



Project Controls

E X P O

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Forensic Schedule Analysis – How to Find the Truth?



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About the Speaker

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Ewen is an experienced expert in the field of programming; delay and disruption; and associated prolongation costs in relation to construction and engineering projects. In particular, he has worked for both international consultants and contractors and has first-hand experience of assisting and representing clients in litigation, arbitration, mediation and adjudication, both for the claimant and respondent. He has prepared numerous expert witness reports; drafted standard forms of contract and lectured on various commercial and contractual subjects within the construction industry. Ewen has also acted in commercial negotiations and settlements, resolving potential disputes as well as providing advice on contract procurement.

Ewen is well versed in many of the standard forms of construction contract including the NEC, JCT, ICE, FIDIC, GC Works Conditions as well as bespoke forms of contracts including PFI contracts and has worked on contracts that span, inter alia, major building, civil engineering, oil and gas, mechanical and electrical, pharmaceutical, infrastructure including highways and rail as well as fit-out works.

Structure

1. Introduction
2. Why Do Schedules Become Distorted?
3. Sources to Examine to Find the Truth
4. The Scenarios – 6 Examples of How Schedules Become Distorted
5. Variables to Review
6. Validation Protocols
7. Software Analysis and Metrics
8. Summary and Questions

Introduction

1. **Forensic Schedule Analysis provides for a retrospective investigation into the schedule to ascertain what delays occurred on a project and who is responsible for those delays.**
2. **No formal standard practice but note:**
 - a) **AACE® International Recommended Practice No. 29R-03, FORENSIC SCHEDULE ANALYSIS TCM Framework: 6.4 – Forensic Performance Assessment; and**
 - b) **Defense Contract Management Agency DCMA-EA PAM 200.1**
 - c) **United States Government Accountability Office Schedule Assessment Guide**
3. **An expert witness has a duty to the court**
4. **Parties should work together to achieve an acceptable programme because that will benefit the project and both parties**

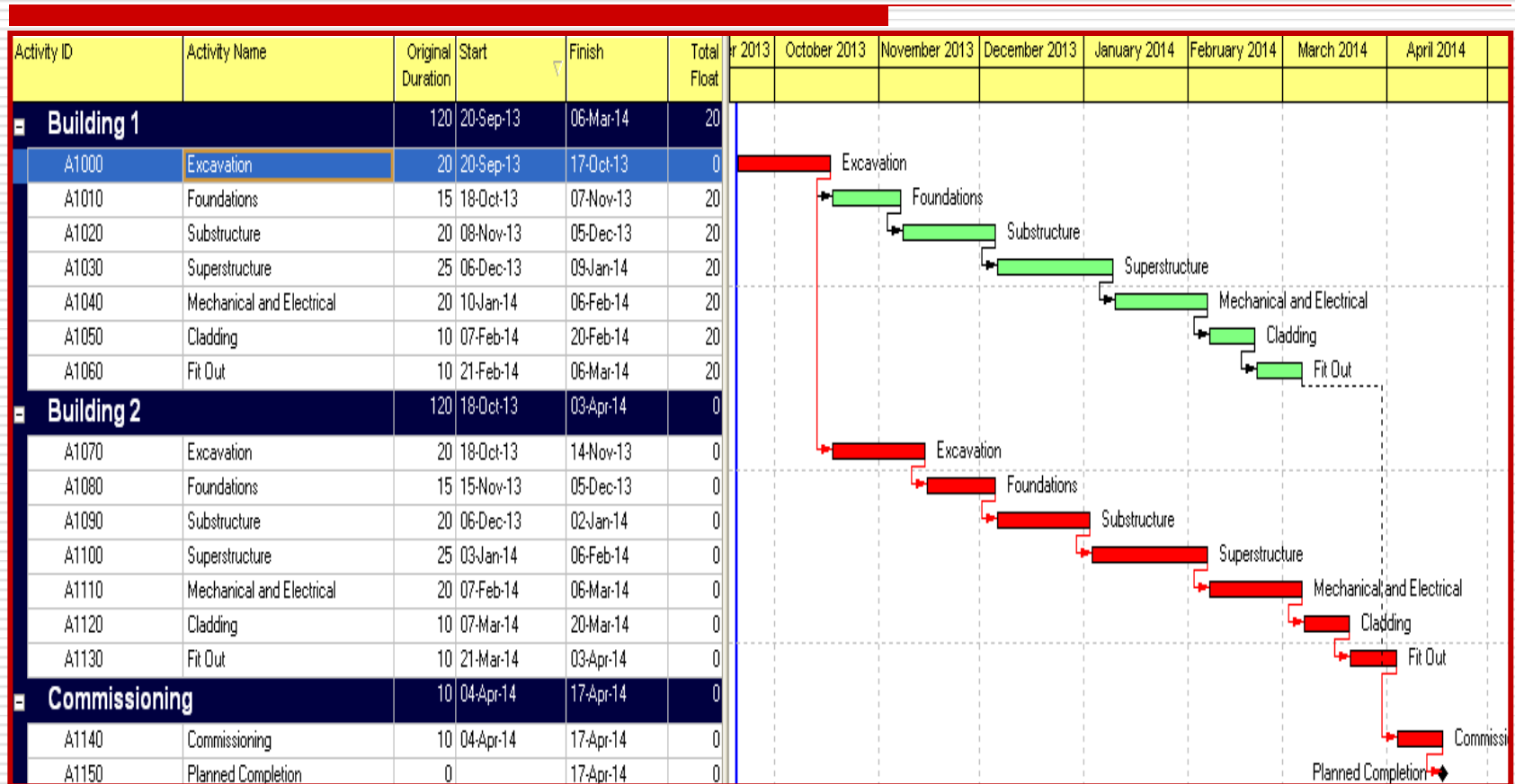
Why Do Schedules Become Distorted?

