Fire Safety Guidance for

Temporary Structures at Elstree Studios

Appendices

Version	v1.1
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Contents

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APPENDIX A

Evacuation Procedures

Dependent on the complexity of the production, particularly where there is a use of multiple temporary structures RP needs to ensure their plan includes:

- how people will be warned if there is a fire;
- what production members should do if they discover a fire;
- how live performances will be stopped;
- the duties and identity of staff who have specific responsibilities if there is a fire;
- how you will communicate with a live audience;
- arrangements for the safe evacuation of people identified as being especially at risk, such as those with disabilities and children.
- procedures for checking whether the temporary structure have been evacuated
- where people should assemble after they have left the premises and;
- how the Fire Service, and any other necessary services, will be called and who will be responsible for doing this.

APPENDIX B

Fire protection including Fire Alarm Systems

BBC Studioworks are able to provide, install and manage a temporary alarm system whilst the temporary structure/s are in place. BBC Studioworks will carry out a survey of the proposed temporary structures and, based on the types of structures and activities within, provide suitable automatic fire detection, connected to a panel which links to the main site fire alarm system.

- Portable accommodation with a permanent link to an existing building, or within 10m of an existing structure, should be provided with an automatic fire detection and alarm (AFD) system of the same category, as defined in BS 5839-1 (ref. 24), as the main building. The installation should be linked to the main indicator and control panel to allow it to be monitored remotely (where applicable), and tested at the same time each week as the existing facilities.
- Portable accommodation on other parts of the site should be provided with an AFD system as determined by a fire risk assessment. The systems should be managed as for other installations on the premises.
- Shipping containers used for the storage of combustible or hazardous materials should be provided with an AFD system as determined by a fire risk assessment.
- The AFD should be linked to the existing building's fire alarm system and tested weekly
- A suitable number of appropriate portable fire extinguishers should be available and immediately accessible in the case of a fire. Such portable extinguishers should be approved and certificated by an independent, third party certification body and be installed in accordance, inspected and maintained in compliance with relevant standards.
- All portable firefighting equipment should be easily and safely accessible.
- In a simple location, with relatively low numbers, installing an AFD system may not be practicable and alerting occupants could be achieved using a simple Air Horn. In larger stages and Locations, radio linked battery operated Call Point/sounders could be used.
- In a studio buildings and some temporary structures (such as portable cabins within 10m of the building), it should be a reliable electronic system, with call points and sounders.
- All fire alarm systems must be tested at least weekly.
- The fire warning sound levels should be loud enough to alert everyone, taking into account any background noise. Any sound system should be muted when the fire alarm sounds.
- In areas with uncontrollable high background noise, the audible warning should be supplemented, e.g. with a visual alarm.
- Whatever the method, everyone should be briefed how the fire alarm will be raised.

For any structure – existing or temporary, if the production is planning to isolate any automatic fire alarms, due to the use of atmos/haze/smoke effects, then the RP must put strict isolation procedures in place, including using alternative methods of raising the alarm such as air horns, site alarms or extra Fire Watch Wardens.

APPENDIX C

Emergency Exits

As your escape routes need to be adequate for the number of people likely to use them, you will first need to consider how many people, including staff, public and others such as contractors, may be present at any one time.

- You need to know precise numbers of persons present in your temporary structures and effectively manage them to ensure maximum occupancy levels are not breached. This must be identified within the fire safety questionnaire *contained within the main guidance document*.
- If there is only one useable escape route, then the maximum that is allowed in that space is 60 persons.
- Any fire escape route, should never be less than 750mm wide, 900mm if there are wheelchair users.
- If drapes or cyclorama cloths are in use, there should also be openings in them so as to access the fire escape routes. Two or more openings (or overlaps) should be provided and indicated.
- Drapes and cyclorama are placed in front of exit doors, across escape routes or obstruct any Fire escape signage, then mitigating controls such as temporary signage and/or trained Fire Wardens should be provided to guide persons out of the temporary structures.
- From any marquee or temporary structure, the minimum width of any exit should be not less than 1.05m.
- Where more than 60 people are accommodated, there should be not less than two exits, separated by a distance which limits the possibility that both will be affected by a fire at the same time.
- An exit width of at least 1.05m can accommodate up to:
    - 160 people in higher risk premises;
    - 200 people in normal risk premises; or
    - 240 people in lower risk premises.

