

CHAPTER 31

SPECIAL CONSTRUCTION

SECTION 3101 GENERAL

3101.1 Scope. The provisions of this chapter shall govern special building construction including membrane structures, temporary structures, pedestrian walkways and tunnels, automatic vehicular gates, awnings and canopies, marquees, signs, and towers and antennas.

SECTION 3102 MEMBRANE STRUCTURES

3102.1 General. The provisions of Sections 3102.1 through 3102.8 shall apply to air-supported, air-inflated, membrane-covered cable, membrane-covered frame and tensile membrane structures, collectively known as membrane structures, erected for a period of 180 days or longer. Those erected for a shorter period of time shall comply with the *fire code*. Membrane structures covering water storage facilities, water clarifiers, water treatment plants, sewage treatment plants, greenhouses and similar facilities not used for human occupancy are required to meet only the requirements of Sections 3102.3.1 and 3102.7. Membrane structures erected on a building, balcony, deck or other structure for any period of time shall comply with this section.

3102.1.1 Tensile membrane structures. Tensile membrane structures, including permanent and temporary structures, shall be designed and constructed in accordance with ASCE 55. The provisions in Sections 3102.3 through 3102.6 shall apply.

3102.2 Definitions. The following terms are defined in Chapter 2:

AIR-INFLATED STRUCTURE.

AIR-SUPPORTED STRUCTURE.

Double skin.

Single skin.

CABLE-RESTRAINED, AIR-SUPPORTED STRUCTURE.

MEMBRANE-COVERED CABLE STRUCTURE.

MEMBRANE-COVERED FRAME STRUCTURE.

NONCOMBUSTIBLE MEMBRANE STRUCTURE.

TENSILE MEMBRANE STRUCTURE.

3102.3 Type of construction. Noncombustible membrane structures shall be classified as Type IIB construction. Noncombustible frame or cable-supported structures covered by an approved membrane in accordance with Section 3102.3.1 shall be classified as Type IIB construction. Heavy timber frame-supported structures covered by an approved membrane in accordance with Section 3102.3.1 shall be classified as Type IV construction. Other membrane structures shall be classified as Type V construction.

Exception: Plastic less than 30 feet (9144 mm) above any floor used in greenhouses, where occupancy by the general public is not authorized, and for aquaculture pond covers is not required to meet the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701.

3102.3.1 Membrane and interior liner material. Membranes and interior liners shall be either noncombustible as set forth in Section 703.5 or meet the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701 and the manufacturer's test protocol.

Exception: Plastic less than 20 mil (0.5 mm) in thickness used in greenhouses, where occupancy by the general public is not authorized, and for aquaculture pond covers is not required to meet the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701.

3102.4 Allowable floor areas. The area of a membrane structure shall not exceed the limitations specified in Section 506.

3102.5 Maximum height. Membrane structures shall not exceed one story nor shall such structures exceed the height limitations in feet specified in Section 504.3.

Exception: Noncombustible membrane structures serving as roofs only.

3102.6 Mixed construction. Membrane structures shall be permitted to be utilized as specified in this section as a portion of buildings of other types of construction. Height and area limits shall be as specified for the type of construction and occupancy of the building.

3102.6.1 Noncombustible membrane. A noncombustible membrane shall be permitted for use as the roof or as a skylight of any building or atrium of a building of any type of construction provided the membrane is not less than 20 feet (6096 mm) above any floor, balcony or gallery.

3102.6.1.1 Membrane. A membrane meeting the fire propagation performance criteria of Test Method 1 or Test Method 2, as appropriate, of NFPA 701 shall be permitted to be used as the roof or as a skylight on buildings of Type IIB, III, IV and V construction, provided the membrane is not less than 20 feet (6096 mm) above any floor, balcony or gallery.

3102.7 Engineering design. The structure shall be designed and constructed to sustain dead loads; loads due to tension or inflation; live loads including wind, snow or flood and seismic loads and in accordance with Chapter 16.

3102.7.1 Lateral restraint. For membrane-covered frame structures, the membrane shall not be considered to provide lateral restraint in the calculation of the capacities of the frame members.

3102.8 Inflation systems. Air-supported and air-inflated structures shall be provided with primary and auxiliary inflation systems to meet the minimum requirements of Sections 3102.8.1 through 3102.8.3.

3102.8.1 Equipment requirements. This inflation system shall consist of one or more blowers and shall include provisions for automatic control to maintain the required inflation pressures. The system shall be so designed as to prevent overpressurization of the system.

