

Escalator and moving walks — Safety rules for the construction and installation of escalators and moving walks —

Part 2: Code of practice for the selection, installation and location of new escalators and moving walks

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- British Retail Consortium
- Consumer Policy Committee of BSI
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- Institution of Electrical Engineers
- Institution of Mechanical Engineers
- Lift and Escalator Industries Association
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Foreword

This part of BS 5656 has been prepared by Subcommittee MHE/4/3/2.

This part of BS 5656 paraphrases many of the requirements specified in all other relevant standards (listed in the bibliography). It indicates the information that should be exchanged between the interested parties and the sequence of events from the preliminary planning stage to the putting into service. The most important issue to take into account during the selection and installation of escalators and moving walks is their safe use by all persons.

General guidance is given in Clause 4 on the procedure to be adopted in obtaining an installation that is satisfactory from the aspects of operation, safety and maintenance. This clause also provides guidance on the exchange of information between the escalator and moving walk contractor and other trades in providing various service facilities, and gives the overall chronological sequence.

The building recommendations for the equipment have been brought together in Clause 5 because of their interest to the architect or other persons responsible for specifying the details of the building construction, which is not a prime responsibility of the escalator and moving walk contractor.

Clause 6 deals with sizing the installation to meet the traffic demands. Clause 7 gives guidance to architects and designers on the options permitted in BS EN 115 with regard to the dimensions for boarding and alighting areas. This clause also offers guidance on equipment location and measures to reduce the risk to users. Clause 8 deals with electrical installation. Escalator and moving walk technology, duty categories and operating control systems are discussed in Clause 9.

Although the main provision for vertical access for disabled people is a lift, it is recognized that many people with disabilities use escalators and moving walks. Therefore this part of BS 5656 takes their needs into account as far as possible and recommendations are given in Clause 10. Guidance on lift provision for disabled people is given in BS 5655-6.

Attention is drawn to the Supply of Machinery (Safety) Regulations 1992 [1] in respect of procedures for contracting parties and in respect of CE marking. Attention is also drawn to the list of relevant statutory regulations given in Annex A.

This part of BS 5656 should be read in conjunction with BS 7801, which gives recommendations for safe working that are additional to the features recommended in this part of BS 5656 and are applicable when installing, examining, inspecting, testing, servicing, repairing, dismantling and demolishing permanent installations.

As a code of practice, this part of BS 5656 takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 32, an inside back and a back cover.

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1 Scope

This part of BS 5656 gives recommendations for the location, selection and installation of new escalators and moving walks in new or existing buildings. It is applicable at the early stages of a project for architects, developers, building owners, building managers, building contractors, general and specialized engineering consultants and other interested parties.

This part of BS 5656 does not give recommendations for existing installations.

NOTE Although this part of BS 5656 does not give recommendations for existing installations, it may be used as guidance when making alterations to such installations.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 1363-2, *13 A plugs, socket-outlets and adaptors — Part 2: Specification for 13 A switched and unswitched socket-outlets*.

BS 2853, *Specification for the design and testing of steel overhead runway beams*.

BS 5499-1, *Graphical symbols and signs — Safety signs, including fire safety signs — Part 1: Specification for geometric shapes, colours and layout*.

BS 5606, *Guide to accuracy in building*.

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

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

BS 7801, *Escalators and moving walks — Code of practice for safe working on escalators and moving walks*.

BS EN 115:1995, *Safety rules for the construction and installation of escalators and passenger conveyors*.

BS EN 12015, *Electromagnetic compatibility — Product family standard for lifts, escalators and passenger conveyors — Emission*.

BS EN 12016, *Electromagnetic compatibility — Product family standard for lifts, escalators and passenger conveyors — Immunity*.

3 Terms and definitions

For the purposes of this part of BS 5656 the following terms and definitions apply.

3.1

angle of inclination

maximum angle to the horizontal in which the steps, the pallets or the belt move

3.2

auxiliary isolating switch

switch located in the vicinity of the drive machinery, or in the return station, or in the vicinity of the control devices, which interrupts the supply to auxiliary equipment

NOTE 1 Auxiliary equipment includes heating, balustrade lighting, comb lighting, under-step lighting, etc. but excludes any switched sockets, bulkhead lights or portable hand lamps, direction indicators, etc.

