



SIMCO

DURABILITY ENGINEERING

**INFRASTRUCTURE
DURABILITY
ENGINEERING**

A LONG-STANDING EXPERTISE IN THE OPTIMUM MANAGEMENT OF CONCRETE INFRASTRUCTURE

By leveraging its unique expertise on the performance of construction materials, SIMCO offers integrated solutions and engineering consulting services for the optimum design and maintenance of civil infrastructure. For the past 25 years, SIMCO has been involved in numerous major international projects relating to the design of durable new constructions and the elaboration of preservation plans for existing structures.

A pioneer in the development of innovative tools for the construction industry, SIMCO has developed the STADIUM® software, which is recognized as the most efficient and accurate numerical solution for the prediction of long-term behavior of reinforced concrete structures exposed to a wide range of aggressive environments. SIMCO's STADIUM® software is the only service-life prediction tool recognized and specified by the U.S. Department of Defense for the design and construction of new maritime works for the U.S. Navy, U.S. Air Force, U.S. Army Corps of Engineers and NASA.

SIMCO assists owners and managers in analyzing, designing, and maintaining civil engineering structures while supporting sound asset management and decision-making practices. By combining sophisticated materials analysis techniques and leading-edge service-life predictive technologies, SIMCO's unique and flexible approach leads to better business decisions for the effective management of concrete infrastructure assets. SIMCO's services include construction support, specialized materials testing, forensic analyses and litigation management.

WE COUNT ON A MULTIDISCIPLINARY TEAM

SIMCO's experts have been called on across the globe to understand infrastructure durability issues that go far beyond the scope of routine engineering works. With the commitment and dedication of a multidisciplinary team of highly-qualified engineers, scientists, technicians, IT engineers, programmers, and professionals, SIMCO continues to deliver unparalleled durable and sustainable engineering solutions for several industries around the world, including Engineering, Transportation, Energy, Defense, Real Estate, Construction, and more...

A UNIQUE UNDERSTANDING OF INFRASTRUCTURE DURABILITY ISSUES THAT GO FAR BEYOND THE SCOPE OF ROUTINE ENGINEERING WORKS



WE HELP PLAN, DESIGN & DEVELOP FOR A MAXIMUM SERVICE LIFE

- Explore any concrete durability issues with the use of state-of-the-art predictive technologies
- Plan for the appropriate selection of materials for concrete production to ensure a maximum service life
- Design structures using SIMCO's methodologies and protocols for enhanced performance
- Generate reliable information for a comprehensive evaluation of buildings, roads, bridges and marine structures
- Determine service-life expectancy of structural components and the performance of repair options that will be in compliance with service-life extension requirements
- Leverage the talents of a multidisciplinary and experienced engineering team to assist you in making decisions that will save you time and money
- SIMCO delivers high-precision durability design solutions that are tailored to your needs

WE OFFER INFRASTRUCTURE DURABILITY SOLUTIONS THAT ARE TAILORED TO YOUR NEEDS

- With the use of leading-edge numerical models, SIMCO helps you to predict the long-term behavior of civil engineering structures
- SIMCO's STADIUM® technologies and methodologies are used to determine time to corrosion initiation of reinforcement and concrete degradation
- SIMCO's predictive tools are used to more accurately evaluate the service life of structures in accordance to different exposure conditions
- SIMCO's advanced methodologies help identify and select the most cost-effective maintenance and repair alternatives
- SIMCO uses state-of-the-art numerical models and methodologies to help reduce construction costs with an optimal selection of materials during the design phase
- Advanced protocols, processes and technologies help to better manage risks and ensure quality control of concrete production during construction or rehabilitation
- SIMCO's durability technologies and solutions provide critical information for the design of new constructions and for the preservation of existing structures

SIMCO'S ENGINEERING SOLUTIONS & SERVICES

SERVICE-LIFE & DURABILITY DESIGN ENGINEERING

- Review of technical specifications and assistance in the preparation of tender documents
- Analysis of concrete material properties for durability & performance requirements
- Standard and specialized laboratory tests and analysis of results
- Calculation of the condition and value of an asset at any time in the future
- Optimization of mixture designs in accordance to service-life requirements
- Lifecycle cost analyses for different repair and rehabilitation options
- Elaboration of durable concrete mixture specifications for different environmental conditions

INSPECTION & CONDITION ASSESSMENT

- Review and analyze available documents
- Conduct visual inspections and document degradation phenomena observed on structure
- Develop a deterioration matrix for each element under investigation, classifying the type of damage observed and the level of severity
- Elaborate a testing program including coring instructions and non-destructive testing requirements
- Analyze results and evaluate repair scenarios to extend the service life of the structure
- Recommend the most efficient intervention plan based on lifecycle cost analyses

