STRUCTURAL REPAIR AND WATERPROOFING

CO-MENDER

Commanders in Concrete Solution

WHO
WE ARE

ABOUT CO-MENDER

Co-mender is a specialized engineering and construction company that uses an online platform and app solution with advanced Augmented reality technology software to link contractors , owners and engineers who have challenges in their concrete structures with its international experts and local certified engineers and contracting partners and help them with the aid of its highly knowledgeable technical team to select the best condition survey protocols and design and implement the optimum repair solutions.

CO-MENDER

TABLE OF CONTENTS

CONDITION
ASSESSMENT & INSPECTION SERVICES

Our Services

The degradation of reinforced concrete material is a big challenge for owners who need to keep ageing structures in service and extend their life. RC condition assessment is a powerful decision-making process for engineers responsible for these types of structures. Exposure of these structures and reinforcing steel corrosion are well-known factors in the degradation of concrete civil engineering works, but it is difficult to quantify via conventional inspection methods (visual inspection and hammer sounding).

In fact, it is essential that during every condition assessment, a further step be taken towards understanding the in-depth anomalies in concrete and steel. Accordingly, Co-mender's state-of-the-art non-destructive testing Live instruments can be used to help conclude overall structural condition.

NON-DESTRUCTIVE TESTING

PROFOMETER

The all-in-one solution for rebar assessment and corrosion analysis.

Overview
Advanced cover meter based on the new generation Profometer touchscreen with universal probe and scan cart. Enhanced correction factor for maximum cover accuracy on congested rebar arrangements. Dedicated functionalities for mapping concrete cover and for reporting one layer rebar arrangements.

PROFOMETER CORROSION

The most advanced corrosion instrument in the market.

Overview:
Advanced half-cell measuring instrument for on-site mapping of the corrosion potential. Dedicated software for assisted measurements with rod and wheel electrodes. Statistical software for immediate data interpretation.

PROCEQ GPR LIVE

The most innovative ultra-wideband portable GPR for concrete testing.

Overview:
The Proceq GPR Live portable ground penetrating radar instrument is the beginning of a new era in NDT. The outstanding, patented ultra-wideband technology combined with a compact wireless probe delivers unmatched industry performance. Just connect to your iPad and detect objects and back walls reliably, with amazing clarity and ease of use.

PUNDIT LIVE ARRAY PRO

making pulse echo testing simpler and faster with Artificial Intelligence (A.I.)

Overview:
The Pundit Live Array Pro is a breakthrough in on-site productivity and image clarity for concrete NDT. The rugged, compact, wireless transducer array incorporates cutting-edge multi-channel Ultrasonic Pulse Echo technology.

PUNDIT PL-200

The new Benchmark for Ultrasonic Pulse Velocity Testing

Overview:
The Pundit 200 is a best-in-class UPV test instrument with an extended range of measurement modes. Rugged touchscreen with intuitive user interface for best possible measuring and analysis of the measured data.

ORIGINAL SCHMIDT LIVE

The world's most advanced R-value concrete test hammer

Overview:
The Original Schmidt Live is a uniquely versatile hammer that can be used as stand-alone analog hammer, a stand-alone digital hammer, together with a Bluetooth printer and finally as the world's most advanced R-value concrete test hammer with the Schmidt Live app.

RESIPOD

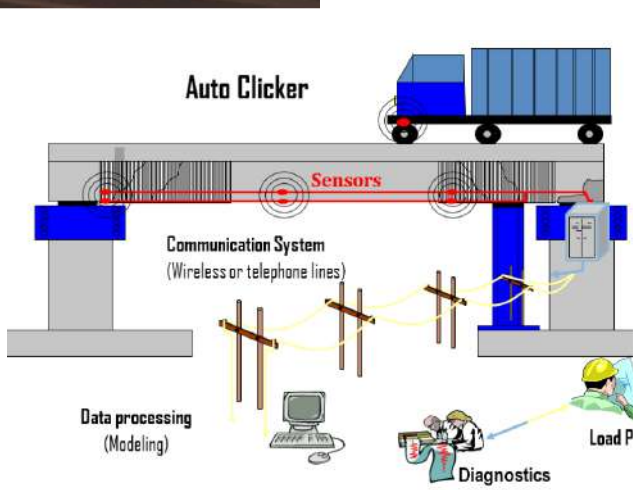
The world's most accurate concrete surface resistivity meter

