They'd ask for a recovery programme," Holloway repeated, as if Arjun had said something a little stupid. "And CHDC reads the Engineer's monthly report. Somebody at CHDC sends it to somebody at the ministry. By Sunday we're the contractor who is a month late on the hospital the minister started. Seven months in." He tapped the screen over the diamond. "We'll recover it. We always do. The basement is behind us, and the tower is going up fast. I'm not going to frighten a client with a month that won't exist by Christmas."

"So what do you want me to do?"

"Hold the dates."

Arjun said nothing.

"I'm not asking you to lie," Holloway said. "A schedule is a communication tool. It says what we plan to do. We plan to finish on the contract date. Make the programme say that."

There were honest ways to do it, and Arjun knew all of them. Change the order of the floors. Add crews. Split the long activities and overlap them where the trades could manage it. Every one of them needed people Holloway hadn't hired and money he hadn't released.

The dishonest way took four minutes.

Arjun clicked the first of the floor-by-floor milestones, *L3 - MEP Rough-in Complete*. He opened the Status tab and chose **Mandatory Finish** from the Primary Constraint list. He typed a date, then did the same for Level 4, Level 5 and every level up to Level 9. Seven activities. He pressed F9.

The completion milestone jumped back to the contract date. The diamond and the red line touched.

"There," Holloway said. He sounded really pleased, the way a man is pleased when a printer finally works.

Arjun felt none of that, because he knew exactly what he had done. A mandatory constraint doesn't argue with logic. It ignores it. P6 had put those seven milestones on the dates he typed, whether the work feeding them was finished or not. Everything after them now believed the past had gone to plan.

The delay hadn't gone anywhere. It had moved upstream, into the hundreds of small activities that fed those seven: duct mains, cable tray, sprinkler risers. Each one now carried negative float, like a debt.

"Some of the predecessors are showing negative float now," he said. "Minus thirty, minus forty. Sørvik's planner will-"

"Sørvik's planner reads the summary and the critical path. Print it by WBS, top level. Nobody reads line four hundred." Holloway stood up and stretched. "Good lad. Send it in the morning."

When the door closed behind him, the cabin was quiet except for the air conditioner.

Arjun sat there for a while. Then he did two things.

First, he exported the constrained schedule as Update 6 and saved it where the project's documents were kept, with the correct file name and the correct revision code.

Then he deleted the seven constraints, ran the schedule again and watched the diamond move back thirty-one days. He exported that one too. He saved it in a folder called *Misc_Old_Templates*, on a shared drive that nobody in the planning team used, under a name nobody would ever think to search for.

He didn't fully know why. He told himself it was so that somebody would always know the real number.

Twelve months later, that somebody turned out to be me.

Part One

Discovery

CHAPTER 1

The Handover That Wasn't

Day 20

HENRIK VOS CALLED ME on a Thursday, and that is how I knew it was serious. Henrik didn't call. Henrik sent calendar invitations with agendas attached.

"Khor Sadaf," he said, without hello. "The hospital in Dubai. Sørvik have rejected two programme revisions in a row, and Craig's planner has resigned. I need someone to tidy the programme and get it through. Four weeks, maybe six. Can you fly on Sunday?"

I said yes before he had finished. I was thirty-four. For ten years I had been the person people called when a P6 file wouldn't schedule, and I had waited a long time for someone to call me about something bigger.

Tidy the programme. I could do that in my sleep. That's what I told myself on the plane.

It was a lie I had been telling myself for years, and I had become very good at it.

I was born in Alexandria. My father was a site engineer on the harbour works there. Some of my earliest memories are of sitting on an upside-down bucket in a site cabin that smelled of diesel and sweet tea. He would unroll drawings across a trestle table and let me follow the gridlines with my finger. When I was nine we moved to Manchester. He never really found work there that used what he knew, and I learned what it looks like when a man who can read a building can't get anyone to listen to him.

I think that's why I became a planner. A planner doesn't have to persuade anyone. She just has to be right. The logic is the logic; the software calculates; the dates fall where they fall. I was good at it. I was the one who untangled the broken networks other planners left behind, rebuilt the calendars, and found the open ends at midnight before a submission. Project managers liked me because I fixed

things quietly. I liked it because nobody ever asked me to stand up in a meeting and say something they didn't want to hear.

On the plane, somewhere over Iran, I opened my laptop and looked at the only document Henrik had sent me. It was a one-page project summary that said the hospital was fourteen days behind. Fourteen days. On a thirty-month job. I had seen worse on projects that finished early.

I closed the laptop and slept. I remember thinking, as I fell asleep, that it would be nice to work somewhere warm for a change.

At seven in the morning in September, Dubai was already thirty-six degrees. The driver took Sheikh Zayed Road south, past the towers of the Marina and the cranes and container stacks of Jebel Ali, then turned toward the sea.

The hospital rose out of flat, salt-grey ground. Nine floors of concrete frame, topped out, with two tower cranes still turning above it. From the west it looked almost finished: glazing on, louvres fitted, the CHDC logo already fixed to the parapet.

