

COMMONWEALTH OF MASSACHUSETTS

SUFFOLK, ss.

Building Code Appeals Board
Docket No. 08-552

_____)
Chuck Davis for Six Flags New England,)
Appellant)
)
v.)
)
Town of Agawam,)
Appellee)
_____)

BOARD'S RULING ON APPEAL

Procedural History

This matter came before the State Building Code Appeals Board ("Board") on Appellant's appeal filed pursuant to 780 CMR §122.1. In accordance with 780 CMR §122.3, Appellant asks the Board to review Appellee's decision which determines that the fire protection system designed for the referenced building is to be considered a *performance-based system* that is subject to review and approval by the Building Code Appeals Board prior to the issuance of a building permit and determines that the referenced building must comply with means of egress requirements as established by 780 CMR, Section 413 and applicable sections of Chapter 10.

By letter to William T. Birdsall, P.E. dated March 20, 2008 Agawam Building Commissioner Dominic Urbinati issued a notice of violation relative to the subject building. The notice identified the following issues as violations and/or matters requiring interpretation, guidance and/or clarification.

1. **780 CMR Section 903.2.1 Alternative Fire Protection Design Methodologies and associated reference standards -**
The municipal building official determined that the fire protection system designed to be installed in the reference building project shall be classified as a *performance-based* system rather than a prescriptive system. In so doing, 780 CMR establishes that performance-based fire protection systems (different from prescriptive systems) require review by members of the Building Code Appeals Board prior to the issuance of a building permit. The Appellant requested clarification as to whether the system should be considered a performance-based or prescriptive system.
2. **780 CMR 413.0 Special Amusement Buildings and associated sections -**
The municipal building official determined that the project shall also be classified as a special amusement building. In so doing, 780 CMR establishes, among other things, that particular consideration shall be given to means of egress paths in special amusement buildings. The Appellant requested clarification as to whether or not the integral means

of egress system that is part of the *Dark Knight Amusement* device that is housed within the building in fact satisfies means of egress requirements for patrons and other building occupants.

3. **780 CMR 1014.11 Interior Exit Stairs** and associated sections -

The municipal building official determined that, in consideration of Section 413 requirements, the building shall be equipped with an additional means of egress in the form of a stair leading from the building directly to grade to allow ride patrons and other occupants to exit the building in the event of an emergency. The Appellant again requested clarification of device versus building means of egress requirements, indicating that the ride's integral means of egress system is sufficient and suitable to evacuate ride patrons in the event of emergency and that the grade floor building means of egress system as designed satisfies egress requirements from the building. Therefore, the Appellant contends that no further means of egress paths are required from the building.

In accordance with G. L. c. 30A, §§10 and 11; G. L. c. 143, §100; 801 CMR §1.02 et. seq.; and 780 CMR §122.3.4, the Board convened a public hearing on April 3, 2008 where all interested parties were provided with an opportunity to testify and present evidence to the Board.

The following individuals were present at the hearing.

Michael Nuezil, representing Six Flags New England
Chuck Davis, representing Six Flags New England
David Daly, representing Six Flags New England
Richard Maloney, representing Six Flags New England
Lee DeVito, representing Six Flags New England
Carl Koslowski, representing Six Flags New England

Louise Vera, representing DPS providing technical assistance to Dom Urbinati, Agawam Building Commissioner (who was not in attendance)

There were no representatives present from the Town of Agawam building or fire department. However, Agawam Fire Chief Stephen M. Martin submitted a letter dated March 31, 2008 which is made part of this decision as Attachment A.

Decisions

Board members made the following determinations:

In regards to **Section 903.2.1**

Board members indicated that credible evidence was presented to establish that the fire protection system should be considered a system that prescriptively complies with requirements of 780 and associated reference standards. Board members further indicated that the system design, as presented, appeared to satisfy the code and should therefore be considered adequate for use. However, Board members indicated that further refinements to the system may be necessary as construction progresses and should be allowed at the discretion of the municipal

building and fire official, if and as necessary. In making this determination, Board members weighed evidence provided by both Appellant and Appellee.

