Pacific Raceways | Kent, WA

BLEACHER SAFETY

Life Safety for Public Events

By Michael T. Daily, PE

Navigating through the practice of structural engineering can be an exasperating journey with a myriad of codes and standards to comply with and the continued evolution of new methodologies so complex you need to adopt a true "Indiana Jones" persona just to locate and validate applicable requirements. Layer upon layer of codes, which once written and published are already beginning the next code cycle, gearing up to either simplify a specific design method or weave more challenge into it.

So, are these codes relevant? Ask the students and parents at the St. Charles Preparatory School in Columbus, Ohio, where multiple injuries occurred during a high school football game after the bleacher collapsed. As reported by NBC4i reporter Ted Hart, several students tried to crowd against a handrail to get a picture taken when the bleacher "*just broke and everyone fell down.*" The injured were rushed off in ambulances and school officials refused to comment on the collapse. Another bleacher collapsed in Columbus a week later, increasing the feelings of doubt among parents, students and the community.

Was this tragedy the result of the lack of using a design standard to design the bleacher or lack of inspection and maintenance? The article further states, "*School districts handle bleacher inspections in different ways. In Columbus City Schools, the inspections are conducted by athletic directors and building and grounds department employees. South-Western City Schools and Westerville…hire professional engineers to conduct the inspections.*"

CODES AND STANDARDS

The International Code Council (ICC) publishes the International Building Code (IBC) which codifies design criteria for which the design of buildings and components can be established. This criteria provides a minimum live load to be used. It becomes the responsibility of the EOR (Engineer of Record) to conform or lay the ground work for a load greater than those published loads.

In addition to the IBC, the ICC publishes the ICC 300-2012, Standard for Bleachers, Folding and Telescopic Seating, and Grandstands and the National Fire Protection Association (NFPA) publishes the NFPA 102, Standard for Grandstands, Folding and Telescopic Seating, Tents, and Membrane Structures. The ICC Board of Directors in March of 2000 developed a standard "*to cover new and existing installations of all types of bleachers and bleacher-type seating, including fixed and folding bleachers.*" This was in response to the Consumer Product Safety Commission's (CPSC) Roundtable in December of 1999. As a result, the ICC has developed a set of standards to comply with when designing bleachers and grandstands, as well as a guide by which existing structures can be inspected.

INSPECTION AND MAINTENANCE

Once the bleacher/grandstand has been designed and constructed, the responsibility falls upon the owner, whether public or private sector, to continue routine inspection and maintenance. Section 105 of the ICC 300-2012 Standards addresses inspections. "*The owner shall cause all bleachers, folding and telescopic seating, and grandstands to be inspected at least once a year in order to verify that the structure is maintained in compliance with*

the provisions of this standard." This same provision includes inspection requirements regarding existing structures. They have adopted the once a year inspections to be performed by a "*qualified person for compliance with the provisions of this chapter.*"

The reality is that the materials used for bleachers, grandstands, and telescopic seating tends to crack, rust, contract, expand, dry out, and get physically abused. And the list goes on. The constant use of and force applied to the structure causes bolts to loosen over time, and wood members to deteriorate; ideal situations do not exist. The best intentions do not stop children from jumping, hanging, and roughhousing on these structures. Furthermore, there is also the potential for vandalism. This is why the standard states facilities "*…shall be inspected …by a qualified person for compliance.*"

Should an incident happen similar to what occurred in Columbus at one of our local schools, colleges, park facilities, race tracks or community centers, are their governing boards or owners prepared for the battle ahead and the possibility of injured victims, probing questions, or legal fees?

HOW LEWIS & VAN VLEET CAN HELP

A Professional Engineer is trained and continually educated to be alert to design standards and the potential hazards that could occur, so as to insure the quality of life that provides safety and comfort. As with any service, engineering does come with a price for their service, and can be an invaluable requisite for the life safety measures one takes to provide a sustainably livable environment.

Lewis and Van Vleet, Inc. (LVVI) has been providing services to both the private and public sector for 20 years. Our structural department has been inspecting bleachers and grandstands for a variety of school districts and private facilities for over 5 years, and has qualified staff registered in both Oregon and Washington highly capable to serve as a licensed **qualified person** to inspect for compliance to life safety standards. Throughout our years providing these inspections, we have discovered potentially hazardous conditions and made recommendations for repairs to hazards ranging from missing bolts and cracked bleachers to corroded metal, significantly compromising the structural integrity of the structure. Having developed a procedure based on the ICC 300-2012 Standard and the NFPA 102 Standard, we are able to provide high quality inspection and assessment, such as:

- -Inspection of all connections whether bolted or welded
- -Examination of excessive wear and tear of all members
- -Deterioration of supporting materials
- -Assessment of overall structural integrity

A report is prepared, based on gathered field data, to summarize what was observed and noted where deficiencies may need to be addressed. This report will enable the owner to assess a cost for the maintenance and labor to procure the required repairs. Once the repairs are complete, it can give all the benefit of a peace of mind, knowing that any future activities performed at the owner's facility will be in a safe, structurally-sound environment. No one wants a collapsed bleacher. ■

For more information on how LEWIS & VAN VLEET can help with any of your engineering needs, please contact Michael T. Daily, PE, Project Engineer, at (503) 885-8605 or miked@lvvi.com. Also visit www.inspectionbleacher.com for additional information.

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