1. Human error
2. The practicalities of planning
3. The quality of records
4. The skill of the planner
5. The settings in transmitting schedules
6. Willful manipulation

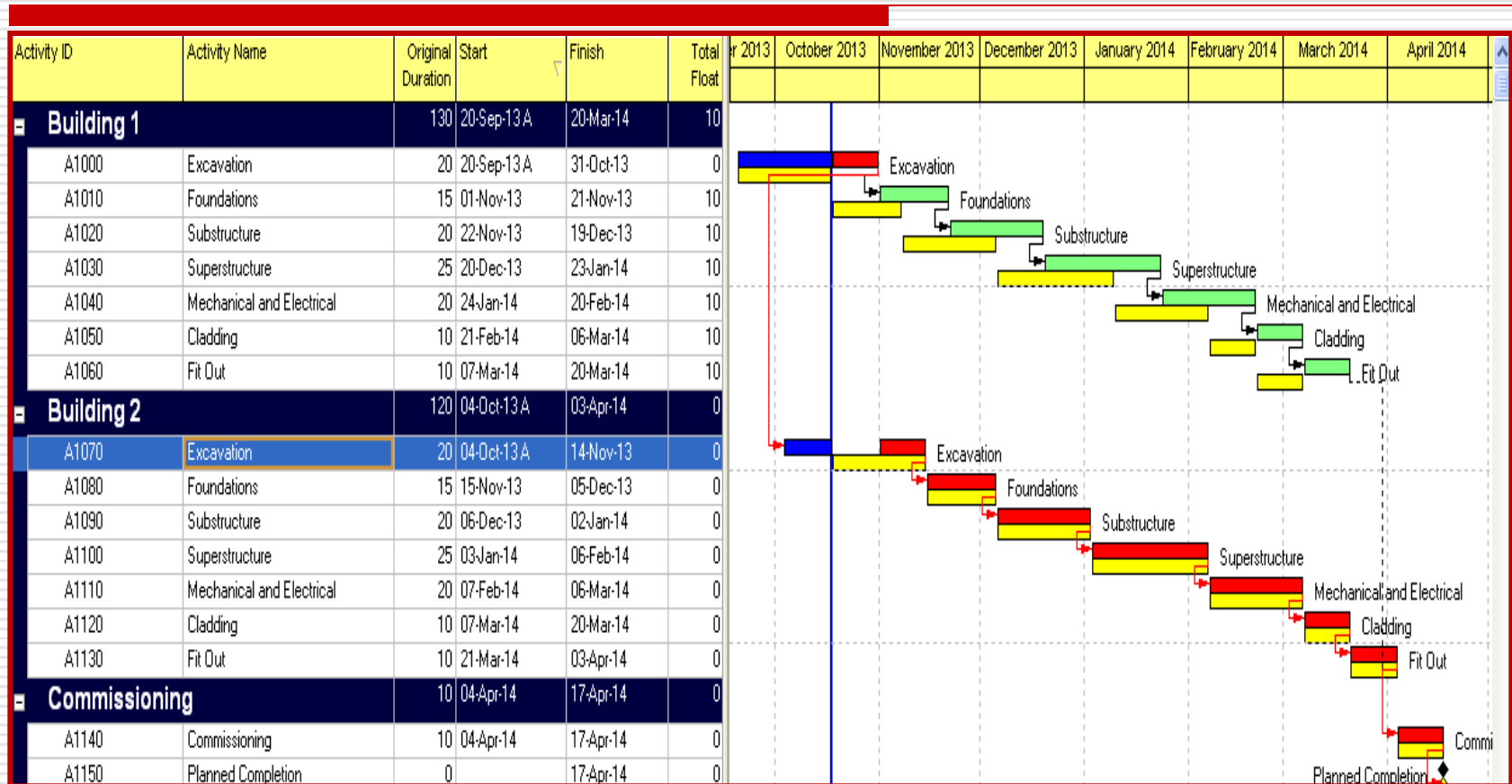
Sources to Examine to Find the Truth

