

SEA FISH INDUSTRY AUTHORITY

Seafish Technology

KILKEEL FISHMARKET EXTENSION

Seafish Report No 363

M A Myers

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SUMMARY

The Northern Ireland Fishing Harbour Authority (NIFHA) is currently committed to a programme of harbour works at Kilkeel that involve the extension of quay walls and the market building to improve the operations of unloading, sale and lay-by berthing of boats. Seafish were requested by the NIFHA to advise upon the structure and configuration of the proposed extension to the existing market in light of the proposed E.C Hygiene Regulations.

Kilkeel is the target port on the Co Down Coast and supports a fleet of some 114 vessels in excess of 10m registered length. The value of landings is about £7 million (1988) with nephrops cod and whiting being the predominant species.

This report provides a little background of the intended regulations and of local operational practice, and makes detailed recommendations relating to the hygienic design and construction of the building. It makes specific recommendation for a secure, chilled section of the market for prawn (nephrops) sales.

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1. INTRODUCTION

The Northern Ireland Fishing Harbour Authority (NIFHA) own the three major fishing harbours within the Province; Kilkeel, Portavogie and Ardglass. The NIFHA have statutory duties to 'improve', manage and maintain the harbours and to operate such facilities as may be provided at the harbours. Amongst their responsibilities are the modernisation and extension of the harbours, operation of the harbour facilities (including ice production, slipways and the fish market), dredging, leasing land and making bye-laws.

The major port of Kilkeel on the Co. Down coast supports a fleet in the order of 114 local boats of over 10 m registered length. Fish and shellfish to the value of £7 m was landed in 1988. During the Spring cod season the market may see daily landings of up to 6,000 boxes.

The port suffers constraints of tidal access across a sand bar that is compounded by physical problems of space within the harbour. These constraints result in considerable congestion within the harbour which in turn affects the efficient operation of the harbour facilities and the fleet.

NIFHA is currently committed to a programme of works at Kilkeel that involve the extension of quay walls and the market building to improve the operations of unloading, sale and lay-by berthing of boats. Seafish were requested by the NIFHA to advise upon the structure and configuration of the proposed extension to the existing market in light of the proposed E.C Hygiene Regulations and trends toward providing chilled holding facilities.

2. BACKGROUND

2.1. E.C. Hygiene Regulations

The European Commission is working on a very broad front of legislation to create a single European Market by 1992. The harmonisation of food hygiene standards throughout Europe is part of this process to prevent different national standards being used as barriers to trade as they are at the moment. Two regulations will specifically apply to fish hygiene and they are:

- i. "Council Regulation on the health conditions affecting the production and the placing on the market of fishery products". VI/2067/87 - En Rev4.
- ii "Council Regulation on the health conditions affecting the production and the placing on the market of live bi-valve molluscs". VI/2067/87 - En Rev4.

The proposals are based on the philosophy that all food handling businesses must be inspected and reach certain standards before they are licensed to trade. These will apply to all trade whether it be local trade within a member state or trade across borders.

The fourth revisions are expected to be put before the European Parliament very shortly in early 1990 and then before the Council of Ministers for approval. The regulations are in the nature of a broad strategy and short on detail although it is likely that a 'code of practice' will be used to give practical guidance for enforcement. The means of implementation and dates of compliance are yet to be agreed but it is likely that the earliest date they will come into force is 1993 and it could well be 1997 before they are fully implemented.

The regulations cover the handling and storage of fishery products on landing and onshore, including, holding, sale, merchanting, processing and distribution. Chapters II, III and IV of the Annex relate specifically to requirements during and after landing and on conditions for establishments onshore.

At the present time Seafish are recommending good practice and design which are believed to be more than adequate to meet the EC Regulations.

2.2. Landings and Sale

Landing times and the time of the auction sale at Kilkeel is determined by tide times, with access to the harbour by the larger boats not possible for the two hours either side of low water. The auction is usually conducted between 17.00 hours and 21.00 hours with occasional morning sales that make for a long day for buyers and merchants. Landings frequently take place while the auction is in progress, with boxes being laid out as buyers remove boxes that have been sold. The existing market provides approximately 600 m² of floor space and a marginal quay that allows 4 to 7 boats to simultaneously discharge, depending on the size of boat and how they tie up. Typical discharge times for prawn boats are in the order of 10 to 20 minutes and up to an hour and a half for whitefish boats in the cod season (Feb - April).

All boats box at sea (except herring skiffs) and discharge using their own landing gear. Boats land port-side-to and this requires boats to turn through 180 degrees on entering the harbour and then come round again to take up their lay-by berth. Finfish is landed in 70 ltr boxes that contain 7 - 8 stone of fish that are sorted at sea by species. The catch is arranged on the market in lots with gaps left to separate the shots of different boats. Prawns (nephrops) are sold in 4 stone units and are weighed prior to display and sale.

