



CSE STRUCTURAL FORENSIC &
REHABILITATION SERVICES

**CORPORATE BROCHURE
&
SUMMARY OF CSE SERVICES**

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CARVAJAL STRUCTURAL ENGINEERS INC.

TORONTO OFFICE
3500 DUFFERIN STREET, SUITE 605
TORONTO (ON) M3K 1N2
FAX: 416-398-2634

BARRIE OFFICE
36 MACMILLAN CRESCENT
BARRIE (ON) L4N 7H1
FAX: 705-725-9949

Phone: 416-876-4357
E-MAIL: george@carvajalengineers.com
www.cse-structural.com

CARVAJAL STRUCTURAL ENGINEERS INC.

CSE STRUCTURAL FORENSIC & REHABILITATION SERVICES

CORPORATE SERVICES

CARVAJAL STRUCTURAL ENGINEERS INC. (**CSE**) is a Canadian based company founded in 2004 in the Province of Ontario . **CSE** is a structural firm dedicated to the investigation, restoration and forensic examination of normal, post-tensioned, concrete, steel, wood and masonry structures.

CSE expertise extends into all aspects associated/related to the forensic and structural rehabilitation of existing structures to include:

- ▶ Forensic Construction - Failure Evaluation Services
- ▶ Forensic Service - Failure Evaluation Services
- ▶ Forensic Maintenance - Failure Evaluation Services
- ▶ Structural Evaluation Services
- ▶ Structural Demolition Design Services
- ▶ Structural Health & Safety & Emergency/ 1st Response Services
- ▶ Pre and Post Construction Review Services
- ▶ Structural Shoring and Re-Shoring Design Services
- ▶ Structural Decommissioning Design Services
- ▶ Parking Structure & Balcony Evaluation Services
- ▶ Roofing Design and Evaluation Services
- ▶ Preliminary and Detailed Condition Evaluation Services
- ▶ Structural Pre-Design Services
- ▶ Structural Design Services
- ▶ Contract Specifications and Plan Preparation Services
- ▶ Construction Review Services
- ▶ On Site Review and Monitoring Services
- ▶ General Structural Design Services

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CSE CORPORATE SERVICES

1.0 SUMMARY OF CSE SERVICES

- 1.1 CSE is a specialized firm dedicated to the structural forensic and structural rehabilitation of existing steel, reinforced concrete (normal and post-tensioned), wood and masonry structures.
- 1.2 CSE expertise extends into all aspects related to structural forensics and rehabilitation to include; forensic construction failures, forensic service failures, forensic maintenance failures, emergency structural reviews, pre-construction reviews, MTO visual surveys, MTO detailed condition surveys, pre-designs, detailed structural designs, contract preparation, construction review services, health and safety reviews, emergency 1st response failure services, emergency shoring, shoring, re-shore, scaffolding design, re-shore and structural demolition design.
- 1.3 Typical facilities include; building structures, parking structures, building balconies, flat roof structures, subway tunnel structures, running structures, vent shafts, above & below facilities, retaining walls, bridges, historical buildings, arenas, structural paving and post-tensioned & pre-stressed concrete structures.
- 1.4 A brief listing of our services from the inception of a typical structural rehabilitation project to its completion can be summarized as follows. A summary of these services is also attached (see Appendix):
- .1 Health & Safety/Emergency Services
 - 24hr-7days a week on call service.
 - Health & Safety/Emergency structural visual evaluation.
 - Health & Safety/Emergency shoring design.
 - Health & Safety/Emergency material deterioration/evaluation.
 - .2 Pre and Post Construction Reviews
 - Visual or detailed residential existing condition surveys.
 - Visual or detailed commercial existing condition surveys.
 - .3 Material Evaluation and Testing Services (Offered through Partnering)
 - CSA certified laboratory material testing services to include;
 - Air Void Testing.
 - Carbonation Testing.
 - Soluble Chloride Ion Testing.
 - Compressive Strength Testing.
 - Non-destructive on-site testing to include;
 - GPR (Ground Penetration Radar).
 - Impact Echo.
 - Yield strength testing of existing reinforcing steel.
 - Concrete Embedded Cable/Conduit Location Services.
 - Metallic metal (Normal Reinforcing Steel) locations.
 - Non-Metallic Metal (Copper, Aluminum) pipe locates.
 - .4 Forensic Structural Review Services
 - Visual and detailed investigations on the cause of structural rehabilitation failures.
 - Forensic Construction Failures.

- Forensic Service Failures.
 - Forensic Maintenance Failures.
- .5 Preliminary/Visual Condition Survey
- Visual surveys in accordance to M.T.O. Inspection Manual.
 - Preliminary structural evaluations.
- .6 Detailed Condition Survey
- Detailed Condition Surveys in accordance to M.T.O.'s Structural Rehabilitation Manual, to include;
 - Visual Surveys.
 - Delamination Surveys.
 - Covermeter Surveys.
 - Corrosion Activity Surveys.
 - Concrete Testing & Laboratory Work.
- .7 Pre-Design Services
- Structural Evaluations.
 - Repair alternative formulation.
 - Construction sequencing and logistics evaluation.
 - Constructability Review.
 - Construction Scheduling.
 - Repair cost estimations.
 - Life Cycle Cost analysis.
 - Repair recommendations.
- .8 Detailed Design Services
- Structural Replacement Design Services.
 - Structural Rehabilitation Design Services.
 - Tender support/evaluation services.
- .9 Construction Review Services
- General Contract Administration Services
 - Contract initiations services.
 - Regular site review services.
 - Shop drawings Review services.
 - Monthly progress billing reviews.
 - Contract Changes evaluation/initiation.
 - Change Directive evaluation/initiation.
 - Progress reports.
 - Construction testing services.
 - Contract schedule preparation and tracking.
 - Contract arbitration and dispute services.
 - Contract Deficiency Reports.
 - Contract Commissioning Services.
 - Contract Close-Out services.

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