1. The Baseline Schedule
2. The As-Built Schedule
3. The Schedule Updates
4. Delay Events and Issues

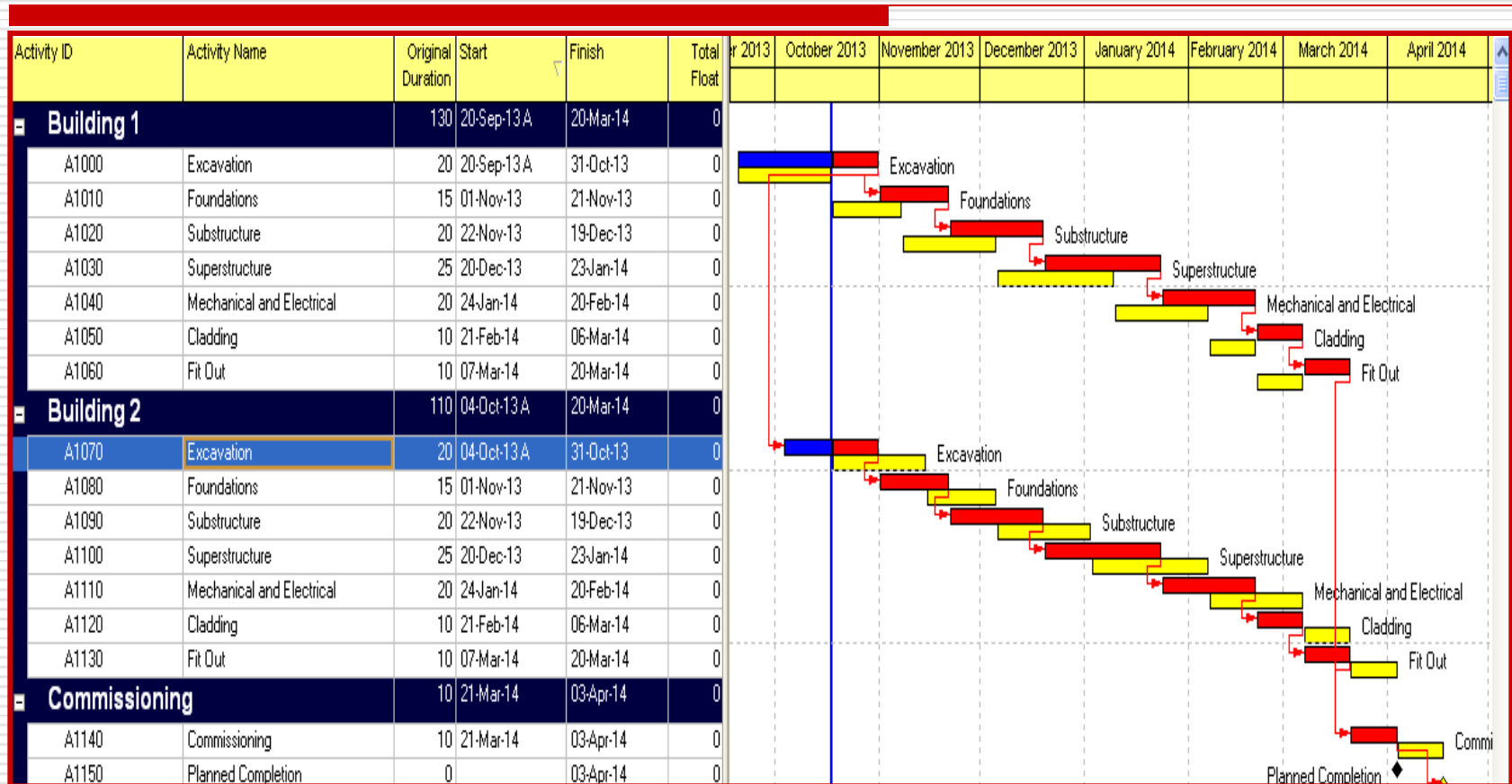
Scenarios: The Baseline Schedule



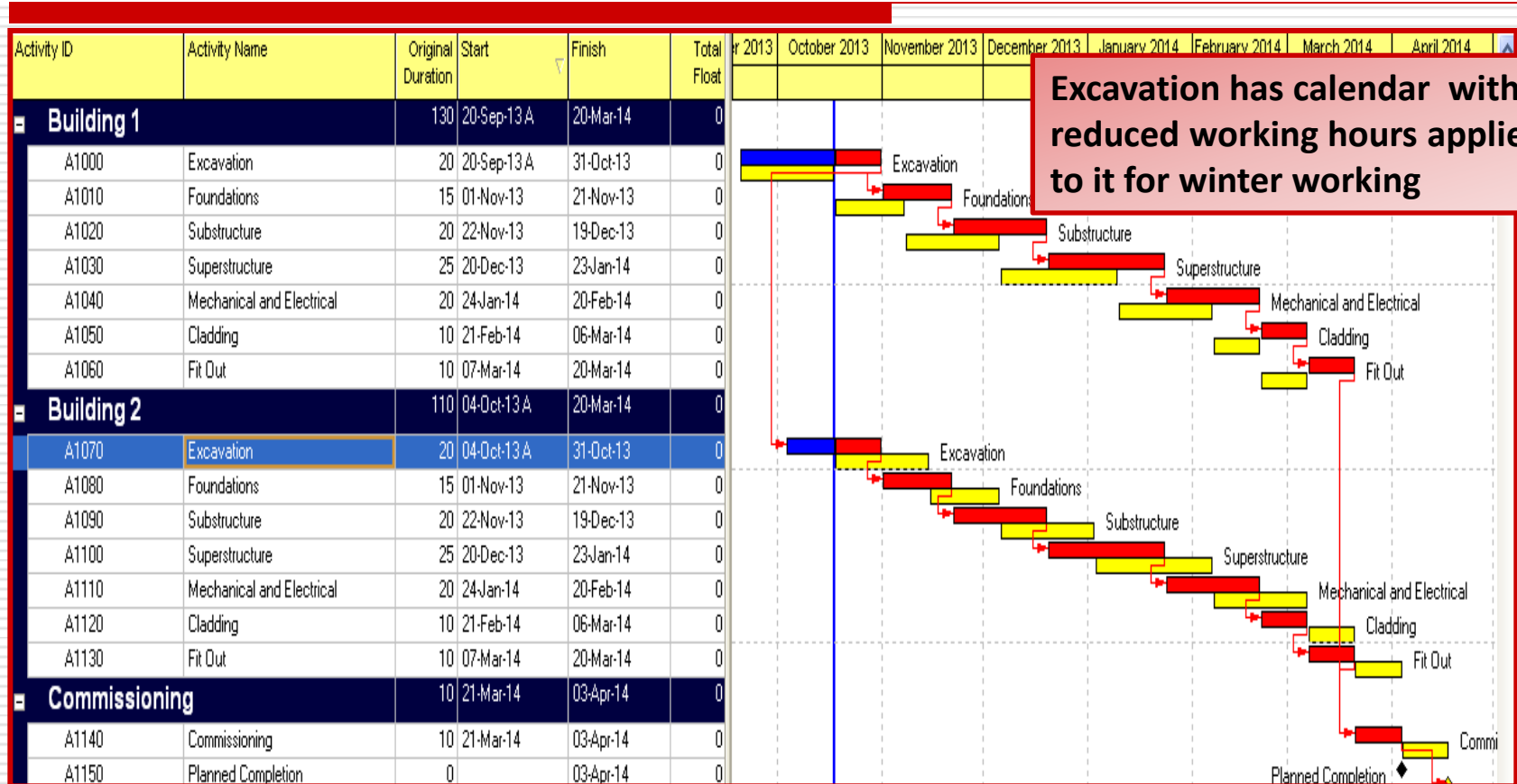
Scenario 1: Progress Override v Retained Logic