Overview:

A complete solution for measuring the electrical resistivity of concrete both in the laboratory under controlled conditions and on site. Standard fixed spacing surface Wenner probe with variable spacing and bulk resistivity accessories.

BRIDGE LOAD TEST

Bridge load testing is a common structural evaluation technique usually done to measure physical properties of the bridge including deflections, strains, etc (Static and Dynamic load testing)... or to module and give a rating for the structure (through our diagnostic load test). It is usually carried out at the structure's different life phases including construction, maintenance, and repair stages. Structural Testing System (STS) has been designed expressly for performing live-load tests on highway and railway bridges, piers, and marine loading structures. Developed through the experience of testing more than 300 Structures worldwide (U.S., Asia, Australia, India & Saudi Arabia), the system has been turned to perfection making it one of the most efficient and reliable testing methods in the structural analysis field.



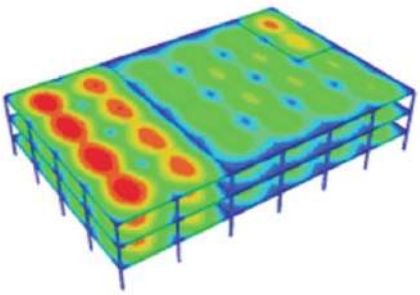
BUILDINGS LOAD TEST

Overview:
Load testing of building components or elements is a popular mean of demonstrating a structure's capabilities when a simple analysis is not practical. Typical situation that arise include: Our services are as follows:

- Structural strength is unknown.
- Impractical change of use involving an increase in loading
- Bomb or fire damage.
- Materials defect or structural deterioration.
- Suspicion in performance such as excessive creep deflection
- Required dimensions and material properties can't be measured or tested.

MEASUREMENTS

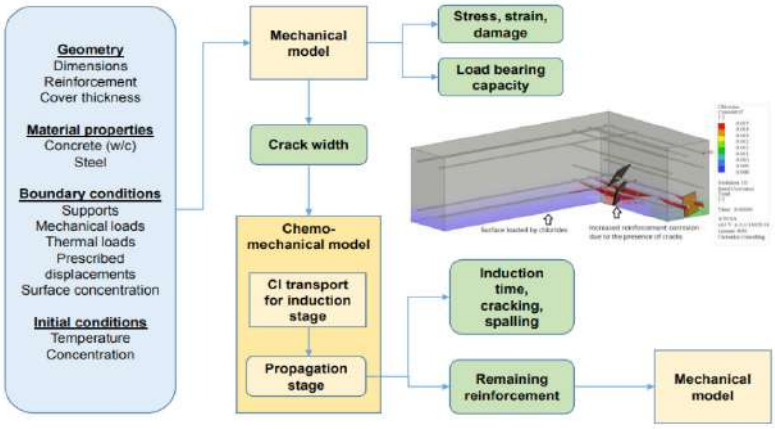
A set of response measurements shall be made after each load increment is applied and after the total load has been applied. On the structure for at least 24 hours. Real-time monitoring of defections and strains is usually undertaken for building load tests using smart sensors installed on the structure to be tested. Those instruments are connected to a data acquisition system which collects.

