MORSSON PYPER

FORESIGHT | CERTAINTY | ASSURANCE

So you think you understand Programming?

Presenter Keith Kirkwood

Date 19th October

For the Institute of Construction Claims Practitioners

Presenter – Keith Kirkwood BSc, FRICS, FCIArb, FCInstCES, MIOD

Principal - Morsson Pyper Ltd

45 years' experience in construction and civil engineering

Previously owned Schofield Lothian Ltd. and Bennington Green Ltd. - both now sold

Past NED of Driver Group & Commercial Director of C&N

Started career with John Laing

Drafted 1st and 2nd Editions of the SCL Protocol on Delay and Disruption

Given Expert Evidence in UK and Internationally in Adjudication, Arbitration and Litigation

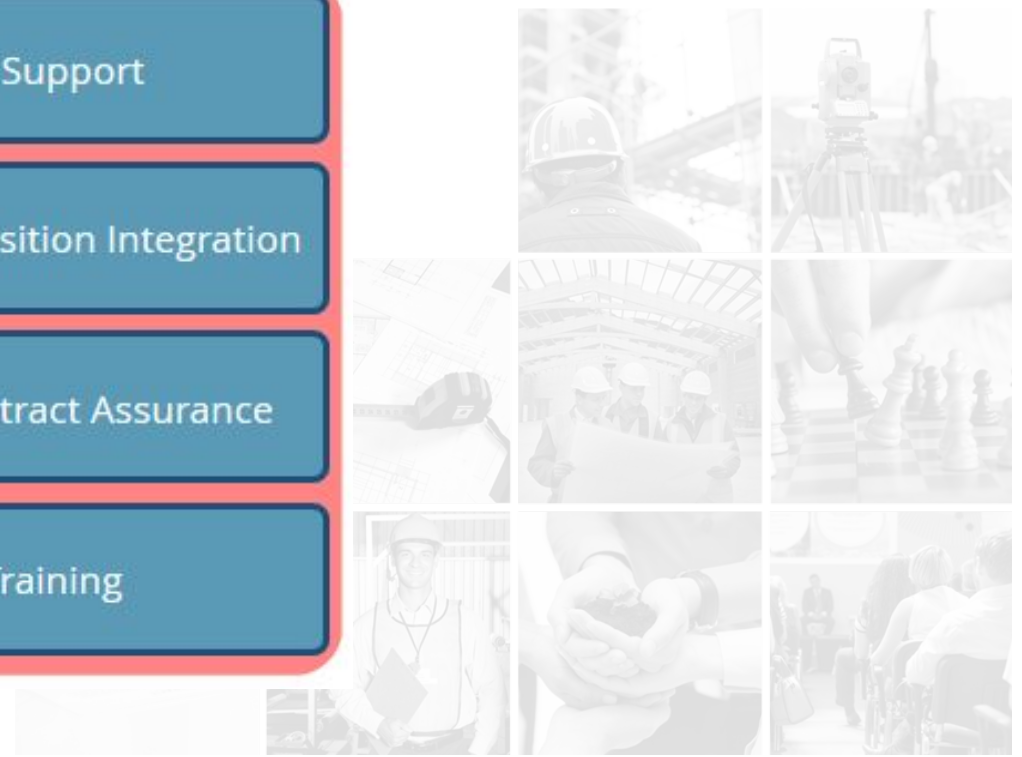
Worked throughout the UK and in over 20 countries around the globe

Morsson Pyper provide:

Exec Services to the Construction sector

Our aim is PREVENTION rather than cure

Governance Assurance	Internal Audit Support	
Pre-Acquisition Due Diligence	Business Turnaround	Post-Acquisition Integration
Pre-Contract Assurance	Project Recovery	Post-Contract Assurance
Procurement	People and Training	

