



## Schedule Delay Analysis Services

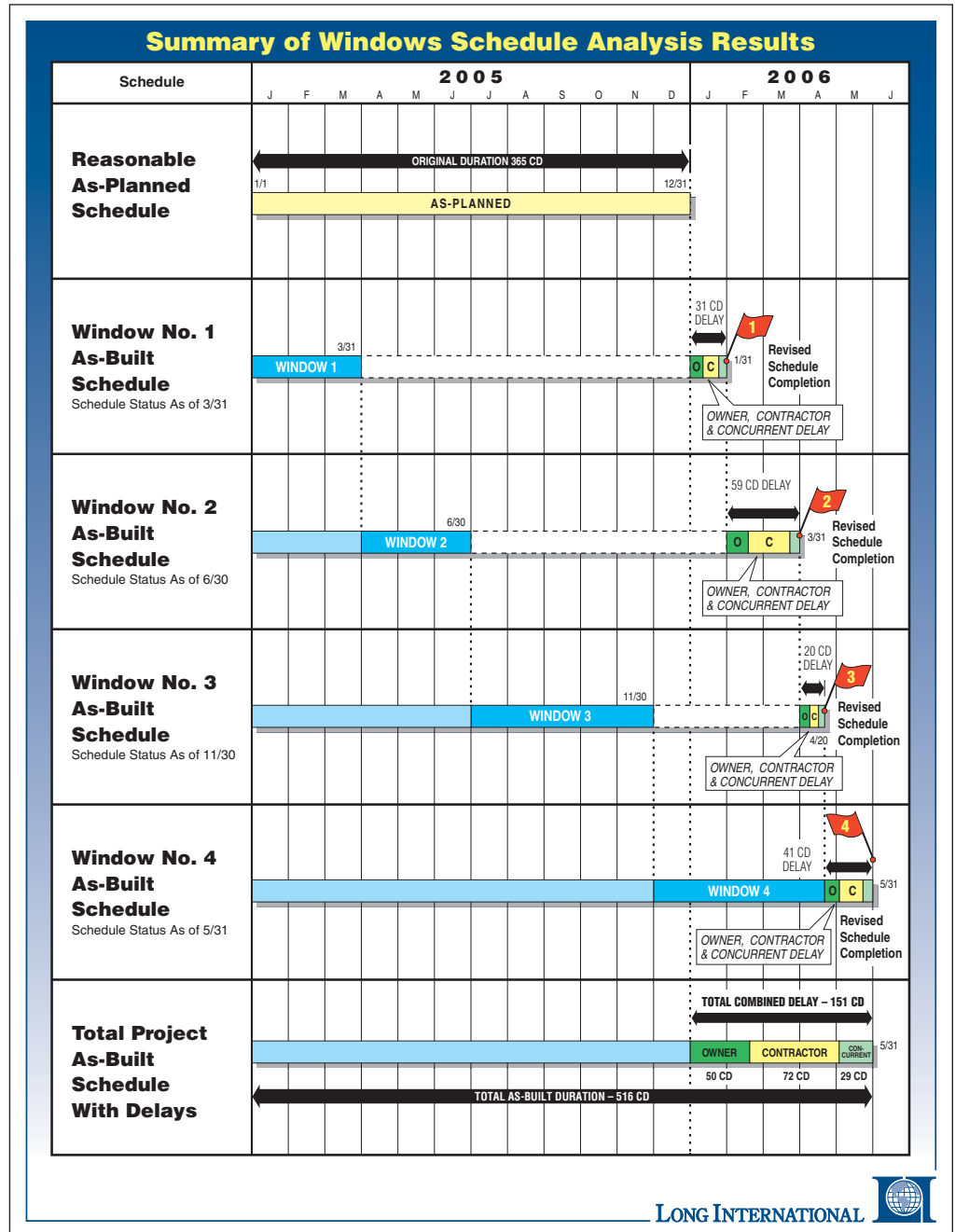
### OVERVIEW

The contemporaneous and retrospective schedule delay analyses performed by Long International typically focus on comparing as-planned, updated, and as-built project schedules to identify and quantify delays to the critical and near critical paths of the project. These delays may include either variances in the duration of an activity or variances in the planned and actual relationship lag durations between predecessor and successor activities. Concurrent delays are also analyzed to properly understand the Owner's and Contractor's liability for delay and impact damages.

### Common Schedule-Related Issues

- Time Extensions
- Ownership of Float
- Compensable Delay
- Pacing Delays
- Acceleration
- Concurrent Delay
- Changes to the Critical Path
- Misrepresentation of Progress

The dynamic nature of the critical path is examined by use of a "windows/period" analysis, and issues of float ownership, pacing delays, and misrepresentation of progress in the contemporaneous project documents are evaluated. Once all critical and near critical path activity delays have been quantified, the origins and causes of each delay are determined. This process often involves the organization and analysis of extensive project documentation to establish the cause-effect relationships of each party's actions or inactions and the resulting delays. The responsibility for each delay is then apportioned to either the Contractor, Owner, a third party if appropriate, and to *force majeure* or other excusable delays defined by the contract. By performing these schedule analyses, Long International can provide supportable opinions with respect to time extensions, compensable delay, and acceleration.

