

Safe design and build of production sets used for film, television and media productions

HSE information sheet

Introduction

In this information sheet, 'must' denotes a legal obligation. Words such as 'do', 'should' etc are used to give advice on good practice.

This information sheet is one of a series produced in consultation with the Joint Advisory Committee for Entertainment (JACE). It gives specific advice on the design, manufacture and build of production sets used for television, film or media productions.

Poorly designed, manufactured and built sets can present hazards to those working or performing on and around them. Priority should be given during the design stage to ensure the set can be assembled, constructed and used safely. These considerations should carry through to the site where the set is constructed and used. The design should also consider safe deconstruction and removal of the set.

Legislation

The main legal requirements covering design and build of sets are the Health and Safety at Work etc Act 1974 and the Management of Health and Safety at Work Regulations 1999 (the Management Regulations). The Management Regulations require a suitable and sufficient risk assessment to be carried out by employers (or self-employed people) to assess the risk to employees and others who may be affected by their activities and to determine the control measures necessary to avoid risk or reduce it to acceptable levels. An opportunity arises during risk assessment to consider the application of any other relevant health and safety legislation, including the requirement to consider fire precautions and emergency procedures.

The Construction (Design and Management) Regulations 2007 affect everyone who is involved in the construction process. Although the CDM Regulations are not likely to apply to most set building activity, there may be occasions when they will. This is most likely to be the case where particularly large or complex sets are involved. More sources of information on the CDM Regulations can be found in Further reading.

Entertainment Information Sheet No 19 (Revision 1)

Hazards

These include, but are not limited to:

- unsafe structures resulting from poor design;
- use of poor quality or unsuitable materials (sharp or unfinished edges, protruding nails etc);
- poor manufacture;
- increased fire risk from the use of unsuitable materials:
- hazardous substances;
- manual handling difficulties caused by heavy and bulky scenery items etc:
- trips and slips on uneven or unsuitable floor surfaces, uneven steps or stair treads;
- inadequate edge protection and/or handrails on open edges:
- failure to provide handrails;
- falling objects (eg scenery or lamps inappropriately suspended or poorly rigged);
- electrical shock or burns from unsafe electrical equipment, or inadequate earthing;
- entrapment and entanglement in unguarded or unprotected mechanical devices;
- visual and/or special effects;
- use of glass on or in the set;
- use of scaffold structures;
- hazards associated with seating provision.

Responsibility

Responsibility for the safety of a production set or scenery lies with the producer and the designers and construction team.

The producer is responsible for ensuring the overall safety of any production and that a competent designer/s and construction team are appointed, with the specific health and safety responsibilities of each member clearly stated and understood. The designer/s and construction team should be provided with information on the nature of the production and any known risks. Adequate resources should be made available so that health and safety standards are not compromised.

The designer/s and construction team are responsible for making sure the set or scenery is designed and manufactured to meet safety requirements and to minimise any identified risk during its entire lifetime. They should arrange for a risk assessment to be conducted for the set or scenery that considers possible risks to all those using the set, including the scene crew, cast, production team and other contractors.

Information regarding the safety of the set gathered from the designer and construction team should be clearly communicated to all parties through the production's own arrangements. Any safety measures required by the designer and construction team, or identified from routine inspections, should be implemented.

The producer and designer are to make sure that adequate controls are put in place to ensure safe design and build of sets by:

- ensuring only competent scenery constructors are used and are properly briefed as to the purpose of the set, are given adequate information about the specification of the set and sufficient resources to complete the construction safely;
- ensuring adequate resources are allocated making sure ongoing health and safety standards are not compromised;
- clearly identifying any areas in the set location where there may be hazards or restrictions that may have safety implications;
- ensuring adequate information regarding the specification for the set is communicated effectively;
- requiring that measures are put in place to ensure all specified and mandatory inspections/ examinations are conducted as necessary;
- periodically checking that systems remain in place and are effective to ensure risks to all parties are adequately controlled at all stages during the scenery's life cycle.