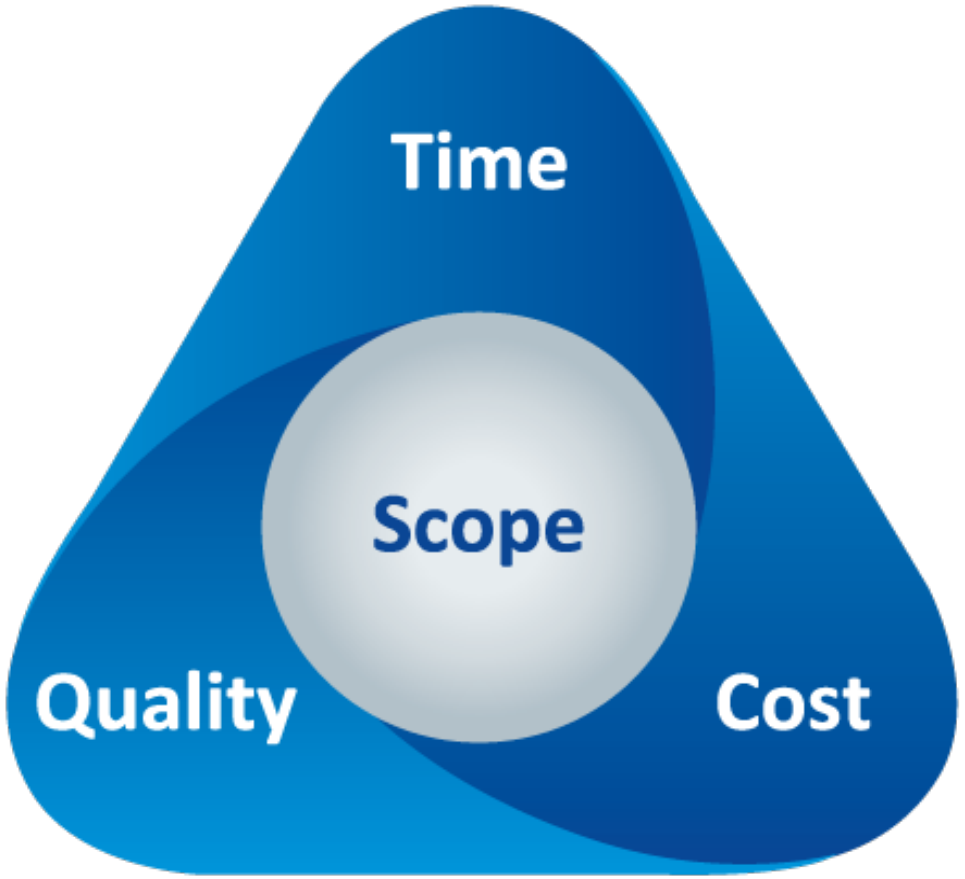


Engineering is a Science

QS'ing is an Art

Programming is a Mythology

Successful Project Management

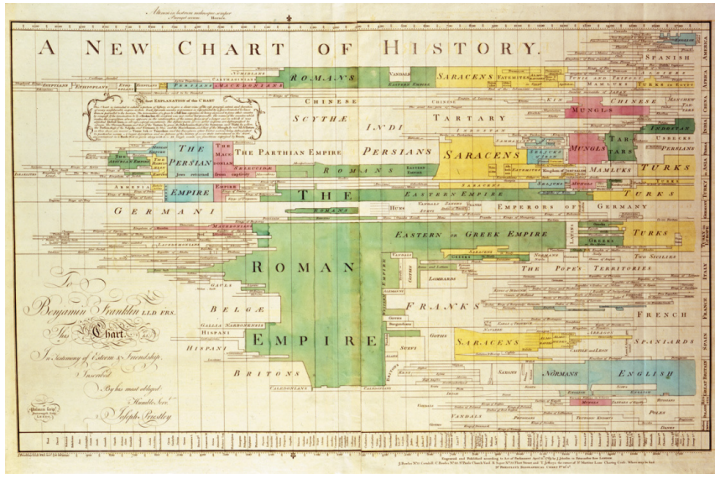


Great Pyramid of Giza

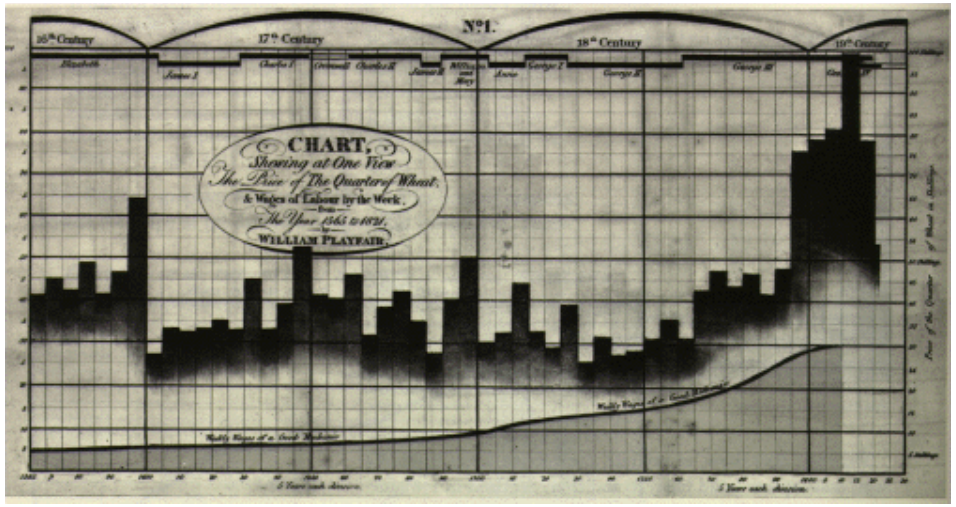
To understand programming, what it is, how it works and why it is so important we must understand the history

