



BBS MEMO



Ohio Board of Building Standards

May 22, 2024

6606 Tussing Road, P.O. Box 4009, Reynoldsburg, Ohio 43068-9009

Temporary Tents, Membrane Structures and Special Event Structures

Whether a building or structure is temporary or permanent, compliance with the building code, including approvals and inspections, is a requirement unless specifically exempt from compliance or exempt from approval. Temporary is determined by the proposed duration of time during which the building or structure will remain in place for occupancy. The intended use, physical characteristics, and time frame determine which provisions are applicable to a proposed regulated structure. This Memo is an expansion on the [BBS Memo 391](#) which discusses tents and temporary structures and provides further guidance a building official should consider when reviewing submittals for these structures given their temporary nature. While the number of occupants and the activities for which the temporary structure was erected has associated risks, the duration is the only category for which the risks may reasonably be adjusted based on the likelihood that identified risks will not be present.

*Changes to the 2024 Ohio Building Code (OBC) affecting Temporary Tents and Membrane Structures
(Refer to the Temporary Structures Approval Flowchart attached to the end of this Memo)*

Where a tent, membrane structure, or special event structure is intended to be in place for less than 180 days, the building official regulates the structure as a temporary structure. OBC § 102.8 addresses temporary structures. The 2024 OBC effective March 1, 2024, includes a modification to Section 102.8.1 to specify that building systems (structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary system) are to be reviewed for conformance with the code only to the extent necessary to ensure public health, safety and general welfare. This modification is intended to direct building officials to focus on the applicable code requirements for temporary structures only to the extent necessary to address the associated risks of the intended use, physical characteristics, and time frame and to exercise discretion in determining compliance with the Board's rules.

Section 102.8.1 also requires that temporary tents and membrane structures comply with OBC § 3103. In addition to the provisions of the building code, the 2024 OBC § 3103 references the 2021 International Fire Code (IFC) Chapter 31 as the enforceable standard for approvals of temporary tents and membrane structures including special event structures. While the OBC has more general provisions, the IFC has more specific requirements regarding the determination of code compliance. When determining compliance, the building official should:

- Consider the risks that are likely to be present for the finite and exact period of time for which the temporary tent will be erected and occupiable.
- Consider establishing operational conditions as part of the approval to further reduce the occupant's exposure to the potential risks. For example, operational conditions like weather watch, fire watch, flood watch and crowd manager to direct occupants to safety (away from the temporary tent or membrane structure) when identified risk thresholds are breached.
- Consider creating a separate application or at least a distinct portion of the application for plan approval used for temporary tents to focus the applicant's attention to key or critical information necessary to address structural strength, fire safety, means of egress, accessibility, light, ventilation, and sanitary system.

Similar to time-limited occupancies, it is important to work with the fire official to coordinate the review, approval and inspection of the installation of temporary tents, special event structures and membrane structures.

Note, however, that OBC §102.10 #9 contains an incorrect reference. The intent was to reference IFC § 3103.2 for exemptions from approval for temporary tents including: temporary tents not in excess of 400 sf; certain temporary tents based on the intended use (recreational camping); and tent(s) with open sides up to 700 sf based on the configuration of the tent or tent(s) in aggregate size and location.

As a reminder, Ohio's "Seal Law" has not changed. The requirement for construction documents to be sealed is established in statute, Revised Code § 3791.04 and further defined with exceptions in OBC § 106.2.1. For a quick reference summary of Ohio's Seal Law, see [BBS Memo 385](#).

Residential Code of Ohio Provisions

A residential backyard event (i.e. wedding, graduation, family reunion, etc.) in a tent on the lawn associated with a dwelling, where the tent is intended to be in place for less than 180 days, is a temporary accessory structure regulated under the Residential Code of Ohio (RCO). RCO § 102.9 requires the tent or membrane structure to conform "...as necessary to ensure public health, safety and general welfare." Because the RCO does not address tents and the OBC does, RCO § 101.2 Scope Exception #15 requires compliance with the provisions in the OBC to be the uniform requirements for code compliance, including all applicable exemptions from approval.