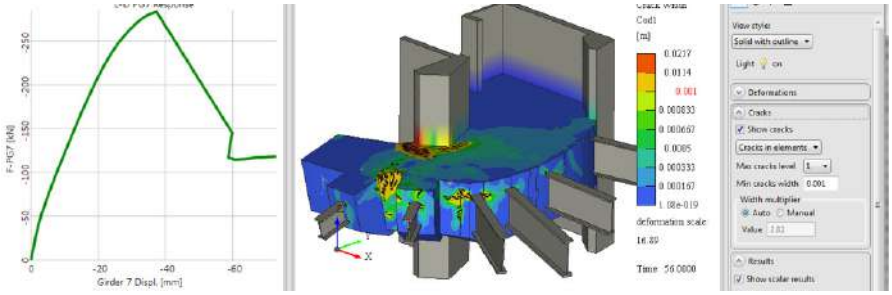


DURABILITY ANALYSIS

Our Services

With years of experience, Co-mender's Team recognized that the durability of concrete structures is related not only to design and material but also to construction issues. Upon completion of new concrete structures, the achieved construction quality always shows a high scatter and variability, and in severe environments, any weaknesses in the concrete structures will soon be revealed in the final condition of the structure whatever specifications and constituent materials have been applied.





In order to better take all this variability into account and to evaluate durability analysis combined with structural analysis software should be applied.

Co-mender experts and in collaboration with its local engineers and with the aid of its communication technology can provide its customers with full comprehensive service for better concrete quality and better construction practices in new construction sites and to evaluate remaining life and residual strength in existing structures.

CONCRETE REPAIR

Our Services

Deterioration in concrete is a big challenge and a major concern for structures and utilities owners especially when it reaches an advanced stage and starts causing an increase in shutdown and replacement costs and create a safety hazard for occupants.

Co-mender and with the aid of its advanced technologies, utilizes state-of-the-art materials, repair methods, tools and trained engineers to repair and restore concrete surfaces and structures.

CATHODIC PROTECTION

Our Services

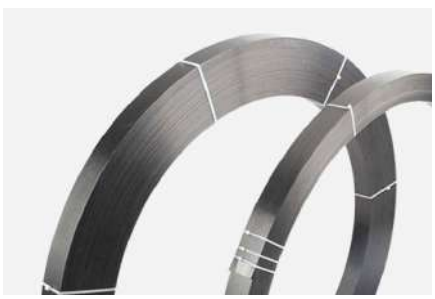
Cathodic protection reduces costs for future repair work and extends the life expectancy of concrete structure. Many reinforced concrete structures suffer from premature degradation, most commonly caused by chlorides. Today, cathodic protection is used by many building owners as an integrated part of the maintenance strategy for reinforced concrete structures.

Therefore, many reinforced concrete structures are prepared for installation of cathodic protection already during the construction in contrast to earlier, when cathodic protection was only used as a method of repair. In both cases, Cathodic protection efficiently stops ongoing corrosion and thus degradation of concrete structure.

The system is comprised mainly of anodes, power supply and control units.

We at Co-mender provide a full comprehensive service and supply wide range of anodes and equipment for existing and new structures as well as customized power supplies and control units.

STRUCTURAL STRENGTHENING



Many structures that originally were constructed for a specific use and loading level now are being renovated or upgraded for a different application that may require higher load-carrying capacity. As a result of these higher load demands, existing structures need to be reassessed and may require strengthening to meet heavier load requirements.

Co-mender Business model is a perfect and highly efficient process that can provide our customers with a comprehensive solution including full Investigate – Design – Supply - Build capabilities.

