

**STATEMENT OF WORK
NASA'S SIXTH ANNUAL ROBOTIC MINING COMPETITION
JOHN F. KENNEDY SPACE CENTER, FLORIDA**

NASA's Sixth Annual Robotic Mining Competition is a college level competition held at the Kennedy Center Visitors Complex (KSCVC). The KSCVC is located on SR 405, approximately 11 mile east of Interstate I-95.

The contractor shall construct tents in the KSCVC grassy area near the Rocket Garden and shall coordinate with the KSCVC operator Delaware North Parks and Resorts. The contractor shall complete tent construction by May 12, 2015 and shall begin removing tents on May 26, 2015. The contractor shall make all deliveries outside of KSCVC operating hours: 9:00 am – 7:00 pm (ex: before 9:00 am or after 7:00 pm). While working during the day, the contractor shall keep the forklifts under the tent due to guest traffic. Bidders to verify all measurements during the pre-proposal site visit.

Item 1 Robopits Tent - The contractor shall provide one air-conditioned (a/c) tent with controls for local staff to adjust the temperature and with plywood floors or non-skid composite flooring material with no other covering.

Provide one, 30' x 10' Bot Shop booth (which is made up of 3 bays); for each bay provide one 6' banquet table, 2 folding chairs and supply four, 120 volts AC, single phase outlets in each bay. Each bay's 120 volt AC outlet shall be on their own 20 Amp or higher circuit. Wall 1 and Wall 2 of the Bot Shop shall be floor to ceiling for sound reduction. Wall 1 and Wall 2 will be of a clear see through acrylic, Wall 1 shall include one, clear see through acrylic double doors with entry / exit ramps no less than 6' wide. Provide lighted exit signs, high intensity discharge (HID) lights such as metal halide lights and an a/c vent.

Provide one, 20' x 10' Hand Cart booth.

Provide fifty seven (57), 10' x 10' booths. For each of the booths the contractor shall provide: 3' high x 10' long drapes (royal blue in color) to separate one booth from the other, one 8' classroom table, 2 folding chairs and supply two grounded outlets (with 120 volts AC, single phase, 20 amps).

The contractor shall equip the tent with eight (8) fire safety packages with lighted exit signs, high intensity discharge (HID) lights such as metal halide lights and six (6) glass double doors with entry / exit ramps and all aisles shall be 10' wide. The contractor shall ensure the tent complies with the Outdoor Special Events attachment. The contractor shall ensure all electrical wiring and outlets are raised above the ground (approximately 6" – 12") to protect from rain accumulation

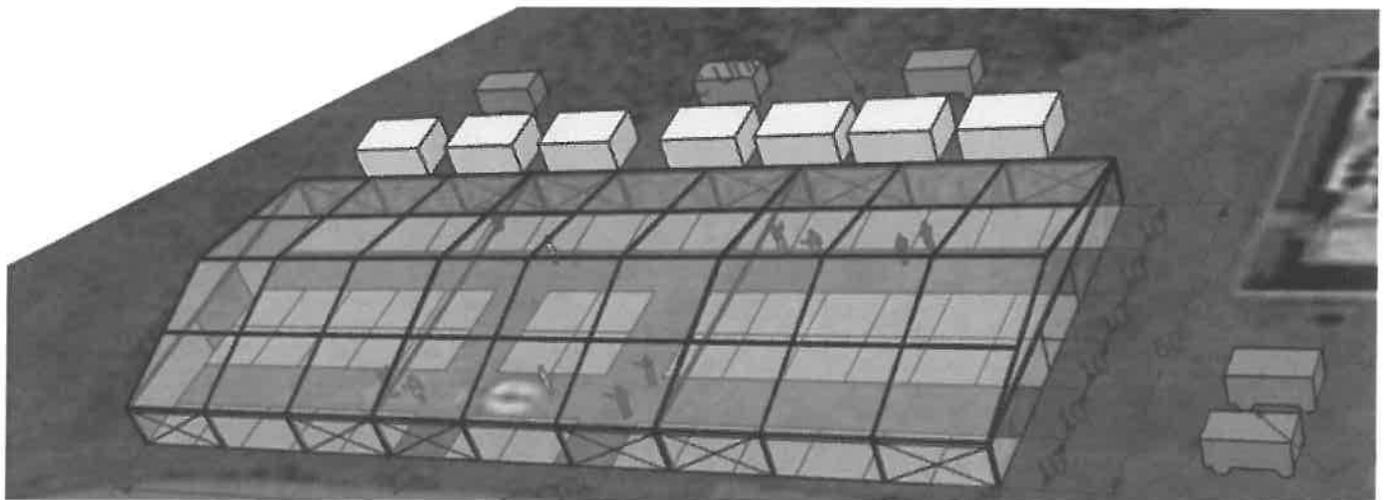
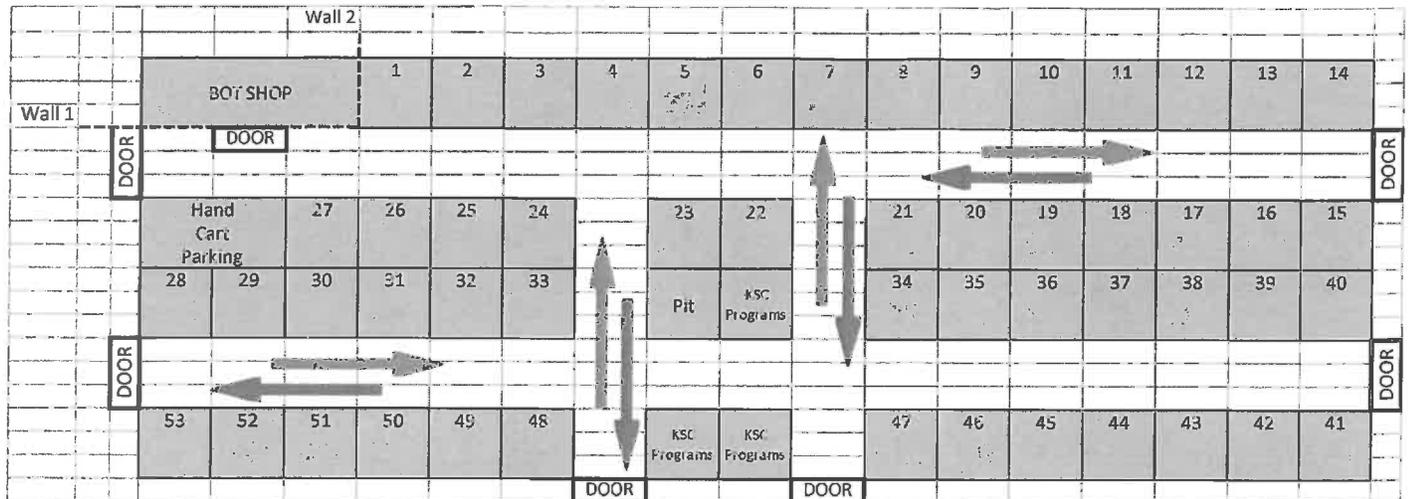


