

BBS MEMO

Ohio Board of Building Standards

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Temporary Structures and Tents

Temporary structures such as tents and membrane structures have been confusing to many because of their infrequent use, fire history, the terminology used in the model code and in the OBC, and because they are often put in place, used, and removed so quickly that code enforcement is difficult. In order to accomplish a greater level of consistency, this BBS Memo offers information on the application of the code provisions to temporary structures, and specifically tents.

The first determination a building official needs to make is whether an installation is actually a temporary structure. According to OBC §102.8 and §3103.1, a temporary structure is one that, from the beginning of its installation through its use and subsequent removal, takes no more than 180 days. A structure erected for more than 180 days is not considered a temporary structure and will have to comply with all the applicable code provisions for a permanent building. Even if a structure will be set in place for more than 180 days but will only be used seasonally for less than 180 days at a time it is *not* considered a temporary structure. For such a condition a time-limited change of occupancy may be appropriate (OBC §111.1.5) and not the designation as a temporary structure.

The code official must also determine whether the structure is a tent or a membrane structure. Because tents are made of fabric, they are often, unfortunately, mistaken for membrane structures mentioned in OBC §3102. Confusion on this point has led to misapplication of code requirements for these structures and unnecessary expense to owners.

As defined in OBC §3102.2, there are two types of non-air-pressurized membrane structures: those that are supported by rigid frames and those that are supported by cables (illustrated to the right). Both use specialized fabrics that can be tensioned over a frame or over cables in a manner that is generally not done with tents. The fabrics used in membrane structures are not only supported by the supporting members, they provide both a weather barrier and structural stability for the supporting members.

A tent differs from a membrane structure and is defined as a “structure, enclosure or shelter, with or without side-walls or drops, constructed of fabric or pliable material supported in any manner except by air or the contents it protects.” While temporary tents and membrane structures share code provisions in OBC §3103, tents have special provisions and thresholds that apply, outlined below.

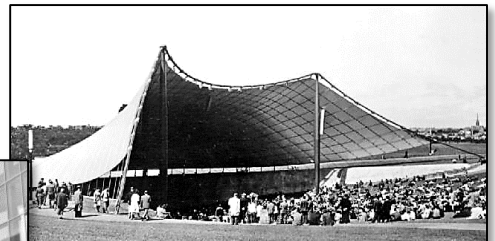
Ohio Building Code §3103.1.2 provides the code official with several thresholds that will determine whether these temporary structures are within the scope of the code and consequently need approvals and inspections. The OBC also sets several thresholds for temporary tents and membrane structures to determine if an approval is required. Items 2 and 3 below apply to both tents and membrane structures and items 1, 4, and 5 apply only to tents.

1. Tents used for recreational camping are exempt from approval.
2. Tents or membrane structures of 400 sq. ft. or less are exempt from approval.
3. Multiple tents or membrane structures with an aggregate area of 400 sq. ft. or less separated from adjacent tents by at least 12 feet are exempt from approval.
4. Tents 700 sq. ft. or less that are open on all sides and are more than 12 ft. from other tents or structures are exempt from approval.
5. Multiple tents open on all sides and placed side by side with an aggregate area of 700 sq. ft. or less that are more than 12 ft. from other tents or structures are exempt from approval.

Any tent or membrane structure outside these exemptions, then, does need a building department approval before it is set in place. These structures, however, do not fit neatly within the normal framework used in the code. The normal height and area, construction type, and occupancy classification are uniquely and specifically addressed in the OBC and OFC provisions that specifically apply to these structures. Because of this, care must be exercised to properly classify, review, approve, and inspect temporary structures and tents.

PLAN REVIEW AND CONSTRUCTION DOCUMENTS.

Construction document requirements for any tent or membrane structure within the scope of the OBC is specified in OBC §3103.2. An application for plan approval must be accompanied by construction documents that include a site plan locating the temporary structure along with information on means of egress and occupant load. Construction documents should also



Membrane-Covered Cable Structure



Membrane-Covered Cable Structure



Membrane-Covered Frame Structure

contain information to address resistance to loads to which the structure will be exposed, such as wind, snow, rain, etc., for the timeframe during which the structure will be used

LOCATION.