3102.8.1.1 Auxiliary inflation system. In addition to the primary inflation system, in buildings larger than 1,500 square feet (140 m²) in area, an auxiliary inflation system shall be provided with sufficient capacity to maintain the inflation of the structure in case of primary system failure. The auxiliary inflation system shall operate automatically when there is a loss of internal pressure and when the primary blower system becomes inoperative.

3102.8.1.2 Blower equipment. Blower equipment shall meet all of the following requirements:

1. Blowers shall be powered by continuous-rated motors at the maximum power required for any flow condition as required by the structural design.
2. Blowers shall be provided with inlet screens, belt guards and other protective devices as required by the building official to provide protection from injury.
3. Blowers shall be housed within a weather-protecting structure.
4. Blowers shall be equipped with backdraft check dampers to minimize air loss when inoperative.
5. Blower inlets shall be located to provide protection from air contamination. The location of inlets shall be approved.

3102.8.2 Standby power. Wherever an auxiliary inflation system is required, an approved standby power-generating system shall be provided. The system shall be equipped with a suitable means for automatically starting the generator set upon failure of the normal electrical service and for automatic transfer and operation of all of the required electrical functions at full power within 60 seconds of such service failure. Standby power shall be capable of operating independently for not less than 4 hours.

3102.8.3 Support provisions. A system capable of supporting the membrane in the event of deflation shall be provided for in air-supported and air-inflated structures having an occupant load of 50 or more or where covering a swimming pool regardless of occupant load. The support system shall be capable of maintaining membrane structures used as a roof for Type I construction not less than 20 feet (6096 mm) above floor or seating areas. The support system shall be capable of maintaining other membranes not less than 7 feet (2134 mm) above the floor, seating area or surface of the water.

SECTION 3103 TEMPORARY STRUCTURES

3103.1 General. The provisions of Sections 3103.1 through 3103.4 shall apply to structures erected for a period of less than 180 days. Tents and other membrane structures erected for a period of less than 180 days shall comply with *this section and Chapter 24 of the fire code*. Those erected for a longer period of time shall comply with applicable sections of this code.

3103.1.1 Conformance. Temporary structures and uses shall conform to the structural strength, fire safety, means of egress, accessibility, light, ventilation and sanitary requirements of this code as necessary to ensure public health, safety and general welfare.

3103.1.2 Approval required. Temporary structures, *other than tents and membrane structures*, that cover an area greater than 120 square feet (11.16 m²) or that exceed an occupant load of 10 or more persons, shall not be erected, operated or maintained for any purpose without obtaining an approval from the building official as authorized in Section 102.8.

3103.1.3 Approval required for tents and membrane structures. Temporary tents and temporary membrane structures having either of the following characteristics shall not be erected, operated or maintained for any purpose without first obtaining an approval from the building official. For the purpose of determining required distances, support ropes and guy wires shall be considered as part of the temporary tent or membrane structure.

1. An individual tent or membrane structure with an area in excess of 400 square feet (37 m²); or
2. Multiple tents or membrane structures with an aggregate area in excess of 400 square feet (37 m²) when adjacent temporary tents or membrane structures are located within 12 feet (3,658 mm) of one another.

Exceptions:

1. An approval is not required for tents used exclusively for recreational camping purposes.
2. An approval is not required for tents open on all sides which comply with all of the following:
 - 2.1. Individual tents having a maximum size of 700 square feet (65 m²).
 - 2.2. The aggregate area of multiple tents placed side by side without a fire break clearance of 12 feet (3,658 mm), not exceeding 700 square feet (65 m²) total.
 - 2.3. A minimum clearance of 12 feet (3658 mm) to all structures and other tents.

3103.2 Construction documents. An application and construction documents shall be submitted for each installation of a temporary structure. The construction documents shall include a site plan indicating the location of the temporary

structure and information delineating the means of egress and the occupant load.

3103.3 Location. Temporary structures shall be located in accordance with the requirements of Table 602 based on the fire-resistance rating of the exterior walls for the proposed type of construction.

3103.4 Means of egress. Temporary structures shall conform to the means of egress requirements of Chapter 10 and shall have an exit access travel distance of 100 feet (30 480 min) or less.

SECTION 3104 PEDESTRIAN WALKWAYS AND TUNNELS

3104.1 General. This section shall apply to connections between buildings such as pedestrian walkways or tunnels, located at, above or below grade level, that are used as a means of travel by persons. The pedestrian walkway shall not contribute to the building area or the number of stories or height of connected buildings.