Travel distances

Having established the number and location of people and the exit capacity required to evacuate them safely, you then need to confirm the number and location of exits required. This is normally determined by the distance people have to travel to reach them. The following table provides suggest guidance on travel distances. However, you should understand that these distances are flexible and may be increased or decreased depending the level of risk after you have put in place appropriate fire-prevention measures.

Type of structure	Escape route	Suggested travel distance
Marquee or tent	Where more than one escape route is provided	18m
	Where only a single escape route is provided	6.5m
Pneumatic structure	Where more than one escape route is provided	12m
	Where only a single escape route is provided	not applicable
Other temporary enclosure	Where more than one escape route is provided	25m in higher fire risk areas 45m in normal fire risk areas 60m in low fire risk areas
	Where only a single escape route is provided	12m in higher fire risk areas 18m in normal fire risk areas 25m in low fire risk areas

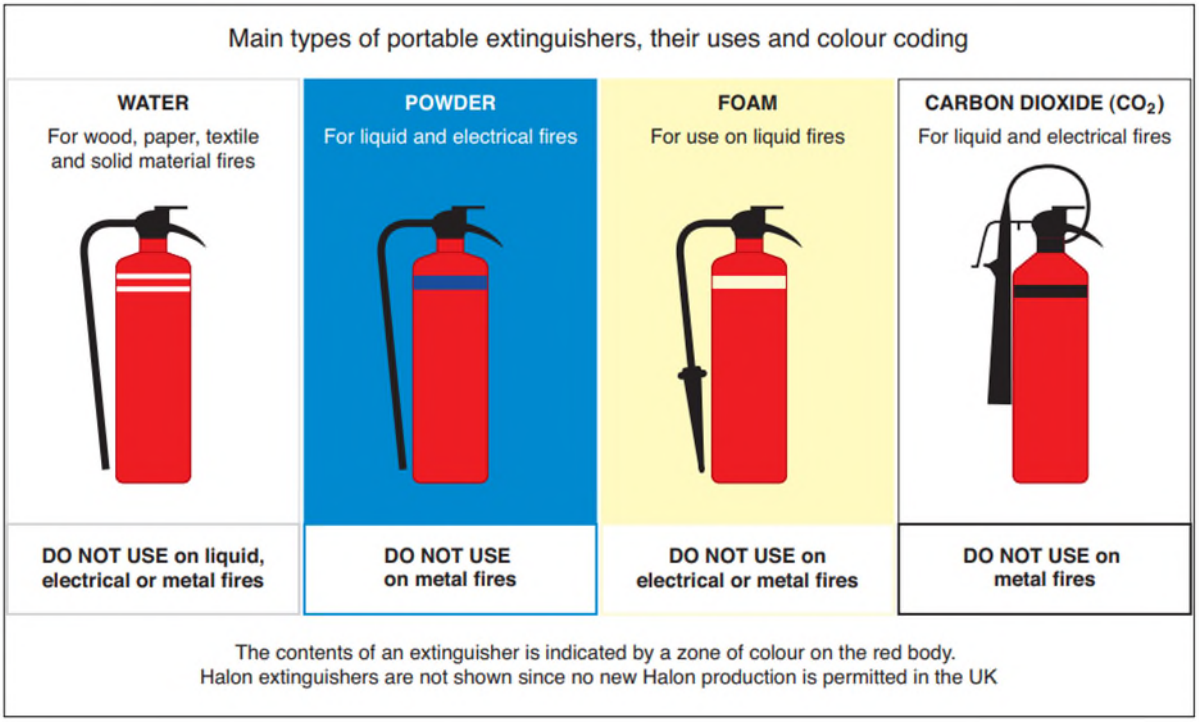
Measuring travel distances

- Includes the route taken though a room or space as determined by the layout of its contents.
- Good practice to ensure that routes to the exits are kept as direct and short as possible.
- Where the contents are moved around or the space is liable to frequent change, you should ensure that the exits and the routes to them do not become blocked and that the length of the route is not significantly extended.