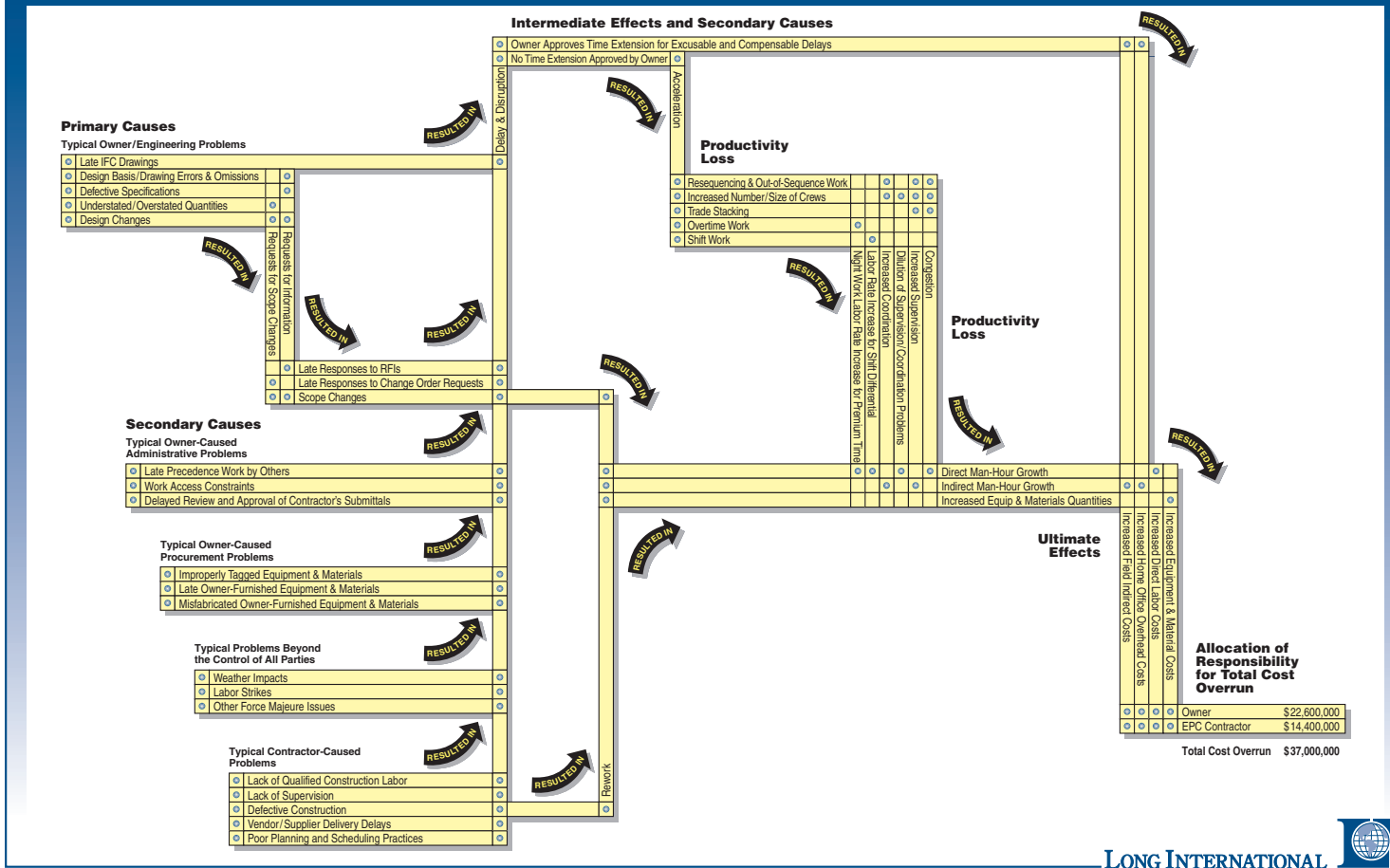


### Schedule Delay Analysis Methodology

- Retrospective (As-Built) Analysis vs. Contemporaneous (As-Planned) Analysis
- Windows/Period Analysis to Address Dynamic Critical Path
- Verification and Correction of Schedule Integrity
- Identification of Activity Duration Delays
- Identification of Activity Relationship Lag Delays
- Analysis of Delay Issues
- Allocation of Delay Responsibility
- Update Impacted Analysis
- Determination of Appropriate Time Extensions
- Analysis of Concurrent Delays
- Calculation of Liquidated/Actual Damages
- As-Built But-For Analysis
- Calculation of Compensable Delay Damages
- Quantification of Acceleration and Potential Basis for Allocation of Loss of Productivity Responsibility

# Schedule Delay Analysis Services

## Typical Cause-Effect Matrix for a Delay/Disruption Construction Claim



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### Cause-Effect Matrix Demonstrating Common Delay Issues Affecting Schedule Analyses

Proving causation in a cumulative impact claim typically requires detailed and complete contemporaneous project documentation. The backbone of the cause-and-effect linkage in any claim is the cause-effect matrix. As multiple causes and their resultant effects are added, the matrix can become complex for a highly impacted project. Primary and secondary causes, including Owner and Contractor-caused problems, are shown to have multiple and duplicative effects, the end result being delays and cost overruns which need to be allocated to the respective parties. Long International's evaluation of the contemporaneous project schedules aids in the understanding of how the Contractor may have adjusted its work sequences as a result of the problems it has experienced.

### Schedule Assurance Services

Many project schedules are often poorly prepared and require extensive rebaselining during project execution to become a useful project management tool to properly measure progress, determine the effect of changes in scope, and forecast the completion of contractual milestones and overall project completion dates. Poorly prepared schedules do not provide a reliable tool to: 1) measure responsibility for delays that occur during project execution, 2) quantify appropriate time extensions, or 3) assess the need for acceleration to mitigate delays. To rectify these common problems with project schedules, Long International provides Schedule Assurance Services to ensure that schedule deficiencies are quickly identified and corrected.

### Schedule Quality Considerations

- Is Contractual Scope of Work Included?
- Is Schedule Logic Reasonable?
- Are Change Orders Incorporated into Schedule Updates?
- Are Schedule Metrics within Standard Industry Practice Norms?
- Are Critical/Near-Critical Activity Paths Reasonable?