DALE CRAIG RESPONSES

ROUNDTABLE 3 - ROLE OF PROFESSIONALS and OTHER BUILDING CONSULTANTS

WEDNESDAY NOVEMBER 20, 2013 – THURSDAY NOVEMBER 21, 2013

Moderator: Bruce Carr-Harris

CONFIRMED PARTICIPANTS:

- Professional Engineers of Ontario (PEO) CONFIRMED NAME TO FOLLOW
- Paul Acchione , President, Ontario Society of Professional Engineers
- J. William (Bill) Birdsell, President, Ontario Association of Architects
- Gregory (Greg) Miller, C.E.T., CBCO, Vice President on OACETT (Ontario Association of Certified Engineering Technicians and Technologists) Council and is Manager, Building and By-Law services and Chief Building Official for the Town of the Blue Mountains
- Dale Craig, Chairman of J.L. Richards and Associates Ltd.
- Prof. Jag Humar, Carleton University

1) Should the term "prime consultant" be defined and the roles and responsibilities clearly enunciated?

Although definition of the term may be a good idea, it is common to have a situation where the Owner's representative fills the role of project coordinator and design manager. Blurring of the traditional roles and responsibilities between Owners, Designers and Builders is more prevalent as alternative forms of project delivery (AFD) become more common.

2) Should Consultants, including engineers, architects and building inspection companies, be required to clarify the scope of their expertise to their clients and to clearly establish which elements of the building they are qualified to provide an opinion on and which elements of the building they will not be inspecting or addressing due to lack of sufficient expertise?

In situations such as a building condition report where reliance by an Owner or other third parties on the findings of the report is certain, it is always wise for professionals to define their scope of services, including which aspects of the facility are not being addressed, either due to scope or fee limitations or due to insufficient expertise. It is also essential to adopt a clear and comprehensive methodology or standard for inspection and analysis of the various systems and to enunciate those in their report. It is implicit in professional practice that practitioners not undertake work for which they are not fully qualified.

3) Should the PEO, the OAA and the OACETT provide guidelines with clearer standards for the inspection of an existing building, including best practices to

- establish clear terminology to ensure that clients and regulators understand the scope of work, defining the scope of work expected in various types of inspections (for example, opening up concealed areas to examine connections or measuring corrosion) and ensuring that the engineer has sufficient resources, and a sufficient retainer, to be able to complete the required work;

- clarify which documents should be reviewed prior to the inspection;

- clarify which questions must be asked of the on-site owner representative, including a request for production of previous structural engineering reports;

- identify the critical areas and determining the appropriate number of samples on which to draw credible conclusions;

- document the inspected areas, including photographs, measurements, samples and notes.

- clarify and define terms such as 'visual' inspection', 'condition assessment', 'detailed condition assessment', 'structural assessment report', 'structural elements' etc.

- prohibit the use of statements in reports such as "*All beams inspected had little loss of section and we would consider the members still structurally sound*" where the location of those beams or structural elements on which that opinion was based has not been identified within the report;

- establish a baseline of what is deemed to be an appropriate representative sample of the structural system and its components, including joints and connections, and structural steel to be inspected before the professional inspecting the building can confidently confirm that a building is 'structurally sound.'

- set out the minimum standards for inspection by the professional inspecting the building to determine whether there has been 'section loss' of structural elements. In particular whether actual measurement is required where corrosion has been identified or that a 'visual assessment' of the degree of corrosion is sufficient?

- define what the professional inspecting the building must include in their reports in relation to which elements of the building have and have not been inspected. Should the Guidelines require that a review of structural steel must include an inspection of and report on the condition of the connections, failing which the structural review is not complete?

- specify when the professional conducting the inspection should include a warning in their report to the client of the potential risks of failing to follow the recommendations in the report where significant or potentially unsafe deficiencies in the building have been identified and recommendations have been made for the repairs;

- set out when it is appropriate to make changes to a draft report based on client feedback;

- set out when copies of the reports for the buildings which have been inspected in the past should be retained;

- establish an obligation to create and maintain a searchable database within their respective offices (locally and nationally) which would allow the professional conducting the inspection to search to see if their respective companies have inspected a particular building in the past (for any reason) and to review the previous files and reports prior to taking on a new retainer, or conducting a further inspection of the building; and

- clarify the procedure to be followed when signing a report prepared by a graduate professional in training, a C.E.T. or an unlicensed engineer.