APPENDIX D

Fire extinguishers

- Fire Extinguishers are designed to tackle SMALL fires. A laptop or a waste paper bin for example.
- If the fire doesn't go out after using one extinguisher. it's too big to fight! You shouldn't go for a second one – leave the building.
- Fire Extinguishers should really only be used if you have been trained AND it is safe to do so.
- However in an emergency, they are quite simple to use. It's more important to choose the correct type….



- The RP must ensure there are fire extinguishers to protect escape route, and to cover hazards such as generators, heaters, and any SFX.

APPENDIX E

Combustible materials

All items of scenery and props should be flame or fire proof to the following standards:

Wood……BS476:7 Class 1
Fibreglass ……BS476:7 Class 1
Drapes, Curtains and Window Blinds……BS 5867 and BS EN 13773
Carpets……BS4790
Beds and Mattresses……BS6807 and BS7176 / BS7177
Upholstered Furniture……BS5825

Where paints, solvents, adhesives and other similar items are used in temporary structures they should be water based and fire retardant where applicable. Therefore, any props, furnishings and other materials which are easily ignited or have rapid spread of flame characteristics should be avoided.

All fabrics, curtains, drapes and similar features should either be non-combustible, or be of durably or inherently flame-retardant fabric, or be treated to make them so.

Polystyrene

If it is unavoidable to use polystyrene on sets, the amounts should be kept to a minimum and material treated with a flame retardant should be used.

Polystyrene foam should be treated as if it were a highly flammable liquid. Further guidance is available in BS 7176 and BS 1892-2.

Greenery

Any greenery used in temporary structures (e.g. dried branches, hay, straw, grass, plants, etc) should be suitably flame proofed.

In the case of straw and hay for use as fodder or bedding for animals, this must not be flame proofed and therefore a suitable risk assessment put in place to mitigate the risk of fire

Only the minimum amount of untreated material should be kept on site and in a suitable location

Other non-flamed proofed greenery should be kept dampened down at regular intervals.

APPENDIX F

Fire resistance of temporary structures:

- The walls and roof of portable accommodation units should achieve 30 minutes fire resistance from inside to out (integrity and insulation) as defined in BS 476 parts 20 and 22 (refs. 17 and 18), or BS EN 1363-1 (ref 19)/BS EN 1363-2 (ref 27) and BS EN 1364-2 (ref 29). The windows should achieve 30 minutes fire resistance (integrity) to BS 476 parts 20 and 22 (refs. 17 and 18), or BS EN 1363-1 (ref 19)/BS EN 1363-2 (ref 27) and BS EN 1364-1 (ref 28), and be securely closed when the area is unoccupied.
- Doors to portable accommodation units should provide at least 30 minutes fire resistance (integrity and insulation) and be fitted with appropriate intumescent strips and smoke seals. They should also be equipped with self-closers capable of shutting the door against the latch, and be
  securely closed when the area is unoccupied.
- All openings for services should be fire-stopped to provide at least 30 minutes fire resistance in terms of integrity.
- Where portable accommodation units are stacked vertically, the roof/floor assembly and elements of construction supporting them should provide at least 30 minutes fire resistance (integrity, insulation and load-bearing capacity) as defined in BS 476 parts 20 and 22 (refs, 17 and 18), or in BS EN 1363-1 (ref 19), BS EN 1363-2 (ref 27) and BS EN 1365-2 (ref 30). They should also comply with relevant Building Regulations requirements where necessary.
- Insulating materials between inner and outer skins of panels should preferably be non-combustible.

