



HSE

Health & Safety
Executive

Health and safety on floating fish farm installations



This publication gives advice on the design, construction and safe use of floating fish farm installations including fish pens or cages, walkways, gangways, vehicle ways, land access ways, shelters and associated equipment.

Construction and maintenance of installations

All parts of the floating cage unit need to be designed and constructed to provide suitable anchorage, buoyancy, strength and stability to ensure the installation's safety.

When deciding on the adequacy of these features it is necessary to take into account the likely loads imposed by vehicles, equipment, fish food etc, and the effect of waves and wind. Continued safety of the installation will depend on regular routine inspection combined with a maintenance inspection, normally at least once a year and after storms.

Easily understood written instructions on the operation and maintenance of the installation should be available to operators. Site supervisors need to have ready access to the name and address of the manufacturer.

Provision of guardrails, footrails and safe working surfaces

A suitable and secure walkway needs to be provided around the exterior of each fish cage with a recommended width of at least 600 mm. It is also recommended that internal walkways be at least 900 mm in width. In the case of existing circular cages which currently have no walkways, it is expected that suitable walkways will be fitted at the earliest opportunity.

Walkways can be fitted when cages are removed from the water for maintenance or, in some circumstances, while still in use. Where the manufacturer can confirm that a cage has insufficient strength to withstand the

additional stresses imposed by the sea on a fixed walkway, work around the exterior of the cage will need to be carried out from a suitable workboat or independent floating walkway so that people do not have to walk on the buoyancy rings. In such cases a full walkway will not be expected, but it will be necessary to fit enough landing platforms, not less than 2 m each in length, to ensure safety when boarding from a boat or independent floating walkway is required. All new cages need to be designed and equipped with an exterior walkway (this should be taken into account by users at the time of purchase).

Guardrails need to be provided, to the greatest extent practical, along open edges in order to protect against falls from height or into the water. They are of particular importance at the inside edge of cage walkways and the open edges of gangways, feed or accommodation barges and similar structures. Intermediate guardrails are optional, except where the upper guardrail has been vertically offset to a position outside the line of the edge being protected, or where a person may fall 2 m or more.

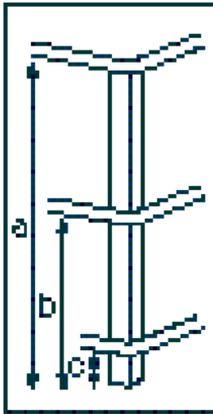
Guardrails are optional at the outside edges of cage walkways where boat landing takes place, unless a person falling from the walkway would be likely to suffer personal injury due to the height or design of the installation. In such cases suitable guardrails need to be fitted at sections where the risk of falling is greatest, eg at T junctions and corners, where the length of the guardrail would be at least equal to the width of the walkway that it faces.

Guardrails can be made from wood, metal or other suitable material, and should be rigid, smooth and able to withstand the weight of people falling against them. Where guardrails on two or more adjacent installations meet each other, they need to be designed so that dangerous trap points are not created as the cages move with the waves. Where necessary, guardrails can consist of taut wire or chain - rope is not suitable.

Footrails need to be fitted at the inside edge of cage walkways to provide bracing and to prevent workers'