Diagram 1 – Robopit Layout

Item 2 Competition Tents – The contractor shall provide two, 50’ x 50’ x 15’ air-conditioned (A/C) tents with controls for local staff to adjust the temperature. The A/C will maintain the inside of the tents at a constant 70°F. The contractor shall provide ten (10) extra A/C filters. The Government will change out the A/C filters on competition days. These tents will cover the competition arenas.

Provide plywood floors or non-skid composite flooring material with no other covering. Provide clear walls with 1 glass wall (facing the bleachers) and 2 sides with flap doors. Provide a 4’ wide walkway around the tents as shown in **Diagram 2**. Place the outer walkways 10’ from the tent walls.

The contractor shall equip the tent with eight (8) fire safety packages with lighted exit signs and lighting consisting of high intensity discharge (HID) lights such as metal halide lights. For each of these tents the contractor shall provide four (4) 6’ banquet tables, eight (8) folding chairs, ten (10) grounded outlets with 120 volts AC, single phase, 20 amps. The contractor shall place the generators across the fire lane as shown in **Diagram 3**. The contractor shall ensure the tent complies with the Outdoor Special Events

attachment. The contractor shall ensure all electrical wiring and outlets are raised above the ground (approximately 6” – 12”) to protect from rain accumulation.

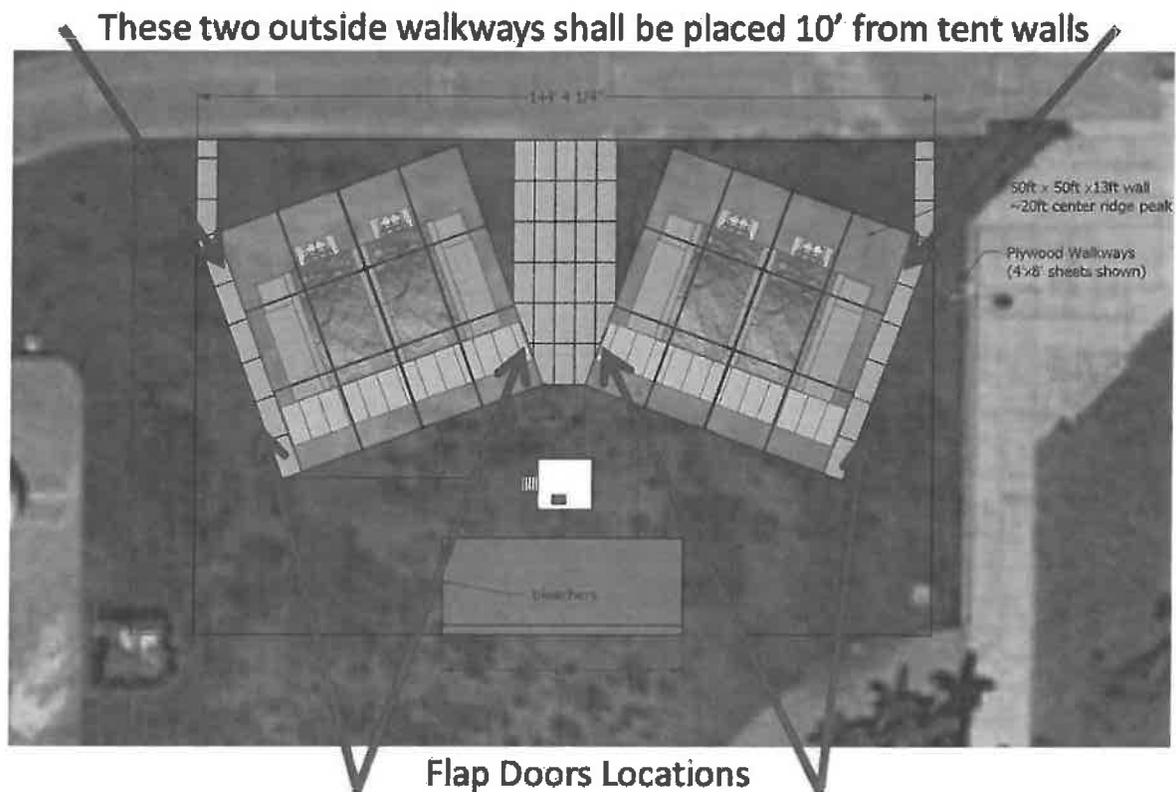


Diagram 2 – Competition Tents & Walkway Layout

Item 3 Festival Tent – The contractor shall provide one tent to cover the tents in Item 2, see Diagram 4 (approximately 15,000 SF). Tent cover shall be beyond the bleachers, but not over the planted areas on the west and south sides of the Rocket Garden. The contractor shall provide six (6) large (min 30” diameter, 5’ high) pedestal fans and electrical connections. The contractor shall place this tent over the tents listed in Item 2 (above).

The contractor shall place all walls of this tent in an open position with the ability of the personnel on-site to close the walls in the event of inclement weather. The contractor shall provide twenty (20) grounded outlets with 120 volts AC, single phase, 20 amps. The contractor shall ensure all electrical wiring and outlets are raised above the ground (approximately 6” – 12”) to protect from rain accumulation. The contractor shall equip the tent with eight (8) fire safety packages with lighted exit signs.

The contractor shall coordinate all work actions with the Contracting Officer and the Contracting Officer’s Representatives and ensure the tent complies with the Outdoor Special Events attachment. Note: All tents will be on the grass. The government will supply fuel for the generators

Item 4. Banner Placement - The Contractor shall place (provided) banners on the inside of the RobotPit Tent, Competition Tent and Festival Tent. There will be approximately 4 banners. Remove and return banners prior to striking tents.

See www.nasa.gov/nasarmc for more information about the competition itself.