APPENDIX G

Site layout

For portable accommodation not including marquees and tents:

- Portable accommodation should be located so as to provide ease of access for the fire and rescue service. Any accommodation introduced to a site must not obstruct access for firefighting vehicles to other parts of the site. In all cases clear access must available to hydrants and access points for other critical services.
- Where multiple portable accommodation units are interlinked on site to form a large structure, care should be taken not to introduce hidden voids.
- Escape routes should be provided from all forms of portable accommodation to a place of safety away from the building; the provision and protection of these should be as in the case of an equivalent permanent facility. Appropriate fire compartmentation should also form part of the structure.
- Where portable accommodation is separated from established buildings, a fire break as wide as possible – ideally at least 10m – should be provided. it is recognised that this may not be practicable on city centre and similar sites where space is at a premium.
- Where portable accommodation is to be directly linked to a permanent building or located within an existing structure, the insurers of the property should be consulted at the planning stage.
- Where portable accommodation is to be located at a raised height in excess of 7.5m from fire service access level or at basement level, the fire and rescue service should be consulted prior to work commencing.
- Rows of temporary buildings should be separated to provide a fire break of at least 10m between adjacent structures. Where this is not practicable, windows facing the fire break should be fixed shut and the glazing designed to provide at least 30 minutes fire resistance.
- Shipping containers used on site for storage should, where possible, be located at least 10m from permanent structures, with the doors kept closed when not in use. Unenclosed storage should be no closer than 10m from portable accommodation units.
- Where accommodation units are stacked, stairways should be provided and protected as in the case of an equivalent permanent structure. Particular care should be taken in the case of external stairways to ensure that glazing in doors and windows (other than toilet windows), within 1.8m horizontally and 9m vertically below the stairs, should provide at last 30 minutes fire resistance (ref. 32).
- Ideally external stairways should be enclosed, but where this is not practicable management procedures should be put in place to ensure that the stairs are maintained and regularly cleaned.

APPENDIX H

Surface spread of flame:

For portable accommodation not including marquees and tents:

- Internal and external walls should be manufactured from non-combustible materials or those of limited combustibility – that is to say, materials meeting Euroclass A1 or A2 respectively when tested in accordance with BS EN ISO 1182 (ref. 31).
- The external surface of the roof should meet the EXT F.AA level of performance set out in BS 476-3 (ref. 22) or Broof-(t4) when tested in accordance with BS EN 13501-5 (ref. 23).

For Marquees and tents:

- All materials should meet an appropriate fire performance. Further guidance can be found in BS 7837. The information can be attained from the manufacturer/supplier of the Marquee/Tent.
- Linings should only be used if constructed from flame retardant material.
- Floor coverings may be re-usable or disposable and should have low flame spread characteristics.

For further information about tents and marquees contact The Performance Textiles Association (PTA); and/or consult chapter 12 of the Institution of Structural Engineers document, Temporary demountable structures30 and/or the Event Safety Guide.10

For air supported structures

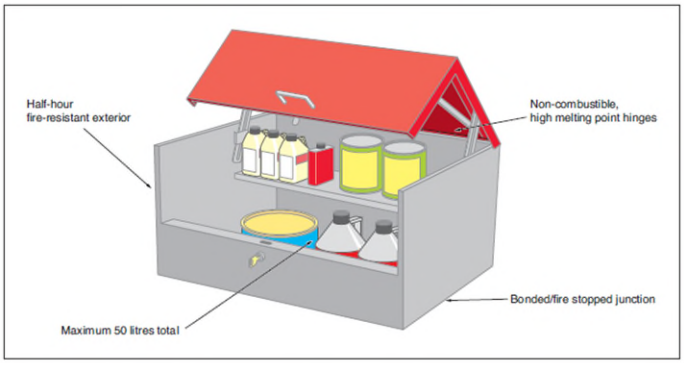
- Reliable air supply system supplemented by secondary support systems to maintain clear exit routes should the structure collapse due to loss of air pressure compromising evacuation routes.
- Ensure adequate ventilation.
- Membrane of an air supported structure should not readily support combustion.