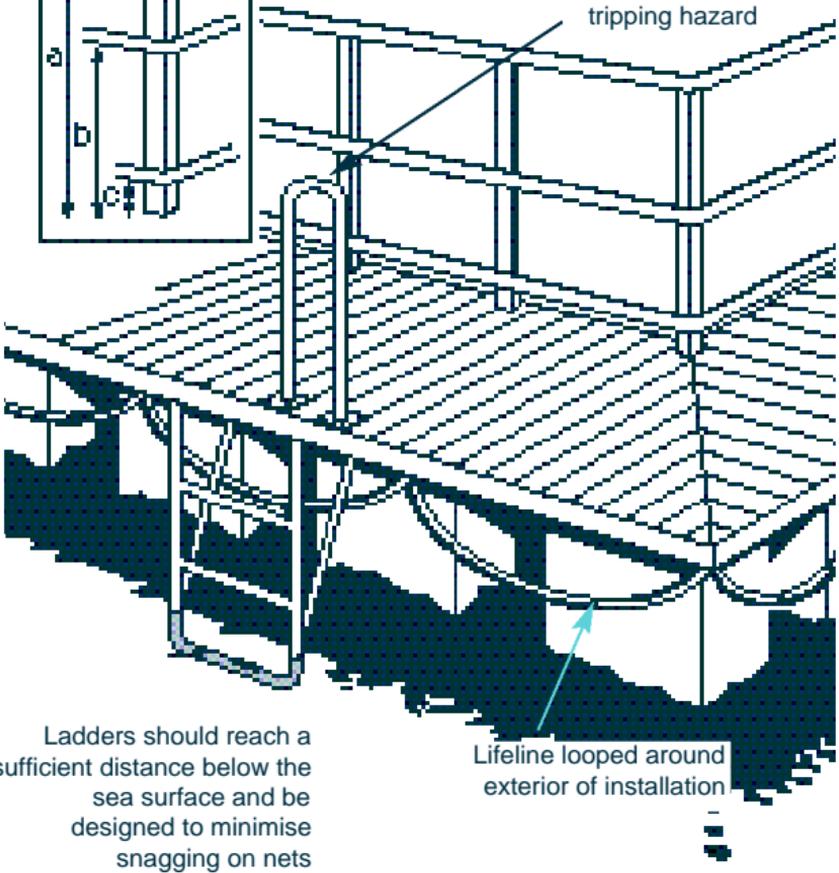
feet slipping from the walkway when nets are being hauled up. A suitable design will prevent fish food or water becoming trapped on the walkway.

Guardrails



- Dimensions**
a 0.9 m-1 m
b 0.45 m-0.55 m
c 75 mm-100 mm

Secure handholds may be vertical or designed horizontally into the walkway surface to minimise tripping hazard



Ladders should reach a sufficient distance below the sea surface and be designed to minimise snagging on nets

Lifeline looped around exterior of installation

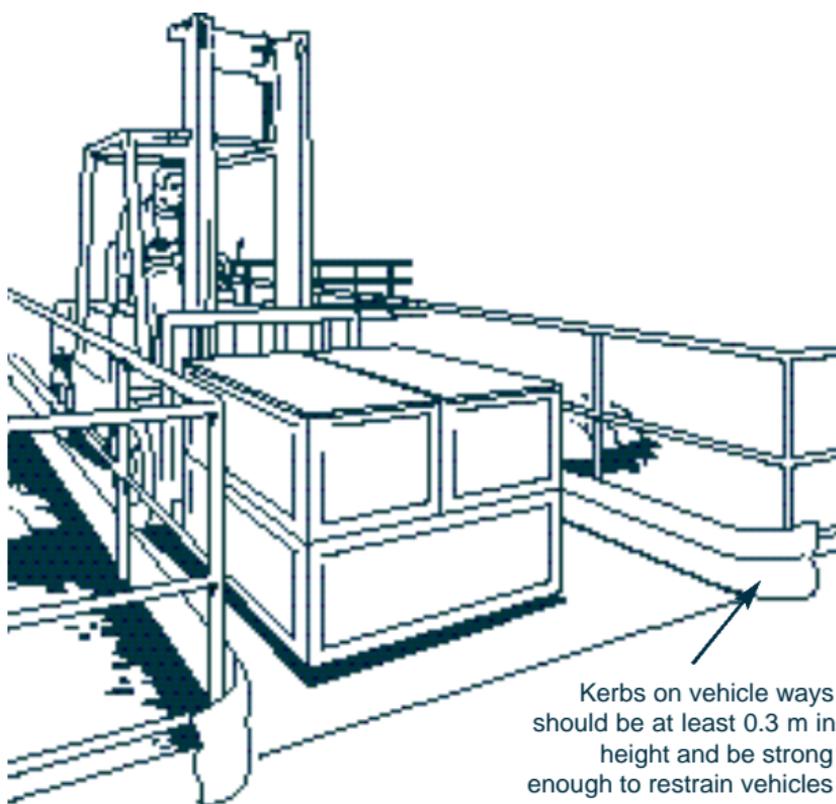
Floors and other surfaces on which people walk need to be free-draining, non-slip and sufficiently firm and continuous to allow safe walking and transport of materials. They should be free of obstructions and splinters, protruding nails, bolts etc. No gaps should exist which may cause someone to trip and any spacing gaps in a walkway or platform floor need to be kept as far below 50 mm as possible.

Where cages adjoin one another any gaps between the cages or cage walkways need to be protected to

prevent the risk of workers becoming trapped or falling through. New cages can be designed to eliminate this risk and existing cages modified, so far as is reasonably practicable.