Then the road curved and I saw the east side. There was no curtain wall at all. Nine floors of bare slab edges were wrapped in orange safety netting. It moved in the wind off the Gulf, like a sentence somebody had stopped writing halfway through.

I remember thinking: *that's not two weeks.*

Then I talked myself out of it. Facades are often the last thing to close. A gap on one side could be a planned sequence, a crane access zone, a hundred innocent things. I had been on site for zero minutes. I was not going to diagnose a hospital from the back seat of a car.

The driver dropped me at the gatehouse. A line of white buses was letting out the morning shift: hundreds of men in blue and orange coveralls, some with scarves over their mouths against the dust, walking past the turnstiles with their ID cards held up to the scanner. A safety officer with a clipboard was shouting names. Somewhere behind the site fence a concrete pump was already working, and the air smelled of hot steel, wet cement and, very lightly, the sea.

The induction took forty minutes in a portable classroom with a broken air conditioner. A video in four languages explained what to do in a fire, in a fall and in a heat emergency. A Nepali scaffolder next to me watched the heat-stress part very seriously. When it finished, he turned to me and said quietly, "Drink before you are thirsty, madam. Always before." I wrote it on the back of my induction card. For some time, it was the best advice anyone gave me on that project.

♦

The site offices were a two-storey block of cabins behind the gatehouse. When I came out of the induction, a woman in a grey linen suit and steel-toed boots met me at reception. She looked at me the way a quantity surveyor looks at a variation: carefully, and expecting to find something wrong.

"You're the planner."

"Nadia Farouk."

"Priya Nair. Commercial." She didn't offer to carry anything. "You're the third planner on this job. The first lasted six months. Arjun lasted twelve. Craig's expecting you."

Craig Holloway had the corner office, with a window facing the tower. On the whiteboard behind his desk, someone had written in red marker:

KHOR SADAF - COMPLETION FORECAST: −14 DAYS

The *14* had been written over something that had been wiped off. You could still see a ghost of it under the ink.

Holloway stood up, shook my hand firmly and gave me the kind of smile that has closed a lot of meetings. "Nadia. Henrik speaks very highly of you. Sit, sit."

I sat.

"I'll be honest with you, because you'll work it out anyway," he said. "This is a good project with a bad programme. Sørvik keep rejecting it on technicalities. The client reads every letter the Engineer sends, and every rejection costs me a week of meetings I don't need. I want a clean revision that gets a Notice of No-objection. Fourteen days late, which we'll recover. That's the job."

He pushed a letter across the desk.

SØRVIK PARTNERS - The Engineer Ref: SP/KSSH/L/0412 To: Castellan Gulf Contracting - Project Director Subject: Sub-Clause 8.3 - Revised Programme Rev 7 - Notice

Following our review of Revised Programme Rev 7, the Engineer gives Notice under Sub-Clause 8.3 that the programme does not comply with the Contract, for the following reasons:

1. The programme contains many date constraints that override the logic links between activities.
2. Progress reported for MEP rough-in on Levels 3 to 6 is not consistent with the Engineer's site observations.
3. The programme does not show a continuous critical path from the data date to the completion of the Works.

---

4. No narrative has been provided to explain changes in logic, durations or progress since Rev 6.

The Contractor is requested to submit a revised programme that addresses the above.

Dr. Ingrid Solberg, Engineer's Representative

I read it twice. Then I said the wrong thing, which was also the true thing.

"These aren't technicalities."

Holloway's smile didn't move. It just stopped meaning anything.

I kept going, because once I start I'm bad at stopping. "Item two says the Engineer's own people have walked the floors and don't believe our progress. Item three says our critical path doesn't connect. If either of those is true, the completion date in this programme isn't a forecast. It's a-"

"It's a programme that needs tidying," Holloway said. "Which is why Henrik sent you." He leaned back. "Omar Saleh, their planner, collects constraints the way other men collect watches. He'll always find something. So fix the constraints, write him a narrative, and give him something he can sign. The number is fourteen days. It's in our monthly report. It's in CHDC's board pack."

He held my eyes a second longer than he needed to.

"Help me keep it."

♦

Priya took me to Arjun's desk. It was by the window on the upper floor of the cabin block. Someone had already cleared it. What was left: a coffee-cup ring on the desk, a dead succulent, two monitors and a mess of cables nobody had bothered to tidy.

"He resigned by email at two in the morning," Priya said. "Didn't work his notice. HR are still furious."

"Why did he leave?"

She looked at me properly then, for the first time, as if I had asked something more interesting than she expected.

"Ask Craig," she said. Then, after a pause: "Or don't."

She left me to it.

I logged in, opened P6 and found the project: KSSH-REV07. Data date 31 August. There were 6,812 activities. I ran the schedule and let the Gantt chart draw itself across both screens.

At the bottom sat the completion milestone, fourteen days to the right of the contract date. Total float: minus fourteen. Clean. Exactly the number on Holloway's whiteboard.