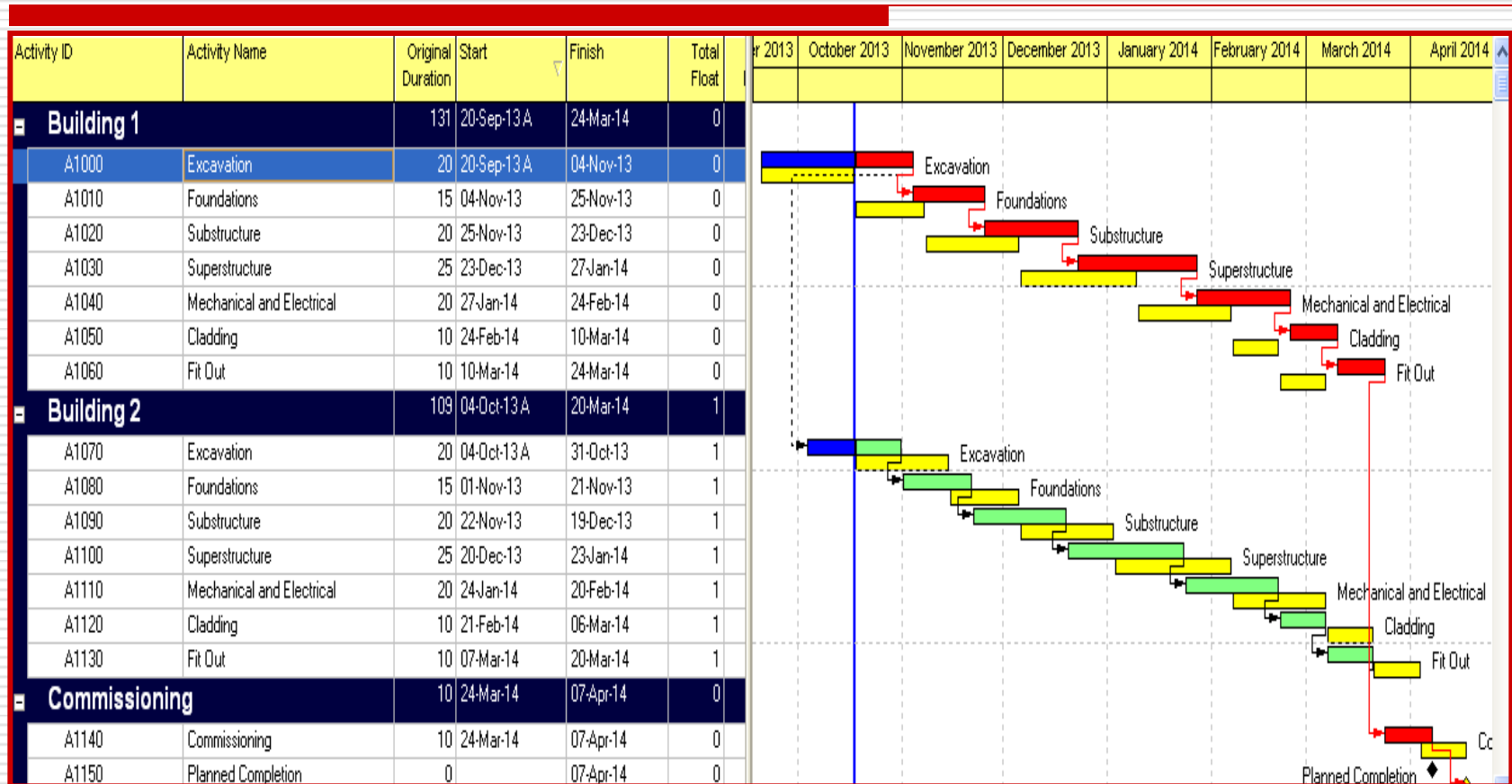
Scenario 1: Progress Override v Retained Logic