NOTE 2 Auxiliary isolating switches should be located close to the main isolating switch (see 3.17) and marked unambiguously.

3.3

belt

power-driven and tensioned continuous surface that forms the treadway of a moving walk, which is supported along its length by various means

3.4

building contractor

person responsible for construction works

NOTE The building contractor may be the principal contractor.

3.5

client

person for whom a escalator or moving walk installation is carried out

3.6

comb

part of an escalator or moving walk that meshes with the steps, pallets or belt at each landing, in order to facilitate the transition of passengers

3.7

contractor

party who is contracted to supply, install, modernize, repair, inspect, service, or dismantle an escalator or moving walk

NOTE For the purposes of this part of BS 5656 the contractor is the escalator/moving walk contractor and is not to be confused with the building contractor (3.4).

3.8

control system

system that controls the manner in which an escalator or moving walk operates

3.9

driving station

area within the truss of an escalator or moving walk, where the drive machinery is located

3.10

duty cycle

loading in terms of number of passengers per hour over a defined period

3.11 escalators

3.11.1

compact escalator

escalator where the drive machinery is located within the truss and access to the machinery is gained from the passenger side

3.11.2

escalator

power-driven installation with endless moving stairway for the conveyance of passengers in an upward or downward direction

3.11.3

remote drive escalator

escalator where the drive machinery is located external to the truss and within a separate machine room

3.12

floor plate

removable plate at the ends of an escalator or moving walk to provide access to the driving and return stations

3.13

handrail

moving part intended to serve as a handhold for passengers

3.14

landing

unrestricted space at the top or bottom of an escalator or moving walk to permit the manoeuvring, boarding and alighting of persons

3.15

machinery space

space in which one or more driving machine(s) and/or associated equipment are located

3.16**main contractor**

see *principal contractor* (3.25)

3.17**main isolating switch**

switch in the vicinity of the machinery, the return stations or the control devices, capable of breaking the supply to the motor, to the brake releasing device and to the control circuit in the live conductors

NOTE This switch can also control auxiliary equipment (see 3.2).

3.18**moving walk**

power-driven installation with endless moving walkway (e.g. pallets, belt) for the conveyance of passengers either on the same level or between different levels

NOTE A moving walk was formerly known as a passenger conveyor.

3.19**nominal width**

width of the step, pallet or belt carrying the load

3.20**owner**

legal entity having right of possession of an escalator or moving walk and responsibility for its safe working

NOTE The owner is usually the landlord or proprietor of the building in which an escalator or moving walk is situated.

3.21**passenger**

person transported by an escalator or moving walk

3.22**permit to work**

authority in writing which includes details of:

- a) work to be undertaken;
- b) procedures involved;
- c) precautions needed;
- d) emergency procedures to be in place;
- e) persons to undertake the work;
- f) timescale of the work to be undertaken;
- g) restrictions on the workplace or equipment

3.23**planning supervisor**

person responsible for overall coordination of health and safety issues

3.24**power system**

system that provides power for directly controlling the motion of an escalator or moving walk

3.25**principal contractor**

person responsible for health and safety issues, including employee training

NOTE The principal contractor is commonly referred to as the “main contractor”.

3.26**putting into service**

making available for safe use an escalator or moving walk that has undergone examinations and tests

3.27

premises

place and its immediate vicinity, where an escalator or moving walk is situated

3.28

rated speed

speed to move an escalator or moving walk under rated load condition

3.29

return station

area within the truss of an escalator or moving walk where the moving steps, pallets or belts commence their return to the driving station

3.30

safe system of work

formal procedure, resulting from a risk assessment, which specifies safe methods of work to ensure that risks to health and safety are minimized and the remaining risks are mitigated

3.31

structural opening

area in which escalators and moving walks are installed in their final location

3.32

truss

structural framework of an escalator or moving walk

3.33

user

person (not necessarily a passenger) making use of the services of an escalator or moving walk installation

3.34

work platform

designated area, moving or fixed, for carrying out work tasks

4 Planning

NOTE General guidance is given in this clause on the procedure to be adopted in obtaining an installation that is satisfactory from the aspects of operation, safety and maintenance. Guidance is also given on the exchange of information between the contractor and other trades in providing various service facilities. This clause provides the overall chronological sequence and subsequent clauses provide detailed guidance on other activities needed during the life of a project.

