



Typical Analysis Procedure for New Project

Optimised Engineering's remit is to undertake advanced computer simulations of mechanical or physical systems or devices in order to predict their performance. Simulation types may include structural analysis, fluid flow analysis, thermal analysis and mechanisms simulation. The following brief description outlines the path of a typical structural analysis project that Optimised Engineering may undertake:

1. **Problem description.** Initial discussions with the customer could include telephone conversations, e-mail exchanges or site visits. Alternatively, the customer may supply a 'statement of work' document. As the amount of analysis effort varies with the accuracy required, it is important for us to understand the use to which the results will be put, so our models carry the right level of detail.
2. **Project Proposal.** Optimised Engineering will supply a proposal/quotation document that outlines its understanding of the problem and briefly describes the techniques that will be applied to the solution. Attention will be drawn to limitations in the analytical method proposed. This document will advise what data is to be supplied by the customer. We recognise that customers often require results in a hurry, so we aim to minimise delays at the quoting stage.
3. **Formal Instruction.** Upon receipt of a purchase instruction and relevant data, work will be carried out, where possible within agreed time scales.
4. **Computer Simulation.** Typically, the proposed solution will involve the generation of a computer simulation of the component/structure/system. The starting point for this is likely to be CAD or drawing data supplied by the customer, and may also involve measurement from physical samples. Inherent in the computer modelling approach may be a degree of geometric idealisation or simplification. Real world material properties and structural loads (for example) must also be represented by idealised models.
5. **Reporting.** Upon completion of the project, a report is presented. The report will describe the analytical method and predict the performance of the design. Information on structural deformation and stress will typically be supplied. Comparison between computed quantities and allowable limits (as specified by the customer or typical for the material of construction) enables Optimised Engineering to conclude whether the structure is adequate for its intended purpose, or where design improvements are indicated. If there are uncertainties in the results due to inaccuracies in the modelling assumptions, these will be stated. It is important to understand that the role of analysis is to increase confidence in a design and reduce the amount of physical testing necessary. It should not be viewed as a substitute for prototyping and good engineering practice.
6. **Optimising.** It is often a requirement of an analysis project that advice is given on improving the performance of a design. The benefit of design changes is assessed in the same way as the performance of the original design. This is usually a collaborative effort between Optimised Engineering and the customer, given that the customer will be aware of design and manufacturing constraints that may not be obvious.