With due allowance for gaps between shots and access for inspection and sale, approximately 800-1000 boxes can be displayed on the existing market without stacking. Only by stacking boxes up to 5 or 6 high and by operating the sale and landing on a continuous basis can the market cope during heavy landings. Fish is sold on a first in first out basis in the traditional manner whereby the auctioneer accepts bids with the lot going to the highest bidder. The buyer is not obliged to take the whole lot. Finfish and prawn sales are conducted separately and are physically segregated. Maximum daily prawn landings are in the order of 800 boxes. After the sale the fish is usually removed fairly quickly from the hall and taken by road to local merchants premises for processing or

onward distribution. The boxes are provided by the boat agents and are usually tipped into the merchants own boxes on the loading bay at the rear of the market. Washing of boxes is undertaken on the market with a hose.

3. PROPOSED DEVELOPMENT

NIFHA are committed to a programme of work to improve Kilkeel to relieve the congestion which is now an acute problem and to improve facilities for the handling and sale of fish. Contemporary Seafish study has shown the port to be in a buoyant situation relative to the rest of the United Kingdom although it is heavily dependent on disposing the prawn catches to traditional markets mainly in England. Some diversification of market effort would be desirable.

The first phase of the proposed development, currently underway, involves the removal of revetments on the north side of the harbour and the building of a new North Quay (265 m) which will allow 14 extra lay-by berths. The position of bollards, ladders, water and electricity points is agreed. The existing fish market is to be doubled in size and will incorporate a chilled section for the holding of prawns. Only the outline design of the market is agreed.

4. PRINCIPALS OF MARKET DESIGN

The principal aims of the market building design should be to:

- provide hygienic conditions of handling and storage.
- provide a cool and draught free environment for maintenance of fish quality.
- enable speedy, efficient and safe handling operation.

With respect to the proposed E.C. Hygiene Regulations there are two basic underlying principals to be considered; product contamination and product temperature control.

4.1. Temperature Control

It is important to note that with regard to temperature control the draft regulations specify that fresh fishery products must be held at the temperature of melting ice and that the temperature of the fish should not be allowed to rise unduly during unloading or display for sale. This does not necessarily mean however that fish markets have to be mechanically chilled, as a high standard of icing practise can achieve this objective. At Kilkeel it is not usual to hold fish in the market for lengthy periods and it is suggested that mechanical chilling of the whole market building is unnecessary and probably inappropriate to local operating practice.

There is strong argument however, to provide a chilled section of the market for the holding and sale of prawns (nephrops) for reasons of hygiene, operational efficiency and security. (As well as meeting the requirements of the hygiene regulations, a secure chilled holding facility would enable greater flexibility of landing of prawn boats and the option of a fixed morning market for prawns). The recommended air temperature for chilled sections of market halls is in the region of +2°C.

4.2. PRODUCT CONTAMINATION

The building design should protect from potential sources of contamination with particular attention to:

- the hygienic design, construction and materials of the fabric of the building
- the exclusion of undesirable pests (domestic animals, vermin and insects, seagulls etc)
- the hygiene requirements of personnel (wash-hand basins, toilets etc)
- exclusion of toxic gases or wind born dirt, (exhaust emissions, sand and dust etc)

5. DETAIL OF DESIGN

5.1. Configuration and Area Requirement of the Prawn Holding Section of Market

Based on the premise that a maximum of 800 boxes (60 boats x 50 stone) would need storage/display, the area requirement is calculated as:

$$\begin{aligned} 800 \text{ boxes} \times 0.815 \times 0.463 \times 2 \text{ (access factor)} \times 1/5 \text{ (stacking factor)} \\ = 126 \text{ m}^2 \end{aligned}$$

The site for the chilled holding section needs to be within the market or immediately adjacent to it to minimise handling operations. A suggestion of Northern Ireland Fish Producers Organisation is to build this facility to the rear of the market between the existing market and the extension. This however restricts access to the rear of the markets, reduces the road width and involves additional construction costs. The Seafish recommendation is to occupy the first four bays (assuming bay widths of 5 m) of the western end of the new extension. Figure 1. Four bays is in excess of the calculated requirement but would provide for expansion if required.

5.2. Doors

To comply with the E.C. Hygiene Regulations the market will need to be totally enclosed. It is recommended that the quayside face of the building be fitted with doors in alternate bays and that the rear face of the building (roadside) be fitted with doors in each bay, with the exception of the chilled area. The chilled area should have doors in alternate bays only on both faces. It should also have a door between it and the rest of the market (figure 1).

