

9.

Installation and Operation Procedure



IMSC - T32/27

1/20/2018

Installation

The system being employed by IMSC is the New Zealand continuous long line system. This system has been designed to withstand hurricanes. It does so by semi-submerging with extreme force and is industry standard across the globe. Ireland has existing sites using this method. Once the force is reduced the buoyancy allows the long-line back to the surface.

The element specifications are contained in the equipment list. This document will not break down the installation into lengths of time as this would require a fixed date of ordering equipment and is licence dependent. The average build time is 6-8 months.

IMSC will be hiring equipment from the UK (Offshore Shellfish Limited, use the same anchors) to install anchors. Fielder Marine consultants install all anchors on site. IMSC provide a suitable vessel with skipper and deck hand. Hydraulic power (50L/min 2000psi), GPS with farm co-ordinates loaded, Anchor Ropes and Floats. Full anchor installation will take a total of 21 days to include two days for boat loading and set up.

Ropes will be supplied by Quality Equipment Limited and will arrive in Ireland in Containers to Dublin Port. It is the responsibility of IMSC from that point. They will be transported by road and contents will be unloaded and stored securely by IMSC ready for installation.

Floats will be supplied by Gem Plastics Limited and delivered to IMSC at Arklow harbour.

Navigational Buoys will be provided by (JSL Limited) and delivered to Arklow harbour.

IMSC will purchase a vessel which is fit for purpose and retrofit with all new equipment. The exact vessel specifications are not set out because availability of vessels are continuously changing and will not be identified until the licence is granted. Ansko Limited will retrofit the vessel and have provided an example of the layout of equipment. IMSC have a preferred design of vessel and will overtime aim to replace our original vessel with a purpose built one. The specifications of all equipment being sourced from Ansko Limited are contained in the equipment list.

Once the anchors and anchor warp are installed the backbone (head rope) and buoys are attached and await spat collector ropes. Spat collector ropes are only in the water for the spat settlement period (end of March/start of April) and remain until harvest in October/November of that same year. Once the spat collector rope is harvested it is cleaned, brushed and bagged for maintenance on land. Regular maintenance checks of the area will be undertaken. Checks are undertaken to ensure security of the high economic investment in the structures. (Maintenance is discussed further in the Code of Practice)

The following diagrams simply describe the process of putting out spat collectors and harvesting;