Taj Mahal India

Joseph Priestly & William Playfair

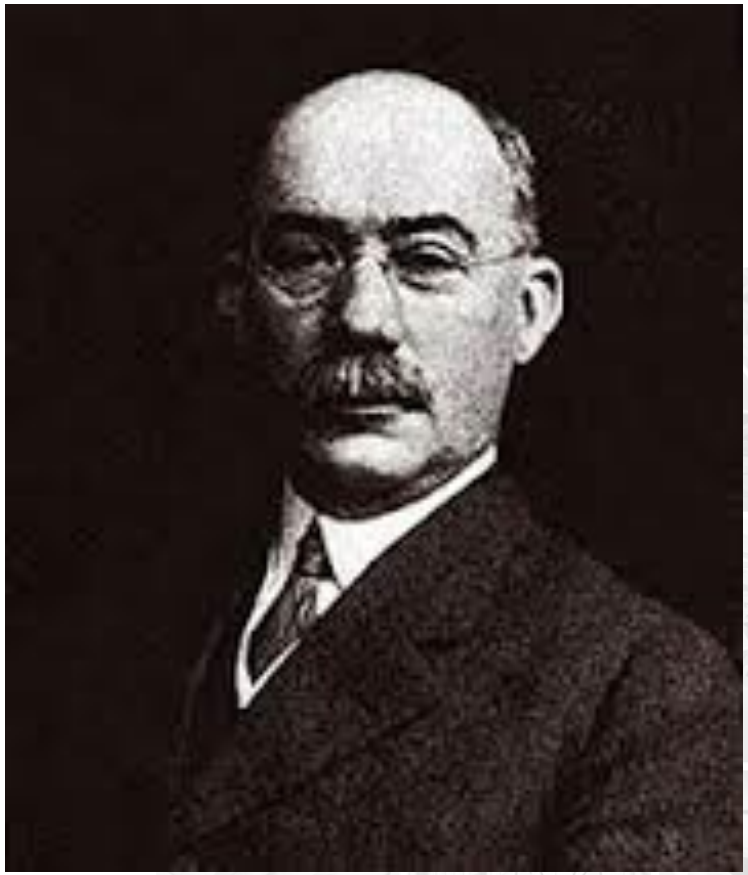


1765 Joseph Priestley's
'Chart of Biography' plotted some 2000 famous lifetimes on a time scaled chart



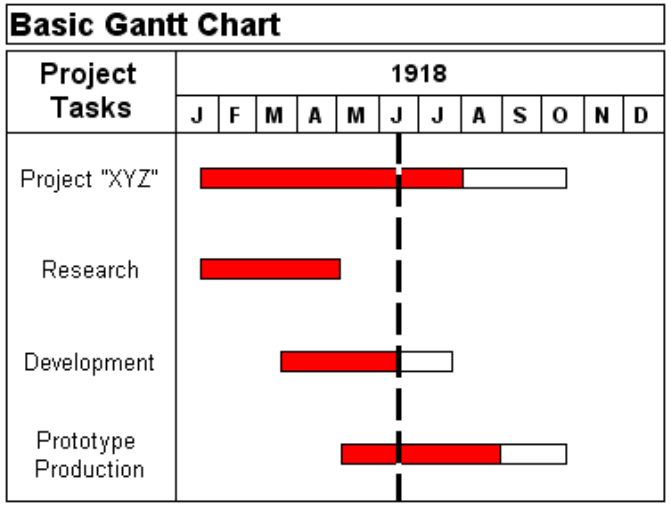
1786 William Playfair
'Commercial and Political Atlas'

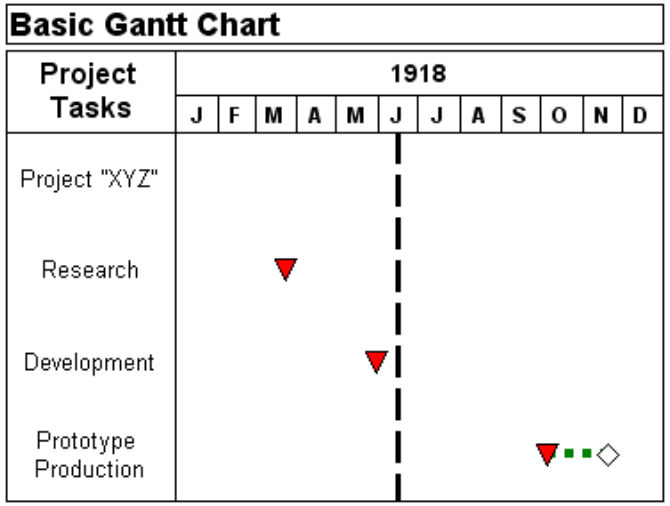
Karol Adamieki & Henry Gantt

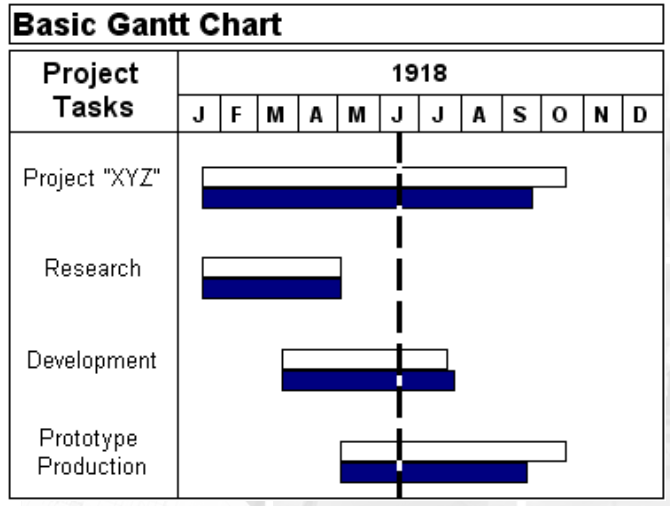


Basic Gantt Chart

The early basic Gantt chart was a simple "fill in the bar" method to show how much of the project was complete