Ohio Building Code Provisions

Occupancies in a tent, membrane structure, or occupancies associated with a special event structure are regulated under the OBC and include examples such as:

- An overflow event (i.e. merchandise sale, showcase/showroom, occupational training, assembly use, religious service, cooking, dining, skating, etc.) under a tent or membrane structure on a parking lot;
- A performance event with stage, rigging, canopy or tower (i.e. concert, circus, theater, etc.) with or without a tent or membrane structure overhead; or
- A special amusement event (i.e. haunted/fun house, escape room, maze, etc.) in a tent or membrane structure where, by purpose and definition, the means of egress may not be readily evident

Where the structure is intended to be in place for less than 180 days, OBC § 102.8 requires the temporary tent, membrane structure or special event structure to conform "...as necessary to ensure public health, safety and general welfare." OBC Chapter 2 defines Special Amusement Area (whether temporary or permanent) and Special Event Structure. IFC Chapter 2 defines Special Amusement Building and specifies requirements for a Special Amusement Area in IFC § 3103.3.1 and for Temporary Special Event Structure in IFC § 3105.

Examples of Risk Considerations

Example 1:

Where the proposed tent does not have sides, access to an exit is more obvious and readily available. This has advantage for decreased egress time away from a hazard, awareness of external risks, improved ventilation, reduced barriers to access and when occupied during daytime, available natural light. Also, the minimum area is increased to 700 sq. ft. for tents with open sides before an approval is required per exception #2 under IFC § 3103.2.

Example 2:

Where the tent is proposed to sit on something other than undisturbed soils, the footing area should be evaluated for the ability to support the superimposed loads and resistance to lateral shift and uplift. Every tent is exposed to gravity loads and wind loads; however, based on the proposed duration, season, location, size and configuration, the loads could be significantly less than those that a permanent structure is required to resist. Evaluation for

compliance of a temporary structure should consider a realistic exposure to environmental loading in balance with safety features which could include a weather watch for conditions that exceed approved limits.

Example 3:

Where the proposed materials of a tent or membrane structure do not have fire resistance information/certification/labeling as is required under IFC § 3104, subsection 3104.2 allows the alternative of treating the materials with a flame retardant. Additionally, the proposed duration, season, location, size, configuration, and activities within and around the tent can be evaluated for the potential of exposure to heat source(s), open flame(s), and fuel load(s), that contribute to the risk of fire and flame propagation in balance with the proposed fire safety features which could include a fire watch. Specific hazards such as cooking, pyrotechnics, special events and fire breaks less than 12 feet all increase the risks to occupants and would have more restrictive requirements which must be addressed.

Example 4:

Where the tent does not have evidence of design engineering, the construction documents must demonstrate structural stability and strength. The seal of a registered design professional licensed to practice in Ohio on the construction documents or a complete technical analysis of the structural system offer two forms of evidence of design engineering. Additionally, the building official may consider a design where reasonable limits are established for the expected climatic conditions that result in reduced loads to which the temporary structure may be exposed for the period of time the temporary structure exists and is occupied. The reasonable limits are established through the approval of construction documents, provided such reasonable limits are dependent on the inclusion of safety features that will address the risk up to the reasonable limit (e.g. anchors or counterweights sufficient to resist uplift and lateral loads created by 40 mph winds) and operational functions (e.g. a safety plan and weather watch) that will prevent occupancy of the temporary structure when exposed to conditions beyond the reasonable limit (e.g. wind speeds in excess of 40 mph.)