3104.1.1 Application. Pedestrian walkways shall be designed and constructed in accordance with Sections 3104.2 through 3104.9. Tunnels shall be designed and constructed in accordance with Sections 3104.2 and 3104.10.

3104.2 Separate structures. Buildings connected by pedestrian walkways or tunnels shall be considered to be separate structures.

Exceptions:

1. Buildings that are on the same lot and considered as portions of a single building in accordance with Section 503.1.2.
2. For purposes of calculating the number of Type B units required by Chapter 11, structurally connected buildings and buildings with multiple wings shall be considered one structure.

3104.3 Construction. The pedestrian walkway shall be of noncombustible construction.

Exceptions:

1. Combustible construction shall be permitted where connected buildings are of combustible construction.
2. Fire-retardant-treated wood, in accordance with Section 603.1, Item 1.3, shall be permitted for the roof construction of the pedestrian walkway where connected buildings are a minimum of Type I or II construction.

3104.4 Contents. Only materials and decorations approved by the building official shall be located in the pedestrian walkway.

3104.5 Connections of pedestrian walkways to buildings. The connection of a pedestrian walkway to a building shall comply with Section 3104.5.1, 3104.5.2, 3104.5.3 or 3104.5.4.

Exception: Buildings that are on the same lot and considered as portions of a single building in accordance with Section 503.1.2.

3104.5.1 Fire barriers. Pedestrian walkways shall be separated from the interior of the building by not less than 2-

hour fire barriers constructed in accordance with Section 707 and Sections 3104.5.1.1 through 3104.5.1.3.

3104.5.1.1 Exterior walls. Exterior walls of buildings connected to pedestrian walkways shall be 2-hour fire-resistance rated. This protection shall extend not less than 10 feet (3048 mm) in every direction surrounding the perimeter of the pedestrian walkway.

3104.5.1.2 Openings in exterior walls of connected buildings. Openings in exterior walls required to be fire-resistance rated in accordance with Section 3104.5.1.1 shall be equipped with opening protectives providing a not less than $\frac{3}{4}$ -hour fire protection rating in accordance with Section 716.

3104.5.1.3 Supporting construction. The fire barrier shall be supported by construction as required by Section 707.5.1.

3104.5.2 Alternative separation. The wall separating the pedestrian walkway and the building shall comply with Section 3104.5.2.1 or 3104.5.2.2 where:

1. The distance between the connected buildings is more than 10 feet (3048 mm).
2. The pedestrian walkway and connected buildings are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, and the roof of the walkway is not more than 55 feet (16 764 mm) above grade connecting to the fifth, or lower, story above grade plane, of each building.

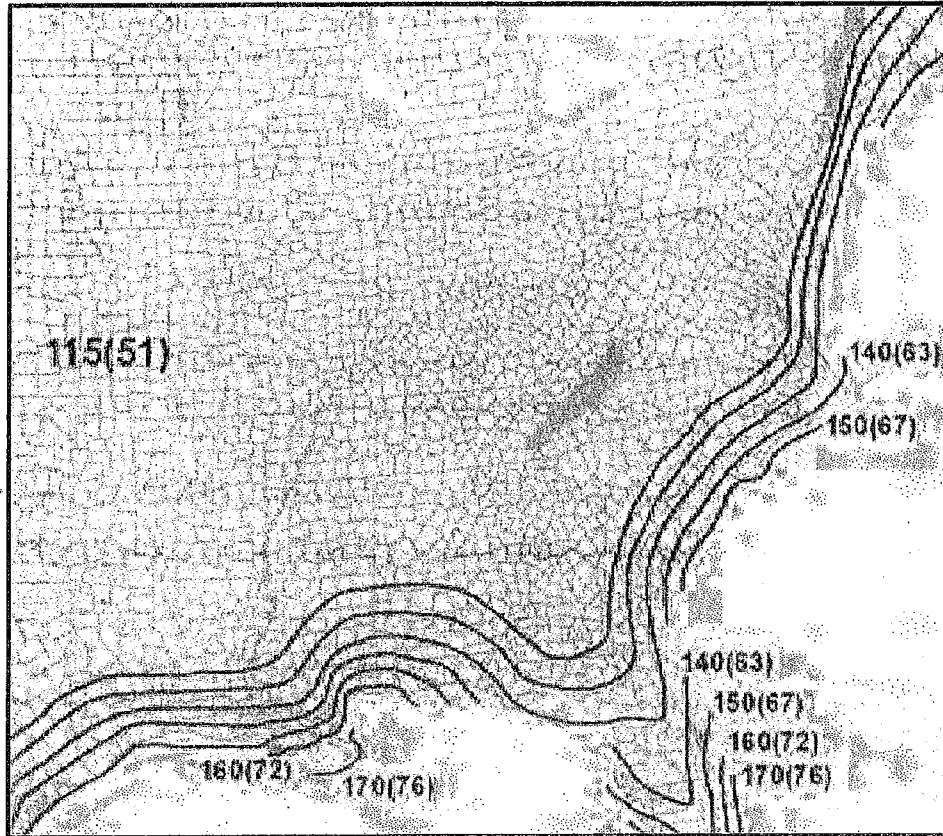
Exception: Open parking garages need not be equipped with an automatic sprinkler system.