INFRASTRUCTURE PRESERVATION

- Conduct comprehensive investigations and condition assessments of structures
- Determine the structure's residual life
- Provide cost-effective repair and rehabilitation alternatives
- Compare the efficiency of different maintenance alternatives based on service-life and lifecycle cost analyses
- Optimize maintenance plan to extend the structure's service life
- Elaborate production processes for different concrete mixtures
- Implement a quality control program during production
- Execute field and lab quality control validation tests during construction, repair, and rehabilitation

SIMCO IS THE EXPERT YOU NEED WHEN IT COMES TO INFRASTRUCTURE DURABILITY ENGINEERING SOLUTIONS



INFRASTRUCTURE MANAGEMENT

- Gap Analysis – (analysis of organizational structure, protocols, programs, processes, resources and internal competencies and expertise)
- Software customization and implementation – Infrastructure Asset Management System
- Integration of Infrastructure Asset Management System into Geographic Information Systems (GIS)
- Information Management (Integrate inventory – operate expert system – integrate inspection data and results – integrate simulation data etc.)

MATERIALS SCIENCE & ENGINEERING

- Field sampling and testing to determine exposure conditions
- In-depth analyses and predictive modeling to determine the residual service life
- Improve production processes and properties of concrete materials
- Define optimum material designs to meet service-life requirements
- Define and implement QA/QC programs to monitor concrete production
- Develop quality concrete mixture specifications using locally-available materials

SUSTAINABILITY ENGINEERING

- Reduction of CO₂ emissions in construction and rehabilitation projects (with the use of SIMCO's ECO software)
- A flexible and customizable application and a readily-accessible, robust repository for information on materials properties, data inventory, environmental conditions, code and standard specifications
- Efficient energy use through conservation measures and use of renewable resources
- Minimization of waste by reducing and recycling materials

STADIUM® TECHNOLOGY PORTFOLIO

- Development of expert systems for the effective management of infrastructure inspection and maintenance activities
- Development of bridge management tools for repair and rehabilitation
- Development of specialized tools to assist in optimizing the preservation of structures and reliably predict the future performance of structures exposed to a wide range of aggressive environments

LABORATORY SERVICES

- Specialized lab testing according to national and international standards in addition to custom testing
- Materials characterization and evaluation
- Specific laboratory certification program (STADIUM® - UFGS lab testing program)
- Mix design optimization
- Compliance with relevant regulations and quality standards
- Performance evaluation of locally-available materials
- Quality control testing during and after construction, repair and rehabilitation projects

R&D - INNOVATION

- Elaboration of different methodologies to characterize materials and concrete structures
- Development of probabilistic analyses to determine the risk of future failures
- Development of solutions to improve the service life of concrete structures and reduce the risks of premature deterioration
- Development of computational software tools to improve the understanding and prediction of long-term behavior of concrete exposed to different degradation mechanisms

FEATURED PROJECTS



PORT OF ROTTERDAM



PANAMA CANAL



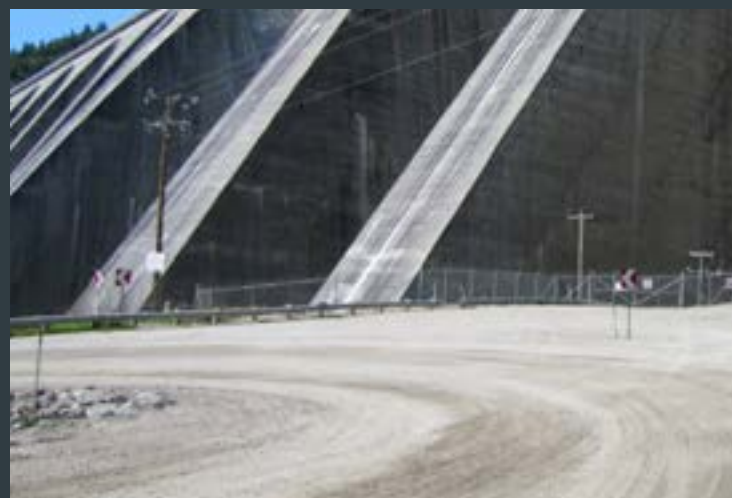
HABITAT 67 MONTREAL



CHUTE-À-LA-SAVANE DAM - RIO TINTO ALCAN



U.S. DEPARTMENT OF ENERGY



ELECTRIC POWER RESEARCH INSTITUTE



DEUTSCHE BANK - GROUND ZERO



NEW YORK NO. 7 SUBWAY LINE



PEARL HARBOR



PULASKI SKYWAY



CHAMPLAIN BRIDGE



UNION STATION, WASHINGTON D.C.



SIMCO

DURABILITY ENGINEERING

CONTACT US

1 877.656.0266

1 418.656.1003

info@simcotechnologies.com

www.simcotechnologies.com