BRITISH STANDARD

BS 6767-2:1998

Transportable accommodation units

Part 2: Recommendations for design and installation of services and fittings with guidance on transportation, siting and aspects relating to habitation

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Committees responsible for this British Standard

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British Holiday and Home Parks Association Limited
Camping and Caravanning Club Ltd.
Caravan Club
Chief and Assistant Chief Fire Officers' Association
Consumer Policy Committee of BSI
Department of the Environment, Transport and the Regions (Central Transport Group)
Institution of Electrical Engineers
LP Gas Association
National Caravan Council Limited
National Prefabricated Building Association Ltd.
Society of Motor Manufacturers and Traders Limited

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Contents

Foreword

This part of BS 6767 has been prepared by Technical Committee B/511. It supersedes BS 6492-2:1995 which is withdrawn. This edition is a full technical revision of the standard reflecting changes in legislation, regulations and standards, particularly with regard to aspects of safety.

The history of transportable accommodation is long and varied and can be traced back to the earliest nomadic tribes who carried, or used the backs of animals to move, their habitation. Today's transportable accommodation units, developed as an alternative to huts and sectional buildings, are now accepted for a wide variety of uses, for which their specification and structural performance, installation and range of sizes, make them particularly suitable.

Relocatable and transportable accommodation units are delivered ready for immediate use. Units without wheels may either be craned, fork-lifted or winched into position or off-loaded from a flat-bed truck by one person using a telescopic jack-leg system. They may be linked end to end, side by side or end to side, or stacked to form a two or more storey structure.

Since the 1960s, transportable accommodation units have been manufactured in large numbers under factory controlled conditions. The volume and diversity of their manufacture has made it desirable to standardize the basic shell which is covered in part 1 of BS 6767. This part 2 of BS 6767 caters for the use of a transportable accommodation unit. It gives recommendations for the design and installation of services, partitions, stairways, steps and equipment. It also includes guidance on fire precautions, legislation, transportation, handling, siting and use in climatic conditions.

The extent to which units are required to conform to legislation depends upon their use, some ranking as permanent buildings and therefore being covered by building regulations. In drafting this part of BS 6767 the Technical Committee has been mainly concerned with giving recommendations on the installation of services, fixtures and fittings and the selection of units for use on sites with differing characteristics and limitations, and with giving guidance on the transportation and handling of units. Attention is drawn to the fact that transportable accommodation units are often located on congested sites and are used together in multiple configurations either adjoining one another horizontally or by being stacked vertically. In the interests of occupant safety, recommendations are given for safety requirements, durability and stability in a variety of uses, configurations and locations.

It has been assumed in the drafting of this standard that the execution of its recommendations and provisions is entrusted to appropriately qualified and experienced people.

A British Standard does not purport to include all necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

In particular, attention is drawn to:

Building Regulations 1991 [1]

Building Standards (Scotland) Regulations 1990 [2]

Building Regulations (Northern Ireland) 1994 [3]

Telecommunications Act 1984 [4]

Chronically Sick and Disabled Persons Act 1976 [5]

Clean Air Acts 1956 to 1993 [6]

Education Act 1993 [7]

Factories Act 1961 [8]

Fire Precautions Act 1971 [9]

Gas Act 1995 [10]

Health and Safety at Work etc. Act 1974 [11]

Local Government (Miscellaneous Provisions Act) 1982 [12]

Offices, Shops and Railway Premises Act 1963 [13]

Petroleum (Consolidation) Act 1928 [14]

Residential Homes Act 1980 [15]

Road Traffic Act 1972 [16]

Town and Country Planning Act 1990 [17]

Town and Country Planning (Scotland) Act 1997 [18]

Planning (Northern Ireland) Order 1991 [19]

Consumer Protection Act 1987 [20]

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 11 and a back cover.

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1 Scope

This part of BS 6767 gives recommendations for the design and installation of services, partitions, stairways, steps, ramps, links, units used for storage and equipment in transportable accommodation units. It gives guidance on legislation, fire precautions, transportation, handling, siting, climatic exposure, environmental considerations, foundations and anchoring, and the inspection and maintenance of the units with particular reference to aspects of safety in use.

These recommendations are intended for use by designers, manufacturers, suppliers, installers and purchasers of transportable accommodation units. They apply to the four types of unit listed in BS 6767-1.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of this British Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the publication referred to applies.

BS 1945, *Specification for fireguards for heating appliances (gas, electric and oil-burning).*

BS 3456, *Specification for safety of household and similar electrical appliances.*

BS 5234-1, *Partitions (including matching linings) — Code of practice for design and installation.*

BS 5266-1, *Emergency lighting — Part 1: Code of practice for the emergency lighting of premises other than cinemas and certain other specified premises used for entertainment.*

BS 5306-3, *Fire extinguishing installations and equipment on premises — Code of practice for selection, installation and maintenance of portable fire extinguishers.*

BS 5440-1, *Installation of flues and ventilation for gas appliances of rated input not exceeding 60 kW (1st, 2nd and 3rd family gases) — Part 1: Specification for installation of flues.*

