

DOWCO

GROUP OF COMPANIES

BIM Consulting Services



OPEN BIM





“Some Say It Can’t Be Done - We Think Different”

In just under 46 years, Dowco has grown from a three-person operation to become one of the largest fully automated 3D Modeling and Virtual Construction Service providers in the world. Established in Burnaby, British Columbia, Canada in 1970, the company today employs more than 325 staff across seven offices and four countries.

Mission Statement

Provide best in class service solutions throughout the design, detailing, fabrication and construction industry. By utilizing innovative tools in the hands of highly skilled teams, Dowco strives to maintain its position as a quality service provider for all its clients.

Our Promise

Dowco’s 46 years of history, heritage, and ongoing success can be explained simply: At Dowco we believe in our service and products. We work hard to get to know our customers, to develop a connection and to understand them and their needs.

Above all else, Dowco is dedicated to bringing integrity and trust back to the design and construction industry. We strive to make every part of your experience working with us as simple and professional as possible.

We are committed to clear and unambiguous consistent language at every point of customer contact.

We demonstrate our commitment daily by providing a superior quality service that our customers and partners can expect and depend on.



Dowco Office, Burnaby BC.

Services we provide:

Modeling Services

- Structural Model Creation
- Fabrication Model Creation
- Structural Steel (Complete with Steel Shop Drawings)
- Cast in Place concrete
- 4D and 5D Model Creation
- Model Management
- Steel Connection Design

BIM Construction Management BIM Workflow Consulting

- Defining who is responsible for what
- Providing a secure common upload and download area hosted by Dowco
- Defining milestones for project detail
- Outlining the key people and defining roles
- Hosting BIM Coordination meetings

BIM Implementation Consulting

- Assessment of your current office procedure
- Adapting your current procedure to incorporate Building Information Modeling
- Training employees in BIM workflow and software

Construction Reviews

- Reviewing Site Layouts using 3D models
- Reviewing Construction Plans using the 4D model

Training

Online Training, Certification

- Dowco Online Connection Design Course
- Dowco Structural Detailer Training Online Course
- Tekla Structures Training
- Graphisoft ArchiCAD Training
- BIM training



Freedom Tower, NY.

Our Clients

- | | |
|-----------------------------------|---------------------------|
| • Alstom Power Systems GmbH (pic) | • Mortenson |
| • Bechtel Power Corporation | • P.T. Freeport Indonesia |
| • Black and Veatch | • Tishman Construction |
| • Gehry Partners LLP | • Tishman Speyer |
| • Hatch International | • Thornton Tomesetti |
| • Hoffman Construction | • Turner Construction |
| • LPR Construction Co. | • WSP Cantor Seinuk |
| • Magnusson Klemencic Associates | • Schuff Steel |
| • JV Driver | • Fluor |



BIM Early Involvement

Dowco Group of Companies (Dowco) have been members of Integrated Project Delivery (IPD) teams at the early stages of many design build BIM projects. With our specialized construction knowledge, effective collaboration methods and applications we have achieved and delivered added value, through true integration between design and construction.

Employing our 3D application Tekla Structures, our Project Managers, Engineers, and Drafting Division can offer design/engineering, component integration, and 4D/5D modeling/Construction services, all of which are essential for an efficient building model.

An additional advantage to working with Dowco is the leveraging of the “as-built” model. At the end of the project construction phase our customers are left with a complete as-built virtual model. This model can be utilized for up-grades, maintenance and facility management, as well as a design reference for future projects.

There are effective benefits that can be gained by all parties with a collaborative virtual model. This is made possible with the early involvement of Dowco and their BIM technologists and technologies.