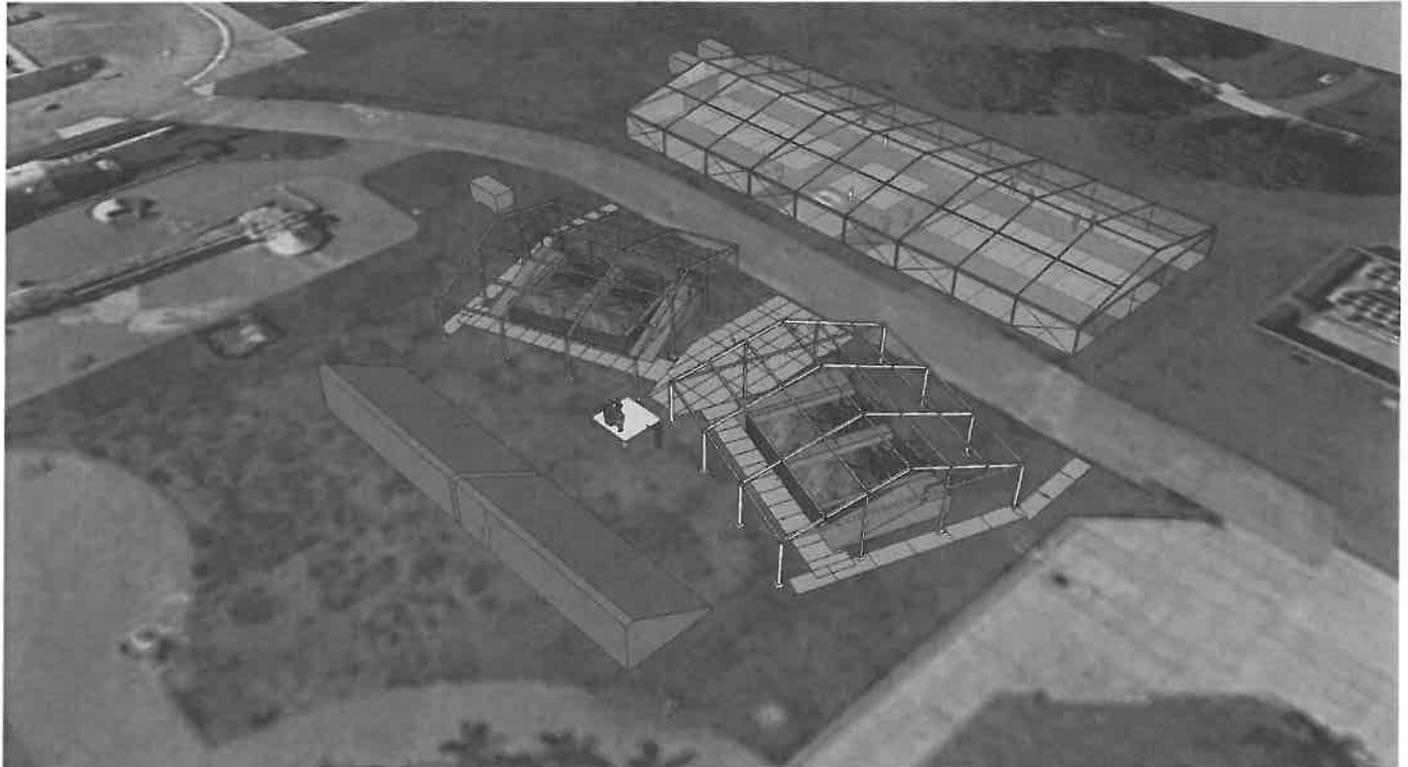


Diagram 3 – RoboPits, Competition Tents and Generator Layout

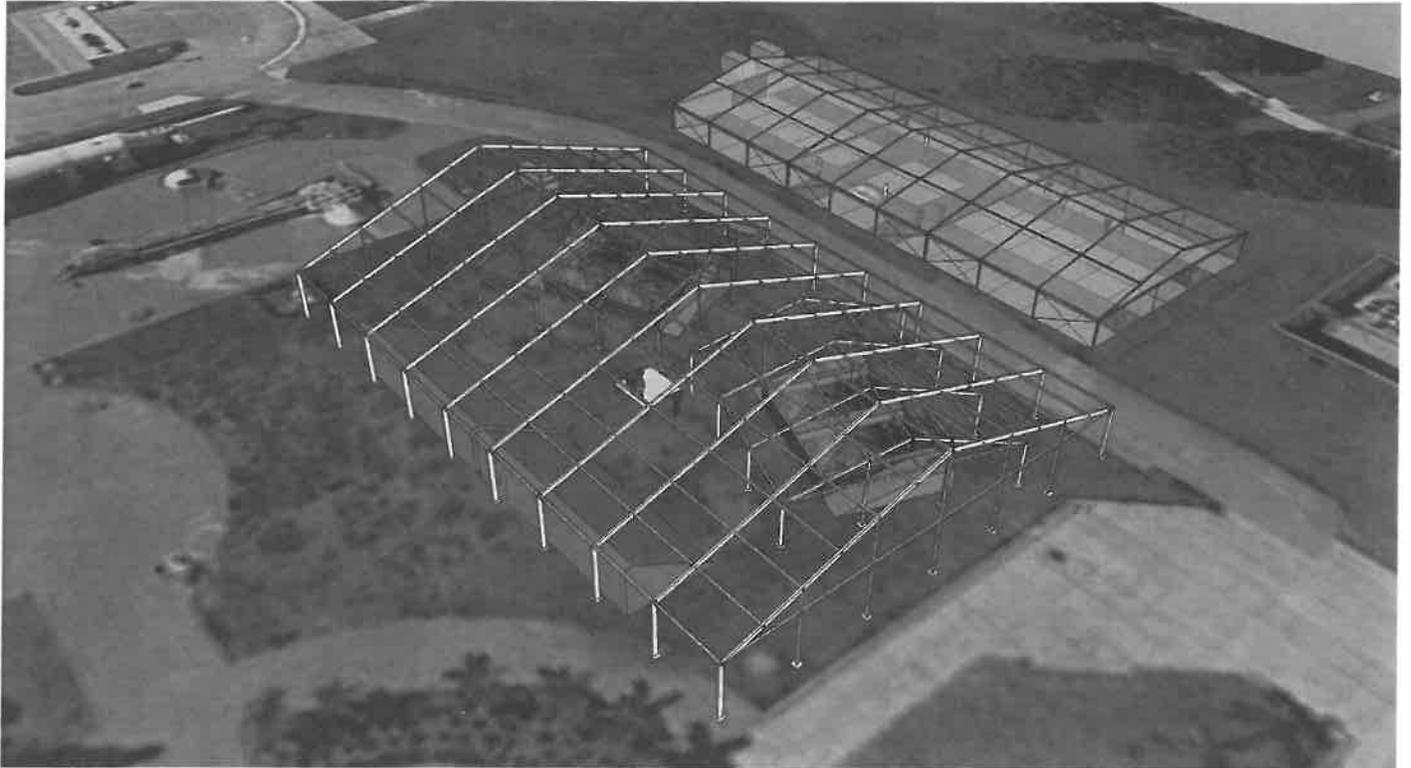


Diagram 4 – Festival Tent Layout



Outdoor Special Events

KSC Fire Prevention Office
Kennedy Space Center, FL
Phone (321) 861-4684 Fax (321) 861-2520