As background (as presented by the Appellant), the referenced building is designed to enclose a new device which essentially is a variant of the old *Wild Mouse* roller-coaster device. The device (and building) is known as the *Dark Knight*. The device is modeled after the new *Batman* movie of the same name and is intended to open in or around the time of the movie's release this spring.

There appeared to be little if any debate between the parties as to whether or not the building designed to enclose the *Dark Knight* amusement device should be classified as a Special Amusement Building as defined by 780 CMR (The State Building Code), Section 413. A special amusement building, as defined by this section "*is any temporary, permanent or mobile building or portion thereof which is occupied for amusement, entertainment or educational purposes and which contains a device or system which conveys passengers or provides a walkway along, around or over a course in any direction so arranged that the means of egress path is not readily apparent due to visual or audio distractions or is intentionally confounded or is not readily available due to the nature of the attraction or mode of conveyance through the building or structure*".

A special amusement building, as the title may suggest, may require building safety features that are somewhat atypical as compared to other more usual building types. The fire protection system for this type of special use, the Appellee contends, is a system that is not specifically addressed in the pages of 780 CMR or its direct reference standards as should therefore be considered a performance-based as opposed to a prescriptive based system. In fact, the Appellee contends that the system was first described as a performance-based system by design engineers during preliminary meetings for the project and the Appellee agreed. Once defined as performance-based system, the code requires a review of the system design by members of the State Building Code Appeals Board. Evidence presented in support of this position included (but is not limited to):

- **Building height** - The structure varies in height, the highest point reaching approximately 65' above mean grade. The Appellee contends that typical fire sprinkler heads are not designed to be installed at such elevations and therefore may not be effective.
- **Reaction temperature** - The Appellee indicated that the sprinkler heads appear to be designed to react at temperatures of 212 degrees Fahrenheit or greater; which may prove problematic in fire conditions.
- **Fire detection and alarm** - The Appellee contends that the four (4) stage alarm system, which does not alert the municipal fire department until stage 3, is a system that appears to be outside the allowed scope of 780 and/or NFPA 72.
- **National Fire Academy** - The Appellee contends that conversations with representatives of the National Fire Academy (NFA) confirmed that it would be difficult to design and install a prescriptive fire protection system in this type of building due to its unique nature; most often, the NFA representative indicated, such designs are considered to be performance-based systems.

The Appellee was not necessarily arguing that the fire protection system as designed is

inadequate for its application, although at times implication was made to that effect. Rather, the Appellee indicated that, due to the initial determination made by the Appellant's own engineer and a review of subsequent designs for the system, it appeared that the Appellant could not successfully establish that the system prescriptively complied with provisions of the code and therefore the Appellee was compelled to categorize the system as performance-based.

The Appellant countered this position arguing that in fact the system does prescriptively comply with provisions of 780 CMR and does not require a review by Board members or the approval of any variances. Evidence offered include (but is not limited to):

- **Building height** - The Appellant argued that neither 780 CMR nor National Fire Protection Association (NFPA) Standard 13 (which establishes design and installation standards for fire sprinkler suppression systems) establishes height limits for this type of sprinkler design. Rather, the Appellant argues, the standard indicates that height must be considered in the system and appropriate consideration must be made in the system design.
- **Reaction temperature** - The Appellee indicated that, as outlined above, neither 780 CMR nor the reference standard places limitations in this regard. It is the responsibility of the registered design professional to appropriately design the system to accommodate expected fire conditions, which, in the Appellant's estimation has been achieved.
- **Fire detection and alarm** - The Appellant contends that the four (4) stage alarm system, is in fact appropriate for the expected conditions in the building and prescriptively complies with 780 CMR and NFPA 72, the appropriate reference standard.
- **Third Party Review** - The Appellant concluded that the fire protection system design has been reviewed by a qualified third party fire protection engineer who agrees that the system prescriptively complies with 780 CMR and reference standards and should be categorized as such. Additionally, the Appellant indicated that it is the responsibility of the registered design professional to ensure that the system is appropriately design and will function correctly in all expected conditions that may occur in the building, to which the Appellant attests that it will.