3104.5.2.1 Passage of smoke. The wall shall be capable of resisting the passage of smoke.

3104.5.2.2 Glass. The wall shall be constructed of a tempered, wired or laminated glass wall and doors or glass separating the interior of the building from the pedestrian walkway. The glass shall be protected by an automatic sprinkler system in accordance with Section 903.3.1.1 that, when actuated, shall completely wet the entire surface of interior sides of the wall or glass. Obstructions shall not be installed between the sprinkler heads and the wall or glass. The glass shall be in a gasketed frame and installed in such a manner that the framing system will deflect without breaking (loading) the glass before the sprinkler operates.

3104.5.3 Open sides on walkway. Where the distance between the connected buildings is more than 10 feet (3048 mm), the walls at the intersection of the pedestrian walkway and each building need not be fire-resistance rated provided both sidewalls of the pedestrian walkway are not less than 50 percent open with the open area uniformly distributed to prevent the accumulation of smoke and toxic gases. The roof of the walkway shall be located not more than 40 feet (12 160 mm) above grade plane, and the walkway shall only be permitted to connect to the third or lower story of each building.

Exception: Where the pedestrian walkway is protected with a sprinkler system in accordance with Section



Notes:

1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10m) above ground for Exposure C category.
2. Linear interpolation between contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.
5. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00143, MRF = 700 Years).

FIGURE 1609.3(1)

ULTIMATE DESIGN WIND SPEEDS, V_{ult} FOR RISK CATEGORY II BUILDINGS AND OTHER STRUCTURES

1609.4 Exposure category. For each wind direction considered, an exposure category that adequately reflects the characteristics of ground surface irregularities shall be determined for the site at which the building or structure is to be constructed. Account shall be taken of variations in ground surface roughness that arise from natural topography and vegetation as well as from constructed features.

1609.4.1 Wind directions and sectors. For each selected wind direction at which the wind loads are to be evaluated, the exposure of the building or structure shall be determined for the two upwind sectors extending 45 degrees (0.79 rad) either side of the selected wind direction. The exposures in these two sectors shall be determined in accordance with Sections 1609.4.2 and 1609.4.3 and the exposure resulting in the highest wind loads shall be used to represent winds from that direction.

1609.4.2 Surface roughness categories. A ground surface roughness within each 45-degree (0.79 rad) sector shall be determined for a distance upwind of the site as defined in Section 1609.4.3 from the categories defined below, for the purpose of assigning an exposure category as defined in Section 1609.4.3.

