



**VECTOR
CONSTRUCTION
GROUP**

Building Strength With Integrity™

CONCRETE

Restoration & Protection



A Portfolio of Solutions

Welcome



Donald W. Whitmore, P.Eng., GSC
Founder and Chairman

A Message from the Chairman of the Vector Construction Group

Today, concrete restoration and corrosion mitigation costs in North America are estimated to exceed \$40 billion per year. Worldwide, they are incalculable. There is no single solution to address a problem of this magnitude. That's why Vector has developed a portfolio of solutions to help you meet the specific challenges facing the structures and facilities in your industry.

I am proud to state that the hallmark of a Vector solution is the unsurpassed integrity, expertise and experience of our people. We will work with you, in partnership, to identify the root cause of the problem – not the symptoms, and we will work with you to develop practical solutions to get the job done. Then, we will do the job right.

That is the way we've been doing it for over 40 years in North, Central and South America and other locations across the globe. The result: innovative, cost-effective concrete restoration and corrosion mitigation techniques that have allowed us to earn our customers' long standing trust and respect.

Our portfolio of solutions is far more extensive than can be presented here. The information and photographs in this booklet are but a few examples of the various solutions we have developed for our customers. Accordingly, I invite you to contact any Vector location to see for yourself how our solutions can help you.

We feel privileged to have been given the opportunity to help our customers address their challenges and we are proud of the solutions we have provided.

We would welcome the opportunity to earn the right of becoming your concrete restoration solution provider as well.

A handwritten signature in black ink, reading "D Whitmore". The signature is written in a cursive, flowing style.

Safety & Environment



Building Strength With Integrity™

Vector's safety, health and environmental protection policy initiatives demonstrate the integrity with which we embrace our ethical responsibilities to you. We strive to prevent workplace injury, property and equipment damage and to control risks to our customers, the public and the environment.

Vector adheres to a "least total cost" philosophy in all our endeavors replacing structures and facilities. This philosophy extends to minimizing environmental impact costs caused by unnecessary consumption of materials and resources.

Our total commitment in this regard has allowed our customers to avoid unnecessary shutdowns and associated liability issues. Vector is proud of our high standards and the numerous safety and environmental awards we have received.



INDUSTRY PARTICIPATION

Vector is committed to the advancement of industry standards, practices and new technologies. We actively participate in the following industry organizations:

- American Concrete Institute
- American Society of Civil Engineers
- Canadian Construction Association
- Canadian Society of Civil Engineers
- Construction Safety Associations
- International Concrete Repair Institute
- ISIS Canada
- National Association of Corrosion Engineers
- Transportation Association of Canada
- Transportation Research Board



Green Light Safety!

YOU ARE ALWAYS SAFE WHEN YOU
GO WITH VECTOR!



Problem Identification

Our definition of integrity is not just doing the job right but doing the right job, right!

Cost-effective solutions are always predicated on the correct identification of the underlying problem – not just the symptoms. For this reason, Vector recommends thorough evaluation to determine why the deterioration has occurred.

While each evaluation and inspection plan is unique, all are designed to ensure the most cost-effective solution is proposed in terms of keeping facilities and structures in service with minimum 'down-time', future disruptions, maintenance or other recurring costs usually associated with temporary repairs.

- ▶ **Condition Surveys**
- ▶ **Concrete Investigation**
- ▶ **Corrosion Testing**
- ▶ **Corrosion Monitoring**
- ▶ **Corrosion Evaluations**
- ▶ **Structural Health Monitoring**





Building Strength With Integrity™

Problem

Cause and extent of corrosion and concrete damage at Kansas City bridge were unknown.



Vector Solution

Vector worked with the structural engineer to evaluate rebar corrosion, extent of delamination and presence of chlorides. This information was used by the engineer to develop a corrosion management strategy and to determine the extent and scope of repairs needed for each section of the bridge.



Problem

Ruptured concrete and loss of structural capacity due to corrosion and failure of post-tension cables in public parking garage.