EVENT NAME NASA SIXTH ANNUAL ROBOTIC MINING COMPETITION

LOCATION KENNEDY SPACE CENTER VISITORS COMPLEX

DATE(S) May 18 2015 through May 22, 2015

FIRE INSPECTOR NAME CARL RAY BOSWELL

<u>EVENT COORDINATORS</u>	<u>AGENCY</u>	<u>MAIL CODE</u>	<u>PHONE NUMBER(S)</u>	<u>SIGNATURE</u>

ORIGINAL SIGNED
CARL RAY BOSWELL
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KSC Fire Prevention Office
321-861-4684

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Chief, NASA Protective Services Office
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FOREWORD

PLANNING FOR FIRE PREVENTION AND LIFE SAFETY AT YOUR SPECIAL EVENT

The Kennedy Space Center Fire Prevention Office is committed to a fire prevention program that places a high priority on the welfare and safety of the public, while minimizing potential fire and life safety hazards. Establishing fire prevention and safety procedures at your special event is an essential component of the event planning process.

As an event organizer you are an important part of our fire safety and prevention team, and we appreciate your participation. It is important that you coordinate with your event promoters, sponsors, and vendors to ensure they are familiar with the fire safety requirements of this document. We look forward to working with you to make your event a safe, successful, and fun experience for everyone who attends.

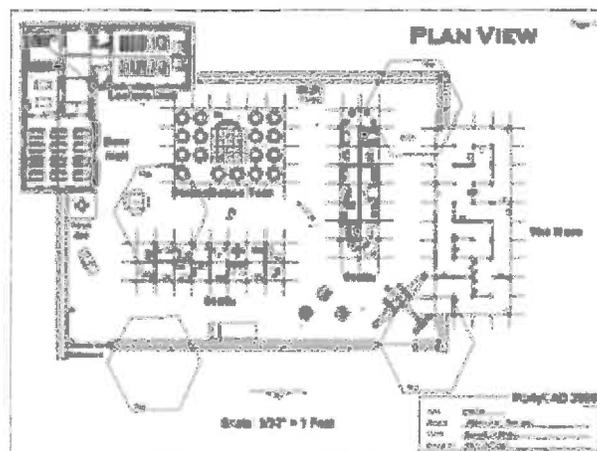


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1. **PURPOSE:** This document establishes the *minimum* fire prevention and life safety requirements to conduct an Outdoor Special Event.
2. **SCOPE:** This document applies to any organized Outdoor Special Event (e.g., Launch Day Events, KSC-Family Day, Organizational Picnics, Air Shows, Concerts, Pyrotechnic Shows, etc.) held on Kennedy Space Center's owned or leased property.

3. APPLICABLE REFERENCE DOCUMENTS

3.1 National Fire Protection Association (NFPA)

NFPA 1	Fire Prevention Code
NFPA 10	Standard for Portable Fire Extinguishers
NFPA 30	Flammable and Combustible Liquids Code
NFPA 58	National Fuel Gas Code
NFPA 70	National Electrical Code (NEC)
NFPA 101	Life Safety Code
NFPA 102	Standard for Grandstands, Folding and Telescopic seating, Tents, and Membrane Structures
NFPA 701	Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
NFPA 1123	Code for Fire Works Display
NFPA 1124	Code for the Manufacture, Transportation, and Storage of Fireworks and Pyrotechnic Articles
NFPA 1126	Standard for the Use of Pyrotechnics Before a Proximate Audience
NASA-STD 8719.11A	Safety Standard for Fire Protection

4. DEFINITIONS *For the purposes of this document, the following definitions shall apply*

- 4.1 **Air-Supported Structure** – A structure whose shape is maintained by air pressure and in which occupants are within the elevated pressure area.
- 4.2 **Authority Having Jurisdiction (AHJ)** – An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials on installation, or a procedure.
- 4.2 **Canopy** - A temporary structure, enclosure, or shelter constructed of fabric or pliable materials supported in any manner other than by air or the contents it protects, which is open, without side walls or drops on 75 percent or more of the perimeter.
- 4.3 **Listed** – Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products of services.
- 4.4 **Outdoor Special Event** – Any organized event held primarily outdoors in an area or location that is atypical from its normal/daily use, or of such significance that extra precautions should be considered for the safety of the attendees. (e.g., NASA Causeway, KSC Press Site, KARS Park, etc.).
- 4.5 **Row** - A row shall consist of two or more structures in a line, or a maximum of two structures abutting on one side, in a line.