BS 5440-2, *Installation of flues and ventilation for gas appliances of rated input not exceeding 60 kW (1st, 2nd and 3rd family gases) — Part 2: Specification for installation of ventilation for gas appliances.*

BS 5482-2, *Domestic butane- and propane-gas burning installations — Part 2: Installations in caravans and non-permanent dwellings.*

BS 5503-1, *Vitreous china washdown WC pans with horizontal outlet — Part 1: Connecting dimensions.*

BS 5503-2, *Vitreous china washdown WC pans with horizontal outlet — Part 2: Materials, quality, performance and dimensions other than connecting dimensions.*

BS 5572, *Code of practice for sanitary pipework.*

BS 5588-11, *Fire precautions in the design, construction and use of buildings — Part 11: Code of practice for shops, offices, industrial storage and other similar buildings.*

BS 5601-4, *Code of practice for ventilation and heating of caravans — Part 4: Installation of electrical heating appliances.*

BS 5839-1, *Fire detection and alarm systems for buildings — Part 1: Code of practice for system design, installation and servicing.*

BS 5839-6, *Fire detection and alarm systems for buildings — Part 6: Code of practice for the design and installation of fire detection and alarm systems in dwellings.*

BS 6367, *Code of practice for drainage of roofs and paved areas.*

BS 6400, *Specification for installation of domestic gas meters (2nd family gases).*

BS 6539, *Specification for fireguards for use with solid fuel appliances.*

BS 6575, *Specification for fire blankets.*

BS 6651, *Code of practice for protection of structures against lightning.*

BS 6700, *Specification for design, installation testing and maintenance of services supporting water for domestic use within buildings and their curtilages.*

BS 6701, *Code of practice for installation of apparatus intended for connection to certain telecommunication systems.*

BS 6762-2, *Services for leisure accommodation vehicles and transportable accommodation units — Part 2: Code of practice for the installation of solid fuel fire heating in park homes and transportable accommodation units.*

BS 6767-1, *Transportable accommodation units — Part 1: Recommendations for design and construction.*

BS 6891, *Specification for installation of low pressure gas pipework of up to 28 mm (R1) in domestic premises (2nd family gas).*

BS 7671:1992, *Requirements for electrical installations. IEE Wiring Regulations. Sixteenth edition.*

BS 8004, *Code of practice for foundations.*

BS EN 3, *Portable fire extinguishers.*

BS EN 722-1, *Leisure accommodation vehicles — Liquid fuel heating systems — Caravans and mobile homes (caravan holiday homes).*

BS EN 60335, *Specification for safety of household and similar electrical appliances.*

3 Terms and definitions

For the purposes of this part of BS 6767 the definitions given in BS 6767-1 apply together with the following.

3.1

link unit

structure designed to interconnect two transportable accommodation units horizontally

3.2

configuration

arrangement of transportable accommodation units relative to other units or other structures

3.3

foundation

construction to transmit dead and imposed loads from a transportable accommodation unit to the supporting ground

3.4

final exit

end of an escape route from a transportable accommodation unit which provides direct access to a street, passageway, walkway or open space, and positioned to ensure the rapid dispersal of persons from the vicinity so that they are no longer in danger from fire and/or smoke

4 Legislation

4.1 General

4.1.1 The legislation applicable to a unit is determined by its siting, occupation and use. This applies particularly to units used as offices, shops and other purposes where the public is admitted or people are employed. Such units could come within the scope of the relevant Building Regulations [1,2,3], the Town and Country Planning Act 1990 [17], Town and Country Planning (Scotland) Act 1997 [18], the Planning (Northern Ireland) Order 1991 [19], Health and Safety at Work etc. Act 1974 [11] and the Fire Precautions Act 1971 [9] and regulations made under section 12 of that Act, such as the Fire Certificates (Special Premises) Regulations 1976 [21]. Units covered by this legislation may require special construction and surface finishes differing from those recommended by BS 6767-1.

4.1.2 There should be early consultation with the appropriate authorities before agreeing details of a specification with a manufacturer or supplier.

4.1.3 The design, handling, siting, linking and removal of units from site are subject to the Construction (Design and Management) Regulations 1994 [22]. Appropriate responsibilities and duties need to be established prior to commencement of work.

4.2 Change of use

For each unit it is important to know its type of construction and surface finish when considering its suitability for a different use. The consultation recommended in **4.1.2** should be held when the use of a unit is to be changed.

5 Installation and connection of services

5.1 General

5.1.1 Where services are required, provisions should be made on the unit for their connection and they should conform to relevant British Standards.

NOTE Attention is drawn to the recommendations given in **5.2** to **5.6**.

5.1.2 Cables and pipework should avoid the structural framework and foundations, unless these are designed to accommodate them. It is essential that the manufacturer of the unit states where service entry and exit points are located.

5.1.3 Adequate sleeving should be provided where the shell of the unit is penetrated by services. Resulting gaps should be sealed to prevent the entry of insects and animals and to prevent draughts and deterioration.

5.1.4 All services, connections and mountings should be adequately secured to withstand impact and vibration during transportation and in normal use.

5.1.5 An accessible means of isolating gas, electricity, oil and water services should be provided near to their points of entry and marked accordingly.