Vector Solution

Employing Vector's Post-Tech™ System, cables were evaluated using PT Corrosion Evaluation to determine the potential for corrosion. Based on the evaluation results, Post-Tech™ PT Drying and PT Grease Injection methods were used to mitigate corrosion activity and provide long-term protection.



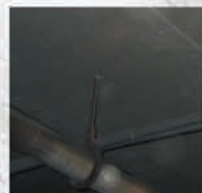
Concrete Repair & Restoration

Vector is a full service rehabilitation contractor – and more!

With over 40 years experience providing turnkey conventional and structural solutions for concrete repairs, Vector possesses unique capabilities to serve as your single source restoration contractor.

In addition to proficiency in conventional repair methods, Vector has developed the expertise to employ innovative, proprietary processes and techniques that ensure timely, cost-effective solutions for all your concrete and corrosion challenges; everything from small patch repairs to major restoration projects.

- ▶ **Conventional Concrete Repairs**
- ▶ **Structural Concrete Repairs**
- ▶ **Epoxy Injection**
- ▶ **Chemical Grouting**
- ▶ **Cementitious Pressure Grouting**
- ▶ **Shotcrete**
- ▶ **Masonry Repairs**
- ▶ **Historic Preservation**
- ▶ **Post-Tension Repair**





Building Strength With Integrity™

Problem

In 1980, significant freeze-thaw damage and concerns about stability of Manitoba Hydro's Seven Sisters Generating Station mandated a long-term solution.

Vector Solution

Vector received the International Concrete Repair Institute Award of Excellence for Longevity for this project. The project utilized multiple rehabilitation processes including concrete removal and replacement, overlays, thermal protection, grouting, rock anchors and additional reinforcement.



Problem

Overseas nuclear reactor containment buildings exhibited structural cracks and were not air tight.



Vector Solution

Specialized concrete repairs and structural injection techniques were utilized to cost-effectively repair the existing structures, bringing them into regulatory compliance.



Protective Systems

If you are faced with the challenge of protecting or replacing your concrete floors, walls, tanks and secondary containment structures from the devastating effects of salt, water, temperature, acid, other chemicals or abrasion, Vector has the experience and technical competence to help you.

No single product or system provides a universal, protective barrier against chemical, thermal and mechanical attack. Specially formulated coatings, linings, membranes, sealers, acid brick and tile and acid resistant concretes are but a few of the possible solutions in our portfolio from which to choose.

Vector's expertise is available to help you select the most cost-effective product solution and application technique. From precise problem definition to meticulous surface preparation, to proper application, let Vector's experience work for you.

- ▶ **Industrial Floor Coatings**
- ▶ **Protective Coatings & Linings**
- ▶ **Refractory Linings**
- ▶ **Traffic Bearing Membranes & Waterproofing**
- ▶ **Concrete & Polymer Overlays**
- ▶ **Expansion Joints**
- ▶ **Acid Brick & Tile Repair**





Building Strength With Integrity™

Problem

Reduced structural integrity due to chemical attack at a pulp and paper mill effluent treatment facility.

Vector Solution

Selection and application of a monolithic protective lining provided a durable barrier and long-term resistance to chemical attack while ensuring the job was completed within the short shutdown window mandated by customer requirements.



Problem

Chemical and thermal attack in food plant caused a health and safety hazard.

Vector Solution

Selection and application of a specialty flooring system provides a cleanable surface and withstands the thermal shock of daily steam cleaning.



Problem

Structural integrity of a kiln is compromised by breakdown of the refractory lining.

Vector Solution

Selection and installation of refractory lining provides thermal insulation to 1200°C (2200°F) operating temperature to protect and cost-effectively extend the service life of the kiln.

Structural Strengthening

Vector is a recognized industry leader and award recipient for the development of innovative processes and techniques to strengthen and repair existing concrete structures. These innovative approaches provide cost-effective solutions to existing structural problems.

- ▶ **Advanced Composite Materials**
- ▶ **Supplemental Strengthening**
- ▶ **FRP Rebar and FRP Mesh**
- ▶ **Rock Anchoring/Stabilization**
- ▶ **Post-Tension Repairs/Replacement**
- ▶ **External Post-Tensioning**

Problem

Structural deficiencies with a highway overpass caused safety and liability concerns to government officials.