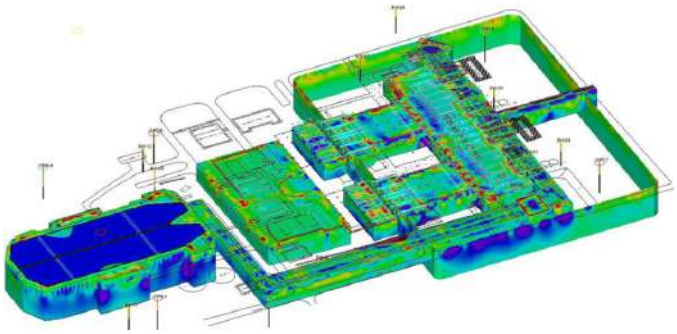
SOIL
INVESTIGATION & REMEDIATION

Our Services

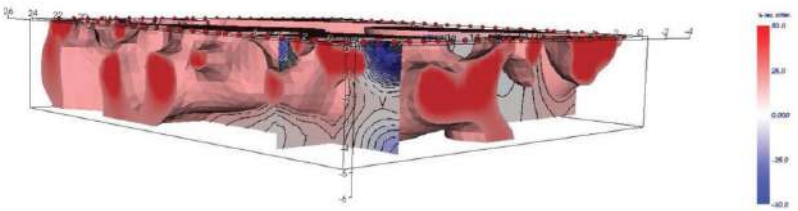
Over the last 20 years, Co-mender's team has acquired solid experience in soil specialized areas, such as investigations, geotechnical studies and the various engineering phases associated with Solutions development.
In the past two years only, the company completed interesting soil investigation and solutions development for major structures, such as bridges, power plants and buildings.
In our approach we use Non-destructive techniques such as ERT (Electrical Resistivity Tomography) and GPR (Ground Penetrating Radar) to better understand the subsurface condition.

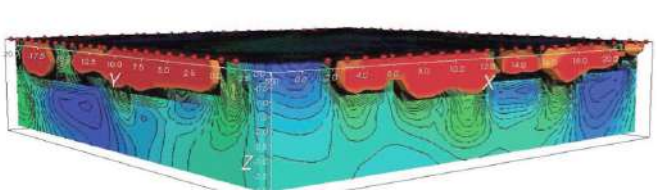
Our Services

- Soil and geotechnical investigation
- Design of shallow and deep foundations
- Soil improvement and stabilization techniques
- Vibrations monitoring



3D ELECTRIC RESISTIVITY TOMOGRAPHY





Characterization of subsurface soil and determination of soil strength are prerequisite for the foundation design of important civil engineering structures. Electrical characterization of soil is done by conducting surface electrical resistivity measurements and subsequently translating these data in terms of electrical properties of subsurface soil.

Electric currents are injected into the ground and the resulting potential differences are measured at the surface, yielding information about the distribution of electrical resistivity below the surface. ERT involves repeated current injections through many electrode pain and into the region of interest (the ground) and the recording of the potential distribution at all other electrodes for each current electrode pair.

This procedure generates several electric potential images of the region of interest from different geometries of current injection.

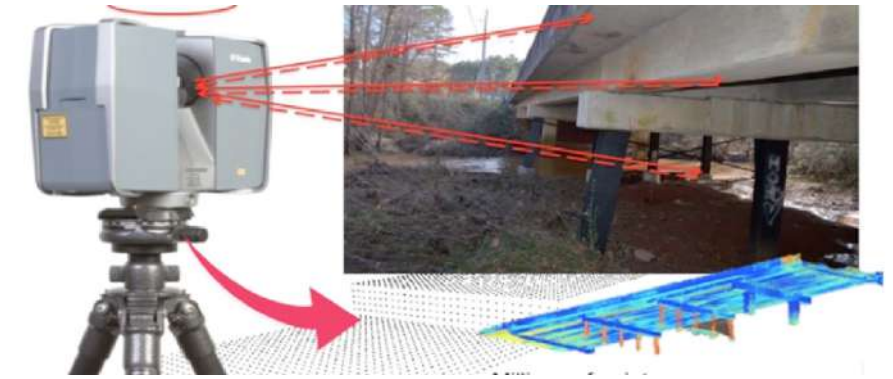
Analysis of these images is processed through a forward and an inverse algorithm. This combines all the data to yield 3-D resistivity distribution inside the studied region.