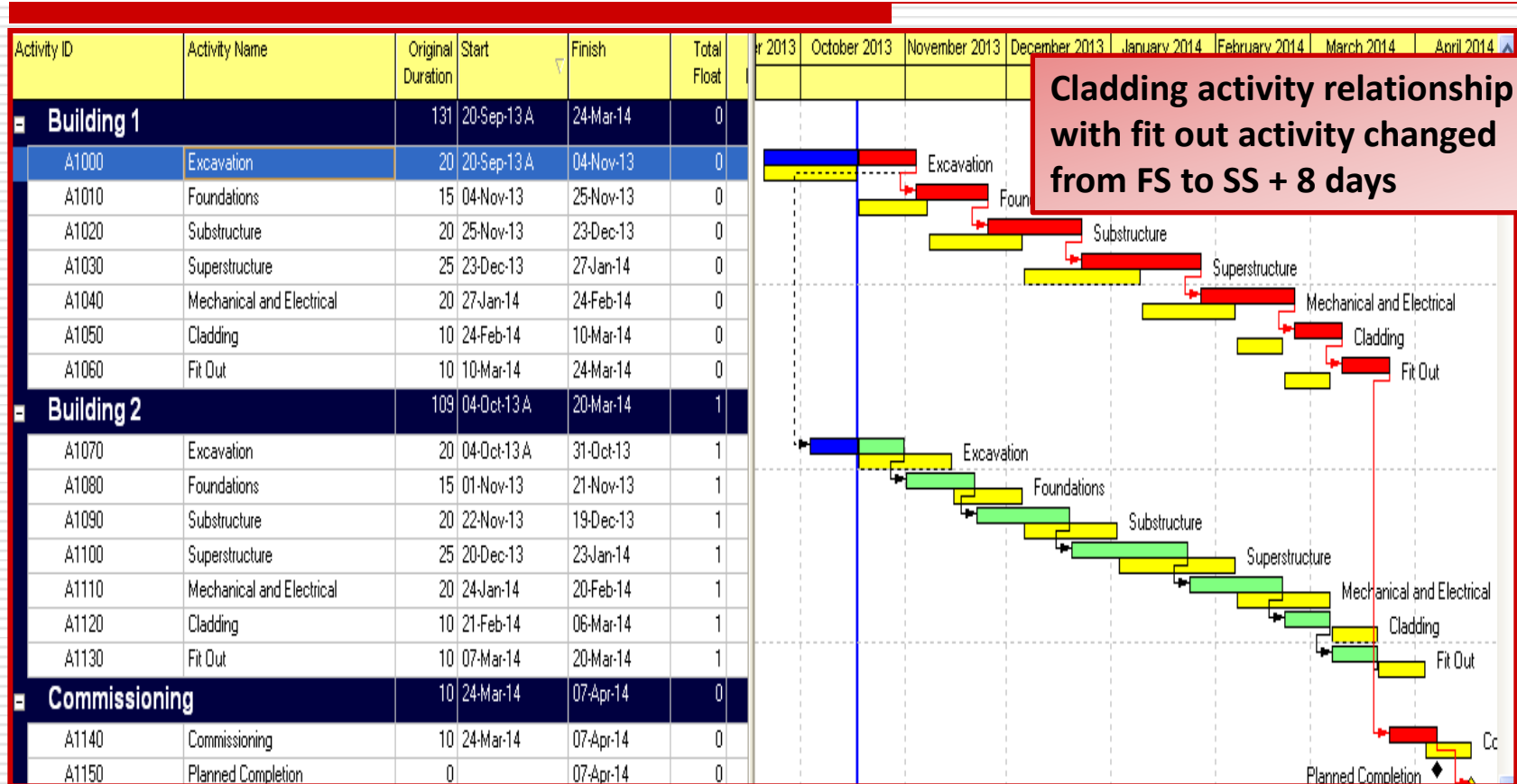
Scenario 2: Calendars



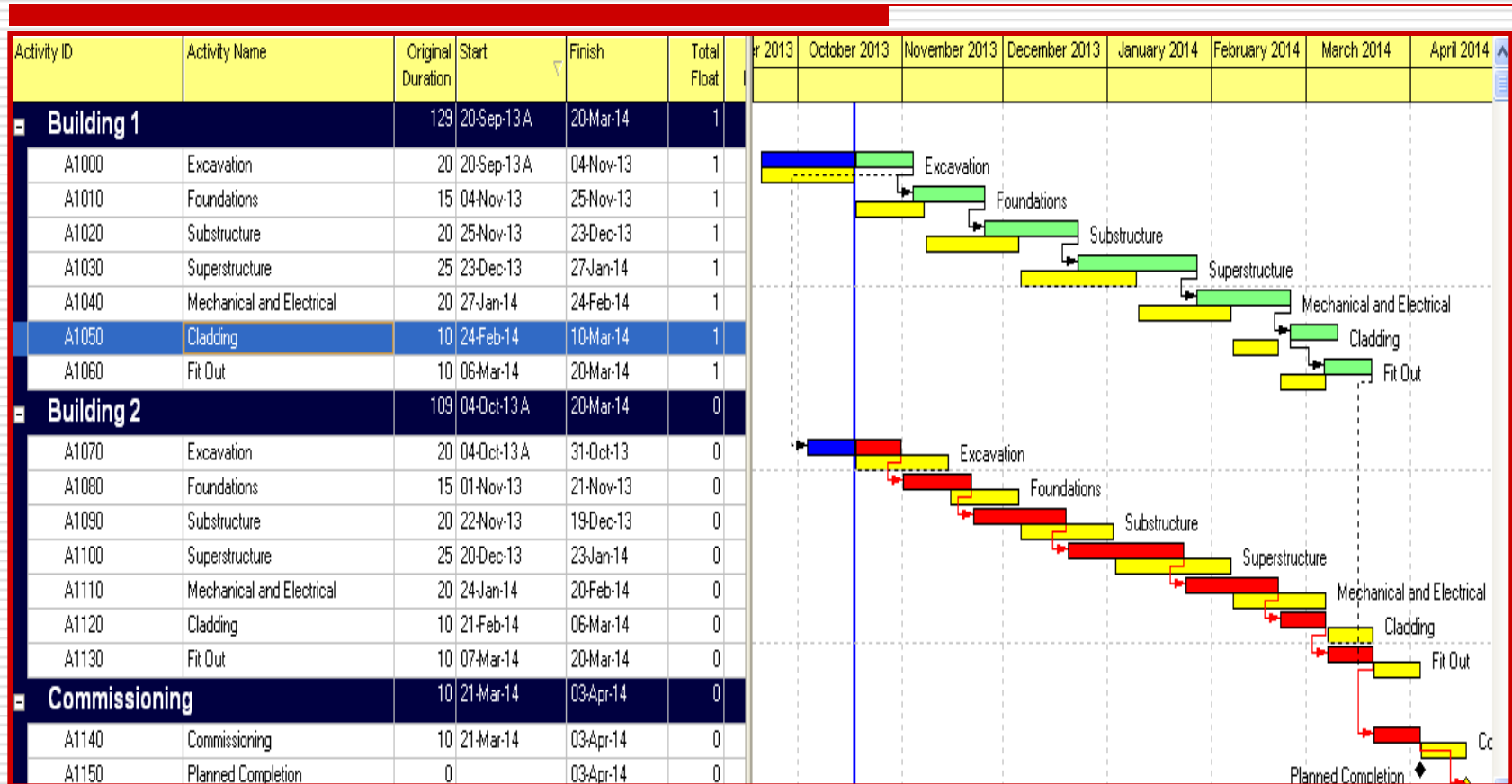
Scenario 2: Calendars



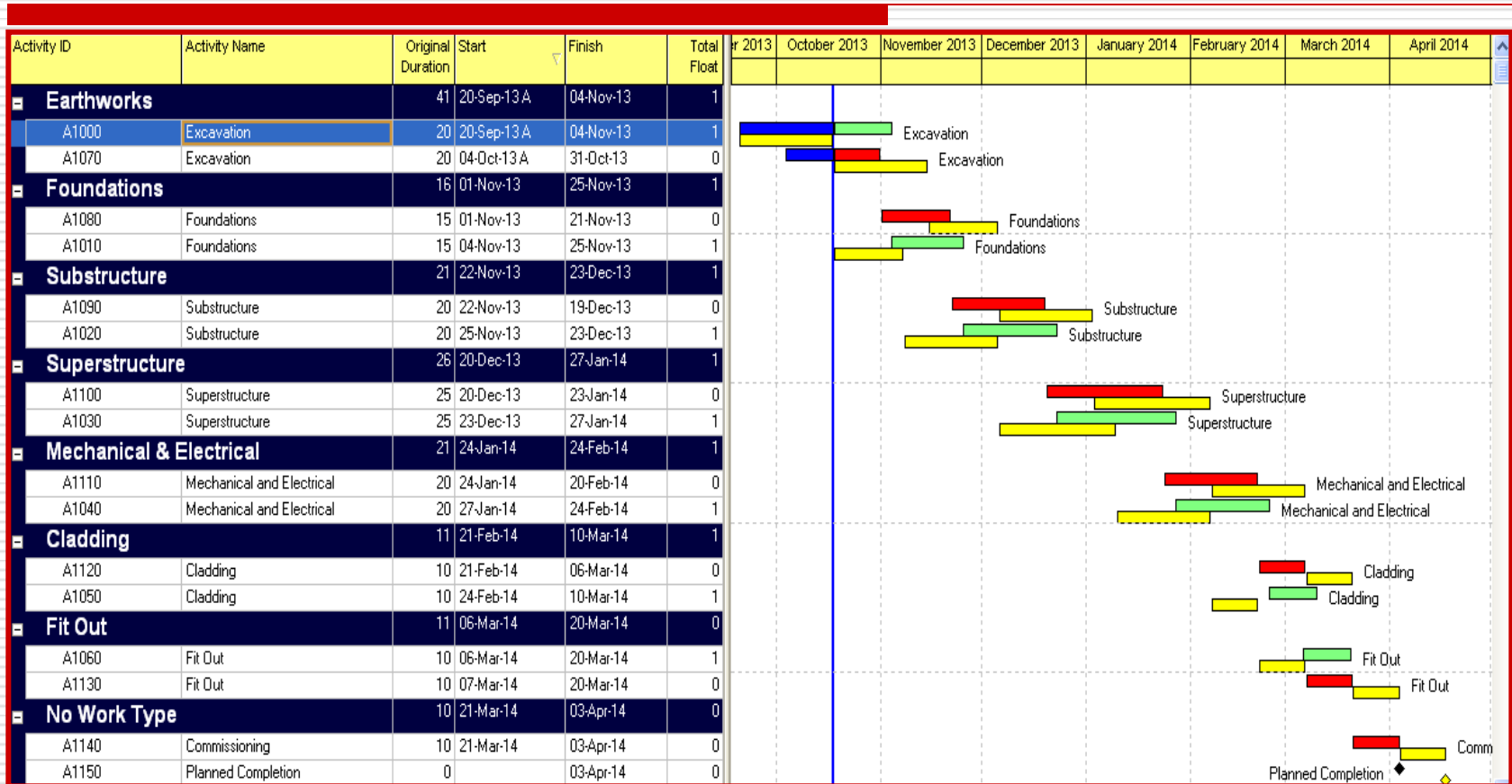
Scenario 3: Logical Relationships



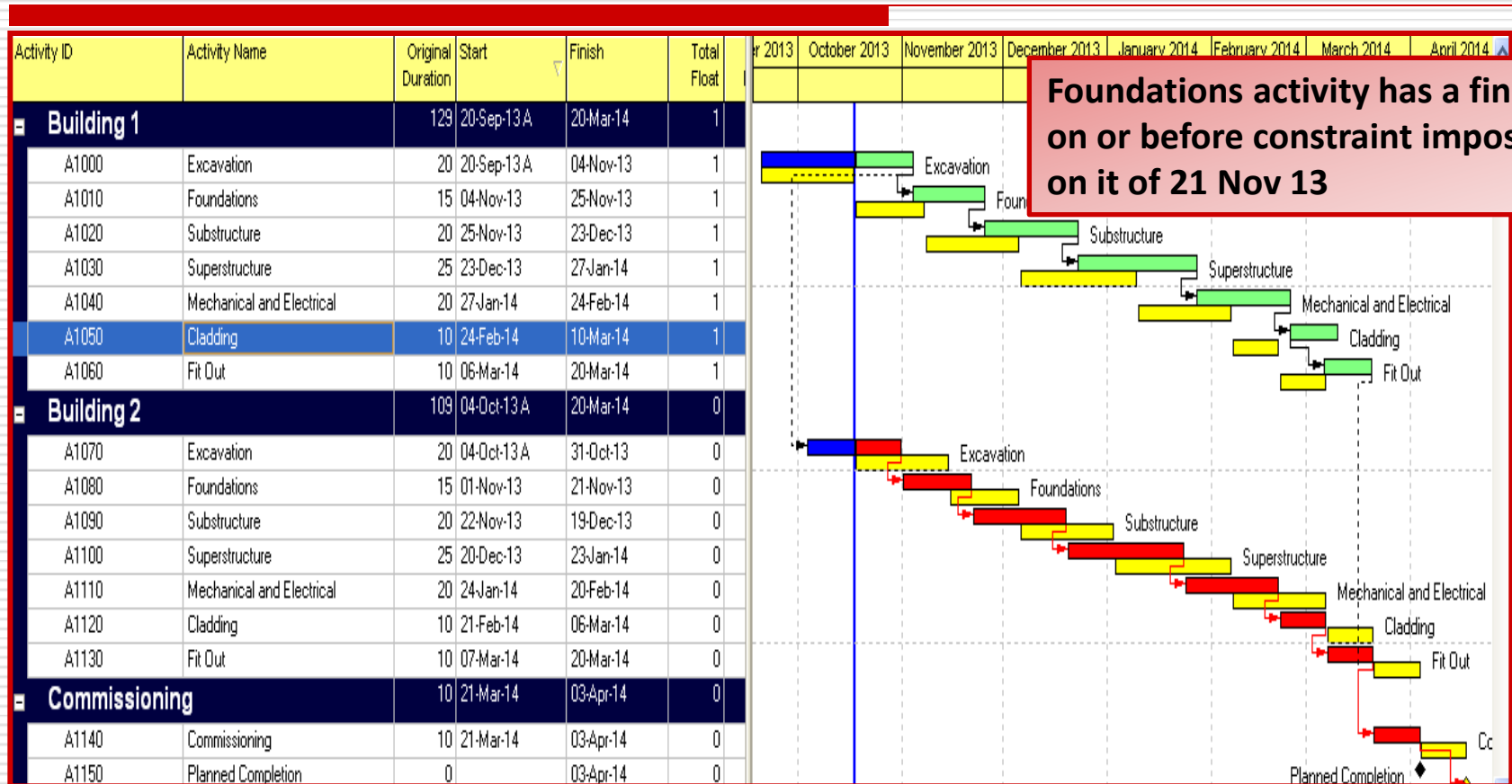
Scenario 3: Logical Relationships



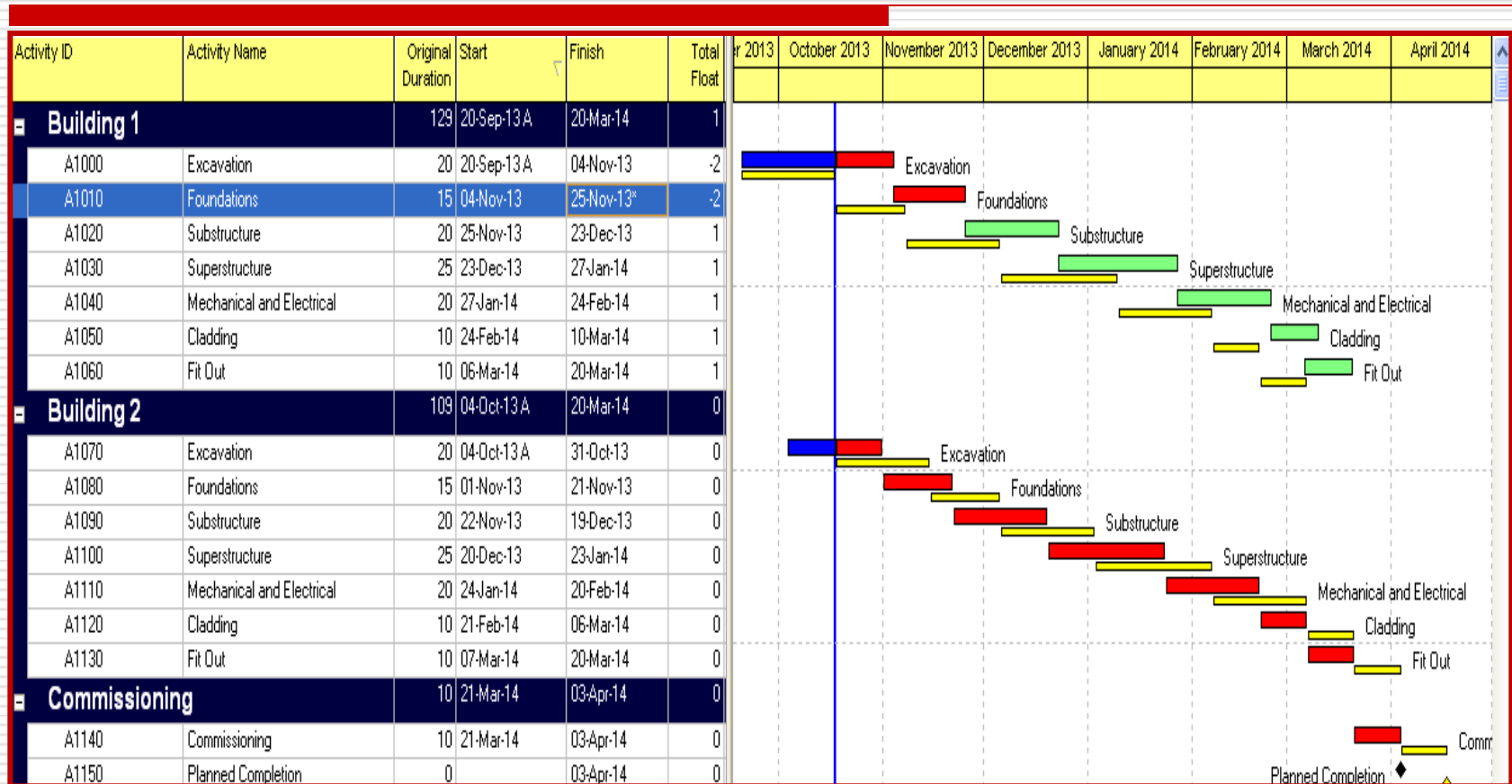