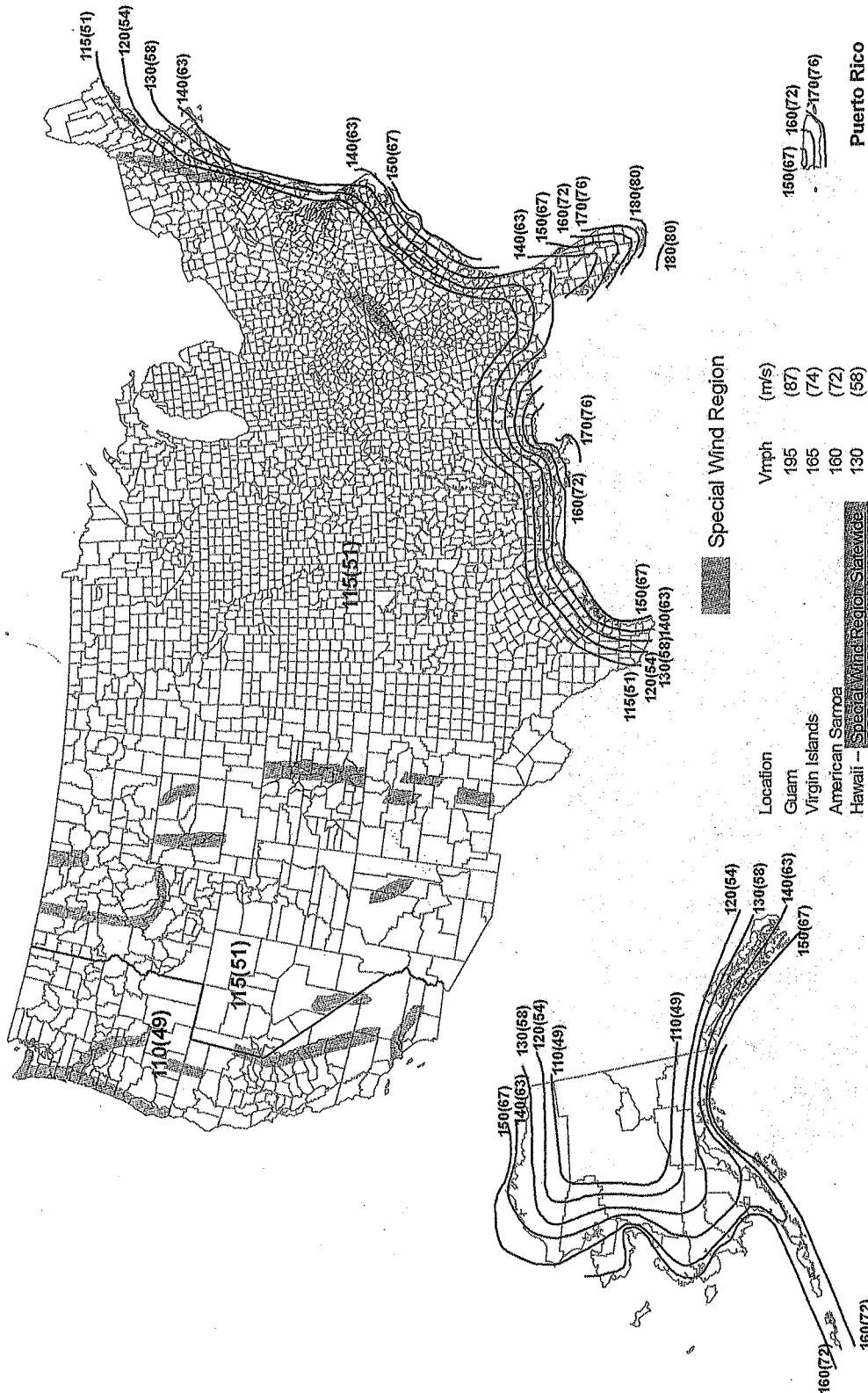
Surface Roughness B. Urban and suburban areas, wooded areas or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.

Surface Roughness C. Open terrain with scattered obstructions having heights generally less than 30 feet (9144 mm). This category includes flat open country, and grasslands.

Surface Roughness D. Flat, unobstructed areas and water surfaces. This category includes smooth mud flats, salt flats and unbroken ice.

1609.4.3 Exposure categories. An exposure category shall be determined in accordance with the following:

Exposure B. For buildings with a mean roof height of less than or equal to 30 feet (9144 mm), Exposure B shall apply where the ground surface roughness, as defined by Surface Roughness B, prevails in the upwind direction for a distance of at least 1,500 feet (457 m). For buildings with a mean roof height greater than 30 feet (9144 mm), Exposure B shall apply where Surface Roughness B prevails in the upwind direction



Notes:

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2. Linear interpolation between contours is permitted.
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4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.
5. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (Annual Exceedance Probability = 0.00143, MRI = 700 Years).

FIGURE R301.2(5)A
ULTIMATE DESIGN WIND SPEEDS

CITY OF NORWOOD

4645 Montgomery Road, Norwood, Ohio 45212

Phone 513-458-4510 Fax 513-458-4511

Permit No. _____**BUILDING/ZONING PERMIT APPLICATION**

Associated BP # _____

1. STREET ADDRESS & SUITE #: _____
2. ZONING: _____ OCCUPANCY: _____ PARCEL NUMBER: _____ (Name of Business) _____
3. ☐ Residential Property (RCO) ☐ Commercial Property (OBC)