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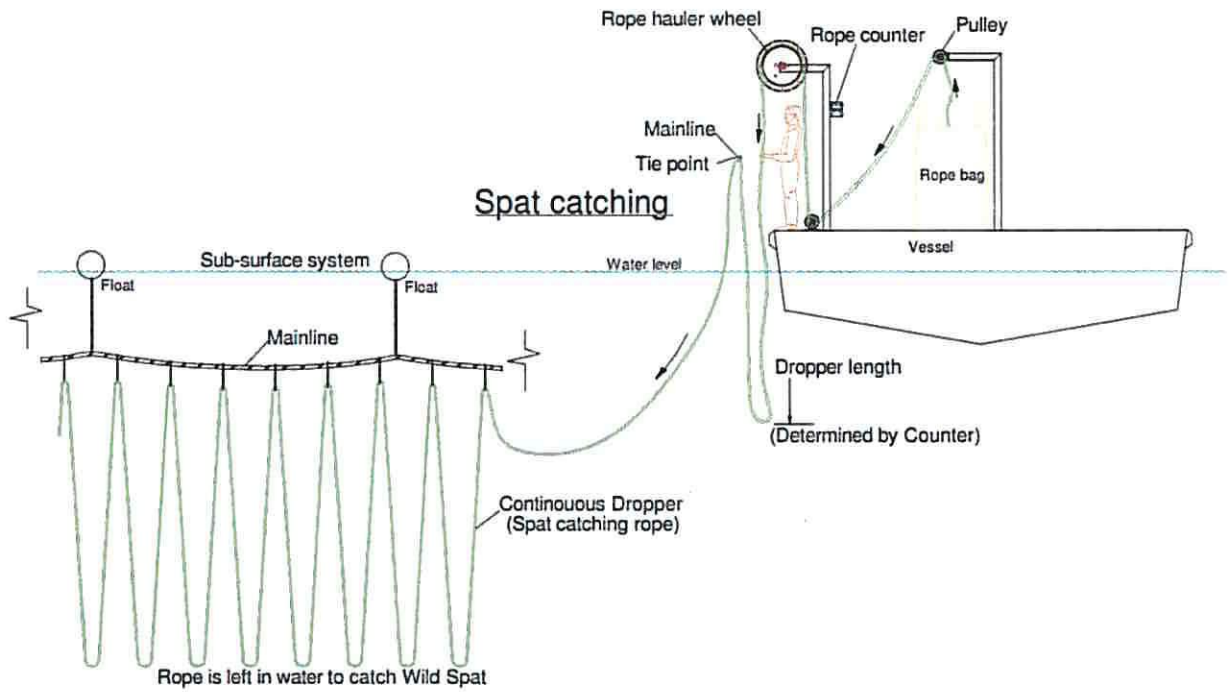
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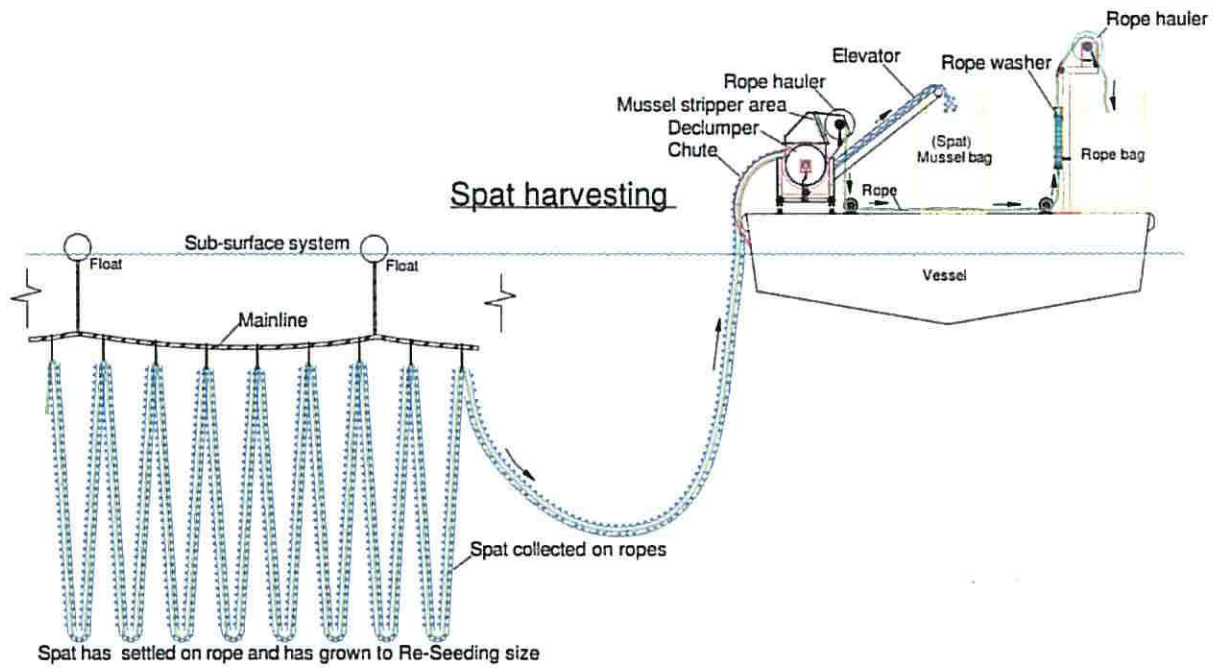
The following diagrams simply describe the process of putting out spat collectors and harvesting;



System of putting spat collectors onto the mainline.



System of Spat harvesting.



Site for storage and maintenance on land

IMSC is currently in negotiation with Wicklow County council with regard to possible sites for storage and maintenance of equipment. This is dependent on the success of this licence application.

Aquaculture Consultant

IMSC will employ the expertise of Fielder Marine in anchor installation but also the installation of ropes, buoys and running of the farm for the first two years. This will then be reviewed and extended if necessary. IMSC will second an experienced member of the Fielder Marine Team to Ireland for this period of time.

Background to Fielder Marine

Fielder Marine Services Ltd, formerly Coromandel Dive, has been operational in New Zealand for 16 years. The primary focus of the company is in servicing the Aquaculture Industry. Our core businesses are Screw Anchor installations, farm design, consultancy, underwater maintenance and commercial diving. Fielder Marine Services have also installed marine farms in Australia and Europe and provide our clients with ongoing advice and developmental support. Graham Fielder, one of the directors of the company, has an honours degree in Marine /Mechanical Engineering and brings a wealth of international experience to the business. Graham began working in the English Royal Navy (RCNC), then as a construction diver and a Field Engineer within the oil industry, before moving to New Zealand and concentrating on Aquaculture.