In regards to Sections 413 and 1014.11

Board members indicated that credible evidence was presented to establish that the building should be provided a second means of egress in the form of an exit stair to afford patrons and other building occupants with an adequate means to evacuate the building in the event of an emergency. Board members were clear to distinguish between the integral means of egress system that is made part of the amusement device upon manufacture and the means of egress from the building. The device is fitted with integral stairs, platforms and/or walkways that do not meet and are not required to meet dimensional requirements of 780 CMR (the state building code) and therefore do not require change or modification. Amusement device means of egress patterns need only comply with 520 CMR (amusement device regulations) and associated reference standards. However, Board members ruled that an additional stair needs to be designed and installed to satisfy means of egress requirements as established by 780 CMR. Accordingly, this stair must be designed to conform to stair geometry, handrails, guardrails and means of egress lighting and signage as required by 780 CMR.

Board members did not prescribe the method by which the Appellant should comply with this order. Rather, Board members indicated that the Appellant may present code conforming design schemes to the municipal building official for approval. Although Board members did not specify, it was suggested that either an interior, fireresistive rated enclosed stair or an exterior, unenclosed, unrated stair may be offered for consideration by the municipal official.

As indicated earlier in this decision, there was little debate as to whether or not the building should be considered a Special Amusement Building. However, opinions differed as to what, if any, sections of 780 CMR are applicable to the building's design in addition to Section 413.

The Appellee expressed that Section 413 clearly establishes that other code sections must be taken into consideration in the building's design. Evidence offered in this regard included (but is not limited to):

- **Construction type, building height and area** - The Appellee contends that, special amusement buildings and all uses defined by 780 CMR, Chapter 4 are required to comply with all special code requirements defined by the chapter as well as all other applicable code requirements. As an example, the building construction type is established to be Type 2A. Construction types are prescribed by Chapter 6 and code users are expected to comply with requirements as established by the code for this type of construction in the design of the building. Such requirements are considered to be in excess of what is required by 780 CMR, Section 413.

- **Means of egress** - As with construction type, the Appellee argued, so too does the design need to conform to means of egress requirements from the building as established by 780 CMR, Chapter 10. In making this argument, the Appellee agrees that the *Dark Knight* amusement device is constructed with a series of catwalks and stairways that are intended to exit building patrons and others from the device in the event of emergency, but the Appellee further contends that building occupants must be provided additional means of egress from the building as established by Chapter 10, particularly from higher elevation points within the building. The Appellee agrees that the device does not need to be modified to achieve appropriate means of egress, but contends that, once placed inside a building, the device means of egress patterns are insufficient to evacuate building patron and occupants due to the fact that they will likely encounter smoke conditions and other limitations as they attempt to exit the building. The device means of egress may work fine in exterior conditions, by the dynamic changes when the device is placed inside a structure.

- **National Fire Academy** - The Appellee again indicated NFA representatives agreed with this position.

The Appellant expressed directly opposing views indicating that consideration must be given to the integral means of egress patterns that come with the device versus means of egress that may be needed from the building. Evidence offered included (but is not limited to):

- **Amusement device means of egress** - The Appellant indicated that 520 CMR expressly governs the design, installation and inspection of amusement devices and that this regulation prescribes the method by which means of egress shall be achieved from the device.

The Appellant agreed that the 780 CMR would define means of egress requirements once patrons and others safely disembark from the ride at ground level, but that 780 CMR does not require the installation of additional egress from higher points in the building. To do so would be, in the Appellant's estimation, a violation of the amusement regulations.

- **Evacuation plan** - The Appellant indicated that, as part of their typical safety procedures, an evacuation plan has been devised for the ride. If a fire or other event were to occur in the building, for instance, the device is program to return to the its point of origin or one of several areas where patrons may disembark and exit through a series of device catwalks and stairs that will bring them to the ground floor and out of the building through appropriately designed building exits. The Appellant indicated that the evacuation plan includes assistance from park employees to help escort patrons from the device and building. The Appellant also argued that similar, if not identical buildings have been constructed in other parts of the country employing such device evacuation plans.