	NAME	STREET ADDRESS	CITY	STATE	ZIP	PHONE/FAX
OWNER						
CONTRACTOR						
PLANS BY						

4. TYPE OF IMPROVEMENT

- | | | |
|--|---|--|
| <input type="checkbox"/> New Building | <input type="checkbox"/> Garage | <input type="checkbox"/> Deck |
| <input type="checkbox"/> Alteration | <input type="checkbox"/> Hood System | <input type="checkbox"/> Pool (Above-Ground) |
| <input type="checkbox"/> Addition | <input type="checkbox"/> HVAC # of Units: _____ | <input type="checkbox"/> Pool (In-Ground) |
| <input type="checkbox"/> Repair/Replacement | ____ Furnace ____ Air Conditioner | <input type="checkbox"/> Fence |
| <input type="checkbox"/> Change of Use | ____ Commercial ____ Residential | <input type="checkbox"/> Shed |
| <input type="checkbox"/> Change of Occupancy | ____ Replacement ____ New | <input type="checkbox"/> Sign ID: ____ SQ FT: ____ |
| <input type="checkbox"/> Fire Alarm | ____ Electric ____ Gas ____ Oil | <input type="checkbox"/> Wrecking/Moving |
| <input type="checkbox"/> Fire Suppression | ____ New System; drawings & specs required | <input type="checkbox"/> Other (specify) _____ |
| ____ Sprinkler ____ Hood | | |

5. DESCRIPTION OF WORK: _____

6. COST: Estimate cost of construction/improvement for which this application is being made: \$ _____

7. USE OF THIS BUILDING AND PREMISES:

☐ Existing Use: _____ ☐ Proposed Use: _____

8. TOTAL FLOOR AREA FOR NEW BUILDINGS/GARAGES/SHEDS/ADDITIONS/DECKS: _____

The owner of this building and undersigned, do hereby covenant and agree with all the laws of the State of Ohio and the ordinances of the City of Norwood pertaining to building(s), and to construct the proposed building(s) or structure(s) or make the proposed change or alteration in accordance with the plans and specifications submitted herewith, and certify that the information and statements given on this application, drawings and specifications to the best of their knowledge, true and correct.

Application by _____ Date: _____
Owner or Agent's Name (Print & Sign) (phone number)

DO NOT WRITE BELOW THIS LINE
(Office Use Only)

Required Review/upfront Fee \$ _____
Permit or Zoning Fee \$ _____
Fine \$ _____
OBC 3% (Commercial) \$ _____
RCO 1% (Residential) \$ _____
Total \$ _____
Balance Due \$ _____

Payment: ☐ Cash ☐ Check ☐ Credit Card Receipt # _____

Plans Examiner Approval: _____ Date Plans Approved: _____

Construction Type: _____ Use Group: _____

Building/Zoning Official Approval _____ Date Permit Issued: _____



Departments of Public Service & Public Safety

NORWOOD CITY HALL
4645 MONTGOMERY ROAD
NORWOOD, OHIO 45212
(513) 458-4500

**BUILDING, HOUSING &
PROPERTY MAINTENANCE**
PHONE (513) 458-4510
FAX (513) 458-4511

FIRE DIVISION
PHONE (513) 458-4550
FAX (513) 458-4551

EMS BILLING
PHONE (513) 458-4554
FAX (513) 458-4551

POLICE DIVISION
PHONE (513) 458-4521
FAX (513) 458-4524

**POLICE RECORDS/
ALARM BILLING**
PHONE (513) 458-4528
FAX (513) 458-4519

PUBLIC WORKS DIVISION
PHONE (513) 458-4615
FAX (513) 458-4622

WATER BILLING DEPT.
PHONE (513) 458-4518
FAX (513) 458-4516

The following applies for temporary event tents and membrane structures over 400 square feet with sides or 700 square feet without sides.

For each tent or membrane structure, you will need to complete the "Building & Zoning Permit Application". In item #5 please be specific.

Three (3) copies of the following information in packet form are required to be submitted with the fee and application:

- A detailed site plan of the grounds indicating: the street(s), buildings, any accessory structures and the purposed location and size of each tent or membrane structure
- Installation/anchor details
- Wind sheer/load/resistance in miles per hour
- Flame resistance details for each tent or membrane structure
- Seating diagram

I have attached a copy of the Ohio Building Code that applies.

Please submit the application, the packets ***and a check in the amount of \$77.25 per tent and/or membrane structure (\$75.00 + \$2.25 (BBS 3%)) to the Building Division **two (2) weeks prior to your event.**

"Gem of The Highlands"