Examples of a row:



- 4.6 **Temporary Structure** - Any enclosure or shelter constructed of materials erected for a period of less than 180 days.
- 4.7 **Tent** - Any temporary structure, enclosure, or shelter constructed of fabric or pliable material supported in any manner other than by air or the contents it protects.

5. General Safety Requirements

5.1 A site plan including group seating configurations shall be submitted at least 15 days in advance to the KSC Fire Prevention Office.

5.2. Fire department access roads shall have:

5.2.1 An unobstructed width of not less than 20 feet

5.2.2 A minimum vertical clearance of not less than 13 feet, 6 inches.

5.3 Electrical wiring shall comply with NFPA 70.

5.3.1 Devices including power cords appear to be in good condition and are properly secured to prevent damage.

5.3.2 Appropriate equipment or safeguards are provided for wet and damp locations.

5.3.3 All electrical wiring shall be protected from pedestrian foot traffic.

5.4 Signs, Posters, Wall hangings, displays, draperies, shall not obstruct egress or pose a safety hazard to the public.

5.5 Grandstands and bleachers shall be stable and properly installed per the requirements of NFPA 1 and NFPA 102.

5.6 Folding chairs shall have a minimum clear width between rows of not less than 22 inches measured from the back of one seat to the nearest projection of the seat behind.

5.6.1 Rows of folding chairs served by aisles or doorways at both ends shall not exceed 40 seats per row.

5.6.2 Rows of folding chairs served by an aisle or a doorway at one end only shall not exceed 20 seats per row.

5.7 Folding chairs within a tent in groups of more than 200 shall be:

5.7.1 Secured together in no less than groups of 3.

5.7.2 A minimum 4 foot aisle shall be provided between groups of chairs.

5.8 Folding chairs in an open area:

5.8.1 Cross aisles shall be minimum 4 feet in width.

5.8.2. Main aisles shall be minimum 20 feet in width.

- 5.9 The ground enclosed by tents and the ground for a distance not less than 50 feet outside of the tents is cleared from the storage of all flammable materials. (Exception: Stored LP gas cylinders are secured and located not less than 10 feet from any cooking or heating equipment or any open flame devices).
- 5.10 The ground enclosed by tents and the ground for a distance not less than 10 feet outside of the tents is cleared of all combustible material or dried vegetation.
- 5.11 All fuel powered generators shall have a portable fire extinguisher having a minimum rating of 2A:20BC.
- 5.12 Permits shall be pre-approved for all open flame devices.

6.0 Portable Fire Extinguisher Requirements - NFPA 10

- 6.1 All fire extinguishers shall comply with NFPA 10 *Standard for Portable Fire Extinguishers*.
- 6.2 Portable fire extinguishers having a minimum rating of 2A:20BC are installed in all tents or canopies within 75' of all areas or as appropriate for the event conditions as determined by the AHJ.
- 6.3 An approved Class K extinguisher is provided for deep fat frying equipment.
- 6.4 Extinguishers shall be pressurized, pins installed, seals attached, and current service tags attached.
- 6.5 Fire extinguishers shall be properly mounted or placed on an approved stand (fire extinguishers shall not be placed on the ground or free standing).
- 6.6 Fire extinguishers shall be clearly visible or marked with signs (as determined by the AHJ).



ABC Dry Chemical Extinguisher



Class K Extinguisher

Figure 6.1

7.0 Cooking Operations

7.1 Fire Inspector shall approve all cooking operations and their location prior to commencement of any cooking.

7.2 Fire Inspector shall issue a Hot Work Permit prior to commencement of warming or cooking with an open flame. (Exception: BBQ grills).

7.3 Cooking appliances:

7.3.1 Shall have UL Listing – (Items not authorized: Turkey Fryers, homemade or modified Smokers, BBQ Grills, etc.). See figure 7.1.

7.3.2 Shall be level, stable and secured to prevent tipping or collapsing of appliance.

7.3.3 Not placed within 10 feet of exits, exit access, canopy fabric or membrane.

7.4 Cooking equipment in fixed, mobile, or temporary concessions, trucks, buses, trailers, pavilions, tents or any *Figure 7.1*

form of roofed enclosure, comply with NFPA 96 and have a current service tag.

7.5 Cooking equipment including but not limited to deep-frying, sautéing, and grilling operations are separated from tents or canopies by a minimum of 10 feet.

7.6 Below and to the perimeter of all cooking appliances shall be non-combustible. (i.e., dirt, metal sheet, or other approved material).

7.7 Below and to the perimeter of all open flame cooking equipment is free of dried weeds, grass, or other combustible materials for a minimum of 5 feet (or as required by AHJ).