Vector Solution

Carbon fiber sheets were integrated into structurally deficient areas, resulting in significant cost and time savings.



Problem

Significant cracking of the timber bridge girders due to overloading.

Vector Solution

Repair and strengthen, rather than replace. A combined approach of epoxy injection and installation of Fiber Reinforced Polymer (FRP) rebar strengthened the existing timbers to carry higher loads.



Corrosion Mitigation



Building Strength With Integrity™

Vector supplies and installs an extensive array of corrosion mitigation technologies to extend the service life of concrete and masonry structures. Vector solutions include galvanic protection systems, impressed current cathodic protection and electrochemical treatments. Let Vector's design and installation capability provide you with turn-key corrosion mitigation solutions that meet your service life and budget requirements.

- ▶ **Corrosion Investigation and Testing**
- ▶ **Galvanic Anodes for Concrete Repair**
- ▶ **Chloride Extraction and Re-Alkalization**
- ▶ **Impressed Current Cathodic Protection**
- ▶ **Activated Arc Spray Zinc**
- ▶ **Galvanic Jackets and Overlays**
- ▶ **Zinc Tape™ and Zinc Sheet™**
- ▶ **Turnkey Design and Installation**

Problem

Deteriorating pre-stressed concrete wharf exposed to an aggressive, marine environment.



Vector Solution

DECK: On the underside of the wharf deck, Vector applied Galvanode® ASZ+, an activated arc sprayed zinc metalizing system where the activated zinc anode provides blanket corrosion protection.

BEAMS: Galvanode® DAS, a distributed galvanic anode system was applied to provide corrosion protection to beam repairs.

PILES: Custom manufactured, Galvanode® Jacket galvanic pile jacketing system was used to provide long-term corrosion protection.



Vector Construction Group

Vector Construction Group offers an extensive portfolio of solutions to extend the service life of concrete and masonry structures and facilities. Domestic and international customers are served by teams of dedicated professionals in 12 offices located in the United States and Canada.

Vector has earned numerous awards and patents for proprietary innovations in products, services and technologies. The Vector organization is proud of its unique capability to offer technically advanced, least-total-cost solutions. Our highly trained engineers, technologists and operations specialists are responsible for Vector's high standards of safety and service.

Vector provides an enhanced level of customer service in terms of seminars, problem-solving clinics and technical support through our network of Concrete Solution Centers.

For further information, please contact us or visit our web sites listed below.

www.vectorgroup.com

email: vector@vectorgroup.com

A few of our customers:

Abitibi Bowater Pulp and Paper	Inco Metals
ADM (Archer Daniels Midland)	Koch Fertilizer
Agrium Fertilizer	Labatt Breweries
American Crystal Sugar	Lanxess Petrochemical
Atomic Energy	Manitoba Hydro
Barrick Gold / Teck Cominco	Mid American Energy
Basin Electric Power Cooperative	Mosaic Fertilizer
Bunge Canada	Nova Chemicals
Cargill	Ontario Power Generation
Cameco Uranium	Pepsi
Canexus Chemicals	Potash Corporation of
CP Rail	Saskatchewan
Departments of Transportation	Procter and Gamble
Dofasco Steel	Regional Hospital Authorities
Domtar Pulp and Paper	St. Lawrence Seaway Authority
Epcor Power	Sask Minerals
Erco Chemical World Wide	Saputo Dairy Products
Federal Aviation Administration	Sherritt International
Federal Highway Administration	Stantec Consulting
Halsall Associates	Weyerheuser Forest Products
Imperial Oil	



International Corporate Office 1-800-665-6680

Winnipeg, MB 204-489-6300	Thunder Bay, ON 807-346-4405	Hamilton, ON 905-662-4020	Saskatoon, SK 306-934-3533	Regina, SK 306-545-7755	Edmonton, AB 780-962-6778
Fargo, ND 701-280-9697	Cedar Rapids, IA 319-364-5355	N. Sioux City, NE 402-494-9305	Tampa, FL 813-830-7566	Denver, CO 303-465-5806	Pittsburgh, PA 724-941-2096