The following table summarizes the benefits of each of the virtual areas:

3D virtual model using Tekla Structures	4D Sibyl and Tekla Structures	5DSibyl and Tekla Structures
<p>Managed by our project managers, engineers, steel detailing technicians and project coordinators</p> <p>3D model available to all enabling visualization of what will actually be built on site</p> <p>Conflict detection, hard and soft clash (access, safety issues)</p> <p>Integrating all construction components into one model</p> <p>Quantity takeoff</p> <p>Elimination of field interferences</p> <p>Less rework</p> <p>Fewer request for information</p> <p>Fewer change orders</p> <p>Less cost growth</p>	<p>Establishes a 4D time dimension to the model environment</p> <p>Managed through our project management, engineering and construction department</p> <p>Visualizations communicate the construction process</p> <p>Construction and planning sequence analysis</p> <p>Site logistics</p> <p>Schedule analysis</p> <p>Integration with cost and schedule control</p> <p>Shorter construction period</p> <p>Improved communication</p> <p>Improved coordination (trades, designers, site logistics)</p> <p>Greater offsite prefabrication opportunities</p> <p>Verification, guidance, and tracking of construction activities</p>	<p>5D environment brings cost into the virtual model</p> <p>Managed through our project management, engineering, estimating, procurement and construction departments</p> <p>Accurate cost estimating</p> <p>Cost evaluation</p> <p>Design and construction status (track and validate the progress of components)</p> <p>Value engineering</p>

Dowco has chosen “best in industry” applications such as Tekla because of their Industry Foundation Classes (IFC) capability. The IFC is a vendor neutral open data exchange specification that facilitates collaboration and sharing of information. Dowco also employs in-house computer technicians/programmers who continuously develop our proprietary applications ensuring uninterrupted support and collaboration with any and all customer information exchange systems.

All of the above criteria guarantee an accurate building model and impress a direct benefit to all members of the project TEAM.

TEAM – Together Everyone Achieves More

Examples of Past Projects:

Vancouver Convention Centre Expansion Project

As one of Dowco's recent BIM projects, the Vancouver Convention Centre is now one of Canada's largest convention centres. Working on the west building, Dowco helped arrange several processes that improved the workflow between the trades such as interchanging models between the Structural Engineer and our steel detailing department including a virtual shop drawing checking process that involved the Contractor, Engineer, Architect and Fabricator. Dowco also used BIM to track RFIs while providing visual representations to the owner. Working with 3D models allowed the connection designer to also visualize joints for connection design and allowed project team participants to quickly resolve any design problems before they appeared on site. Model zones were also exported that had assisted the Contractor for specific erection sequences.

The west building was certified LEED Platinum by the Canada Green Building Council in 2010.



Chicago Millennium Park

The Chicago Millennium Park has been hailed the city's most important project since the World's Columbian exposition of 1893. Officially opened in 2004, this Frank Gehry project (Guggenheim Museum Bilbao) has many unique features. Dowco participate in this project setting up a method of importing and exporting 3D models between the Structural Engineer and the Steel Detailer.

Due to the complex structure (park's bandshell structure shown on left) Dowco helped set up a way of importing laser survey points into the 3D model because of the modification required with the framing of the building and the structure of the exterior cladding. Custom software macros were developed and structural connections adapted to meet the as-built requirements of the park's structures.

Walt Disney Concert Hall

Considered as one of the world's most sophisticated concert halls in the world, the Walt Disney Concert Hall in Los Angeles, California provides for both an aural and visual experience.

Another one of Frank Gehry's complicated designs, Dowco worked with the Architect on this highly complex geometric building in the late 90s. Interoperability between construction tools was still in its early stages and importing the Architect's Catia model into Tekla Structures proved to be challenging but demonstrated our company's capability as an early adaptor of BIM solutions. The contractor, Mortenson Construction, describes how they were literally forced to use 3D/4D technology in this difficult project by receiving 3D models as contract documents. Their early experience evolved to be fruitful as they then embraced 3D/4D/BIM technology in their succeeding Denver Art Museum Expansion project.



Denver Art Museum

A signature landmark for the city is Denver's Frederic C. Hamilton Building, or otherwise called the Denver Art Museum expansion. Consisting of 2,700 tons of steel in an awesome angle, this project was proud to be one of Dowco's pioneer projects using advanced BIM solutions to accurately detail this incredibly complex structure.

Aside from keeping all the other team members (M.A. Mortenson Construction, ARUP, L.P.R. and Zimmerman Metals Inc.) in the loop using BIM, a building schedule was drawn up beforehand and integrated into the 3D model to create the move that showed every step of construction. The degree of the collaboration using BIM is what made the project successful which also resulted in a completion that was 3 month's ahead of schedule. Reference models of Cranes were also inserted into the 3D model to visualize staging plans done at the erector's office before going into the field.