7.8 An approved Class K extinguisher is provided for deep fat frying equipment.

7.9 An approved portable fire extinguisher having a minimum rating of 2A:20BC is available within close proximity of each cooking location.

7.10 Grills shall be kept cleaned and are free of excessive grease.

7.11 Grills shall have clean grease collection pans in place. An appropriate waste container is provided to collect grease if pans become filled during the event.

7.12 Grills shall be level, stable and secured to prevent them from tipping or collapsing.



7.13 Below and to the perimeter of all grills shall be free of dried weeds, grass and combustible materials for a minimum of 5 feet or as required by AHJ.

8.0 LP Gas Fuel Requirements - NFPA 58

8.1 LP gas cylinders are in good physical condition.

8.2 LP gas cylinders are secured in their upright position with a chain, strap or other approved method to prevent the tanks from tipping over.

8.3 Spare LP gas cylinders are located and secured so that they are not accessible to the public.

8.4 Stored LP gas cylinders are secured and located not less than 10 feet from any cooking or heating equipment or any open flame devices.

8.5 LP gas cylinders in use are not positioned in close proximity or directly below open flames or heating equipment except as designed by the appliance manufacturer. (Manufacture instructions shall be provided and verified as required by AHJ).

8.6 LP gas equipment, hoses and connections appear properly installed and maintained per the requirements of NFPA 58, *Liquefied Petroleum Gas Code*.

8.7 Containers for liquefied petroleum gases shall be installed not less than 5 feet from any tent and shall be in accordance with the provisions of NFPA 58, *Liquefied Petroleum Gas Code*.



Figure 8.1

9.0 Tents, Air - Supported Structures, and Canopy Membranes

9.1 All Tent fabric including side walls and drops shall meet the performance criteria in NFPA 701 *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films*.

9.1.1 AHJ shall require:

9.1.1.1 A certificate or other evidence of acceptance by an organization acceptable to the AHJ showing compliance with NFPA 701.

9.1.1.2 A report of test made by other inspection authorities or organizations acceptable to the AHJ showing compliance with NFPA 701.

9.2 Air supported structures and membrane structures have prior AHJ approval and meet requirements of NFPA 1 and NFPA 102 for safe use.

9.2.1 Standby Power System – A fully automatic standby power system shall be provided to ensure continuous inflation in the event of a failure of primary power.

9.3 Tent Spacing: A minimum of 10 feet between tent stake lines shall be provided.

NOTE: For the purpose of determining required distances, support ropes and guy wires shall be considered as part of the temporary membrane structure, tent, or canopy.

9.3.1 Tents, each not exceeding 1200 ft² in finished ground level area and located in fairgrounds or similar open spaces, shall not be required to be separated from each other, provided that safety precautions meet the approval of the AHJ.

9.3.2 Tents not occupied by the public or for storage of combustible material may be permitted to be erected less than 10 feet from other structures provided that safety precautions meet the approval of the AHJ.

9.4 Where 10 feet between stake lines has not been provided, the distance necessary for means of egress relative to other structures is at the discretion of the AHJ, with consideration given to occupancy, use, openings, exposures, and other similar factors.

9.5 Temporary membrane structures, tents, and canopies and their appurtenances shall be adequately braced and anchored to prevent weather-related collapse. Documentation of structural stability shall be furnished to the Fire Chief upon request.

- 9.6 Exits shall be spaced at approximately equal intervals around the perimeter of the temporary membrane structures, tents and canopy and shall be located such that all points are 100 feet or less from an exit.
- 9.7 Exit signs in temporary membrane structures, tents and canopies shall be installed at required exits and where necessary to clearly indicate the direction of egress when the exit serves an occupant load of 50 or more.
- 9.8 Exit doors (if provided) shall swing in the direction of exit travel.
- 9.9 Exit access and exit openings from tents shall be kept clear and unobstructed at all times.
- 9.10 Exit openings from tents shall remain open unless covered by a flame-resistant curtain as follows:
 - 9.10.1 Curtains shall be free sliding on a metal support. The support shall be a minimum of eight (8) feet above the floor level at the exit. Curtains shall be so arranged that, when open, no part of the curtains obstruct the exit; and
 - 9.10.2 Curtains shall be of a color, or bear markings that will contrast with, the color of the tent.

MINIMUM NUMBER OF EXITS AND EXIT WIDTHS FOR

TEMPORARY MEMBRANE STRUCTURES, TENTS AND CANOPIES* Occupant Load	Minimum Number Of Exits	Tent or Canopy Exit Opening Size	Air-supported Structure Exit Opening Size
10 to 199	2	72 in.	36 in.
200 to 499	3	72 in.	72 in.
500 to 999	4	96 in.	72 in.
1,000 to 1,999	5	120 in.	96 in.
2,000 to 2,999	6	120 in.	96 in.
Over 3,000	7	120 in.	96 in.