Too clean, I thought. Then I told myself I was being dramatic on my first day.

Whenever I open someone else's schedule I do the same thing first, the way a doctor takes your pulse before asking about symptoms. I filtered for every activity with negative total float and sorted them from worst to best. If the programme was honest, I expected a short list: the critical path at minus fourteen, and a few activities around it.

The filter returned 412 rows.

The top of the list wasn't minus fourteen. It was minus 186.

L4 - Supply Air Duct Main, Zone B. TF −186.

L5 - Cable Tray Installation, Zone A. TF −171.

L4 - Sprinkler Riser Connection, Core 2. TF −168.

There were dozens of them, floor after floor, all mechanical and electrical rough-in. I clicked on the duct main and followed its successors with the relationship lines switched on. Two steps downstream, the float jumped from minus 186 to minus fourteen. One step further it was zero.

I sat back.

In a network where every activity is tied to the next by logic, float doesn't jump like that. Delay flows downstream like water, and nothing stops it except a gap in the logic or something holding the later dates in place. If an activity was really six months late, everything that depended on it should be six months late too, all the way down to the completion milestone.

Unless something was holding the dates.

I didn't know what yet, and I wasn't going to say a number out loud on my first day. Not after the meeting I had just had. I took a yellow pad from the drawer and wrote:

−186? What is holding the dates?

Then I underlined it twice, which is what I do when I'm frightened and don't want to admit it.

♦

Henrik called at six.

"First impressions?"

I looked at the yellow pad. "It's messier than the Engineer's letter says. I need a week before I give you a number."

There was a pause, long enough for me to hear the London traffic behind him.

"We have a number, Nadia. Fourteen days." Another pause. "Craig's a good project director. He's delivered three jobs in the region. Don't make enemies on your first day."

"I won't," I said, and I meant it.

♦

By seven the cabins were empty. A cleaner pushed a trolley along the corridor. Outside, the tower lights came on floor by floor, on every side except the east.

I didn't hear him arrive. When I looked up, a man was standing in the doorway with his helmet in his hand. He was in his fifties, with a grey moustache, and his hi-vis vest had faded to the colour of weak tea.

"You are the new planning madam?"

"Nadia."

"Rajesh Pillai. Everybody says Raj. General foreman." His eyes went past me to my screens and the long red bars running off the right-hand edge. He looked at them for a moment, the way you look at a photograph of someone you used to know.

"Arjun used to come up to the floors every Thursday," he said. "Then one day he stopped coming."

He turned his helmet over in his hands.

"Tomorrow, seven o'clock. You want to see Level 4?" He nodded at the screen. "Not the photos, madam. Level 4."

FROM MALCOLM'S NOTEBOOK

What a programme is for

Written later, in the notebook he gave me, once I knew enough to see what I had missed on Day 20.

- A programme does four jobs: it plans the work, coordinates the people, measures progress and proves what happened. If you fail at the last one, sooner or later you have failed at all four.
- The data date is the line between fact and forecast. To the left of it, everything should be recorded. To the right of it, everything should be logic.
- Under FIDIC 2017 Sub-Clause 8.3, a programme must show the logic links, early and late dates, float and the critical path(s). The Engineer has 21 days to give Notice that it doesn't comply. Silence counts as a Notice of No-objection.
- A No-objection is not an approval of your dates. It only means that nobody objected, and it doesn't free the Contractor from its obligations.
- Delay flows downstream like water. If float jumps between an activity and its successor, something is blocking the flow. Find the dam.
- When the schedule and the site disagree, the site is right. Go and look.

CHAPTER 2

Green Everywhere

Day 21

RAJ WAS WAITING AT the hoist at five to seven, his shirt already wet with sweat. He gave me a hard hat with a new chinstrap and a pair of gloves still in their plastic.

"Your size, madam. I asked stores."

The hoist cage shook its way up the outside of the tower. The sun had only been up for an hour, but inside the concrete frame the air was already heavy and still. It smelled of cement dust and the sweet chemical smell of fire-stopping sealant. On every floor I heard the same sounds: a drill, a radio playing Malayalam film songs, someone shouting for a ladder.

We got out at Level 3.

The main corridor in Zone A looked like a hospital. The walls were boarded and taped. The ceiling grid was in, the tiles were up, and the light fittings were fixed, though not yet live. For thirty metres it was the most finished thing I had seen on the whole site.

"This looks good," I said.

Raj didn't answer. He walked to the middle of the corridor, reached up, and pushed one ceiling tile with two fingers. It lifted, and he slid it to one side.

I stood on my toes and looked into the void. There was ductwork, cable tray and a sprinkler main, all apparently installed. But there was no insulation on the duct joints. The fire-stopping around the penetrations was half done. Not one of the pipes had the inspection tag I had been taught to look for on every job since my graduate year.

"Pressure test?" I asked.

"Not done."

"Then why are the ceilings closed?"

END OF FREE SAMPLE

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