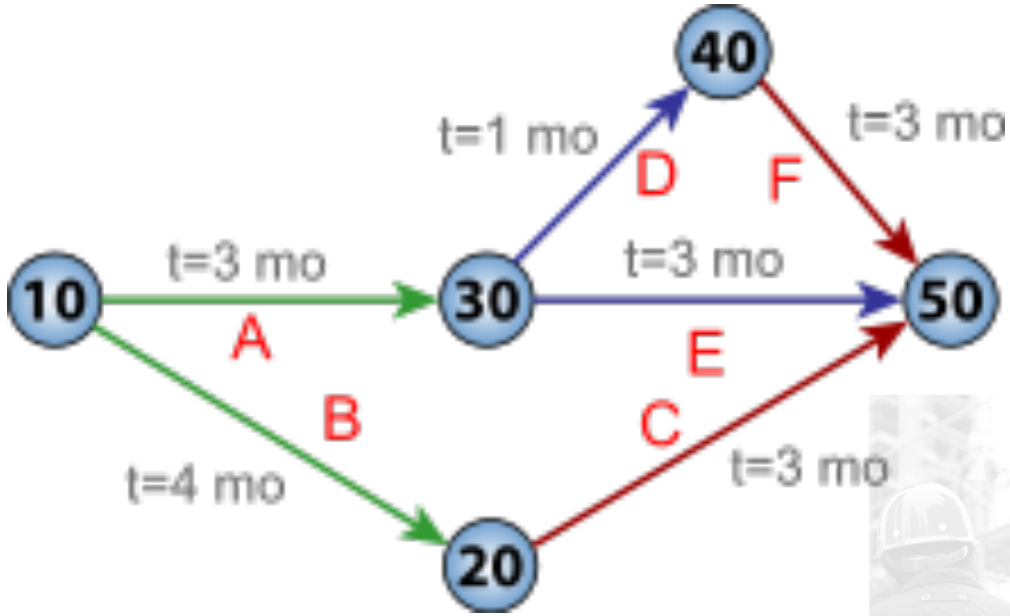




Hoover Dam USA

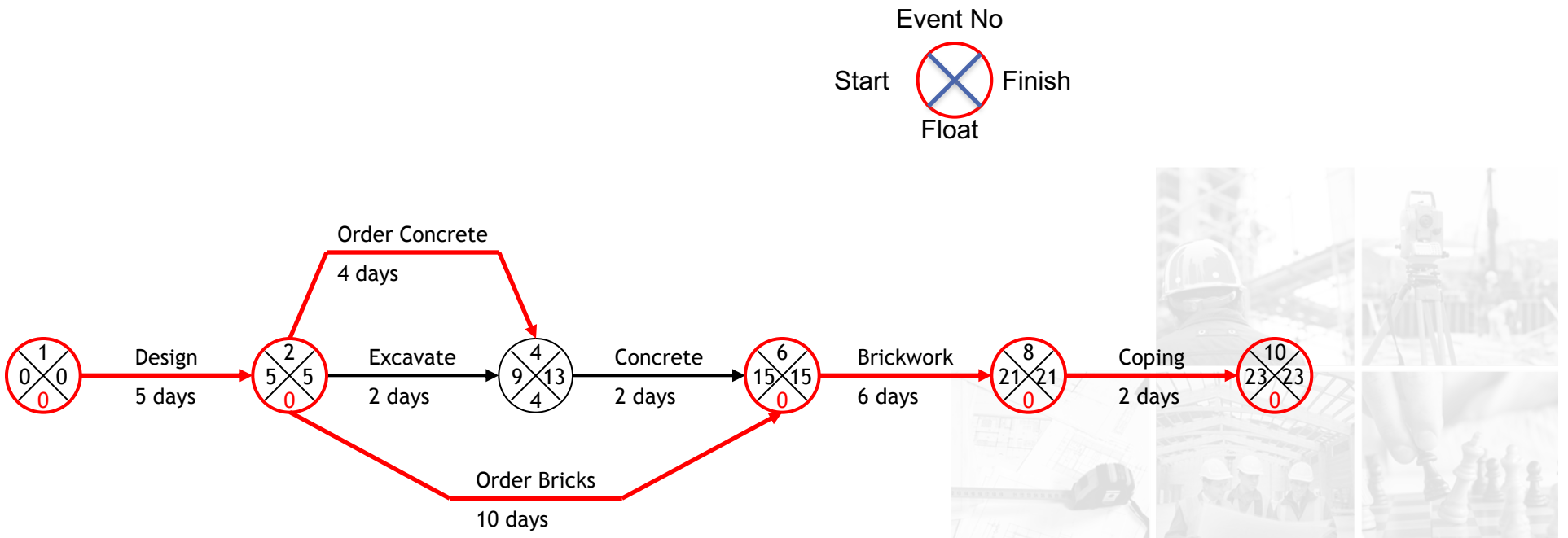
PERT Diagram

- PERT chart for a project
- 5 milestones (10 through 50)
- 6 activities (A through F)
- The project has two critical paths: activities B and C, or A, D, and F – giving a minimum project time of 7 months with fast tracking
- Activity E is sub-critical, and has a float of 1 month