4.1 Classification of escalator and moving walk equipment

The classification of escalator or moving walk equipment is given in BS EN 115 as summarized below.

The most commonly available nominal widths for escalators are 600 mm, 800 mm and 1 000 mm. The most commonly available rated speed is 0.50 m/s; other speeds available are 0.65 m/s and 0.75 m/s. The most commonly recommended angle of inclination is 30°, which is permitted for any rise. An angle of inclination of 35° is permitted for rises not exceeding 6 m and rated speeds not exceeding 0.5 m/s.

The most commonly available nominal widths for moving walks are 800 mm, 1 000 mm and 1 400 mm, but this is dependant on the inclination. These nominal widths are permitted up to an angle of inclination of 6°. Above 6° to the maximum permissible angle of inclination of 12°, the nominal width should not exceed 1 100 mm.

4.2 Enquiry or invitation to tender

4.2.1 General

Information exchanged between parties should be carried out using a specified format, e.g. paper-based, web-based, etc.

The purchaser's representative should allow adequate time for the contractor to tender. A period of 4 weeks to 8 weeks is generally sufficient, although a longer period can be necessary dependent on the complexity and size of the scheme.

The enquiry documents should be strictly confined to material relevant to the work and the particular project. The enquiry documents should state which regulations and standards the equipment is to conform to. Extracts from standards and regulations should not be quoted in the enquiry documents.

NOTE 1 Attention is particularly drawn to the Supply of Machinery (Safety) Regulations 1992 [1] with regard to new escalators and moving walks.

NOTE 2 A typical checklist of the information to be exchanged is shown in Annex B (B.1 and B.2.1).

Where building restrictions preclude the use of escalators or moving walks conforming to the relevant requirements of BS EN 115, additional data should be included in the enquiry documents as necessary, according to the particular circumstances.

4.2.2 *Additional items*

The enquiry documents should indicate any additional items beyond those required by BS EN 115, such as:

- a) dismantling of an existing escalator or moving walk;
- b) fire detection;
- c) fire protection;
- d) level of fire resistance and compartmentation;
- e) forced ventilation;
- f) landing features and fixtures;
- g) any special controls and designations;
- h) any beneficial or temporary use (see 4.5.3);
- i) any factors which affect health and safety;
- j) any special equipment;
- k) any special guarding.

The principal contractor should specify the building construction method for the escalator or moving walk and any machine room or machinery space.

The contractor should provide details of support points for equipment, loadings, dimensions, etc. The contractor, in consultation with the principal contractor, should specify any proposed installation method for the escalator or moving walk.

Escalators or moving walks to be installed in adverse conditions, e.g. outside buildings, in chemical works, seaside locations, sandy (desert) locations, vandal-prone situations and similar applications, require special consideration according to the circumstances.

4.2.3 *Finishes*

Finishes should be specified at the enquiry stage. It is important that any surface finishes to components, e.g. handrails, balustrades, skirt panels, floor plates, etc., do not hinder or prevent safe access and egress for all users.

NOTE Attention is drawn to the Disability Discrimination Act 1995 [2]. See Clause 10 and A.3.

4.2.4 *Other items*

A number of other items are associated with an escalator or moving walk installation, of which some should normally be provided by the principal contractor and some should normally be provided by the contractor. The items vary with the type of installation. It is important that the limits of responsibility are clearly understood by all parties, particularly with respect to turnkey projects, and the enquiry documents should be specific in this respect.

NOTE B.2.2 gives details of the items normally supplied by the contractor and B.2.3 gives details of the items normally supplied by the building contractor.

More detailed recommendations for site preparation and work by other trades are given in 4.4 and Clause 8.

4.2.5 Support points and fixings

According to the construction methods adopted, support points and fixings for attaching equipment might be required. The principal contractor and the contractor should agree the exact requirements, particularly with respect to dimensions and tolerances, before a tender is offered.