This is a detailed and comprehensive question with many points to consider but, in general, I would agree that establishment of a sound and comprehensive guideline for the conduct of "Building Condition Assessments" or "Building Audits" addressing the points noted above would be a good idea if adopted by the PEO and the OAA. There are several existing guidelines which are commonly referred to by engineering firms which practice in this field and which could form the basis of a "Best Practice" guideline, the most common of which is ASTM E2018 "Standard Guide for Property Condition Assessment". Another good guideline we have identified in our research is the NRC publication "Protocols for Building Condition Assessment" published by the Institute for Research in Construction (IRC). Companies such as Standard & Poors also publish comprehensive guidelines for Property Condition Assessment Criteria which contains useful criteria for such work which could contribute to a "Best Practices" guideline.

In the case of the Algo Centre Mall, the primary concern was one of structural failure leading to a loss of life. Since that tragic incident, the PEO has published a Professional Practice Bulletin on Structural Engineering Assessments of Existing Buildings. This is a good first step but the level of detail in the bulletin should be expanded and incorporated into a comprehensive Building Condition Assessment Guideline as noted above.

4) Should there be a requirement on engineers and architects to advise clients (past and present?) of the suspension or revocation of their license?

This will be a matter for some debate but, in view of the seriousness of license revocation, it may be a prudent move. Some thought needs to be given to the method of enforcement of such an edict as compliance will rest with the individual practitioners without effective oversight. Some thought might also be warranted with respect to a public awareness campaign from the PEO and mandatory posting of license revocations on the PEO website in an easily accessible location and with appropriate details regarding the reasons for revocation.

5) Although architects and engineers currently have a duty to report a building which poses a threat to the safety and security of the public, should a guideline be issued by the PEO, OAA and/or the OACETT which provides:
    a. a standard of when the professional is to report the unsafe conditions (i.e. degree of risk);
    b. that public safety should be the primary consideration;
    c. to whom the professional is to report the unsafe condition (i.e. professional organization, CBO of the municipality in which the unsafe building is located, owner, etc.); and
    d. whether the professional (architect, engineer, C.E.T.) reporting the unsafe building should be afforded immunity from liability where the building has been reported in good faith.

This information should be included in the comprehensive guideline referred to in question 3. above.

5A) The Algo Centre Mall included an open air parking lot over occupied space. Are you aware of other commercial buildings in Canada of similar design and construction? Are there problems with this kind of structure which need to be addressed by consultants?

I am aware of several similar buildings through a brief literature search but am sure that many such instances exist in the major cities of Canada where land prices create an economic incentive to utilize such space to the greatest extent possible. The instances I am aware of are the Eaton Centre in Toronto, the Station Square mall in Burnaby (which was the site of a 1988 collapse), the Rainbow Centre Mall in Sudbury and the Cataraqui Mall in Kingston. There are also numerous instances of open air, pedestrian accessed plaza decks over occupied areas throughout the country although for some reason owners and designers have traditionally paid more attention to the proper detailing and waterproofing of such features.

It would be very useful to compile a database of all buildings (such as shopping malls, hotels, public buildings, condominiums/apartments, convention centres and educational facilities) which have incorporated parking areas above occupied spaces to inform ourselves of the potential magnitude of the problem and allow development of an appropriate screening tool. The database could then be used to screen higher risk facilities such as those which have not incorporated a waterproof membrane or have experienced

historical evidence of water penetration or those which are more susceptible to corrosion (eg: comprised of precast hollow core slabs over a structural steel frame).

One source of such information would be restoration and waterproofing companies which are often called in by Owners looking for a solution to an ongoing leakage problem but who may not be aware of the impact such leakage could have on the structural capacity of their building.

6) Should the concept of a "provincial engineer" be adopted in Ontario?

Before adding another layer of bureaucracy to an already burdened system, I would suggest an open and wide ranging discussion on the proposed duties and powers of a Provincial Engineer and a clear demonstration of how the creation of such a position would benefit public safety and not simply create paperwork and delays in the design, approval or construction continuum.

7) In the past, engineers had specialties that were identified on their seals. Should the PEO, in the case of structural engineering at least, revert to that approach, including specific training and mandatory continuing professional education components for engineers practicing and holding themselves out to the public as "structural engineers"?