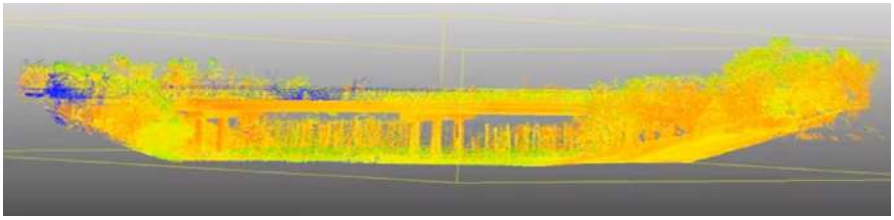
APPLICATIONS

- Determination the location of buried faults
- Detection of voids and cavities in the subsurface
- Leak Detection (water, fuel and others)
- Building Restoration Sites
- Real time monitoring of injection works

ASSET MANAGEMENT SYSTEMS

Our Services





Asset management is the process of making decisions on structure needs and arranging for resulting actions to occur at appropriate times. These may include maintenance, repair, rehabilitation, and replacement actions. Some routine maintenance actions are regularly scheduled, while other maintenance and repair actions are identified through the Department's Asset Inspection and Maintenance (AIM) system. Rehabilitation and replacement strategies are typically determined through an asset assessment that involves varying levels of analysis and engineering. All asset management decisions require inventory and inspection data on the structure to identify needs and appropriate actions.We at co-mender and through our innovative business model, provides the owner's with the ability to manage their structures and making sure their inspection data are continuously updated without the need to hire a resident full time consulting firm.

Our solution is comprised of four modules as follows:

INSPECTION MODULE

Our local Inspectors receive the Inspection Schedule and inspection checklists on our ComendX App.
Conduct the needed inspection and/or NDT.
Uses ComendAIR AR to assign detected defects into the developed 3D model for the critical structure.
Depending on availability, our experts can participate online using ComendAIR or alternatively make a virtual tour in the inspected structure.

INVENTORY MODULE

We host your existing asset management data online.
We perform Initial Inspection to update these data.
We Laser scan some/all the structures and develop 3D models.
We decompose the 3D model using BIM.

ANALYSIS MODULE

Our experts manage the structures.
Analyze the collected data. Conduct Durability Analysis where needed.
Prepare routine and detailed Inspection Schedule. Red flag critical structures.
Use ComendX to Invite our local Inspectors to conduct the needed Inspection program.

REPAIR MODULE

Our experts prepare the Inspection and testing results reports.
Preparation of full repair strategy including B.O.Q.
Inviting local partners to bid for the developed repair solution.

STRUCTURAL WATERPROOFING-EXISTING STRUCTURES

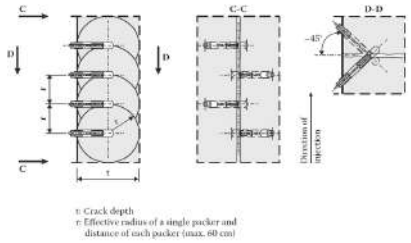
Our Services

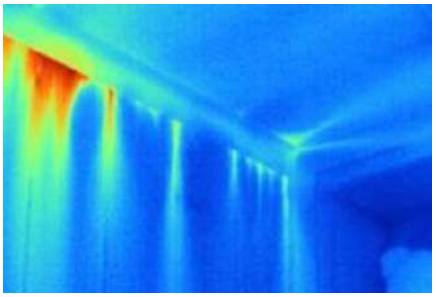
Water can leak into and out of structures. Reasons for this can be cracks, failed joints and even through permeable substrates. Once identified, if not treated, further problems can occur including the corrosion of reinforcement, thus resulting in durability issues and consequential loss of a usable area within the structure.

Co-mender collaborates with solutions providers and provides comprehensive solutions for all your basements water leakages and durability issues.

Our services are as follows:

- Full Condition assessment
- Durability Analysis
- Design of repair and waterproofing solutions
- Supply of materials and Technologies





STRUCTURAL WATERPROOFING-NEW CONSTRUCTION

Our Services

Knowing the importance of the concrete quality in achieving below grade watertight structures, Co-mender developed a full solution to help contractors achieve better durability results in their below grade structures construction. In the Middle East region numbers showed that 80 % of these structures and despite using a sophisticated waterproofing sheet membranes system are still leaking leading to real durability issues in the remaining life of the structures.

