

Productivity will be reduced because of the effect of extended day on the workforce. There will also be a change in the earned income/cost ratio due to premium payment for overtime.

- 4.27.9 The third point of the analysis by Hicks J identified the assumption that the activity of concrete pour on the project was divisible. The evidence showed to the contrary that a concrete pour had to be started and completed on the same day. It could not be delayed by part of a day. It was either not delayed at all and started and completed on the day as planned, albeit by late working, or its was postponed and a day was lost.
- 4.27.10 Hicks J therefore derived no assistance from the Expert. Instead, he was left to his own analysis. He decided that it was inherently likely that despite late working there was some delay and proceeded to award a reduced extension of time.

4.4 DELAY ANALYSIS AS EVIDENCE

- 4.28 Commercially available software allows many activities to be recorded and analysed, in the form of readily understood programmes. The software creates a mathematical model in which activities are represented by durations and the dependence on other activities represented by time constrained links. The assumptions in the model and the inherent limitations on the way the links represent construction logic must not affect the validity of the model, particularly when events cause methods of construction to be changed, otherwise the model will be inaccurate. Available software also allows the modelling of the constraints of available resources and optimisation for efficient working, but this is not easily represented on a programme analysis.
- 4.29 There are many methods of analysis of delay. The choice of the appropriate analysis depends upon the evidence available, the existing programme evidence and the particular circumstances. The analysis must be based on the facts and the evidence as demonstrated in *Great Eastern Hotel Company Ltd v John Laing Construction Ltd* [2005] EWHC 181 (TCC).
- 4.29.1 The experts used different approaches to the analysis of delays and the identification of the critical path. Great Eastern's expert used an impacted as-planned programme analysis by which the project was analysed on a monthly basis to measure the impact of events as the project proceeded. The experts agreed that original programme demonstrated Laing's programme intentions at the time it was drawn and at the time the periods allocated to the activities were reasonable. Laing's expert in the main part proceeded retrospectively from an as-built programme to determine the critical path and respective periods of delay and causes. The principal critical path determined by each expert was broadly similar. The total extent of delay periods found by each expert broadly coincided.
- 4.29.2 The vital differences between the experts related to the route of the critical path and the causes of delay advanced by each expert.

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- 4.29.3 Laing's was a broad-brush case that none of the delays was caused by Laing's and that such delays that may be proved was the consequence of concurrent causes such as the default of the design team to produce timely design information and the performance of the Trade Contractors.
- 4.29.4 HH Judge David Wilcox considered that the research and analyses of Eastern's expert were impressive and comprehensive. They were based upon the contemporary primary documentation that included computer records and timed site photographs depicting the actual progress of the demolition preparation and construction on site and the inter-relation of these activities. This data was objectively evaluated.
- 4.29.5 Wilcox J was less impressed by Laing's expert. Wilcox J considered that he demonstrated himself to be lacking in thoroughness in his research and unreliable by reason of his uncritical acceptance of the favourable accounts put forward by Laing. Laing's expert had no concept of his duty to the court as an independent expert. Despite seeing the photographs and material contained in Eastern expert's two reports received and read by him, totalling undermining credit and accuracy of a witnesses' account upon which he relied, Laing's expert chose not to revisit his earlier expressed views in accordance with his clear duty to the Court.
- 4.29.6 As to Eastern's analysis, Laing argued that the retrospective delay analysis carried out on the planned construction programme by Eastern's expert entirely ignored any and all existing concurrent causes of delay and/or other factors affecting other activities which might have caused delay to completion if, hypothetically, each of the identified critical activities had in fact been completed within the originally programmed period. Wilcox J considered this was not correct and that Eastern's expert did in fact separately and comprehensively carry out such an analysis and concluded that none was in fact critical.
- 4.29.7 Wilcox J found based on the evidence that there were no causes of critical delay other than those caused by Laing.
- 4.30 In *John Barker Construction Ltd v London Portman Hotel Ltd* [1996]83BLR31 Mr Recorder Toulson QC was required to consider the approach to be taken in analysing the entitlement to extension of time under a contract which incorporated the JCT Standard Form of Building Contract with Quantities, 1980 Edition, also incorporating the sectional completion supplement.
- 4.30.1 Toulson emphasised the need for logical analysis of the effect of events on planned progress shown by the programme established at the date of an acceleration agreement.
- 4.30.2 He held that the Architect's assessment of extension of time was fundamentally flawed because he did not carry out a logical analysis in a methodical way of the impact that the relevant matters had or were likely to have on the plaintiffs' planned programme. Instead, he made an