



Scheduled Facility Structural Inspections Are Key Asset and Safety Management Tools

VERSION 2.0

ISSUE DATE: SEPTEMBER 2018

orfa.com



Building Community Since 1947

ONTARIO RECREATION FACILITIES ASSOCIATION INC.

1 Concorde Gate, Suite 102, Toronto, Ontario M3C 3N6, Canada

Tel: 416-426-7062 Fax: 416.426.7385

info@orfa.com www.orfa.com

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Introduction

On February 28th, 1959 the collapse of the Listowel Arena, in Ontario, Canada resulted in the death of seven lives and changed the recreation facility landscape forever. Aging recreation infrastructure is once again challenging the industry, requiring today's facility managers to continue to be diligent in conducting ongoing building maintenance and detailed structural inspections. These operational obligations are referred to as "asset management".



Looking Back to Move Forward

The Listowel collapse had government leadership take progressive action. The outcome created the first attempt at municipal, public and provincial (3-P) partnerships, as the province created funding opportunities to build recreation facilities that allowed all stakeholders to participate. In addition, the Ministry of Labour (MOL) was tasked to oversee a regular inspection program that forced recreation facility owners to undertake detailed structural inspections and report back to the Ministry; no less than every 5-years. This regulatory concept was flawed as the Ministry oversaw inspections of newly



constructed facilities for their first 25-years of their life-cycle and then abruptly abandoned the program at an important junction of the buildings age. The shift by the Ministry transferred responsibility as overseers back to building owners under the Occupational Health and Safety Act (OHSA). The Ministry continues to engage reporting requirements on a case by case basis, which has elevated since the Elliot Lake, Shopping Mall collapse. During the Mall collapse inquiry, it was

revealed that the MOL actually had offices in the Mall, and that leaking had occurred since the building was first constructed with no persons of authority taking any real action toward the obvious decay and ultimate failure of the facility.



"Though it was rust that defeated the structure of the Algo Mall in Elliot Lake, the real story behind the collapse is one of human, not material, failure."
(Paul R. Bélanger)

[Read more on the Listowel Arena tragedy.](#)

[See full Mall inquiry report.](#)

Regulatory Compliance Requirements

The MOL previously released reminders to owners of obligations, but stopped this formal process through a Bulletin dated April 4th, 1997.

When the Ministry of Labour stopped requiring ice arena owners to submit structural inspections from a qualified engineer, it did not reduce the obligation to ensure these and other public buildings were safe for both users and the public. The change merely placed more legal and moral responsibility on the owners to conduct their operations accordingly. The Ministry will continue to respond to building safety complaints and investigate as required, but monitoring and compliance is left with the building owner under:

The Occupational Health and Safety Act (OHSA) RSO 1990 c.).1 which includes arenas in the definition of "industrial establishments" therefore regulates the structural condition of any arena under the jurisdiction of the Ministry of Labour (MOL). "It is the responsibility of the employer to ensure that a roof "is capable of supporting all loads to which it may be subjected without causing the materials therein to be stressed beyond the allowable unit stresses established under the Building Code Act" [s. 25(1)(e)]. The OHSA, section 9 (23) further requires

that “all physical conditions of each building be inspected for safety at least once a month”.

The Elliot Lake Mall collapse resulted in a detailed inquiry. The lessons learned from this tragedy are expected to be adopted by all public building owners. Any subsequent building failures that result in loss of life who have not embraced the learned lessons can expect a higher level of accountability to be applied. Such an incident that discovers that the owner failed to conduct regular detailed/adequate structural inspections that contributed to the failure may have Bill C-45 applied which are considered criminal charges.



Recreational Structural Risk Factors

Since the Listowel Arena collapse much has been learned on how to design these types of facilities. National Building Codes have been strengthened, and construction materials greatly improved upon. Most recreation facilities will have a long life-cycle. However, there are some common destructive elements that can drastically reduce the structural integrity of recreation buildings. Moisture and humidity, if left unchecked, will dramatically impact the health and safety of all who use these facilities. Controlling moisture and humidity levels is paramount to obtaining a long building life-cycle.

Refer to: [ORFA Understanding Humidity in Ice Rinks](#)

Protecting and maintaining the building outer skin from moisture penetration or damage from the weather must be a regularly scheduled maintenance activity. Roofs, siding, drains, eavestrough, siding, windows and doors must be kept to the original level of function. Most of these building pieces will have less of a life-cycle calculation than the actual structure. It is important to plan for upgrades of these pieces throughout the buildings life-cycle.

Snow load is the most common contributor to failed recreation infrastructure. New buildings in the early stages of life-cycle should not be impacted by this issue if designed and engineered correctly. However, the same level of inspection diligence to new buildings should be applied. Aging buildings that have been impacted by moisture, humidity, lack of maintenance and capital investment raises the risk of collapse. Building managers in charge of older facilities must be more proactive in confirming ongoing structural integrity.