As a guide the new chilled section of the Fraserburgh market specifies 4.6 m (wide) x 3.0 m insulated sectional overhead doors with a 'U' value, fitted in place of $1.2 \text{ W/m}^2\text{C}$. Insulated doors to the rest of the building are recommended.

Doors should be finished in a light colour and not fitted with windows. Suppliers like Henderson and Lowland manufacture to size. All doors should be lockable.

5.3. Walls

The E.C regulations specify that walls are easy to clean. The ideal finish is plastic cladding but it is very expensive. A cheaper alternative is rendered block with a light coloured painted finish in either chlorinated rubber or epoxy paint (food grade), or a fibre-glass/resin spray coating. Wall-floor intersections should ideally be coved to facilitate efficient cleaning. The chill section should have a 'U' valve no greater than $0.4 \text{ W/m}^2\text{C}$. See also 7.

5.4. Roof/Ceiling

The underside of the roof or ceiling should likewise be easy to clean. Ceiling finishes should be in light colours to assist in securing high lighting levels within the building and maintaining satisfactory hygiene standards. Apex ventilation if specified must have adequate bird guards.

5.5. Floors and Drains

The regulations call for 'waterproof flooring which is easy to wash and disinfect and laid in such a way as to facilitate the drainage of water'. Earlier drafts of regulations make specific mention of drains. Floor finishes need careful consideration as water and fish slime can cause dangerous working conditions. A well compacted and cured concrete laid to falls of between 1:50 and 1:75 is recommended. The surface should not be polished but must enable efficient cleaning. It is recommended that a drainage system be included in the design rather than a direct discharge over the quayside.

5.6. Lighting

The regulations call for markets to 'be well lit to facilitate the inspection of fishery products'. Not only must lighting intensity be

high but of the right quality for inspection and sale. An intensity of 500 lux is ideal for selling but lower intensities are accepted and preferable for laying out, hence a system that allows the switching in and out of half the fluorescent tubes is useful. Glass tubes must be protected by clear plastic safety covers.

Translucent roof panels that admit natural light are not recommended as they can produce a 'greenhouse effect' that raises the temperature within the hall, unless designed to be north facing.

5.7. Refrigeration

Within the design of the building a small enclosed area (well ventilated) must be allowed for the refrigeration plant for the chilling of the prawn market section. A plant room of approximately 5 m x 4 m should be adequate for this purpose. A flat-roof extension to the market would enable air-cooled condensers to be located above. Depending upon the constructional design of the walls/roof supports the evaporators could be mounted beneath the roof or wall mounted on the gable-end or between doors on the quayside.

5.8. Washrooms

The regulations state that markets 'be equipped with sanitary facilities with an appropriate number of wash-basins and flush lavatories. Wash basins shall be supplied with materials for cleaning the hands and disposable hand towels'. It is assumed that these facilities are provided for by the existing washrooms. Foot or knee operated taps are mandatory.

5.9. Washdown Water

Water supply of potable quality should be provided on the market for purposes of washdown. Retractable hose-reels, located at suitable positions off the floor, along the length of the market are recommended. Dock water is not acceptable for washdown purposes.

5.10. Loading Bay - Road Access

Hygiene Regulations do not directly concern the specification of the loading bay. The loading bay design is however fundamental to the efficient operation of the market in that it enables the expeditious removal of products with the minimum of delay and frustration. The existing saw-tooth design was intended to be used by vehicles backing up to the narrower width of the saw-tooth so that they faced down the dock (away from the entrance). Because the size mix of road vehicles using the facility resulted in the smaller vehicles being obstructed however, it has been used in a reverse fashion.

The site layout drawing by Doran and Partners shows this corrected in the extension design, with the loading bay apron also widened slightly. It is recommended that the loading bay be provided with overhead cover. It is suggested that the pedestrian steps or ramp from road level to the market run down the side of the market and not the rear. This would enable another docking bay for road vehicles to the rear of the refrigerated prawn market. It is also suggested that more of the embankment be cut away opposite where the chilled prawn market would be to improve access.

5.11. Box Washing

The regulations state that 'crates (boxes) must, after each sale, be cleaned, disinfected and rinsed inside and outside with drinking water'. The existing arrangements for box washing are basic and rather perfunctory.

No recommendation is made in this respect other than that at some future date consideration might be given to the installation of an automatic box-washer. Covered box storage for cleaned boxes and water and electric services would be required to service box washing machinery.

5.12. Communications

With the market extension at some distance from the existing offices it is suggested that extension phones be provided at the intersection of the new and existing market.

5.13. Smoking and Spitting

Markets must have displayed in a prominent position signs prohibiting smoking and spitting.

6.0 Compliance with Regulations

No firm dates have yet been given as to when the industry is expected to comply with the forthcoming regulations although various dates have been suggested. It is likely however that compliance will be phased in over some years possibly between 1993 and 1997.