Motions

The Chair entertained two separate motions relating to the Appellee's *request for interpretation*. Following testimony, and based upon relevant information provided, Board members voted to each Motion, as described on the record and presented below.

Motion Number 1.

Relative to 780 CMR Section 903.2.1 Alternative Fire Protection Design Methodologies and associated reference standards -

.....Granted Denied Rendered Interpretation
.....Granted with conditions Dismissed

Board members indicated that credible evidence was presented by the Appellant which was supported by the third party reviewing engineer to establish that the fire protection system should be considered a system that prescriptively complies with requirements of 780 and associated reference standards. Board members further indicated that the system design, as presented, appeared to satisfy the code and should therefore be considered adequate for use. However, Board members indicated that further refinements to the system may be necessary during construction and should be allowed at the discretion of the municipal building and fire official, if necessary.

The vote was:

.....Unanimous Majority

Motion Number 2. Relative to Sections 413 and 1014.11

.....Granted Denied Rendered Interpretation
.....Granted with conditions Dismissed

Board members indicated that credible evidence was presented to establish that the building should be provided a second means of egress in the form of an exit stair to afford patrons and other building occupants with an adequate means to evacuate the building in the event of an emergency with access to the stair at disembarking levels that were identified to exist at approximately 30' and 50' above the building's ground level. Board members were clear to distinguish between the integral means of egress system that is made part of the amusement device upon manufacture and the means of egress from the building. The device is fitted with integral stairs, platforms and/or walkways that do not meet and are not required to meet dimensional requirements of 780 CMR (the state building code) and therefore do not require change or modification. Amusement device means of egress patterns need only comply with 520 CMR (amusement device regulations) and associated reference standards. However, Board members ruled that an additional stair needs to be designed and installed to satisfy means of egress requirements as established by 780 CMR. Accordingly, this stair must be designed to conform to stair geometry, handrails, guardrails and means of egress lighting and signage as required by 780 CMR.

Board members did not prescribe the method by which the Appellant should comply with this order. Rather, Board members indicated that the Appellant may present code conforming design schemes to the municipal building official for approval. Although Board members did not specify, it was suggested that either an interior, fireresistive rated enclosed stair or an exterior, unenclosed, unrated stair may be offered for consideration by the municipal official.

Board members indicated that, although the park requires an evacuation plan from this and all devices at the park, they were concerned that patrons may be trapped at high elevations without means of escaping the building during an emergency event. Board members were further concerned that evacuation procedures may in fact exacerbate the problem since means of egress patterns from the device measured only about 24" in width which would make it difficult for patrons and others to successfully traverse and exit the device and building in a timely manner; particularly in smoky, fire conditions.

The vote was:

.....Unanimous

..... Majority

Harry Smith, Chairman

Stanley Shuman

Jake Nunnemacher

Any person aggrieved by a decision of the State Building Code Appeals Board may appeal to a court of competent jurisdiction in accordance with Chapter 30A, Section 14 of the Massachusetts General Laws.

A complete administrative record is on file at the office of the Board of Building Regulations and Standards.

A true copy attest, dated: April 8, 2008

Patricia Barry, Clerk ¹

All hearings are audio recorded. The digital recording (which is on file at the office of the Board of Building Regulations and Standards) serves as the official record of the hearing. Copies of the recording are available from the Board for a fee of \$10.00 per copy. Please make requests for copies in writing and attach a check made payable to the Commonwealth of Massachusetts for the appropriate fee. Requests may be addressed to:

Patricia Barry, Coordinator
State Building Code Appeals Board
BBRS/Department of Public Safety
One Ashburton Place - Room 1301
Boston, MA 02108

FOOTNOTE:

1. Following the hearing and after this decision was drafted, pursuant to 801 CMR 1.01 (6) (g) and 801 CMR 1.02(7) Six Flags New England requested to withdraw the appeal (see attached letter from Attorney David J. Daly dated April 9, 2008). A DPS legal review determined that the Appellant was within his rights to make such a request, and the request was granted. However, in that the hearing had already convened and a written decision was constructed, the draft decision will remain in the case file, unsigned, but part of the public record pertaining to the matter.