Figure 9.1

- 9.11 Emergency lighting shall be provided as required per NFPA 101.
- 9.12 Comfort air shall be ducted inside from equipment located exterior of the tent.
- 9.13 Arrangement of tents, air-supported structures, and canopies shall comply with the following:
 - 9.13.1 A row shall consist of two or more structures in a line, or a maximum of two structures abutting on one side in a line.

Examples of a row:



Figure 9.2

- 9.13.2 A row shall not exceed 200 feet in length without a minimum separation of 20 feet.
- 9.13.3 Rows shall be separated by a minimum of 20 feet.
- 9.14 The ground enclosed by the structure, and the surrounding ground not less than 10 feet outside of the structure, shall be cleared of all flammable or combustible material and vegetation.
- 9.15 No guy wire or ropes cross any means of egress at a height of less than 7 ft.
- 9.16 A flag or other similar means shall be attached to support ropes and guy wires to increase visibility and reduce the chance of injury.
- 9.16 Tent stakes adjacent to means of egress from any tent are railed/roped off, capped, or covered so as not to present a hazard to the public.
- 9.17 No Smoking signs shall be posted in all tents.
- 9.18 Where smoking is permitted, an adequate number of approved smoking receptacles shall be provided.

10. Fire Works Displays & Use of Pyrotechnics Before a Proximate Audience NFPA 1123 and NFPA 1126

10.1 All show events and documentation provided by company/operators shall be in COMPLETE COMPLIANCE with *NFPA 1123 Code for Fire Works Display* and *NFPA 1126 Standard for the Use of Pyrotechnics Before a Proximate Audience*.

10.2 An inventory list of pyrotechnics shall be provided.

10.3 Before the performance of any production, the permittee shall submit a plan for the use of pyrotechnics to the AHJ per NFPA 1123 and 1126.

10.4 A site plan plotted with distance requirements for the following:

10.4.1 Pre-show plan storage of pyrotechnics (if stored on KSC property)

10.4.2 Show plan with crowd control, wind fall out distances

10.5 Pyrotechnic materials and devices shall not be stored within 50 ft of any unprotected source of heat or open flame.

10.6 All pyrotechnic operators shall be

10.6.1 At least 21 years old and licensed or approved by the authority having jurisdiction in accordance with any and all applicable laws.

10.6.2 All assistants shall be at least 18 years old.

10.6.3 Proof of ages shall be provided to the AHJ.

10.7 Four or more fire extinguishers of the classification and size as approved by the AHJ shall be readily accessible while the pyrotechnics are being loaded, prepared for firing, or fired. In all cases, at least two pressurized water, Class 2-A extinguishers and two Class 10-BC extinguishers shall be provided.

10.8 Portions of fire detection and life safety systems shall be permitted to be interrupted during the operation of temporarily installed pyrotechnic effects when the following conditions are met:

10.8.1 Approval by the authority having jurisdiction

10.8.2 Approval by the owner or owner's agent

10.9 Presence of an approved **fire watch** capable of directing the operation of all fire detection and life safety systems installed in the building.

10.9.1 The **fire watch** shall remain present until the restoration of normal operating conditions has been verified.

10.10 All pyrotechnic devices shall be mounted in a secure manner to maintain their proper positions and orientations so that, when they are fired, the pyrotechnic effects described in the plan submitted by the permittee are produced.

10.11 Each pyrotechnic device fired during a performance shall be separated from the audience by a minimum of 15 ft or twice the fallout radius of the device, whichever is greater, except where otherwise approved by the authority having jurisdiction.

10.12 There shall be no glowing or flaming particles within 10 ft of the audience.

10.13 Concussion mortars and concussion effects shall be separated from the audience by a minimum of 25 ft.

10.14 Smoking shall not be permitted:

10.14.1 Within 25 ft of the area where pyrotechnics are being handled or stored.

10.14.2 NO SMOKING signs shall be conspicuously posted (as deemed necessary by AHJ).

10.15 Pyrotechnic devices shall be fired only when the area where the effect is to occur is in clear view of the pyrotechnic operator or an assistant who is in direct communication with the operator.

10.15.1 Direct communication with the pyrotechnic operator or assistant shall be permitted to be accomplished using signal lights or other nonverbal means of communication. While the authority having jurisdiction has the authority to stop the firing of pyrotechnics, the ultimate responsibility for firing shall be that of the pyrotechnic operator.

10.16 No pyrotechnics shall be left unattended other than in a secured location approved by the event sponsor, security, and the AHJ.

10.17 Any unfired or misfired pyrotechnic materials or devices shall be disposed of in accordance with the manufacturer's recommendations.

10.18 Life safety and other systems that have been disarmed or disengaged shall be restored to normal operating condition as soon as the likelihood of false alarms from the use of pyrotechnics has passed.

10.19 All required forms, documents, permits, and other requested material shall be presented to the AHJ at least 15 days prior to commencement of event for final approval.

10.20 Final Permit: Fire Inspector shall issue a Hot Work Permit prior to commencement of the firing of any device.