The designer/construction team are to make sure;

- details are provided to the producer about any required inspection, testing or maintenance of the set;
- all inspections, tests or certification required during the construction are completed and provided to the producer;
- the construction complies with all relevant standards and legal requirements;
- suitable and sufficient risk or other (eg COSHH) assessments are conducted for the manufacture of the set:
- only competent scenery constructors are employed and are briefed as to the purpose of

- the set, given adequate information about its specifications and are provided with the resources to complete the construction safely;
- all electrical fittings and attachments comply with current standards.

Any set build/de-rig team employed is responsible for making sure that:

- scenery is built, installed, rigged and dismantled safely in line with the information provided by the competent designers;
- they cooperate with the designer at all times on health and safety matters;
- only competent staff or subcontractors are employed;
- only safe and suitable equipment or materials are used.

Risk assessment

The producer must make sure that a suitable and sufficient risk assessment is completed by the designer/construction team and that it identifies appropriate control measures for any sets or scenery, including props. The risk assessment should set out risks to members of the production team, artists, crew, other contractors, contributors and other parties. Where appropriate, assessments should be supported by calculations or certification. The following areas should be considered in the assessment, as appropriate:

Fire

The risk of fire is high on temporary sets due to their construction materials. A suitable fire risk assessment must be completed for sets as required under the Regulatory Reform (Fire Safety) Order 2005 (the Fire Safety Order) and control measures identified therein implemented. These may range from the simple provision of appropriate fire extinguishers for smaller sets, to alarms, evacuation plans and major fire fighting plans for larger, more complex sets.

Suspended scenery items

The provisions within the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER) and The Provision of Work Equipment Regulations 1998 (PUWER) must be complied with for all sets/scenery incorporating suspended or flown items (eg maintenance and inspections). Measures to achieve compliance with these legislations should be specified within the risk assessment.

Scaffolding and supporting trusses

Working scaffolds and supporting trusses, whatever

their intended purpose, should be designed and built by competent people. Each structure should be built to ensure it is safe for its intended purpose and inspected at appropriate intervals.

Electrical installation, integrity and protection

It is important that competent electrical advice be sought early on in the design of sets to ensure that fittings and wiring can be routed and mounted so that they are safe. A competent electrician should undertake the work of fixing and wiring-up electrical fittings and fixtures. The essential principles are covered in both BS 7671 and/or BS 7909 (see Further reading).

Gas/LPG

The installation of gas appliances, whether supplied from mains or from liquefied petroleum gas (LPG) from fixed or transportable cylinders, should only be done by a competent person. Gas appliances need good, general and fixed ventilation so that combustion products are safely dispersed.

Water

Water tanks or containers should be properly designed to ensure that they are suitable for the intended use and adequately tested for leakage prior to use. Normal practice should include the provision of secondary containment. Ensure the water source is free from contamination, including bacteriological contamination, especially legionella. Water treatment may be necessary if the water is retained.

Machinery and equipment

Equipment or machinery, either integral to the set or used during its construction, needs to meet the requirements of the Provision and Use of Work Equipment Regulations 1998. The main requirements are that:

- it is appropriate for its intended use:
- all dangerous or moving parts are adequately guarded;
- the controls are accessible and understandable;
- emergency stops are fitted and provide isolation from power source, if required;
- adequate information on its safe use and operation is provided.

Pressure systems

Production sets incorporating hydraulic and pneumatic assemblies as part of the operating systems should be built to current standards, especially if failure could result in injury.

Designs should be subject to failure mode analysis carried out by a competent engineer, to ensure that all critical components fail to safety. Once built, an installation should be subjected to an initial test to check the safety critical elements, such as switches, valves, variable controllers (eg pressure regulators) and overload protection (eg pressure-release valves) are properly set and functional. Thereafter, pressure systems should be subject to a regular periodic thorough examination as recommended by a competent person in a written scheme of examination. Any system with an operating pressure of 0.5 Bar or above or using steam at any pressure will be subject to the Pressure Systems Safety Regulations 2000.