4.2.6 Building contract programme

The enquiry should indicate as accurately as possible the building contract programme as it affects the contractor, and a mutually acceptable programme should be agreed.

4.2.7 Pre-tender-stage health and safety plan

NOTE Attention is drawn to Regulation 15 of the Construction (Design and Management) Regulations 1994 [3], which requires a pre-tender-stage health and safety plan to be prepared that is sufficiently developed for it to form part of the tender documentation supplied to the contractor.

The pre-tender-stage health and safety plan should make plain the issues specific to the project, so that contractors can take account of these in their proposals. As a minimum it generally includes:

- information the client has made available;
- information about risks which cannot be avoided;
- any surveys of the site and its neighbourhood with the related health and safety implications;
- contributions from designers;
- any identified precautionary measures to be taken against particular risks.

4.2.8 Tender submissions

Tender submissions should be returned as instructed, and should include all the information required, additional information to support the tender bid and the pre-tender-stage health and safety plan, associated risk assessments and operational issues.

4.3 Acceptance of tender and subsequent procedure

NOTE The procedure indicated in 4.3.1 to 4.3.6 particularly relates to the most usual case, where the contractor is a subcontractor (contractor under the Construction (Design and Management) Regulations 1994 [3]).

4.3.1 Order

An order is placed with the selected contractor. If alternative schemes have been offered, the order should clearly indicate which has been accepted.

4.3.2 Escalator or moving walk contractor's programme

As noted in 4.2.6, the building contract programme should have been indicated as accurately as possible at the time of enquiry. At the time of order the contractor's programme for manufacture and installation of the escalator or moving walk should be agreed. The contractor's programme should cover each escalator or moving walk separately and should indicate the dates when:

- a) the order was placed;
- b) all approvals are to be complete, i.e. when:
 - 1) all relevant building information is to be finalized;
 - 2) builders' work and layout drawings prepared by the contractor are to be finalized and approved;
 - 3) the finishes are to be finally accepted and approved;
- c) the procurement and manufacture of the equipment is to be completed;
- d) the escalator or moving walk site is to be ready for installation;
- e) the provision of electricity supplies are required;
- f) the escalator or moving walk is to be installed and commissioned;
- g) handover and CE marking is required;
- h) the technical file is to be available, etc.

For additional information relevant to programming the site work, see 4.4 and 4.5.

NOTE 1 As the equipment units are large, it is important that liaison with the local authorities and police is undertaken at an early date in order to ensure that road closures are programmed into the schedule. Attention is particularly drawn to local byelaws and to the Health and Safety at Work, etc. Act 1974 [4].

NOTE 2 Attention is also drawn to the Lifting Operations and Lifting Equipment Regulations 1998 [5] and to local regulations and byelaws with regard to access, storage and crane facilities.

4.3.3 Drawings

After the order has been placed the contractor should supply drawings showing the builders' work required, the structural loadings, electrical loadings, sprinkler details, any machine room layouts, etc., indicating minimum dimensions and tolerances (see Clause 5). To enable these to be prepared, the purchaser's representative should provide the contractor with the relevant detailed building drawings.

4.3.4 Approval of drawings

Written approval should be given by the purchaser's representative for the drawings (see 4.3.3) submitted by the contractor, after modification, if necessary, and within the limitations of the information provided.

4.3.5 Selection of finishes

The final choice of finishes (see 4.2.3) such as panel finishing, decorative features, decorative finishes, colours, etc., should be communicated by the purchaser's representative to the contractor, not later than the time of approval of the drawings.

NOTE Attention is drawn to the Disability Discrimination Act 1995 [2]. See Clause 10 and A.3.

4.3.6 Electricity supplies to escalator or moving walk

A permanent power supply is recommended for final commissioning and testing of the escalator(s) or moving walk(s), but a temporary supply is acceptable provided that it is equivalent to the permanent supply. A permanent power supply should be available before the escalator or moving walk is put into service (see 8.3).

NOTE If an electrical supply is not available when required, this can cause additional works and delays.

4.4 Coordination of site work

4.4.1 Pre-construction and site meetings

For the successful progress of site work, full cooperation between all parties is essential, and on large sites regular meetings are beneficial. Programmes for the construction and installation work in that part of the building containing the escalator or moving walk should be made in consultation between all parties concerned. It is important that critical dimensional tolerances (see 5.2.1) are fully discussed at this stage as correction after structural openings have been formed can result in time delays.