A site plan showing the location of these temporary structure is required (OBC §3103.3) to be provided. This section also refers to Table 602. This table can raise additional questions since it refers to occupancy type and type of construction. Once a temporary structure is found to be within the scope of the OBC – not exempted by §3103.1.2 – in order for it to have no rating of its exterior walls, it will have to meet the ≥30 ft. fire separation distance requirement that is good for any construction or occupancy type. There may be temporary structures that have rated exterior walls and can take advantage of Table 602 but in the case of tents that is not likely.

The OBC §3103.1 also references OFC Chapter 24 which prescribes additional sizing, separation, and location requirements that are applicable and are to be enforced, just like any other referenced standard, by the building department. These provisions can permit, under certain specific conditions, no separation and temporary structures as large as 10,000 and 15,000 sq. ft. (OFC §2403.8.2).

MEANS OF EGRESS.

The means of egress for temporary structures are required to comply with OBC Chapter 10 but, it is important to remember, the OBC §3103.4 has set the maximum travel distance for these structures specifically at 100 feet. This is an essential factor in the approval of temporary structures. Chapter 10 compliance is not as complicated as it may appear and, for example, the means of egress is sized by using Table 1004.1.1.

Table 1004.1.1 is based upon the *function* of a space not its *Use and Occupancy* described in Chapter 3. Reviewing the table, it can be seen that per-occupant values could be assigned to the function of the tent-covered space (assembly, stage and platform, agricultural, storage, skating, or swimming). Consequently, an occupant load can appropriately be verified.

OCCUPANT LOAD.

Once the occupant load is verified, based on the values in Table 1004.1.1, the egress width, protrusion limits, signage, rail, ramp, and other Chapter 10 requirements can be verified. The difference for temporary structures, however, is that the number of exits for the established occupant load is not determined by using Table 1021.1 (Number of Exits for Occupant Load) but by using the more restrictive maximum travel distance set at 100 feet in OBC §3103.4 and the provisions for minimum numbers of exits in the OFC (Table 2403.12.2). The ICC Commentary emphasizes this by stating that:

"The means of egress in temporary structures is to comply with the requirements of Chapter 10, except the maximum exit access travel distance is limited to 100 feet (30,480 mm). The reduced travel distance applies to all temporary uses and is based on concerns associated with the nature of temporary structure construction, which may accelerate fire spread or rapidly decrease the stability of the structure during a fire."

Because of the limited travel distance allowed for these structures, as a temporary structure gets larger and the occupant load increases, the number of exits grows dramatically compared with other permanent structures.

BUILDING AND FIRE CODE PROVISIONS.

The OBC Section 3103.1 references the OFC Chapter 24. In addition to the construction related provisions such as sizing, separation, and location requirements, these provisions address such things as type and location of heating and electrical equipment, seating arrangements, seating aisle widths, exit signage, egress illumination, flame propagation of fabrics and components, fire apparatus access, and requirements and clearances for equipment and materials which must also be verified by the building department as a part of its review.

These provisions address fire safety in an effort to permit the use of temporary structures while maintaining safety for the occupants. This emphasis on fire safety is consistent with OBC Section 102.8.1 which states that a temporary structure:

"...shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare. Temporary tents and membrane structures shall also comply with the applicable provision in section 3103."

When applying the building code, and the referenced OFC, to temporary tents and temporary membrane structures, two things need to be remembered:

1. According to OBC Section 102.1, where there is a conflict between a general requirement and a specific requirement, the specific requirement shall be applicable. In this case, the *specific* requirements for temporary tents and temporary membrane structures found in OBC Chapter 31 (including the referenced requirements) take precedent over the *general* requirements such as height and area limitations, fire protection systems, means of egress, etc. found in the OBC.
2. The term "fire safety" is not a defined term. It is a broad, general concept. The term "fire safety" is used in several sections of the OBC but is not the same as and should not be construed or interpreted to mean that a "fire protection system", which is a defined term, is required for temporary tents or temporary membrane structures. Again, the *specific* provisions found in OBC Chapter 31 and OFC Chapter 24 take precedent over the *general* requirements such as height and area limitations, fire protection systems, means of egress, etc. found in the OBC for permanent structures.

All of this information, which is part of a complete construction document submission and review, will provide for a code compliant use of these temporary structures and allow for their timely and consistent review and approval by building departments around the state. If you have further questions regarding the application of these requirements, please call the Board's office at 614-644-2613 or send your question by E-mail to dic.bbs@com.state.oh.us.