Wind Loads

When considering review of technical analysis, remember that wind speed and wind load are related but they are different values. The strength of the structure must resist the loads produced by the wind. As a basic overview, the determination of wind load follows a path similar to:

- The use of OBC Table 1604.5 to set the risk category used to determine the applicable wind speed from OBC Figures 1609.3(1) through (4). Wind speed is further modified by the exposure of the structure to increased or decreased wind speed (see OBC §1609.4) and/or conversion to allowable stress design (asd) wind speed (see OBC §1609.3.1) for use in determining wind load per Chapters 26 to 30 of the ASCE 7 Standard for Minimum Design Loads for Buildings and Other Structures.
- Structural strength is resistance to wind load which is derived from wind pressure tables in the referenced standard ASCE 7 and will vary based on the wind speed (column heading/classification), wind direction (toward, away or across), the area of exposure and the location on the building upon which the wind is acting.
- These tabular values assume that the building is permanent in nature and likely to experience the condition over the life of the building. Where a building or structure is temporary, the expected wind conditions may be more narrowly predictable; and each approval may consider an operational provision to limit occupancy based on a reduced upper limit of wind speed in coordination with the stability and strength of the temporary structure.

Given the unique considerations for temporary structures, a building department may consider developing a specific application for plan approval or review checklist for temporary structures and/or tents. The following is a list of code provisions that should be reviewed for applicability and may be incorporated into an application or review checklist.

Applicable Provisions for Temporary Structures

Structural Strength:

Including but not limited to, Chapter 16 and a complete load path to supporting soils.

1. Additional requirements from IFC §3103.9 (stability under all design conditions, additional requirements where the temporary structure is >1 story, >7,500sf, and/or >1000 occupants) and §3103.10 (air supported membrane structures have specific requirements for doors, fabric, blower, & aux. inflation.)
2. Loads on a tent or membrane structure act in downward (gravity), upward (wind, frost), and sideways/lateral (wind, seismic) directions as a result of constant (dead, wind, seismic), seasonal (temperature, snow, rain) and live (occupants, activity, chattel) load sources.
3. Consistent conditions verses exposure to change across the event duration will impact a reasonable combination of load sources used in the evaluation of structural strength.
4. Where a design load condition is unknown or not expected to be encountered over the duration that the temporary tent or membrane structure will be occupied, a reasonable limit must be set and supported with technical analysis or operational method (e.g. weather watch) to restrict occupancy to only those times where the climatic conditions will not be exceeded.
5. For clarification purposes, wind speed and wind load are two different values. The wind speed is more like a classification than a load. Wind speed is used to determine the wind load. Wind load is used in ASCE 7, § 2.3, ASCE 7, § 2.4 or OBC § 1605.2 to develop the load combination which the structural system must be strong enough to resist.

Fire safety:

Including but not limited to, Chapters 7, 8 and 9 and resistance to the start or spread of fire.

- Building code and Fire code. (OBC § 3103.3 and IFC Chapter 31.)
- Additional requirements from IFC 3104 for the fire resistance of the fabric.
- Built-in fire protection versus operational fire prevention. (IFC §§ 3103.8, 3106 and 3107)
 - Address increased risks based on location, occupancy, activity and fuel load
 - Fire department access, apparatus and presence
 - Fire detection, notification, suppression, extinguishing and resources to support the system.

Means of egress:

Including but not limited to, Chapter 10 and access to the public way by all occupants in or on the structure.

- Exit access travel distance is 100 feet or less. (OBC § 3103.4 and IFC 3103.12.1)
- Additional requirements from IFC §§ 3103.11 and 3103.12
- Limited number of exits versus open sided structure.
- Identification of exit, travel distance, exit access and obstruction(s.)

Accessibility:

Including but not limited to, Chapter 11 and reasonable access for all.

- Is the location accessible and does the activity require accessibility?
- Accessible route (external), entrance, accessible route (internal)

Light and ventilation:

Including but not limited to, Chapter 12 and an interior environment that is healthy for the occupants and the activity.

- Where electricity is provided, Chapter 27 to the extent of the electrical wiring system proposed.
- Where HVAC is provided, Chapter 28 to the extent of the HVAC proposed.

Sanitary system:

Including but not limited to, Chapter 29 and access to toilet facilities as well as sanitary conditions based on activities.

- Duration of event, type of activities
- Closest permanent facilities versus use of temporary facilities

If you have questions about this BBS Memo, please contact Board of Building Standards staff at (614) 644-2613 or bbs@com.ohio.gov.

Temporary Structures Approval Flow Chart