Screw Anchors and Rock Anchors

Screw anchors are a proven technology that has been used in the anchoring of marine farms for many years now. Not only are the anchors cost effective, they also provide an environmentally friendly mooring system which minimizes disruption to the seabed.

Fielder Marine Services Ltd has developed and hold patents in an underwater screw anchor system, in which the entire drilling rig is portable. This enables installations to be carried out from most vessels currently used in the aquaculture industry without the use of divers and gives our clients the option of using their own vessels. FMS have also developed and patented a rock anchoring system, we can now offer the same benefits as screw anchors in ground consisting of rock.

All anchors/moorings are positioned using a Trimble differential GPS system, giving sub meter real time accuracy.

Installing the FMS system has allowed our clients to re-evaluate how they have traditionally worked their farms.

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FMS provide and install around 95% of all Mussel farming anchors in the North Island of New Zealand, with over 3000 anchors currently holding Mussel Lines, Pearl lines and ship moorings.

Underwater Maintenance

The company services and maintains the majority of the marine farm underwater structures in the Coromandel, with the emphasis being placed on preventative rather than reactive maintenance. FMS's 'asset protection' service minimize crop loss and line breakages, ensuring that the Aquaculture farmers get the maximum harvest possible. Our underwater profiling survey's, help the Farmers to understand the underwater stresses on their farms, and work out effective management systems to ensure maximum productivity.

Commercial diving

FMS carry out commercial diving contracts for a number of Councils and Companies.

Fielder Marine Services and Eastern Sea Farms

First true offshore mussel farm

Location 6miles east of New Zealand, open ocean, 9m swells. Depth 45-55m

Fielder Marine Services were approached to install the initial 10 screw anchors (5 lines) for Eastern Sea Farms as well as being involved in the design and orientation of the initial farm.

Lines were installed Oct 2010 each line is 500m anchor to anchor with 250m of backbone on each line and around 3000-4000m of spat catching rope hung out on each of the lines. We set the lines as semi subsurface with the backbone 4m below the surface.

It soon became apparent that without ongoing involvement by FMS the aims of proving the feasibility of an offshore farm were not going to be achieved. With Graham Fielder's experience of practical marine farming, we were asked to take on the day to day operation for the Eastern Sea Farms, as well as consultancy on the practical application of 'Open Water Farming' and development of new techniques and products to deal with this exposed open water environment.

FMS carried out the work on the farm for the next four years before turning over a working model to the owners.

Now in 2016 we have 48 lines in the water with a further 96 planned for later this year

The lines have performed very well over the last 6 years with storm seas up to 8m annually, FMS have worked on improving the design, learning more about the mussel cycle offshore and working on minimising wear and tear on the structure.

Offshore Shellfish LTD South Coast UK

Location 12miles from Weymouth 3-5 miles Offshore English Channel depth 24-28m. Fielder Marine Services were approached by John Holmyard from Offshore Shellfish Ltd in around 2010. After initial consultation and legislative work we installed the first trial lines in 2013, despite some of the worst winter storms for over 100 years lashing the south coast they have had no line damage. Offshore shellfish currently have around 60 lines installed with a further 150 planned for this summer. Each line is moored with one FMS aquaculture anchor each end and carries on the knowledge acquired from Eastern Sea Farms.

Paspaley Pearling Intl Ltd Australia depth 12-45m

Location Northern Territory and Western Australia. FMS have worked with Paspaley for nearly 8 years, with over 10,000 lines in the water in 2008 spread over some of the most hostile and remote coastline in Australia they needed a reliable way to anchor their farms and to Cyclone proof them.

FMS have provided the anchors, the drilling equipment plus the expertise to start a systematic overhaul of their farm structures, starting with the traditional 100m lines and now installing 800m plus lines the FMS aquaculture anchors plus FMS rock anchors have brought increases in efficiency and cyclone proofing never before achievable.

Catalina Sea Ranch USA

Location 3miles offshore Los Angeles California depth 55m. FMS are working with Catalina Sea Ranch to install the first Open Ocean Mussel farm in the USA. With the anchors arriving on site in May 2016 once their Mussel farming Vessel is completed the first Offshore Farm in the USA will be installed using FMS aquaculture anchors.

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