APPENDIX I

Flammable Liquids

- Storage and use of highly flammable liquids must be carefully managed.
- Ensure materials contaminated with solvent are properly disposed of and when not in use, they are safely stored.
- Up to 50 litres may be stored in a fire-resisting cabinet or bin that will contain any leaks. See *Picture 1* below.
- Quantities greater that 50 litres should be stored in a dedicated highly flammable liquids store. *Further guidance on the storage of highly flammable liquids in containers is available from the HSE.*
- There should be no potential ignition sources in areas where flammable liquids are used or stored and flammable concentrations of vapours may be present.
- Any electrical equipment used in these areas, including emergency escape lighting systems, needs to be suitable for use in flammable atmospheres.
- In such situations, you should seek advice from a competent person.

Picture 1



APPENDIX J

LPG use, storage and disposal

- Minimum amount of LPG onsite.
- Locate the LPG cylinders in and cartridges in a safe, secure and well-ventilated place,
- Kept upright (with valve protection fitted)
- Away from sources of ignition and/or readily ignitable materials
- Away from any corrosive, toxic or oxidant materials.

Further guidance on the safe storage of LPG is available from your supplier or the Liquefied Petroleum Gas Association's Code of Practice.

APPENDIX K

Storage and use of cylinders

Only those compressed gas cylinders or gas vessels containing flammable liquids or gas under pressure required for immediate use should be kept within the premises. Any spare cylinders should be stored in a safe and secure location outside the building.

APPENDIX L

Use and storage of hazardous materials.

- Control of Substances Hazardous to Health risk assessments should be undertaken for all hazardous materials brought to site.
- Safety Data sheets should be kept on file and accessible in an emergency.
- All hazardous materials should be stored in line with the specifications of their safety sheet.
- Shipping containers used for the storage of combustible or hazardous materials should be provided with an automatic fire detection system as determined by risk assessment.
- Ensure that the quantity of all pyrotechnics, fireworks and other hazardous equipment are kept to a minimum. Additionally ensure that they are stored safely and securely until they are used;
- substitute highly flammable substances and materials with less flammable ones; reduce the quantity of dangerous substances to the smallest reasonable amount necessary; correctly store dangerous substances, e.g. in a fire-resisting enclosure.
- All flammable liquids, and gases substances should ideally be locked away, especially when the events or venues are unoccupied, to reduce the chance of them being used in an arson attack. This may include storage of materials such as fireworks or pyrotechnics; and ensure that you and your employees are aware of the fire risk the dangerous substances present and the precautions necessary to avoid danger.
- Certain substances and materials are by their nature, highly flammable, oxidising or potentially explosive. These substances are controlled by other legislation in addition to fire safety law, in particular the Dangerous Substances and Explosive Atmospheres Regulations 200213 (also see HSE's Approved Code of Practice and guidance14).
- If portable accommodation units are used for the storage or handling of hazardous substances, an assessment should also be undertaken in accordance with the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR) (ref. 10) and requirements of COSHH risk assessment.

APPENDIX M

Fireworks, explosives and use of real flames

- Any activities using and/or storing fireworks, explosives or real flames must be first approved with BBC Studioworks.
- Where real flame is used, a competent SFX person should be in control of the effect, and a trained member of the production should monitor the activity and have an appropriate fire extinguisher readily available.

APPENDIX N

Equipment and machinery

Heating

- all heaters should be kept well clear of combustible materials and placed where they do not cause an obstruction, particularly to escape routes.
- portable fuel burning heaters (including LPG) should only be used in public areas in exceptional circumstances and if shown to be acceptable in your risk assessment, and unless specifically designed for use in the open air such heaters should be sited away from draughts.