Falls from heights

There is no prescription in the Work at Height Regulations 2005 (WAHR) regarding the height at which precautions should be taken to prevent a person falling a distance, likely to cause personal injury. Risk assessment should be used to decide whether precautions are needed and in what form. Where it is not possible to avoid the need to work at height, there are three basic ways of minimising the risk, in order of preference:

- use of work equipment to prevent a fall, eg edge protection – parapet, guard rails, mobile elevated work platforms (commonly known as cherry pickers);
- personal fall prevention and work restraint systems etc:
- work equipment which minimises the consequence of a fall, eg soft landing systems (such as nets at low level). See Further reading for more information.

Manual handling

To comply with the Manual Handling Operations Regulations 1992 (MHOR) (as amended 2002), consideration should be given to manual handling issues at the design stage to reduce problems by:

- reducing the weight of individual sections so far as reasonably practicable;
- providing handles or similar at suitable points on all bulky or heavy items;
- ensuing that heavy or off centre set pieces are marked as appropriate.

Where specific controls are likely to be required, the designer should make sure that such information is provided to the producer or contractors in advance of the scenery being delivered.

Audience seating

Audience seating must be fit for purpose, inspected as appropriate and meet any local licensing requirements. With temporary seating, it is advisable to refer to the IStructE guidance on Temporary demountable structures (see Further reading).

Further reading

Management of health and safety at work. Management of Health and Safety at Work Regulations 1999.

Approved Code of Practice and guidance L21 (Second edition) HSE Books 2000 ISBN 978 0 7176 2488 1 www.hse.gov.uk/pubns/books/l21.htm

Safe use of work equipment. Provision and Use of Work Equipment Regulations 1998. Approved Code of Practice and guidance L22 (Third edition) HSE Books 2008 ISBN 978 0 7176 6295 1 www.hse.gov.uk/pubns/books/l22.htm

Workplace health, safety and welfare. Workplace (Health, Safety and Welfare) Regulations 1992. Approved Code of Practice L24 HSE Books 1992 ISBN 978 0 7176 0413 5 www.hse.gov.uk/pubns/books/l24.htm

Safe work in confined spaces. Confined Spaces Regulations 1997. Approved Code of Practice, Regulations and guidance L101 HSE Books 2009 ISBN 978 0 7176 6233 3 www.hse.gov.uk/pubns/ books/I101.htm

Safe use of lifting equipment. Lifting Operations and Lifting Equipment Regulations 1998. Approved Code of Practice and guidance L113 HSE Books 1998 ISBN 978 0 7176 1628 2 www.hse.gov.uk/pubns/books/l113.htm

Safety of pressure systems. Pressure Systems Safety Regulations 2000. Approved Code of Practice L122 HSE Books 2000 ISBN 978 0 7176 1767 8 www.hse. gov.uk/pubns/books/l122.htm

Managing health and safety in construction. Construction (Design and Management) Regulations 2007. Approved Code of Practice L144 HSE Books 2007 ISBN 978 0 7176 6223 4 www.hse.gov.uk/ pubns/books/l144.htm

Smoke and vapour effects used in entertainment Entertainment Information Sheet ETIS3(rev1) HSE 2011 www.hse.gov.uk/pubns/entindex.htm

Working at heights in the broadcasting and entertainment industries Entertainment Information Sheet ETIS6(rev1) HSE 2011 www.hse.gov.uk/pubns/entindex.htm

Department for Communities and Local Government (DCLG) Fire safety risk assessments: Theatres, cinemas and similar premises The Stationery Office 2006 SBN 978 1 85112 822 8 www.firesafetyguides.co.uk

Temporary demountable structures. Guidance on procurement, design and use (Third edition) Institution of Structural Engineers 2007 ISBN 978 0 90297 45 7

BS 7671: 2008 Requirements for electrical installations. IEE Wiring Regulations. Seventeenth edition British Standards Institution

BS 7909: 2008 Code of practice for temporary electrical systems for entertainment and related purposes British Standards Institution

Further information

For information about health and safety, or to report inconsistencies or inaccuracies in this guidance, visit www.hse.gov.uk/. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

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