Vehicle ways also need to be fitted with guardrails at open edges and a kerb/barrier at least 300 mm in height provided to prevent the wheels of powered vehicles going over the edge.

Vehicle ways



Boat-mooring facilities need to be suitable and secure with mooring eyes positioned so that ropes or cables do not cross or rest on walkways. Boats moored to parts of the cage which have not been designed for that purpose could result in damage to the cage or boats going adrift.

Stairways and ladders should be soundly and properly constructed including the provision of a secure handhold at the top of any stairway which is at an angle of 30 degrees or less from the vertical. Other stairways

need a handrail on open sides and, where appropriate, safe means of embarking or disembarking from boats or barges.

Safety and rescue equipment

When working over water at any location, at least two people need to remain within sight and sound of each other at all times. They will require constant access to a moored boat or life raft.

Suitable ladders or other equally effective ways of assisting workers to climb from the water onto the installation need to be provided at regular intervals around the exterior. It will be necessary to consider the design and location of these to help prevent the risk of physical damage from boats (adjacent to cage mooring points may be appropriate). Ladders ought to extend below the water surface to give sound footing and incorporate a secure handhold at the top. Equipment such as a boat-hook can be provided to help rescuers retrieve people from the water.

Where the edge of a perimeter walkway, working platform or jetty is more than 300 mm above the water surface, a lifeline or other facility should be fitted around the exterior to help a person maintain contact with the installation and gain access to the ladders.

Lifebuoys, meeting either of the standards set out in the Merchant Shipping (Life Saving Appliances) Regulations (SI 1986 No 1066), with a suitable buoyant lifeline of adequate length attached, should be available within 50 m of any working position where a person could fall into the water. Lifebuoys may not be necessary where they are provided on a workboat at small or single cage installations. Alternatively, a separate buoyant throwing line can be provided.

Suitable personal buoyancy equipment, such as lifejackets, should be provided by employers and worn by everyone on an installation. Selection of the correct buoyancy equipment depends on a number of factors including frequency of use, size/weight of the wearer,

ability to swim, protective/foul weather clothing being worn, use of tool belts or other loads, likely weather conditions and availability of help.

European standards (BS ENs) exist for buoyancy equipment. Each standard is intended to be suitable for different activities and conditions. Equipment needs to be selected from the appropriate standard, taking into account the factors mentioned above. HSE Information Sheet AIS1 *Personal buoyancy equipment on inland and inshore waters* provides further guidance.

The provision and use of lifejackets while on workboats is contained in the Maritime and Coastguard Agency (MCA) Code of Practice *The safety of small workboats and pilot boats*. This standard is relevant to both tidal and freshwater fish farm operations. Use of an MCA 'approved standard' lifejacket while on an installation would be acceptable.

Floating cage installations need to be securely held in position by adequately designed lines, fixing points and anchors or by other suitable means. These should be able to withstand the wave heights and tide ranges appropriate to the site. Correct positioning and setting up of moorings is essential.

Training should be given on the procedures for rescuing people from the water (including rescue into a boat) and also on the correct fitting, maintenance and use of lifejackets.

Clothing for wet weather/cold protection

There is always a risk of rheumatic complaints due to a combination of cold, damp and repetitive strain. To minimise such risk, protective clothing and/or adequate warm clothing (including gloves and boots) need to be provided and worn relevant to the prevailing conditions.

When working over water at low temperatures (average sea surface temperatures of 10° C or less) there is a particular risk that a person falling into the water will suffer from cold shock or become rapidly hypothermic.

If there could be delay in rescue from the water, particularly if people are working from a single, small, open boat (without life raft provision) or there are not enough people to provide immediate assistance, then a suitable dry suit, immersion suit or other similar garment (eg multi-layer clothing and waterproofs) needs to be worn by each person.

Shelter

Adequate and suitable shelter needs to be provided at installations which are not close to the shore base, ie within verbal hailing distance, or joined to the land by a permanent gangway where the shelter can be provided on the shore. It should be weatherproof and big enough to accommodate the maximum number of employees normally expected to work at the installation at any one time. Where there are no shelters, covered accommodation may be provided on a suitable workboat moored at the installation while people are present.

Light

Every part of the installation where people work should be adequately lit by natural or artificial light.