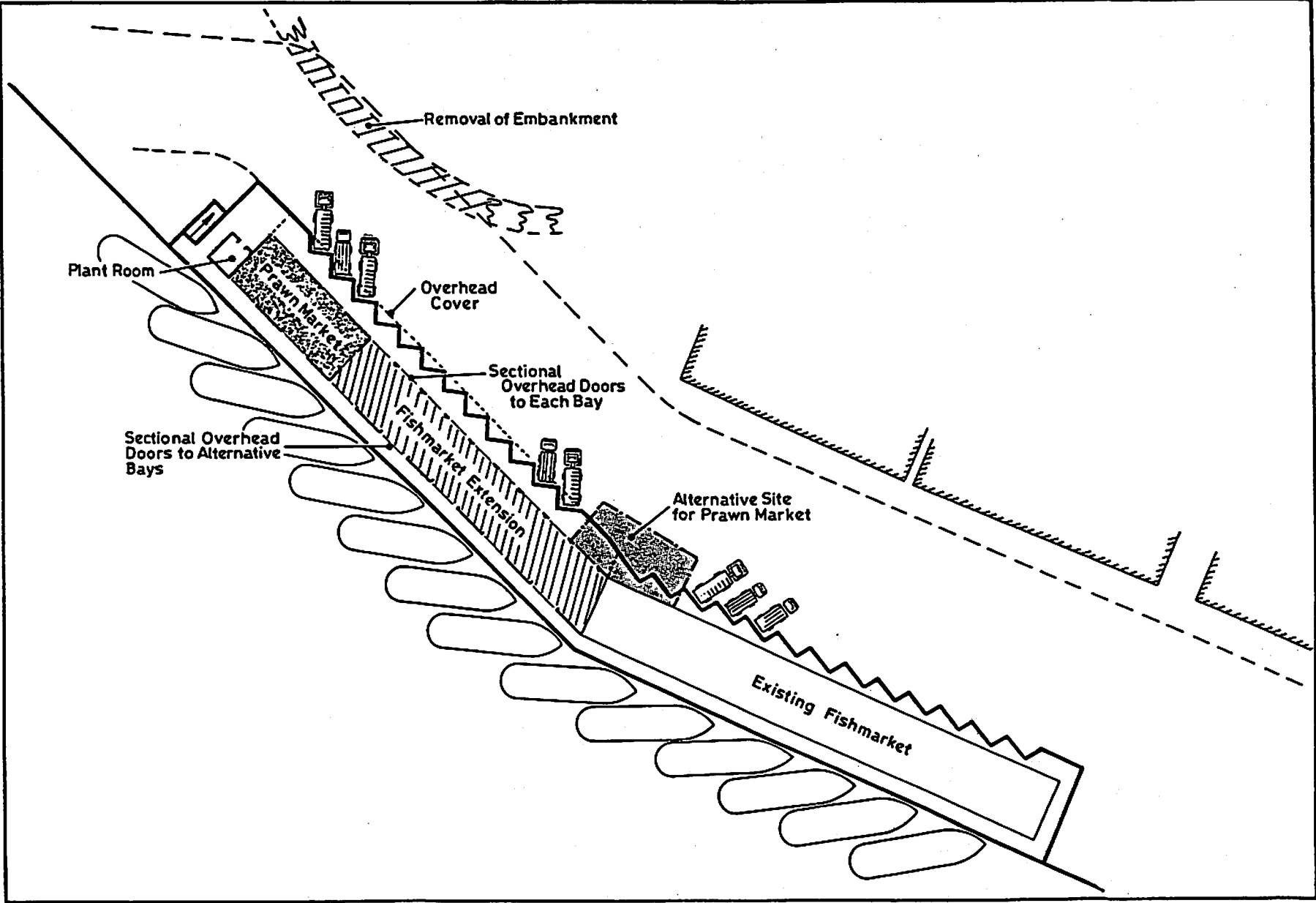
7 Implications to the Existing Market

The major implication for the existing market will be the requirement for doors to be fitted to the open bays on the quay side of the building.

In theory until doors are fitted to the existing market the new extension would not comply unless a wall was built between the extension and the existing market.

8 Disciplined Use of the Market Building

The benefits of an enclosed market in terms of temperature control, hygienic control and security can only be achieved if a strict regime is employed viz a viz the opening and closing of doors. It is recommended that the roadway side, doors be kept locked, until the sale has commenced and the first fish is being removed. Dockside doors may be opened by crews during landing periods but should be shut if not in use. Outside of landing periods these doors should also be kept locked except for access for cleaning and market maintenance etc.



Kilkeel Fishmarket Extension

Fig.1