5.1.6 The local authority should be consulted regarding local regulations and requirements applicable to the supply of services to transportable accommodation units.

5.1.7 All service installations fitted by the manufacturer should be factory inspection tested and certified prior to despatch.

5.1.8 Where pipe work and fittings protrude externally, their effect on the overall dimensions of the unit (see **10.3**) and the necessary clearances between the unit and the transporter should be taken into account.

5.2 Electricity

5.2.1 *Installations*

Electrical installations should conform to BS 7671. No transportable unit should be connected on site to electricity unless the manufacturer's declared values of prospective short circuit current and earth loop impedance are compatible with those of the supply, the bonding arrangements are suitable, and the supply can safely provide the maximum demand of the unit.

A notice should be affixed near to the point of connection of the electricity supply bearing the following wording: 'It is recommended that the electrical connection and disconnection should be made by a competent person'.

5.2.2 *Other design considerations*

When designing the electrical installation for a transportable accommodation unit, the provisions of the Health and Safety Commission Approved Code of Practice No. 35 [23], BS 7375, BS 6907, BS 5345, BS 5839, BS 5266 and the Construction (Design and Management) Regulations 1994 [22] should be taken into account where appropriate.

All socket outlet circuits rated at 32 A or less should be protected by a suitably rated residual current device (r.c.d.).

NOTE Attention is drawn to the Electricity at Work Regulations 1989 [24].

5.2.3 *Fitted appliances*

All fitted appliances should conform to the relevant part and section of BS 3456 or the relevant part and section of BS EN 60335.

5.2.4 *Information to be supplied by the manufacturer*

Details and information on the electrical installation should be provided in accordance with BS 7671 and should be despatched with the unit.

5.2.5 *Site connection*

It is the responsibility of the competent person connecting the electrical supply to the unit to carry out further tests to ensure the values of earth fault loop impedance, maximum prospective fault current at the origin, polarity and r.c.d. tests conform to BS 7671.

Reference should be made by the competent person to the details and information on the electrical installation provided by the manufacturer, see **5.2.4**.

5.3 Gas

5.3.1 *Natural gas installations*

Installations for the use of natural gas should be installed in accordance with BS 6400, BS 6891 and BS 5440-1 and BS 5440-2 and with recommendations for mobile homes and caravans in the British Gas Corporation Publication DM1 [25]. Installations should be tested and purged in accordance with The Institution of Gas Engineers Publication UP/1 [26]. A gas soundness test certificate should be provided by the installer.

5.3.2 *Liquefied petroleum gas installations*

Installations for the use of liquefied petroleum gas should be installed and tested in accordance with BS 5482-2.

5.3.3 *Regulations*

Particular attention is drawn to the Gas Safety (Management) Regulations 1996 [27], Pipeline Safety Regulations 1996 [28] and the Gas Safety (Installation and Use) Regulations 1994 [29].

5.3.4 *Ventilation and flues for gas installations*

Whilst general ventilation for the unit is given in BS 6767-1, the need for air for combustion and the installation of flues for gas burning appliances as appropriately defined in BS 6400, BS 6891, BS 5440-1, BS 5440-2 and BS 5482-2 should be complied with in all cases.

5.3.5 *Considerations*

The following points should be taken into account before providing a gas supply to the unit.

a) The type of gas.
b) The pressure.
c) The inlet position(s) and type of connection.
d) The size of supply pipes and usage rate.

5.4 Water

5.4.1 *Installations*

Hot and cold water supply systems should be installed in accordance with BS 6700 and should be protected from frost.

NOTE Attention is drawn to the Water Supply Byelaws.

The insulation of hot water systems is covered by the appropriate sections of the relevant Building Regulations [1,2,3]. BS 5422 gives methods of specifying thermal insulation.

To ensure that an installation is acceptable throughout the country it is advisable to seek the advice of the Water Research Centre, the Water Byelaws Advisory Service[1)] and to ensure that any fitting appears on their Water Fittings and Materials Directory.

5.4.2 *Considerations*

The following points should be taken into account before providing a water supply to the unit.

a) The inlet position(s) and type of connection.
b) The size of supply pipes and usage rate.
c) For mains cold water supply, the pressure.
d) For tank cold water supply, the head of water, the size and position of the storage tank and the application of the local water authority.
e) For hot water supply, the pressure, flow rate and temperature.

5.5 Drainage

5.5.1 *Installations*

Soil and waste systems should be in accordance with BS 5572 and rain water systems in accordance with BS 6367. Local and Water Authorities consent needs to be obtained for the connection of wastes to a septic tank, cesspool or public sewer. Where a flushing WC is provided the pan should conform to BS 5503-1 and BS 5503-2 and the cistern should be capable of single flushing action.

[1)] Water Byelaws Advisory Service, Fern Close, Pem 'Y' Fan Industrial Estate, Oakdale, Gwent NP1 4EH

5.5.2 *Considerations*

The following points should be taken into account before providing drainage from the unit.

a) The type of drainage required.

b) The outlet position(s) and type connection.

c) Unobstructed access to connections.

d) Ventilation requirements.