The identification of areas of specialty on an engineer's seal is a sound idea but it should not be limited to only structural engineering but rather the entire range of engineering disciplines if adopted. See the comment in 8. below regarding continuing education provisions.

8) Should Professional Engineers Ontario adopt a system of mandatory continuing education similar to other professions in the province and like other professional engineering licensing bodies in several other provinces?

Yes, that would be a good idea. The PEO has discussed and debated this topic for many years without resolution while other professions in Ontario and across the country have adopted just such a system. It is time to implement a mandatory but flexible and reasonable CE system for professional engineers in Ontario.

9) Should PEO adopt guidelines for structural engineering practice and independent documented structural engineering review similar to those now published by APEGBC and which resulted from the inquiry into the Station Square collapse in Burnaby, B.C. in 1988?

Yes, learning from the BC experience would be a wise course of action. APEGBC should be consulted to ascertain how they feel their system is working and if there are any

improvements they would suggest in hindsight before simply adopting their guidelines verbatim.

10) What is the general state of knowledge in the engineering profession of corrosion, and particularly what conditions affect the rate of corrosion of structural steel and what is the impact of corrosion on the anticipated life of a building's structural integrity? Is there continuing education in this area and, if not, should there be?

Corrosion engineering is a specialty branch of engineering and there are a limited number of qualified practitioners. When confronted with a situation in which corrosion of structural elements is a probability or actually evident, a reasonable practitioner would consult a corrosion specialist for guidance in assessing the seriousness of the corrosion encountered and not simply dismiss it as inconsequential without technical backup for this opinion.

11) Considering the information you have gleaned from the proceedings of the Elliot Lake Commission of Inquiry, can you provide your top five recommendations as to what should be done to ensure that a similar tragedy does not occur again in Ontario or Canada? If possible, identify the sort of buildings or occupancies which should be the highest priority?

My five top recommendations would be:

1. Insist upon mandatory municipal and provincial property standards regulations to ensure they address ongoing building envelope and structural problems which might threaten the health or safety of occupants. Enunciate the means of redress Owners must follow and penalties for non-compliance. Strengthen and standardize existing bylaws where appropriate.

2. Make it mandatory for Owners to provide reports which identify structural concerns to municipal bylaw enforcement authorities along with a plan for rectifying the identified problems and a time frame for doing so. Along with this, make it a professional obligation for engineers or architects conducting building condition assessments or structural engineering adequacy reports to provide a copy of the report to municipal officials if a serious condition is noted and they have reason to believe that an Owner will not undertake the remedial action recommended, recognizing that this puts the professional in a very uncomfortable position with his client. Alternatively, mandatory submission of all such reports could be considered if this was deemed a suitable way of removing the discretionary or uncomfortable position the professional is faced with.

3. Task the PEO and OAA to develop a comprehensive guideline for the conduct of building condition assessments as discussed above. There are

several existing standards and protocols available for reference and incorporation which should expedite this work.

4. Make it mandatory for Owners of buildings which are intended for public assembly (malls, sporting venues, convention centres, educational buildings, hospitals, public institutions, etc.) or high occupancy (hotels, high rise apartments and condominiums, etc.) to have a building condition assessment done to the standard noted in 3. above and the report filed with municipal authorities every five years to ensure that buildings are not allowed to deteriorate to an unsafe condition through the lack of adequate repair and maintenance. Well maintained buildings and conscientious Owners should be allowed to extend the reporting period based on evidence of a high quality maintenance program and confirmation in the initial assessment report that the building was designed to the standards required at the time of construction. Since such a program would likely tax the resources of the design profession and be very costly to the building owners and managers group if instituted broadly at one time, a phased approach starting with the deemed higher risk type of facilities or construction types might alleviate some of the impact.

5. Institute a program of mandatory continuing education for the engineering profession in Ontario modeled after best practices in other provinces and professions in Canada along with a system of independent peer review of structural engineering designs for certain classes of building as was done in British Columbia following the Station Square collapse inquiry.

The highest priority should be placed on a careful assessment of existing buildings which were designed and constructed prior to 1990 and which have service conditions that could lead to premature deterioration or collapse. Shopping malls or other buildings with parking areas over occupied space would be high on the priority list due to the likely presence of chlorides in any leakage water penetrating the structure. A panel of knowledgeable structural engineers and architects could quickly come up with other examples of facilities or construction types with higher than normal risk of premature deterioration.