4.4.2 Health and safety plan and file

4.4.2.1 Construction-phase health and safety plan

NOTE 1 Attention is drawn to Regulation 15 of the Construction (Design and Management) Regulations 1994 [3], which requires a construction-phase health and safety plan to be prepared prior to any work being carried out, in order that the contractor can carry out or manage the construction work.

The construction-phase health and safety plan should draw on:

- the principal contractor's health and safety policy and assessments;
- the health and safety plan prepared by the planning supervisor (3.23);
- details of the management and risks created by the contractors and subcontractors.

The detail and size of the construction-phase health and safety plan depends on the nature and extent of the project and the contracting arrangements for the construction work and should be relevant to the circumstances of the project. The construction-phase health and safety plan should continually evolve in order to provide a focus for the coordination of health and safety as the construction progresses.

NOTE 2 The planning supervisor has a duty to ensure that a health and safety plan is prepared.

4.4.2.2 Health and safety file

NOTE 1 Attention is drawn to Regulation 14(d) of the Construction (Design and Management) Regulations 1994 [3], which requires the planning supervisor to produce a health and safety file.

NOTE 2 The health and safety file is essentially an extended maintenance manual alerting persons responsible to the risks to be managed during the operation, repair, service, renovation or demolition of the structure and plant, after the escalator or moving walk has been put into service.

The production of the health and safety file should draw on at least the following information:

- record or “as built” drawings and plans used and produced throughout the construction phase;
- general details of the construction methods and materials used;
- risk assessments and method statements;
- details of the equipment and maintenance facilities;
- maintenance requirements;
- manuals produced by specialist contractors;
- details of the location and nature of services, including emergency and fire-fighting systems;
- operational issues.

During the construction phase the principal contractor and other contractors and subcontractors should provide all relevant information to the planning supervisor to enable the file to be reviewed, amended or additions made.

4.4.3 Preparatory work on site

It is customary for the contractor to make periodic visits to the site before the starting date, to check progress on the construction of the escalator or moving walk location and discuss relevant matters with the building contractor. The building contractor should check that all building work has been carried out in accordance with the agreed dimensions (see 5.2). In existing buildings, where equipment is being replaced, the contractor should check the dimensions and other requirements for the new equipment to be installed.

Immediately before the time for escalator or moving walk installation to commence, the contractor should check that site conditions are fit to permit installation to proceed.

In some circumstances where a very large escalator or moving walk is to be installed or the building presents difficult conditions (e.g. poor access) then the escalator may be delivered to site in sections to be assembled in situ. Where an escalator or moving walk is to be installed in adverse conditions it can be necessary for the building contractor to temporarily deck out and waterproof the location prior to delivery. Any special requirements should be included in the pre-tender-stage health and safety plan and should be specified at the time of the tender enquiry.

4.4.4 Delivery of material

The contractor should advise the building contractor when equipment is ready for dispatch. The building contractor in consultation with the contractor should make arrangements on site to receive and unload the equipment with appropriate crange, hoisting equipment, etc. onto a hard flat surface at an agreed location as near as possible to the final escalator or moving walk position.

Movement of the units through the building should be via an agreed route, clear of obstructions and step level changes, ramped (where appropriate), protected against damage and supported to bear the weight of the units. Where necessary, pulling and tie-back anchorages should be provided along the route and lifting points should be provided above the upper and lower seating positions together with access scaffolding.

4.4.5 Storage and protection

The contractor should ensure that the equipment is protected from damage, at all times, during the installation phase.

Arrangements should be made by the building contractor, during the installation until entering into service, for the storing, protecting and preserving against loss, deterioration or damage, of the escalator or moving walk and materials on the site.

NOTE Attention is drawn to the potential adverse effect of associated construction activities on the site affecting the subsequent performance of the mechanical and electrical equipment.

Escalator or moving walk equipment normally receives a final coat of paint at the works before dispatch to site. Any additional painting required owing to adverse site conditions or damage to decorative finishes should be subject to separate negotiation between the contractor and the purchaser.