Electricity

All electrical installations and equipment should be constructed, installed, operated, protected and maintained to prevent the risk of danger from electric shock or burns. This needs to take into account foreseeable weather conditions and the corrosive marine environment in which they will be used. Special attention should be paid to 'earthing' if the supply is from portable generators. The Electricity at Work Regulations 1989 apply.

An industry Code of Practice *Electrical installations on and about sea and inland water located fish farms* has been produced by The Electrical Contractors

Association of Scotland in conjunction with the Scottish Salmon Growers Association and The Electrical Contractors Association. This provides practical guidance to both contractors and fish farmers, and can be obtained from the above Associations.

Communication

Adequate 'installation to shore' communications need to be provided. Normally these would be provided on the workboat in accordance with the MCA Code of Practice (hand-held or fixed VHF radio and flares). However, it is recommended that, where practical, each cage installation be provided with a suitable number and type of flares stored in a waterproof container.

Operators need to be given clear instructions on the procedures to follow should they discover any poachers on or approaching a cage installation.

Manual handling

Lifting equipment and other means of mechanical handling should be used where reasonably practicable. If this is not possible, manual handling operations will need to be assessed in order to identify ways of minimising the risk of injury. Suitable training will normally need to be given on correct lifting techniques for items such as nets, feedstuffs and containers of fish.

Lifting operations

Where fixed lifting equipment is provided, it should be securely attached to the structure and account will have to be taken of its effect on buoyancy and stability.

Lifting equipment must be suitable for the intended use and of adequate strength. It must be positioned or installed to reduce risks from the moving load. The safe working load(s) must be clearly marked.

Lifting operations must be planned, supervised and carried out safely. Lifting equipment must be thoroughly examined at least every 12 months. Where safety depends on the way lifting equipment is installed, it should also be examined before use. Lifting accessories (chains, slings etc) and any lifting equipment used to lift people must be thoroughly examined at least every 6 months.

Records of examinations and any other inspections must be kept and provided to the new user if lifting equipment moves from one undertaking to another.

Washing and toilet facilities

Adequate washing facilities need to be provided at cage installations or on workboats. The minimum would be a supply of clean water (eg in containers), hand cleanser and towels. Suitable toilet facilities should be provided at the installation or on workboats unless operating close to a shore base where such facilities are provided.

First aid

Employers and workers at an installation need to be given adequate first aid training. The training needs to take account of the remoteness of the fish farm and should include resuscitation, treatment of bleeding, the recognition and treatment of hypothermia and the movement of an injured person from a floating installation to the shore. Suitable and sufficient first aid equipment needs to be provided at the floating installation or on the workboat.

Health risks

The Control of Substances Hazardous to Health Regulations 1999 (COSHH) require employers to formally assess health risks at the workplace, take steps to prevent or adequately control exposure to the risks, and in certain cases, monitor any exposure and

provide health surveillance for employees. The results of the assessment should be brought to the attention of all relevant employees and anyone else who may be affected. The assessment would be expected to include details of the following matters.

Dust

Workers handling feedstuffs and exposed to dust are at risk from irritation to eyes, nose and the respiratory system. Inhaling fish meal and other dusts could also lead to acute respiratory allergy in susceptible people. The risks with medicated feed may be higher.

Where dusts cannot be prevented or controlled by engineering methods then respiratory protective equipment (dust masks etc) needs to be worn. Respiratory protective equipment needs to be selected from a range of 'CE' marked products manufactured to a recognised standard such as BS EN 146 or BS EN 149.

Veterinary medicines

Risks from contact with organophosphorus (OP) and other medicines should be reduced by choosing the least hazardous alternative that will do the job and using a system which avoids or reduces operator contamination.

Personal protective equipment, operator training and supervision will all help to reduce risks.

Operators will need to be trained on the correct method of administering vaccinations and associated procedures. Accidental self-injection of certain oil-based vaccines can result in serious tissue damage leading to amputation or in rare cases, anaphylaxis.

If vaccinating by hand it is of particular importance that fish are properly anaesthetised to prevent unexpected movement. Syringe guns with needle guards and retracting needles need to be used and adequate protective gloves worn during the process. Where

appropriate, consideration can be given to the use of automatic or semi-automatic vaccination equipment. It should be noted that there can still be a risk of self-injection with such equipment, particularly during cleaning or adjustment.

Users of veterinary medicines need to follow the product label instructions. The free HSE leaflet, AS31 *Veterinary medicines, safe use by farmers and other animal handlers* provides further information.