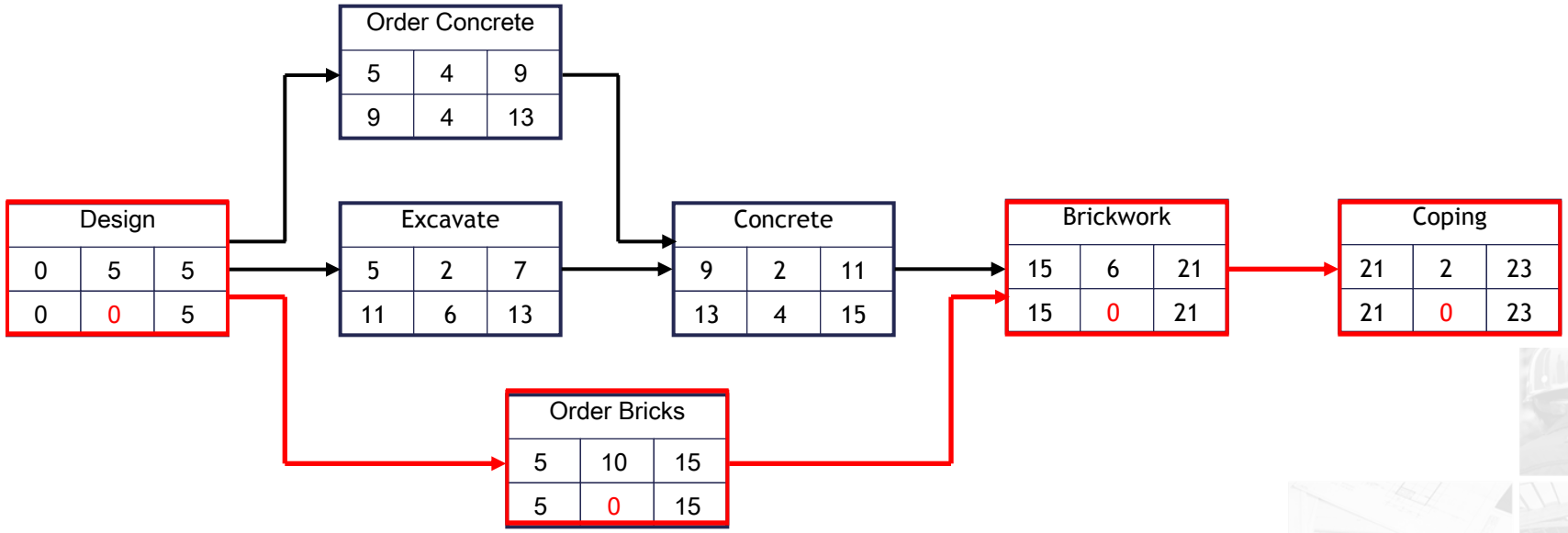


Trident Missile Project - USA

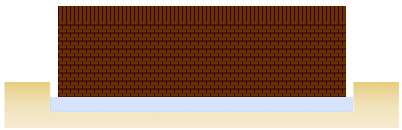
Activity on Line v PERT Diagram



Activity on Node Diagram



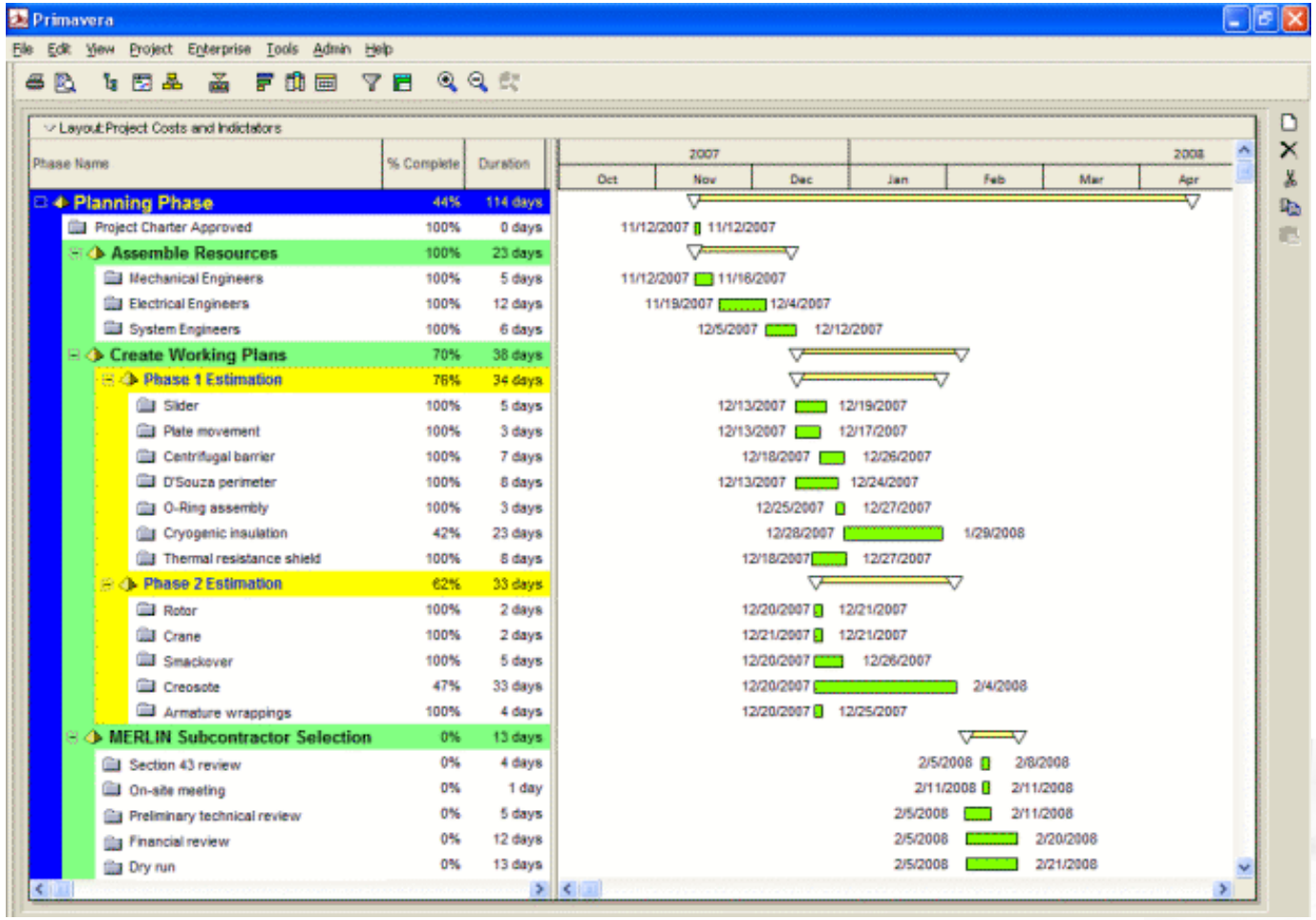
Critical Path shown in Red



Activity

Activity Description		
ES	Dur	EF
LS	Float	LF

Primavera Chart



Hong Kong Airport

London Olympics

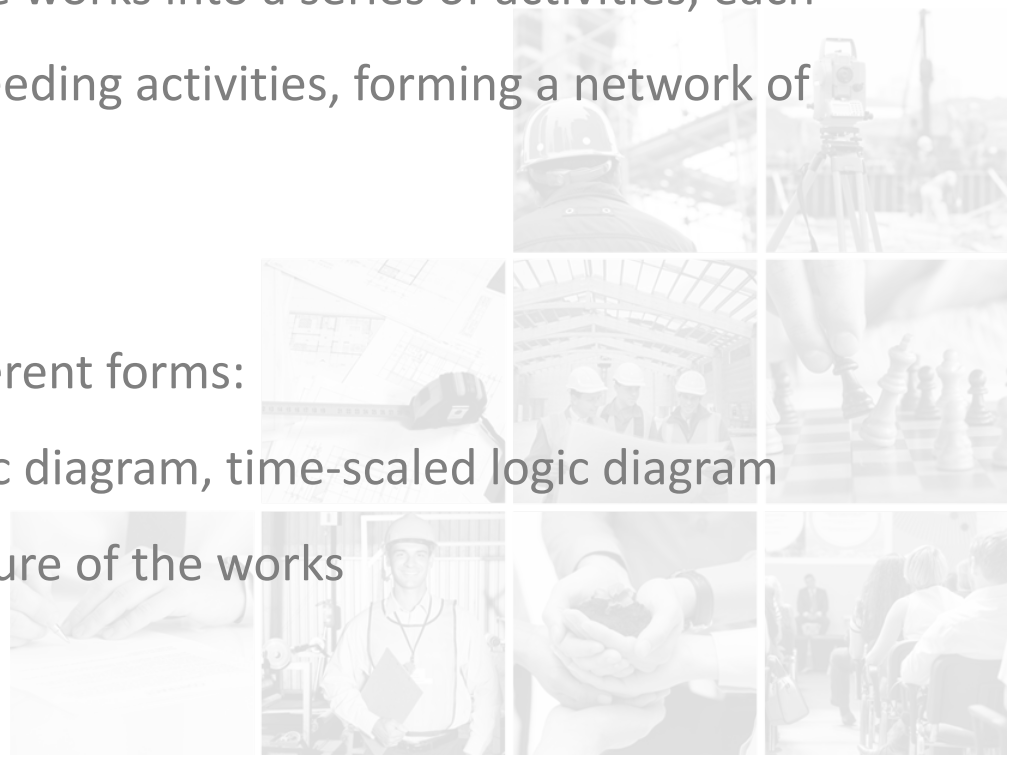
So what is a programme?

A programme is a planned series of future events

In Construction a programme is a tool that divides the works into a series of activities, each with a duration and logic links to preceding and succeeding activities, forming a network of activities

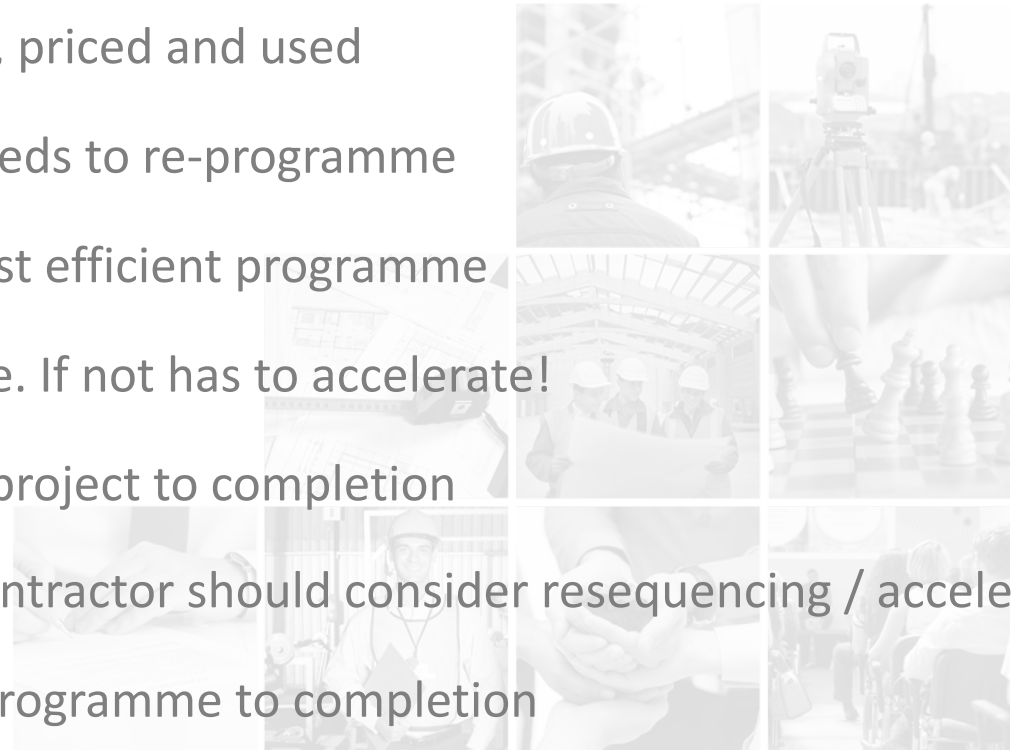
The programme may be depicted in a number of different forms:

Gantt or bar chart, line-of-balance diagram, pure logic diagram, time-scaled logic diagram or as a time-chainage diagram, depending on the nature of the works



The Logic of best practice programming

1. Good projects require good contractors
2. Good contractors need good management
3. Good management requires a good programme
4. Good programmes cover all works, are resourced, priced and used
5. If an employer event delays – Good contractor needs to re-programme
6. Contractor always needs to be working to the most efficient programme
7. This can only happen if EoT is awarded at the time. If not has to accelerate!
8. If the EoT is awarded the project remains a good project to completion
9. If a contractor event delay the programme the Contractor should consider resequencing / acceleration
10. The contractor should always work to a realistic programme to completion



Programming Risks

- Weather – Too hot / cold / windy / wet
- Labour, material, plant, subcontractor - Availability
- Labour, subcontractor, management - Quality
- Outputs achievable
- Failures of subcontractors
- H&S Risks
- Economic risks
- Political risks – Brexit
- Unforeseen and unanticipated circumstances
- Ground condition / Existing conditions
- Acts of god
- Design / Specification uncertainty

Prospective and Theoretical

- Programmes are prospective!
- Most Contracts are not designed for retrospective programming assessment
- Most contracts, however, allow for retrospective assessment of the costs!
- A programme is not a factual document. It is an assessment of the anticipated sequence and durations that the Contractor will aim to achieve based on a quick review of the works

Critical Path

The critical path is a path (sequence of activities) with least float. The Critical path runs through activities and dependencies that have zero float

The Critical Path - Why it is important?