5.6 Telephones

5.6.1 *Installations*

The installations of a private branch exchange and other communications equipment should be in accordance with BS 6701.

5.6.2 *Legislation*

Attention is drawn to the Telecommunications Act 1984 [4], which requires any apparatus to be approved[2)] before it may be connected to any network run by British Telecommunications, Kingston Communications (Hull) plc or any equivalent operator.

5.6.3 *Considerations*

The following points should be taken into account before providing a telephone service to the unit.

a) The provision of an access point at low or high level.

b) The need for anchorage of straining wire.

c) Means of internal distribution.

5.7 Disconnection of services

The appropriate authority should be notified before a unit is disconnected from any service and moved.

6 Partitions and fixtures

6.1 General

Where partitions are provided, either fixed or relocatable, they should be installed in accordance with BS 5234-1 and be capable of taking the dynamic forces of transportation.

6.2 Provision for fixtures

Where provision is made within the unit for the fixing of storage units and fittings the manufacturer should make clear which fixing devices can be used, the loads they can support and the need for any special fittings to support such units. If any special fixings have to be installed within a partition, then due notification should be given in writing by the manufacturer.

6.3 Penetration by services

Provision should be made in partitions for any services to pass through without impairing the design performance of the partition.

7 Stairs, entrance steps and ramps

The responsibility for the provision of steps and ramps should be established between the purchaser and the manufacturer, with due regard being given where disabled access is required.

Stairs, steps and ramps should be designed in accordance with the appropriate parts of the relevant Building Regulations [1,2,3]. Anti-slip treads should be fitted, particularly to external stairs and landings. Lighting should be provided capable of illuminating areas of access and egress.

8 Installation of equipment

8.1 Heating appliances

Where heating appliances are fitted they should be installed in accordance with BS 5440-1 and BS 5440-2, BS 5482-2 or BS 5601-4 or BS 6762-2 or BS EN 722-1; as appropriate to the type of fuel. Air for combustion, ventilation for the products of combustion and protection of adjacent surfaces should be provided in accordance with those British Standards. It is essential that appliances are not fixed where they can cause obstruction, particularly in passageways, fire exits or other escape routes, nor should provision be made for the use of free standing appliances in such positions. Neither solid fuel appliances nor oil fired appliances are considered suitable for transportable accommodation units.

8.2 Upholstered furniture

Attention is drawn to the Furniture and Furnishings (Fire) (Safety) Regulations 1988 [30] and regulations which amend them, issued under the Consumer Protection Act 1987 [20].

NOTE Built-in upholstered furniture for transportable accommodation units does not fall within the scope of the Furniture and Fittings (Fire) (Safety) Regulations 1988 [30]. However, it is recommended that furniture which is in accordance with these regulations is used.

[2)] Information on the approval of telecommunications apparatus can be obtained from the British Approvals Board for Telecommunications (BABT) 34 Molese Road, Walton-on-Thames, Surrey KT12 4RQ.

9 Fire precautions

9.1 General

The enforcement of the Fire Precautions Act 1971 [9], which is designed to ensure the provision of adequate means of escape in case of fire and of means for fighting fires and for raising the alarm in case of fire, is the responsibility of the Fire Authority in whose area the unit will be located. The Health and Safety Executive controls units on sites subject to the Fire Certificates (Special Premises) Regulations 1976 [21]. Where building regulations approval is required (see **4.1**), application should be made to the Local Authority for the area concerned or an approved inspector.

9.2 Means of escape

9.2.1 *Considerations*

Considerations to be taken into account when providing means of escape and assessing the need for additional escape doors are as follows.

a) The maximum number of persons likely to use the unit.

b) The type of use.

c) The height of any floors above ground level.

d) The depth of any floor below ground level.

e) The maximum distance to be travelled by an occupant to reach a final exit.

f) The protection of escape routes, including fire resistance of materials and their surface spread of flame.

g) The position of gas and electricity mains inlets.

9.2.2 *Further information*

The recommendations of BS 5588-11 should be followed where applicable and further information can be found in Fire Precautions in the Work Place; Information for Employers about the Fire Precautions (Workplace) Regulations 1997 [31]. Attention is also drawn to the relevant Building Regulations [1,2,3].

9.3 Fire detection and emergency lighting

Where required, fire detection and emergency lighting should be installed in accordance with BS 5839-1 and BS 5839-6 and BS 5266-1 respectively.

9.4 Units used on construction sites

Reference should be made to the General Fire Precautions of Temporary Accommodation Units on Construction Sites [32] and to the Construction (Health, Safety and Welfare) Regulations 1996, Section 19 [33].

Units used on construction sites that are within 6 m of, or sited inside a building under construction or refurbishment, should be capable of achieving a fire performance in accordance with the recommendations given in Fire Prevention on Construction Sites [34]. Attention is also drawn to the Code of Practice for Fire Rated Temporary Accommodation on Construction Sites [35].

