

# IBDAS

## A Powerful Tool for Integrated Design



The Great Belt East Bridge, Denmark.

IBDAS (Integrated Bridge Design and Analysis System) is a powerful software package developed by COWI for integrated design and analysis of load bearing structures. The name indicates that the system contains special facilities for bridge design but the program can advantageously be used for almost any structural design project.

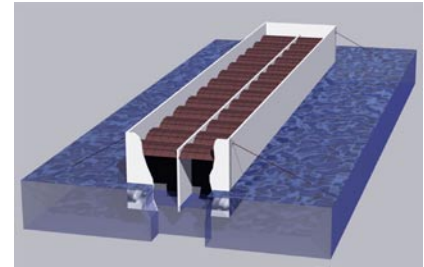
The program differs from conventional analysis programs in being based on three-dimensional logical parametric solid modeling. Further, IBDAS provides complete procedures for fully integrated design.

IBDAS was developed by COWI A/S in the early eighties, and has been continuously developed since then. Today it is COWI's primary tool for design and analysis of all bridge and tunnel projects. Results of a benchmark test with IBDAS against SAP 90 led Caltrans in 1997 to approve use of IBDAS. Communication with the program takes place via IML (IBDAS Model Lan-

guage), which is specifically devoted to handle parametric definitions. A geometric parametric definition could for instance be a length or thickness of a structural component.

The fact that the geometry of the structure is a part of the input has several advantages. Among the most obvious are that IBDAS is capable of producing design drawings and a variety of geometrical analysis such as quantities and setting out tables. Finally, a consistent FE-model is automatically generated using the information stored in the geometry database. Similarly, output from the FE-model act as a database for static and dynamic analyses, post processing, verification and documentation.

Ben C. Gerwick Inc. is designer of the Kentucky Lock float-in cofferdam units for the US Army Corp of Engineers Nashville District. The illustration above demonstrates a float-in segment in transit. Compressed air is used to con-



Kentucky Lock float-in cofferdam.

trol the draft and attitude of the 3500-ton floating structure. The completed design of the Kentucky lock float-in cofferdam was used as a test case to model stability and floating behavior. The results from IBDAS were found to be similar to the results obtained from the original design calculations.

On future projects involving floating stability analysis, Ben C. Gerwick, Inc. plans to use IBDAS as the primary means or as the independent check method of analysis.

### Significant benefits of IBDAS:

- Higher design quality due to a consistent model database.
- Design changes are fast and securely implemented. As an example, a change in geometry automatically leads to an update of analyses, drawings and other output.
- Excellent tool for parameter studies and design optimization.
- Fast and lower cost designs.