Scenario 4: Grouping and Sorting



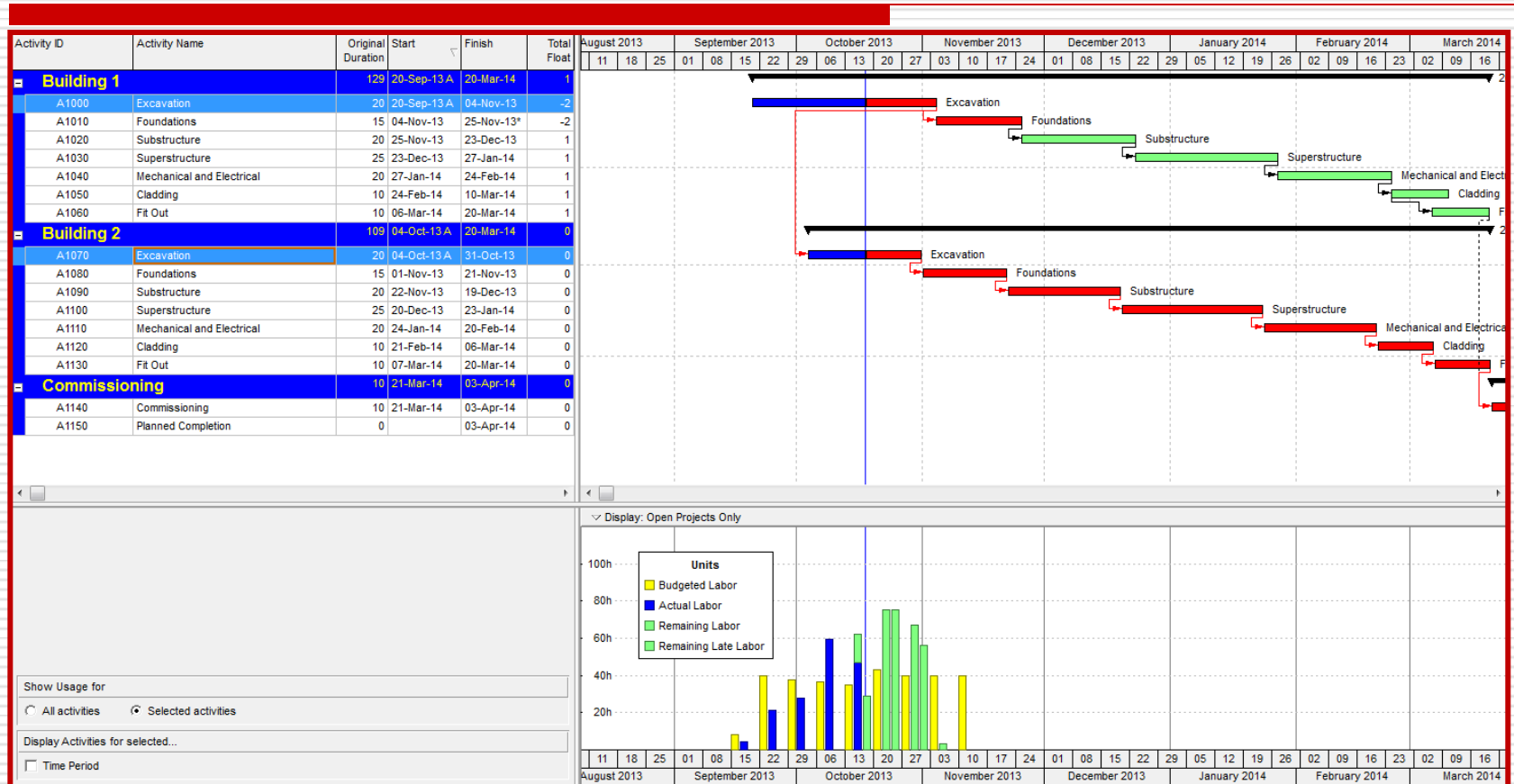
Scenario 5: Constraints & Negative Total Float



Scenario 5: Constraints & Negative Total Float



Scenario 6: Increased Labour Resources



Variables to be Reviewed for Variance

1. Calendars
2. Incorrect / missing logic
3. Types of relationships
4. Lead / lag
5. Constraints: hard / soft
6. Progress
7. Durations
8. Float: high / negative
9. Hammocks
10. Resources
11. Dates
12. Missing activities

13. Reorganising activities
14. Lack of detail
15. Time risk allowance
16. Progress Override / Retained Logic
17. Longest Path or Critical Path