9.5 Check list

The following recommendations should be observed, whether or not units are subject to legislative requirements.

a) The advice of the local fire brigade or local authority should be obtained as early as possible on the siting of the unit and on fire precautions.

b) If escape can be in one direction only, the maximum distance of travel from any point within a unit to a final exit should not exceed 18 m. Certain uses may dictate a lesser distance.

c) All exit routes should be maintained free from obstruction.

d) Any cooking appliance should be positioned such that in the event of it catching fire, the escape of occupants is not impeded.

e) All combustible materials should be kept well clear of heating and cooking appliances and escape routes.

f) All radiant heating appliances should be fitted with guards conforming to BS 1945 and BS 6539.

NOTE Attention is drawn to the Low Voltage Electrical Equipment (Safety) Regulations 1989 [36].

g) A water or dry powder fire extinguisher, with a fire rating of 13 A or 13 B respectively, as defined in BS 5306-3 and conforming to the relevant part of BS EN 3, should be provided and positioned by the main exit door. A fire blanket conforming to BS 6575 should be provided next to any cooking appliance.

h) Instructions for the use of available means for fighting fire and the general fire precaution arrangements on the site should be displayed where they can be easily read or seen.

10 Transport

10.1 General

Units that are designed and constructed in accordance with BS 6767-1 should be transported over land, either by towing the units with their own wheeled chassis or on a land transporter. Attention is drawn to the Department of Transport Code of Practice — Safety of Loads on Vehicles 1984 [37]. Wheel-mounted units constructed for use on public highways are subject to the provisions of the current road traffic regulations.

10.2 Transportation

The form of transport should be appropriate to the type, size, mass and safe handling of the unit. When a transporter is used the unit should be securely fixed to it by means of the anchor ties recommended in BS 6767-1. Attention is drawn to the Road Vehicles (Construction and Use) Regulations 1996 [38], Motor Vehicles (Construction and Use) Regulations Northern Ireland 1989 [39], the Motor Vehicles (Authorization of Special Types) General Order 1979 [40], Motor Vehicles (Authorization of Special Types) Order Northern Ireland 1997 [41], the Road Vehicle Lighting Regulations 1989 [42], and the Road Vehicle Lighting Regulations Northern Ireland 1995 [43].

10.3 Transit information

The total width, height and mass of the unit in its loaded position should be established and checked against the relevant regulations and orders made under the Road Traffic Act 1972 [44]. High, wide, long, heavy or dangerous loads may need special provisions with regard to the checking of suitable routes, escorts, marking and lighting.

10.4 Additional considerations

10.4.1 *Height*

The maximum permissible overall height of the vehicle and its load is usually governed by the necessary clearance beneath bridges and overhead cables along the route.

10.4.2 *Mass*

It is usually the size of the unit that decides the type of vehicle to be used, but when mass becomes a factor, particular attention should be paid to the axle loadings and combinations.

10.5 Orientation of transport

Depending on any special limitations of the site on which the unit is to be placed it may be necessary to position the unit on the vehicle in a way which ensures correct orientation when off-loading.

10.6 Sequence of delivery and erection of units

Where a number of units are to be placed side by side or stacked, a delivery and erection sequence should be established.

10.7 Access to site

The destination, site contact, telephone number and details of the entrance to the site should be established prior to delivery. The route to the site may need to be surveyed, taking into account the nature of the load and its method of transport. Obstructions, particularly cables at the side of the route and overhead, should be noted in relation to the manoeuvrability of the vehicle. The mass of the vehicle and its load should be considered in relation to ground and underground hazards or weaknesses and appropriate protective measures taken.

11 Handling

11.1 General

All types of unit should always be lifted and positioned strictly in accordance with the manufacturer's instructions. Care should be taken to avoid damage to exposed pipework and fittings.

11.2 Safety

11.2.1 Planning should be undertaken to ensure safety for the workforce and third parties prior to and during the siting and erection of the units. It is the responsibility of the person appointed to supervise or undertake the operation, to ensure that the unit is handled in accordance with the manufacturer's instructions. This may be by using either the correct jack handling equipment or lifting equipment and tackle, e.g. chains, slings, shackles, ensuring that they are of the appropriate size and are used in the correct manner so as to ensure that excessive loads are not placed on the lifting points. Handling equipment should not be overloaded. Units should not be handled by fork lift truck, unless otherwise authorized by the manufacturer.

11.2.2 Crane lifting operations are specifically covered by the Construction (Lifting Operations) Regulations 1961 [45] and it is essential that a clear line of responsibility is established regarding who is responsible for the supervision and the execution of the lifting operation.

11.2.3 Supervisors and operators should be adequately trained and hold the necessary certificates to undertake lifting operations.

11.2.4 Special attention should be given to older units, prior to the handling operation, to ensure that the unit is in a structurally satisfactory condition.

11.2.5 Care should be taken to ensure that all doors, windows and non-fixed items are properly secured before handling a unit.

11.3 Delivery, installation and removal

11.3.1 The method of delivery, installation and removal of units may influence the space needed for manoeuvring on site. If a crane is required, account should be taken of the position of the crane and of its elevated jib in relation to hazards, such as trees, adjacent buildings and overhead cables. Similarly, the reach and lifting capacity of the crane should be related to its positioning. Tracking or temporary protection may be required for movement over difficult ground or an area vulnerable to damage.