Refer to: [ORFA Snow Loading and Roof Failures Alert](#)



Avoiding The Future

Human nature often causes a sense of false security as the belief that tragedy could not possibly happen in our community. Others rely on the expectation of government intervention to occur prior to any such event happening. Both are poor management philosophies that require reassessment. Some will argue that the MOL’s decision to stop directly overseeing ice arena infrastructure condition is short-sighted. In fairness, at the time of implementation by the Ministry, ice arenas were often the only community recreation facility. In a very short time span, recreation infrastructure ballooned well beyond ice arenas. The real issue might be the lack of planning by building owners to create a system that would maintain new construction. Municipal government is designed to over turn community leaders on a regular basis. New leadership is not always keen on investing on past political decisions as their mandate is community growth and prosperity. While private operations are bottom line driven with an expectation of return on investment. Both systems present similar but different managerial challenges. The other contributing factor to failing recreation infrastructure

is the users demand for reasonable fees. The lack of contribution often places pressure on the tax payer to subsidize. Finding a balance is a facility managers responsibility.

Refer to: [ORFA Resource Ready, Shoot, Aim – Recreation Facility Revenue Generation](#)

Refer to: [ORFA Resource Analyzing and Calculating User Fees](#)



Facility Inspections

Although there has been significant concentration placed on the potential role of a certified structural engineer, the real focus must be the vital part that facility staff play in ensuring building safety. As frontline staff go about their daily duties, they should be trained to observe, correct and report building conditions. Significant cracking, shifting or water penetration must be immediately reported as these are often prime indicators as to what may be ahead. Facility management must commit to maintaining equipment to its original state. HVAC-R that is not working correctly will significantly contribute to building failure. Regularly engaging building specialists in areas such as roofing, windows, doors and siding to provide condition reports to support budget requests is good management.

Many larger communities have engineers on staff who will be responsible to inspect infrastructure. While other operations will have professional relationships with such firms. Facility management must understand where their buildings are in the inspection process and raise the issue of extended periods between inspections with senior staff.

Industry Best Practices Inspection Schedule

- Annual building inspection by competent person
- Facilities that show no sign of rot, decay, water, damage, stress or strain should be

inspected by a qualified engineer every 5-years

- Buildings that exceed 25+years of age should also consider the benefits of a more comprehensive detailed inspection
- Buildings that are built from materials other than concrete or steel or are not of a “pre-engineered steel frame design” may require more regular comprehensive detailed inspection

If no formal system is in place, facility management must then determine how confirmation of structural integrity that reflects industry best practice will be obtained.

Refer to: [Selecting a Professional Structural Engineer Guideline](#)

Facility Structural Inspection Guideline

Conducting structural inspections from ground level is considered appropriate for buildings less than 10-years of age which have not experienced any shifting, cracking or other such structural events; and who maintain internal humidity levels of less than 50% at all times.

The ORFA strongly recommends the following structural inspection activities:

1. That all recreation facilities receive a comprehensive structural inspection at least once every 5-years which includes a detailed aerial review by a recognized professional who is experienced in arena structural review with focus on these key areas:

That such inspections using the most appropriate lifting device include:

- a detailed roof beam,
- roof paneling,
- roof joints,
- expansion areas,
- connections, and
- insulation condition.

2. The final structural inspection report should include a recommendation of when the next structural inspection is to take place. Depending on the age of the building and the findings of the structural inspection, this

may be annually, every two years or every five years.

The facility insurance carrier may offer a variety of support risk inspection services that can be accessed to support facility managements recommendations for a more detailed facility structural inspection. The Joint Health and Safety Committee also plays a role in building safety and as such, should be consulted as required.

Recreation Facility Asset Management (RFAM)

The ORFA, in collaboration with the Ontario Good Roads Association (OGRA), and Marmak



Technologies, offer a customized user-friendly software application, based on OGRA's successful Municipal DataWorks asset repository program. This software application greatly assists recreation facility professionals in the collection and management of recreation facility assets data. The basic service is available at no cost to all ORFA members; with a fee for service when certain modules are activated.

RFAM includes modules that:

- Manage Open Spaces
- Manage Recreation Facilities
- Manage Warehouse Inventory
- Collect Asset Data
- Collect Condition and Life Expectancy
- Create Custom Routine Inspections
- Create Service Requests
- Create Work Orders
- Generate Output Reports
- Attach Images

Visit the ORFA web-site at <http://www.rfam.ca/> for more information.

Conclusion

The ORFA reminds members that one of their key responsibilities is that of "information broker". Our responsibility to the owner, and the people we serve, is to continually remind all involved of what is expected of our operation byway of legislative or industry best practice. We must further table reasonable plans on how these obligations can be achieved. These responsibilities and recommendations should not become lost – they must be tabled on a regular basis as a constant reminder of that obligation. Recreation facility structural adequacy is attainable.