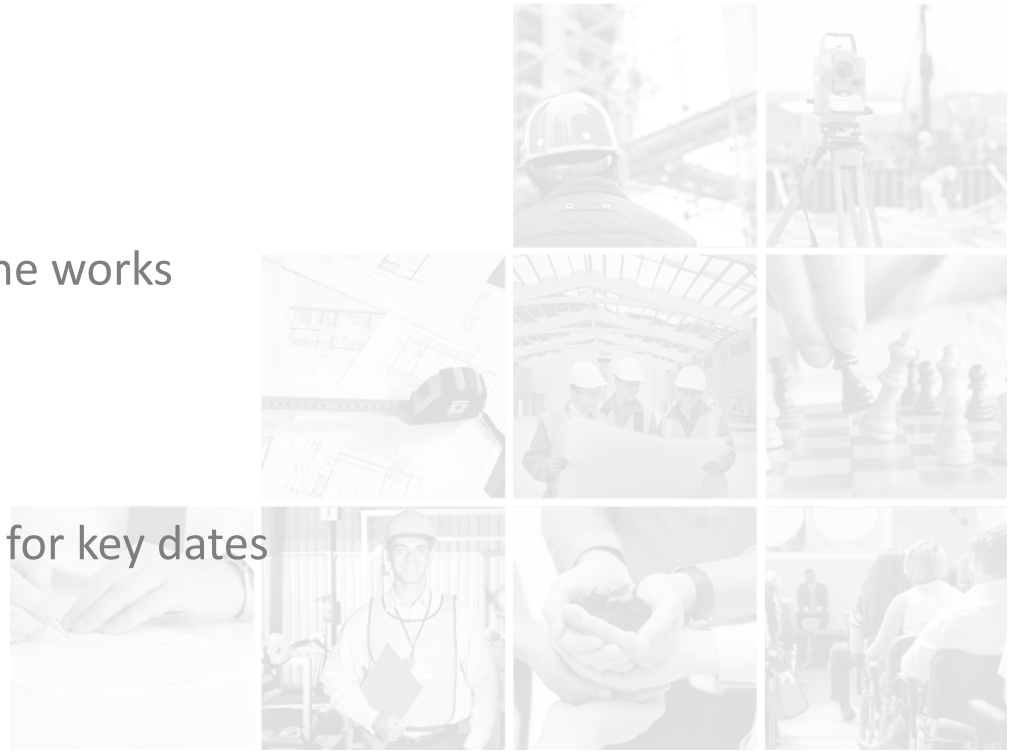
- Determines the anticipated earliest completion date for the project
- Determines the anticipated earliest and latest completion dates for individual activities
- Calculates *float*
- Identifies which activities are important to the completion of the project
- Identifies areas of risk
- Identifies areas where action should be taken to reduce the project duration or recover from delays

Types of Programme

- The Tender / Contract Programme
- The Baseline / Accepted Programme
- The Updated Programme Progress Comparison
- The Updated Programme New Baseline
- The As Built Record
- Short Term Programme
- Internal Target Programme
- Procurement Programme
- Design Programme
- Trade / Subcontractor Programme
- Storey Book

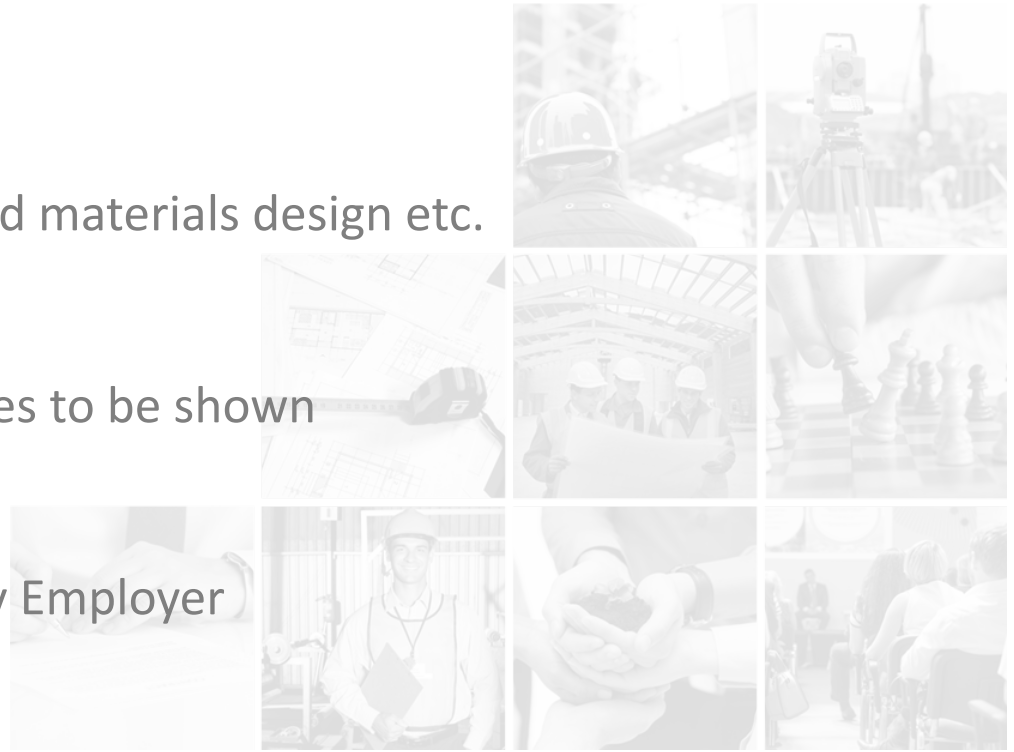
NEC Programme Requirements 1 – 19!!!