11.3.2 When dismantling multiple units, the correct sequence and procedure recommended by the manufacturer should be strictly observed. (See also **5.7**.)

12 Climatic exposure

12.1 Where units are to be used in climatic conditions that are more severe than those recommended in BS 6767-1 then the units should be designed accordingly. Data on wind speeds and the effects of exposure to driving rain are contained in BS 6399-2.

12.2 Care should be exercised to prevent excessive snow loads by not siting units under overhanging eaves or in the lee of taller structures.

12.3 Precautions should be taken to ensure that protection against lightning is provided in accordance with BS 6651.

13 Environmental considerations

13.1 Aspect and prospect

Careful consideration should be given to the visual and functional relationship of a unit to its surroundings, as well as to the outlook from it and the possible effect of this on occupants, if the unit is likely to be occupied for any length of time.

13.2 Services

Where possible, units should be located close to existing services to minimize service runs.

13.3 Microclimate

The siting of the units should minimize exposure to adverse weather conditions. For example, shading to reduce solar heat gain and protection from the prevailing wind should be considered. Units should not be sited in damp, poorly ventilated positions.

13.4 Location

Sites should be selected to allow for easy positioning and removal of units.

13.5 Ground conditions

Sites that are sloping, that have a poor ground-bearing capacity, or that are liable to flooding or contamination should be avoided unless special precautions are taken.

13.6 Special precautions

Hazardous locations, or those with a high security requirement, or those vulnerable to vandalism may require special precautions for the siting, fencing and lighting of units.

14 Foundations and anchoring

14.1 Foundations

14.1.1 *Assessment of loads*

Before siting and positioning units, an accurate assessment should be made of the loads to be imposed on the selected formation. Full use should be made of information marked on the exterior fabric of the unit in accordance with BS 6767-1 and/or given in the explanatory literature provided by the manufacturer prior to delivery.

14.1.2 *Transference of loads*

Measures adopted to accept and transfer loads imposed by the unit onto the foundation or a supporting structure should be level, firm and stable, and should resist settlement, slip or heave. They should be capable of withstanding the maximum gross design loads, including wind, snow loads and any temporary loading during installation. Such assessments and any design work should be in accordance with BS 8004 and, where necessary, expert advice should be sought to ensure the provision of adequate support of units, commensurate with their use and exposure.

14.2 Anchoring

14.2.1 *Anchor ties*

Each unit should be secured to anchorages either by direct connection or by the anchor ties recommended in BS 6767-1, unless it can be established that no climatic or other forces are likely to be applied so as to exceed the intrinsic stability of the unit in its unloaded state.

14.2.2 *Anchorages*

Anchorages consist of buried plates, screws, blocks, or similar devices. The type selected, including their number and spacing, should be suitable and effective for the particular use taking full account of loading capacity and the condition of the formation and foundation. Care should be taken in the installation of anchorages, following exactly any special requirements. Anchorages and connections to units should be protected from corrosion.

15 Linking of units

15.1 Configurations

Depending upon the particular type, transportable accommodation units can be linked directly or with a link unit in the following configurations.

a) Side to side.

b) End to end.

c) Side to end.

d) Vertically, i.e. stacked two or more storeys high with an internal and/or external staircase.

e) As a), b) and c), stacked two or more storeys high.

f) By other stacking methods, subject to confirmation by the manufacturer of the safety and suitability of the resulting configuration.

15.2 Safety

When linking and stacking units, care should be taken to ensure that the configurations formed by linked units are in accordance with the relevant recommendations in this standard, in particular with regard to means of escape and fire precautions (see clause **9**). Special consideration should be given to wind loads, foundations and anchorages.

NOTE Attention is drawn to the relevant legislation.

15.3 Connection

All units forming a configuration should be securely connected and the connections should be weather resistant.

15.4 Additional loads

Individual units should be capable of carrying additional dead and imposed loads which result from linking.

15.5 Levels

Floor surfaces of units and link units should be at the same level with no raised thresholds other than floor joint cover plates. When fitted, joint cover plates should not have upstands exceeding 10 mm and, where greater than 3 mm, the top edge should be bevelled.

15.6 Link units

15.6.1 *General*

Link units should be designed and manufactured in accordance with BS 6767-1. Depending on their size and use they may be either supported by the units they interconnect or self-supporting.

15.6.2 *Basic considerations*

Consideration should be given to the following.

a) Floor loading.

b) Weather resistance, especially at connections.

c) Spread of flame and protection against fire.

d) Thermal insulation.

e) Matching appearance with the units they interconnect.

15.6.3 *Handling*

A means of handling a link unit should be provided and any lifting points and anchor ties should be in accordance with BS 6767-1.

15.6.4 *Siting considerations*

The relationship of the link unit to the main units depends upon its use and the relevant regulations (see **4.1**) and fire precautions (see clause **9**). Attention should be paid to the following.

a) Safe operation of door and windows.

b) Space between units for maintenance.

c) Natural lighting.

d) Projections.

16 Units used for storage

16.1 General

Units designed solely for storage and that are not heated should not require thermal insulation. Consideration should be given to increasing the ventilation provided to unheated units above the recommendations of BS 6767-1.