All veterinary medicines need to be safely stored. HSE information sheet AIS16 *Guidance on storing pesticides for farmers and other professional users* gives relevant advice on the construction of a suitable store. Empty veterinary medicine containers need to be properly disposed of. The containers may be accepted (after consultation) at local authority refuse disposal sites, normally after being cleaned and, where possible, crushed. They should not be thrown into the water or dumped.

The advice of the supplier, local authority or a reputable waste disposal contractor may need to be sought on the safe disposal of unwanted substances.

Leptospirosis (Weil's disease)

Water and feedstuffs contaminated by infected rats can transmit this disease to humans. Operators need to cover broken skin and wash hands thoroughly after coming into contact with rat-contaminated areas. Early symptoms of the disease are non-specific and could be misdiagnosed at the stage when treatment is most effective. Those who work in areas where rats are likely should consult their doctor if symptoms such as feverish headaches and general aches and pains similar to influenza occur. They will need to explain that they have been working in rat-contaminated areas.

Diving operations

The use of diving as a routine activity needs to be kept to a minimum. Alternative methods of checking

anchors, net washing and removal of dead fish or other debris are available and ought to be adopted.

The Diving at Work Regulations 1997 apply to diving operations both inside and outside cages and need to be fully complied with. Use of divers with amateur or no qualifications is not permitted. Further information can be obtained by contacting HSE's Offshore Division, Lord Cullen House, Fraser Place, Aberdeen.

Training, instruction and supervision

All employees should be given adequate information, training, instruction and supervision in respect of all matters affecting their health and safety at work. Adequate reference to this needs to be included in the written safety policy statement, required where five or more workers are employed. In addition to general operational training, specific training standards and competency certificates exist and will normally be necessary for operators of fork-lift trucks (Approved Code of Practice *Rider operated lift-trucks - operator training* HSE Books L117 ISBN 0 7176 2455 2) and boat operators (in accordance with MCA standards, typically Royal Yachting Association/ Department of Transport Certificate of Competence or Coastal Skipper (Motor) or equivalent).

Wind speed/sea conditions

Taking account of swell and wave height, employers need to specify those sea conditions when installations should not be manned or when evacuation should take place.

Navigation markers

In tidal waters, requirements for marking and lighting will be determined, in principle, by the Secretary of State for Environment, Transport and the Regions and in detail by the relevant lighthouse authority in consultation with any local harbour authority. In the absence of any

comparable control regime in non-tidal waters, marker buoys will need to be provided to indicate obstructions in the water or for other safety reasons. The buoys need to be of suitable size, brightly coloured and designed and constructed so that navigators are made aware of potential hazards by day and night.

Boats

All seagoing workboats of up to 24 metres in length used on fish farms need to meet the requirements of The MCA Code of Practice. This standard will also be relevant on freshwater fish farms. Larger vessels will normally be subject to the full requirements of maritime safety legislation.

Health and safety legislation

The following list identifies the core of legislation applicable to fish farming which is enforced by HSE. This legislation places duties on employers, the self-employed and employees. Approved Codes of Practice and/or guidance are available on each set of regulations.

- The Health and Safety at Work etc Act 1974
- Health and Safety (First Aid) Regulations 1981
- Diving at Work Regulations 1997
- Loading and Unloading of Fishing Vessels Regulations 1988
- Electricity at Work Regulations 1989
- Management of Health and Safety at Work Regulations 1999
- Workplace (Health, Safety and Welfare) Regulations 1992

- Provision and Use of Work Equipment Regulations 1998
- Lifting Operations and Lifting Equipment Regulations 1998
- Personal Protective Equipment at Work Regulations 1992
- Manual Handling Operations Regulations 1992
- Control of Substances Hazardous to Health Regulations 1999
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995

Further information

Additional information is available from the Maritime and Coastguard Agency, Spring Place, 105 Commercial Road, Southampton SO15 1EG Tel 01703 329100

HSE priced and free publications are available by mail order from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA. Tel: 01787 881165 Fax: 01787 313995.

HSE priced publications are also available from good booksellers.

For other enquiries ring HSE's InfoLine Tel: 08701 545500, or write to HSE's Information Centre, Broad Lane, Sheffield S3 7HQ.

HSE home page on the World Wide Web:
<http://www.hse.gov.uk>

This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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