1. Start date
2. Access dates
3. Key dates
4. Completion date
5. Planned completion
6. Order, timing & sequence the contractor plans to do the works
7. Order, timing & sequence of works by the Employer
8. Order timing & sequence of works by others
9. The dates the contractor plans to meet the conditions for key dates



NEC Programme Requirements 10 – 19!!!

10. The dates the contractor plans to complete other works to allow the Employer and others access to do their work
11. Provision of float
12. Provision for time risk allowance
13. Health and safety requirements
14. Key interfaces and Milestones – access, plant and materials design etc.
15. The date access is required to the site
16. Other information the works information requires to be shown
17. The date acceptances are required
18. The date plant and equipment to be provided by Employer
19. Date information required from others (BT)



Acceptance of Programme under NEC

- Employer / Client either accepts or rejects within 2 weeks

- Limited reasons for rejection

1. Plan is not practicable
2. It is not realistic

3. It does not show the information which the contract requires
4. It does not comply with the works information

What happens if the PM does not approve the programme under NEC?

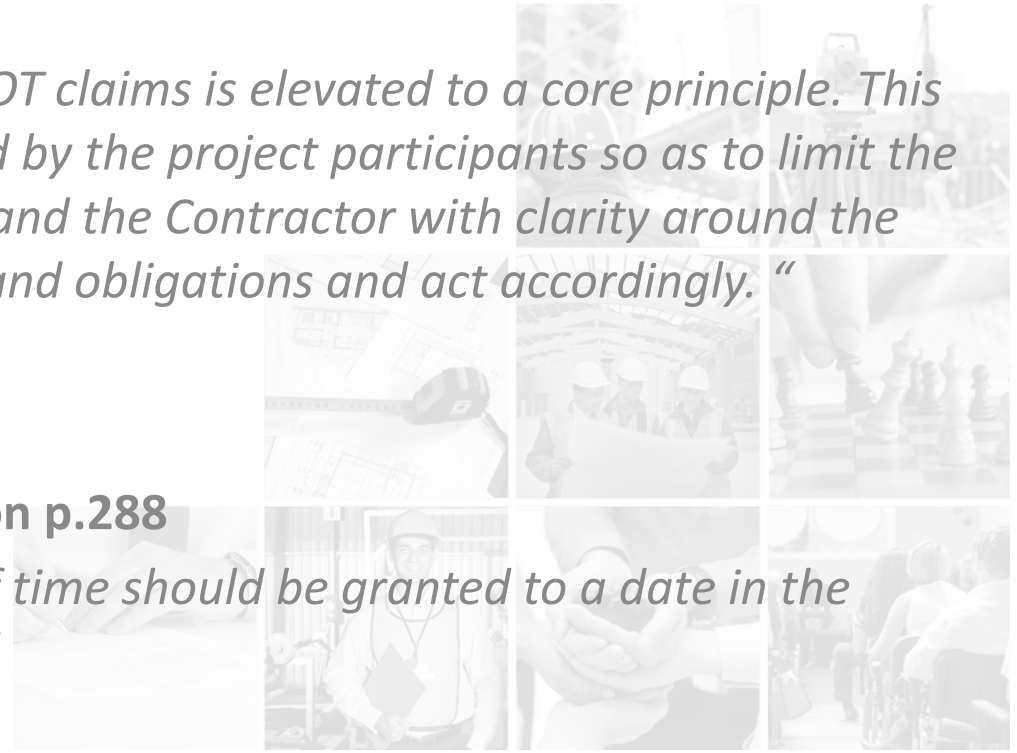
NEC 4 New Procedure – Deemed Acceptance!!!

When should an EoT be Awarded?

Most Contracts require the EoT to be awarded at the time of the delaying event or as close as possible to the time to the event

SCL Protocol - Rider 1

"The contemporaneous submission and assessment of EOT claims is elevated to a core principle. This allows appropriate mitigation measures to be considered by the project participants so as to limit the impact of the delay event. It also provides the Employer and the Contractor with clarity around the completion date so that they can understand their risks and obligations and act accordingly. "



Furst & Ramsey, in the 2012 edition of their book, say on p.288

"It is clearly desirable that when possible an extension of time should be granted to a date in the future so that the contractor can plan work accordingly."

Delay Analysis Techniques

Method of Analysis	Analysis Type	Critical Path determined	Delay Impact determined	Requires:
Impacted As-Planned Analysis	Cause & Effect	Prospectively	Prospectively	Logic linked baseline programme. A selection of delay events to be modelled.
Time Impact Analysis	Cause & Effect	Contemporaneously	Prospectively	Logic linked baseline programme. Update programmes or progress information with which to update the baseline programme. A selection of delay events to be modelled.
Time Slice Windows Analysis	Effect & Cause	Contemporaneously	Retrospectively	Logic linked baseline programme. Update programmes or progress information with which to update the baseline programme.
As-Planned versus As-Built Windows Analysis	Effect & Cause	Contemporaneously	Retrospectively	Baseline programme. As-built data.
Longest Path Analysis	Effect & Cause	Retrospectively	Retrospectively	Baseline Programme. As-built programme.
Collapsed As-Built Analysis	Cause & Effect	Retrospectively	Retrospectively	Logic linked as-built programme. A selection of delay events to be modelled.

Questions?

www.morssonpyper.com