16.2 Highly flammable materials

Units used for the storage of materials subject to the Highly Flammable Liquids and Liquefied Petroleum Gas Regulations 1972 [46] should be in accordance with the advice given in the Health and Safety Executive publications: "The storage of flammable liquids in containers" [47]; "The keeping of LPG in cylinders and similar containers" [48]; or "The storage and use of LPG on construction sites" [49], as appropriate.

NOTE Most of such units are subject to the provisions of Part 1 of the schedule to the Certificate of Approval (Form F2434) made under the Highly Flammable Liquids and Liquefied Petroleum Gas Regulations 1972 [46].

16.3 Additional notice

In addition to the manufacturer's certificate and marking recommendations given in BS 6767-1, units designed for the storage of hazardous materials should include the following in the manufacturer's certificate and on the exterior fabric of the unit.

"This unit complies with the Factories Act 1961, the Highly Flammable Liquids and Liquefied Petroleum Gas Regulations 1972, Regulations 5(1)(c), 7(1)(d) and (8.6)".

17 Inspection and maintenance

17.1 General

Inspection and maintenance should be carried out by the purchaser in accordance with the manufacturer's recommendations.

17.2 Inspection intervals

Units should be inspected and maintained to a regular programme. Maintenance inspections should be carried out at least twice a year, preferably including inspections of the external fabric during autumn and spring. Close visual inspection of the structure should be carried out at intervals no greater than 1 year, with additional inspections both immediately before and after the installation or removal of a unit.

17.3 Inspection of structure

Elements of structure and substructure including beams, joists, wall frames, columns or legs and their connecting components should be inspected for alignment, dissassociation and damage due to corrosion, rot, impact or wear and tear. Any damaged parts or fixings should be repaired or renewed prior to further use or re-siting. Checks should also be made to ensure a unit has not become overloaded and that it remains within the limits for which it is designed.

17.4 External maintenance

The external fabric should be regularly cleaned and the weather resistance maintained. If close to trees, rainwater goods may require more frequent clearance than the main planned maintenance cycle. External redecoration or recoating with compatible materials should follow the manufacturer's recommendations.

17.5 Internal maintenance

Maintenance should take into account the safety of the occupants. The flame spread characteristics of linings should not be impaired and floor finishes should not be allowed to deteriorate. Damage due to or deterioration of services or fittings should be rectified immediately.

17.6 Electrical installation

The electrical installation within the unit should be initially inspected and tested; and thereafter at periodic intervals subject to the conditions and use of the unit and its electrical installation, all in accordance with the requirements of BS 7671:1992, Part 7.

17.7 Appliances and equipment

All appliances and equipment should be maintained in a safe condition and be examined and inspected in accordance with their manufacturer's instructions.

Bibliography

Standards publications

BS 5345, *Code of practice for selection, installation and maintenance of electrical apparatus for use in potentially explosive atmospheres (other than mining applications or explosive processing and manufacture).*

BS 5422, *Method for specifying thermal insulating materials on pipes, ductwork and equipment (in the temperature range − 40°C to + 700°C).*

BS 6399-2, *Loading for buildings — Part 2: Code of practice of wind loads.*

BS 6907, *Electrical installations for open-cast mines and quarries.*

BS 7375, *Code of practice for distribution of electricity on construction and building sites.*