There are more complex variables included in measurements such as risk analysis, cost and earned value analysis

Validation Protocols – 1

VALIDATING THE BASELINE SCHEDULE

1. Full scope represented
2. WBS in sufficient detail
3. Separate activities for each responsible party
4. Activities to have at least one predecessor and one successor
5. Ensure calendars are truly representative
6. Document the basis of constraints – replace if necessary
7. Correct start date
8. Earliest conforming plan
9. At least one continuous critical path using the longest path
10. Contract provisions represented

Validation Protocols - 2

VALIDATING THE AS-BUILT SCHEDULE

1. Data date after the events being considered
2. Activities to left of data date to have actual start / finish dates
3. Activities to right of data date not to have actual start / finish dates
4. Use contemporary records to confirm as-built dates in schedule
5. Interview site staff to check validity of data
6. Check activity descriptions have not changed
7. Check scope of activities so as-built data reflects that scope
8. Check all critical and nearly critical activities (sample others)
9. Check all significant milestones / contract dates are accurate
10. Show delay events separately

Validation Protocols - 3

VALIDATING THE PROGRESS UPDATE SCHEDULES

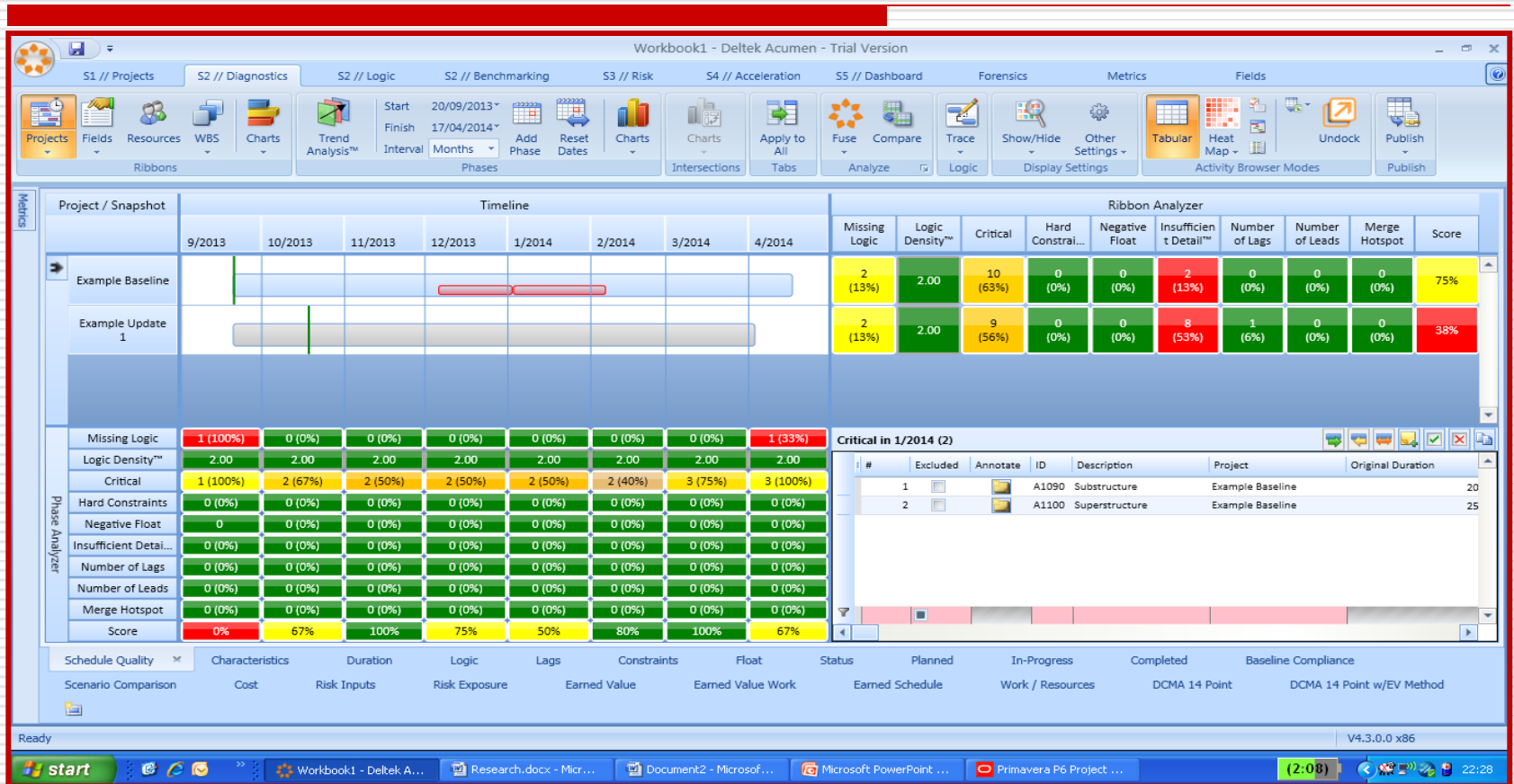
1. Assemble suite of progress updates to monitor variables
2. Historic data can be checked as per as-built validation protocol
3. Interview site staff
4. Forecast data can be checked as per baseline schedule
5. Review logic at updates
6. Review all changes – all variables through suite of updates
 - a) Reference list of variables provided
 - b) Ensure all data is provided – constraints, calendars, resources etc
 - c) Ensure schedules are submitted electronically

Validation Protocols - 4

VALIDATING THE DELAY EVENTS AND ISSUES

1. Determine the delay identification from the schedule or documents
2. Tabulate sources of delay data – use most reliable
3. Identify actual start and finish dates for each delay
4. Correlate specific activities affected in schedule
5. Identify variances in schedule
6. Determine the criticality of those variances
7. Determine the causation of those variances
8. Determine the responsibility or proceed based on assumed allocation
9. Quantify the responsibility
10. Account for existing extensions of time

Software Analysis and Metrics



Summary

1. **FSA: a retrospective investigation to ascertain delays & responsibility**
2. **Schedules can be distorted for various reasons (not willfully)**
3. **Validate the baseline, progress updates, the as-built and correlate with contemporaneous data, facts and oral evidence**
4. **Variables mean the opportunity for inaccuracy**
5. **Review all changes throughout each schedule**
6. **Ensure all information is provided**
7. **Records might dictate the extent of analysis**
8. **Use an expert if you are not sure**

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