Cooking processes

The following should be considered, as appropriate to the size and location of the installation, to reduce the fire risk from cooking processes:

- regular cleaning to prevent build-up of crumbs and other combustible material;
- fire resisting containers for waste product;
- a fire suppression system capable of controlling an outbreak of fire (these could be fitted within a mobile catering vehicle);
- monitored heat/oil levels, even after the cooking process is complete, and installation of temperature control/cut-off/ shut-off devices as appropriate;
- duct, joints and supports able to withstand high cooking temperatures;
- insulation of ducts to prevent heating/igniting nearby combustible materials and wall/ceiling panels;
- a regular programme for inspection and cleaning;
- a programme of electrical and mechanical maintenance; and
- annual service of all gas heating appliances by a competent person.

APPENDIX O

Electrical Safety

Issues to consider include:

- insulation earthing and electrical isolation requirements;
- cable routing and fixing;
- correct fuse ratings;
- PAT testing and testing of the fixed installation;
- protection against overloading of installation;
- use of residual current devices (RCDs)
- protection against short circuit;
- frequency of electrical inspection;
- temperature rating and mechanical strength of flexible cables;
- portable electrical equipment, including lanterns;
- physical environment in which the equipment is used (e.g. wet or dusty atmospheres);
- use and maintenance of suitable personal protective equipment; and
- voltage of the electrical equipment, (e.g. 110v or lower).

APPENDIX P

Emergency escape lighting

- For simple sites or venues with very small numbers of people, suitably placed torches for use by trained staff or volunteers may be acceptable.
- At larger sites or venues it is likely that a more comprehensive system of automatic emergency escape lighting will be needed to illuminate the escape routes and you should consult with a suitably qualified person for the type and specification of installation required.
- Where appropriate, emergency lighting should be installed in accordance with BS 5266 (ref. 15). It should be tested monthly, with records being kept and maintained in accordance with BS 5266 by a competent electrician.
- An emergency escape lighting system in a marquee, tent or other temporary structure should normally cover the following:
    - each exit door;
    - escape routes;
    - assembly areas;
    - intersections of escape routes;
    - emergency escape signs;
    - stairways and steps so that each flight
    - receives adequate light;
    - changes in level;
    - windowless rooms and toilet accommodation exceeding 8m2;
    - firefighting equipment;
    - fire alarm call points;
    - equipment that would need to be shut down in an emergency; and
    - areas greater than 60m2.

APPENDIX Q

Signs and notices

Signs must be used, where necessary, to help people identify escape routes/exits, find fire-fighting equipment and emergency fire telephones. These signs are required under the Health and Safety (Safety Signs and Signals) Regulations 19967,8 and must comply with the provisions of those regulations.

Notices

Notices must be used, where necessary, to provide the following:

- Instructions on how to use any fire safety equipment
- The actions to be taken in the event of fire
- To help the fire and rescue service (e.g. to show the location of fire water mains)

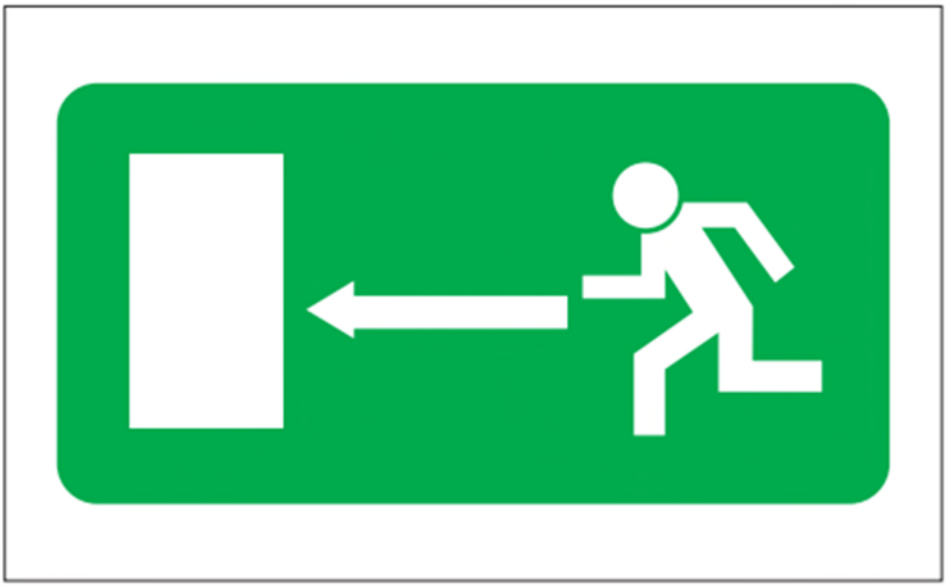
Example of simple fire actions notice:

Emergency signs

- they should provide clear, unambiguous information to enable people to safely leave a building or structure in an emergency;
- every escape route sign should, where necessary, incorporate, or be accompanied by, a directional arrow. Arrows should not be used on their own;
- if the escape route to the nearest exit is not obvious then it should be indicated by a sign(s); and
- signs should be positioned so that a person escaping will always have the next escape route sign in sight.
- sign to comply with signs and signals regulations it must be pictographic

Figure 25: BS-type sign

Figure 26: Euro sign



Where your site or venue is used during periods of darkness all signs and notices should be illuminated by a suitable lighting installation.

All signs and notices should be positioned so that they can be easily seen and understood.

APPENDIX R

Weather

The weather should be continually monitored throughout the day in particular:

- Lighting storms and risk of lightning strikes with consideration given to emergency procedures.
- Impact of adverse weather conditions (such as heavy rain); particularly in relation to electrical equipment and slip hazards compromising evacuation routes.
- The weight of heavy snow on the roof of marquees/tents and high winds that may affect structural integrity.
- A visual inspection should always be carried out by a competent person after any adverse weather conditions

APPENDIX S

Arson

- ensure that the site is well lit and, if practical, secure the perimeter of the site
- make sure that any people working late or alone still have adequate escape routes;
- do not place rubbish skips adjacent to occupied areas and secure waste bins in a compound separated from occupied areas;
- make sure you regularly remove all combustible rubbish;
- do not place vehicles, caravans or other portable structures adjacent to occupied areas;
- encourage staff to challenge people acting suspiciously;
- secure flammable liquids so that intruders cannot use them;
- remove automatic entry rights from staff who have been dismissed; and
- ensure that your security, alarm/fire-detection system is monitored and acted on.

APPENDIX T

Types of temporary structures:

Catering facilities are any type of temporary structures where food is either cooked or heated. Due to the nature of cooking activities this of course potentially increases ignition sources and fuel so additional controls would be expected to reduce the risk of fire and identified within the production fire risk assessment.

Tents and Marquees are very similar generally material over a steel frame. Marquees tend to be larger with higher apex roofs.

Pneumatic Structures are the special type of structure which is generally characterized by the slightly higher air pressure of internal surrounding.

The pneumatic structure is a membrane structure which is stabilized with the help of the compressed air.

There are mainly two types of Pneumatic structures

- Air supported pneumatic structures
- Air inflated pneumatic structures

Portable Offices/Cabins

Portable cabins are prefabricated structures manufactured for uses such as site office, security cabin, accommodation, storage, toilets etc.

Portaloos/toilet cabins

Two main types:

Single user without hand washing facilities

Multi-user with or without hand washing facilities

Shipping containers

A shipping container is a container with strength suitable to withstand shipment, storage, and handling. Shipping containers range from large reusable steel boxes used for intermodal shipments to the ubiquitous corrugated boxes. In addition to their original use for storage it is becoming more frequent that these are being repurposed for a host of other purpose such as office space/storage/toilets etc.

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