This project was recognized by the American Institute of Architects as a successful Building Information Modeling project.

Panama Museum of Biodiversity

Another interesting Frank Gehry design, the Museum of Biodiversity, also called the Bridge of Life Museum, is currently being erected in Panama City. Situated at the Pacific entrance to Panama Canal, visitors will soon marvel at this construction wonder.

Working with BIM solutions, Dowco was tasked to detail its complicated roof framework as well as the supports for the 15 buildings. A preconstruction model and 'partially complete' general arrangement and fabrication drawings were also provided to the contractor that was used to provide information to potential bidders. Obtaining the true size, location and geometry of the main members in the structure was done by importing the Architect's 3D model into Tekla structures, resulting in huge cost and time savings to the owner.



BIM Experts

Ewen Dobbie



Ewen Dobbie is the President and Chief Executive Officer for The Dowco Group of Companies (Dowco Consultants Ltd and Dowco Technology Services Ltd).

Ewen graduated from the University of British Columbia in 1990, beginning his full time business career with Dowco Consultants Ltd soon after. Over the past 26 years he has managed both the technology and software sales divisions, and the 3D modeling & detailing services business. Dowco being North

America's first Tekla Structures user and Reseller, he was instrumental in the development of North America's 3D Modeling and emerging Building Information Modeling market.

Currently, as President, Chief Executive Officer, Ewen is responsible for the global expansion of the Dowco Group's business interests. Seen by many in the industry as a business strategist, he has worked to position the Dowco Group of Companies as a global provider of 'end-to end' solutions for the Design and Construction Industry. He is a regular presenting speaker and active member of several construction industry associations, particularly in the implementation of Building Information Modeling and changing design and construction workflows, and considered to be one of the leading BIM visionaries in the construction industry.

Brian Pyper



Brian Pyper is the Executive President of Dowco Consultants Ltd. He began his career in the structural steel industry in 1987 as an iron worker in Scotland. In 1994 Brian immigrated to Canada and completed 18 months of college to receive his diploma in structural steel detailing. He has dedicated the last 18 years to the steel detailing industry, continuously increasing his knowledge in drafting, engineering and business. He earned his MBA and is a registered Project Management Professional. Brian started his steel detailing career with

Dowco but went on to successfully establish a BC branch for a prominent Alberta steel detailing company. Brian has now rejoined Dowco, bringing with him a wealth of knowledge and experience to become another key member of the management team.

Sanjay Prasad



Sanjay joined Dowco Consultants Ltd. as a Structural Steel Detailer in 1987. In those 29 years he has worked as a Structural Steel detailer, Checker, Project Manager, Software Sales Rep, Software Developer, R&D Manager, Technical Support and Trainer. A major career change for Sanjay came in 1995 when he became heavily involved with the customization of macros for Tekla Structures (formerly Xsteel) for the North American Market. With this early involvement with Tekla Structures Sanjay became one of the real

power users and Tekla developers worldwide. Working in a development and support position he works closely with Dowco's production team to refine our technical environment and production processes. Sanjay also leads Dowco's R&D efforts. Sanjay's exposure to both the production and the technical side of the business has led him to implement various "BIM" processes for Dowco's detailing operations.

Dowco is proud to be a partner for the following BIM Solutions:



Tekla Structures is a Building Information Modeling (BIM) software that enables the creation and management of accurately detailed, highly constructible 3D structural models regardless of material or structural complexity. Tekla models can be used to cover the entire building process from conceptual design to fabrication, erection and construction management.



Panzura is a hardware solution that allows you to host construction models in the cloud. Panzura allows multiple office locations to share BIM models in real time and enable instant collaboration and simultaneous sharing of project data.



Bluebeam PDF Revu was designed to make your life easier with simple PDF creation, markup, editing and access features. When using Bluebeam you will soon come to realize the ease of use and functionality provided with our software. Bluebeam PDF Revu integrates with MS Office programs for one button file creation and includes the Bluebeam PDF printer to create a PDF from just about anything.

Dowco is also proficient in the following solutions:

- Tekla Structures
- Tekla BIMsight
- Graphisoft ArchiCAD
- Bluebeam
- Autodesk Navisworks
- Autodesk Revit

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THE DOWCO GROUP OF COMPANIES

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