Other references

[1] GREAT BRITAIN. The Building Regulations 1991. SI 1991 No 2768. London: The Stationery Office.
[2] GREAT BRITAIN. The Building Standards (Scotland) Regulations 1990. SI 1990 No 2179. London: The Stationery Office.
[3] GREAT BRITAIN. The Building Regulations (Northern Ireland) 1994. SR 1994 No 243. London: The Stationery Office.
[4] GREAT BRITAIN. The Telecommunications Act 1984. London: The Stationery Office.
[5] GREAT BRITAIN. The Chronically Sick and Disabled Persons Act 1976. London: The Stationery Office.
[6] GREAT BRITAIN. The Clean Air Acts 1956 to 1993. London: The Stationery Office.
[7] GREAT BRITAIN. The Education Act 1993. London: The Stationery Office.
[8] GREAT BRITAIN. The Factories Act 1961. London: The Stationery Office.
[9] GREAT BRITAIN. The Fire Precautions Act 1971. London: The Stationery Office.
[10] GREAT BRITAIN. The Gas Act 1995. London: The Stationery Office.
[11] GREAT BRITAIN. The Health and Safety at Work etc. Act 1974. London: The Stationery Office.
[12] GREAT BRITAIN. The Local Government (Miscellaneous Provisions Act) 1982. London: The Stationery Office.
[13] GREAT BRITAIN. The Offices, Shops and Railway Premises Act 1963. London: The Stationery Office.
[14] GREAT BRITAIN. The Petroleum (Consolidation) Act 1928. London: The Stationery Office.
[15] GREAT BRITAIN. The Residential Homes Act 1980. London: The Stationery Office.
[16] GREAT BRITAIN. The Road Traffic Act 1972. London: The Stationery Office.
[17] GREAT BRITAIN. The Town and Country Planning Act 1990. London: The Stationery Office.
[18] GREAT BRITAIN. The Town and Country Planning (Scotland) Act 1997. London: The Stationery Office.
[19] GREAT BRITAIN. The Planning (Northern Ireland) Order 1991. London: The Stationery Office.
[20] GREAT BRITAIN. The Consumer Protection Act 1987. London: The Stationery Office.
[21] GREAT BRITAIN. The Fire Certificates (Special Premises) Regulations 1976. SI 1976 No 2003. London: The Stationery Office.
[22] GREAT BRITAIN. The Construction (Design and Management) Regulations 1994. SI 1994 No 3140. London: The Stationery Office.
[23] Health and Safety Commission Approved Code of Practice No. 35 1990. The Use of Electricity at Quarries. HSE BOOKS, PO Box 1999, Sudbury, Suffolk, CO10 6FS.
[24] GREAT BRITAIN. The Electricity at Work Regulations 1989. SI 1989 No 635. London: The Stationery Office.
[25] British Gas Corporation Publication DM1. INSTITUTION OF GAS ENGINEERS, 21 Portland Place, London W1N 3AF.
[26] Institution of Gas Engineers Publication UP/1. INSTITUTION OF GAS ENGINEERS, 21 Portland Place, London W1N 3AF.
[27] GREAT BRITAIN. The Gas Safety (Management) Regulations 1996. SI 1996 No 551. London: The Stationery Office.
[28] GREAT BRITAIN. The Pipeline Safety Regulations 1996. SI 1996 No 825. London: The Stationery Office.
[29] GREAT BRITAIN. The Gas Safety (Installation and Use) Regulations 1994. SI 1994 No 1886. London: The Stationery Office.

[30] GREAT BRITAIN. The Furniture and Furnishings (Fire) (Safety) Regulations 1988. SI 1988 No 1324. London: The Stationery Office.
[31] GREAT BRITAIN. Fire Precautions in the Workplace; Information for Employers about the Fire Precautions (Workplace) Regulations 1997. London: The Stationery Office.
[32] General Fire Precautions of Temporary Accommodation Units on Construction Sites. HEALTH AND SAFETY EXECUTIVE, 2 Southwark Bridge, London SE1 9HS. Ref: HSE 404/23.
[33] GREAT BRITAIN. The Construction (Health, Safety and Welfare) Regulations 1996. SI 1996 No 1592. London: The Stationery Office.
[34] Fire Prevention on Construction Sites: *The Joint Code of Practice on the Protection from Fire on Construction Sites and Buildings Undergoing Renovation.* BUILDING EMPLOYERS CONFEDERATION and the LOSS PREVENTION COUNCIL, Melrose Avenue, Borehamwood, Herts, WD6 2BJ.
[35] Code of Practice for Fire Rated Temporary Accommodation on Construction Sites. NATIONAL PREFABRICATED BUILDING ASSOCIATION, PO Box 3, Kenilworth, Warwickshire, CV8 1SD.
[36] GREAT BRITAIN. Low Voltage Electrical Equipment (Safety) Regulations 1989. SI 1989 No 728. London: The Stationery Office.
[37] Department of Transport Code of Practice — Safety of Loads on Vehicles 1984. London: The Stationery Office.
[38] GREAT BRITAIN. The Road Vehicles (Construction and Use) Regulations 1996. SI 1996 No 1078. London: The Stationery Office.
[39] GREAT BRITAIN. The Motor Vehicles (Construction and Use) Regulations Northern Ireland 1989. SR 1989 No 299. London: The Stationery Office.
[40] GREAT BRITAIN. The Motor Vehicles (Authorization of Special Types) General Order 1979. SI 1979 No 1198. London: The Stationery Office.
[41] GREAT BRITAIN. The Motor Vehicles (Authorization of Special Types) Order Northern Ireland 1997. SR 1997 No 109. London: The Stationery Office.
[42] GREAT BRITAIN. The Road Vehicle Lighting Regulations 1989. SI 1989 No 1796. London: The Stationery Office.
[43] GREAT BRITAIN. The Road Vehicle Lighting Regulations Northern Ireland 1995. London: The Stationery Office.
[44] GREAT BRITAIN. The Road Traffic Act 1972. London: The Stationery Office.
[45] GREAT BRITAIN. The Construction (Lifting Operations) Regulations 1961. London: The Stationery Office.
[46] GREAT BRITAIN. The Highly Flammable Liquids and Liquefied Petroleum Gas Regulations 1972. London: The Stationery Office.
[47] The Storage of Flammable Liquids in Containers 1990. HSE BOOKS, PO Box 1999, Sudbury, Suffolk, CO10 6FS. Ref: HS(G)51.
[48] The Keeping of LPG in Cylinders and Similar Containers 1986. HSE BOOKS, PO Box 1999, Sudbury, Suffolk, CO10 6FS. Ref: CS/4.
[49] The Storage and Use of LPG on Construction Sites 1981. HSE BOOKS, PO Box 1999, Sudbury, Suffolk, CO10 6FS. Ref: CS/6.

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