In Co-mender and after 20 years of experience with the below grade waterproofing of major concrete structures, we believe that concrete is the second defending line in case of the failure in the external waterproofing sheet system. To achieve a watertight concrete, Co-mender have developed an advanced engineered solution that can reduce the amount of water seepage into the structures and minimize its consequential damages.

Elements of Co-mender's structural Waterproofing system:

- Engineering
- Watertight concrete
- Post-tensioning System
- Waterstops

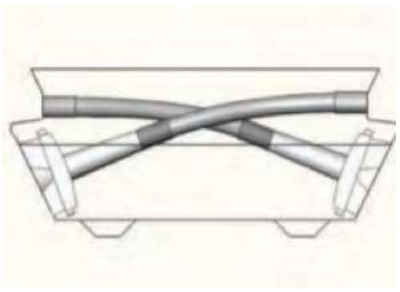
STRUCTURAL WATERPROOFING-NEW CONSTRUCTION

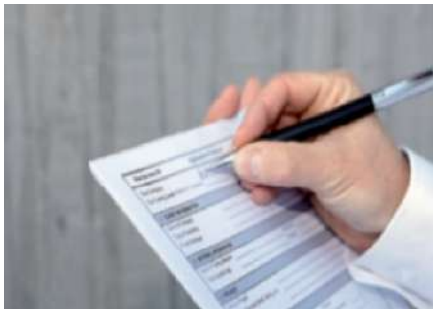
Our Services

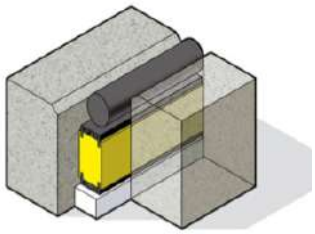
ENGINEERING:

Co-mender's engineering experts collaborates with designers and construction firms throughout all stages of design and construction and provides the following services:

- General advices on the design of underground structures.
- Design the additional post-tensioning system for vertical walls to reduce or eliminate cracking
- Revision and approval of concrete mix design
- Review the reinforcing bars detailing for shrinkage requirements.
- Review the design of the jointing system and introducing cracks inducers if needed
- Construction management including recording of data, photographs and plans for laying all Co-mender's technologies systems.







CO-MENDER'S WATERPROOF CONCRETE

Co-mender's engineering team reviews the mix design, conducts trial mixes and advises our customers with the use of our crystalline waterproofing admixtures where needed.

Also, we provide, monitoring of the concrete temperature and maturity Experts Supervision of the concrete quality, both on-site during construction and testing in the laboratory using our Co-mendAIR technology.

CO-MENDER'S POST-TENSIONING SYSTEM

Co-mender and in collaboration with its partner OVM-MENA have developed a special post-tensioning system that can be applied to vertical walls and reduces the amount and width of cracking.

Similarly to post-tensioned water-tanks the cracks in basement walls can be better controlled or even eliminated providing better durability and functionality to the basement spaces.

CO-MENDER'S WATERSTOP

Joints and penetrations are the most critical elements in the below grade waterproofing system.

Special attention is needed in the design phase and construction phase to achieve a sealed joints. Co-mender's joints sealing system is carefully selected for both durability and performance.

CO-MENDERAIR TECHNOLOGY

After designing the full waterproofing system and reviewing all its essential components, Co-mender provides its international waterproofing experts live and easy access to the site operations during concrete placement.
It's smart monitoring system and live connectivity with the site team allow the experts to provide their technical advice right on the spot eliminating a lot of possible concrete quality issues at site.

CO-MENDER
Commanders in Concrete Solution

CONTACT US

CO-MENDER
F3006, 283 Alexandre-Taché Blvd
Gatineau, QC J8X 3X7

Tel : +1 819 484-1022
Mob : 819 - 9681713

e : info@co-mender.net
w : Co-mender.com