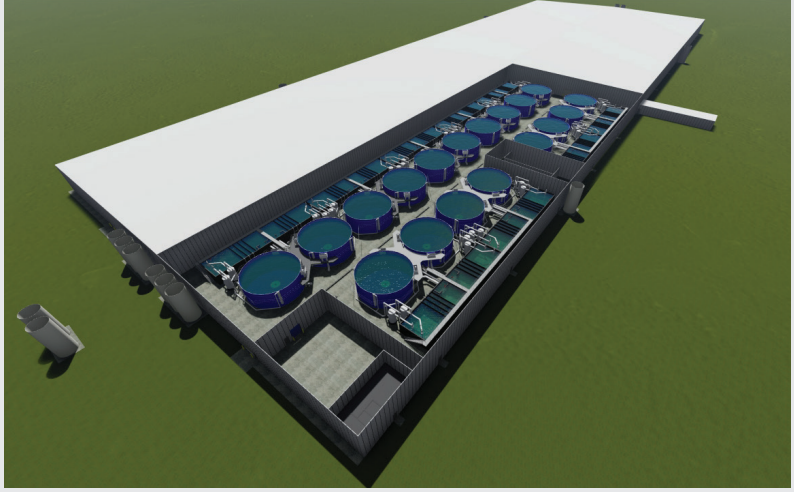
FACILITY DESIGN ELEMENTS THAT ENHANCE BIOSECURITY & FOOD SAFETY WITHIN LAND-BASED AQUACULTURE FACILITIES

HANSEN-RICE

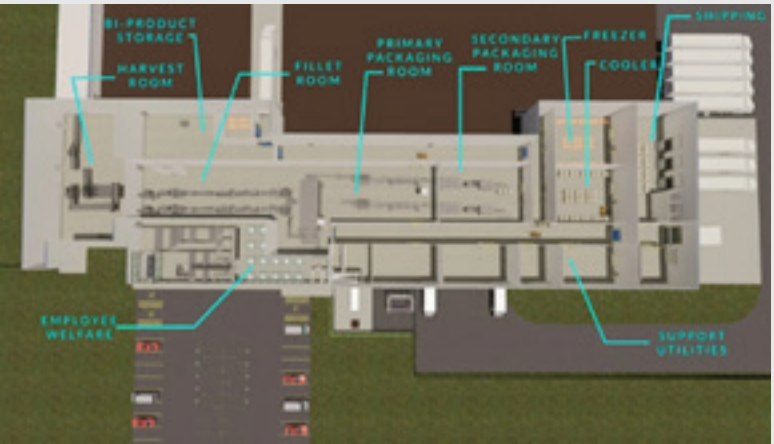


ABSTRACT

Food Safety and Biosecurity are two critical design elements that are widely addressed within seafood processing and more recently, land-based aquaculture facilities. Paying close attention to the design of both equipment and facilities is one of the primary elements of biosecurity and food safety. About 48 million people (1 in 6 Americans) get sick, 128,000 are hospitalized, and 3,000 die each year from foodborne diseases, according to recent data from the Centers for Disease Control and Prevention. Beginning with the American Meat Institute's (AMI) Design Task Force in 2002 and later supported by the 2011 Food Safety Modernization Act (FSMA), the Principles of Sanitary Design were developed to focus on preventing problems rather than reacting to problems after they occur. Of course, the biosecurity and food safety elements of these best practices should provide a strong motivation to implement sanitary design, but also as a way to lower operating costs. Equipment and facilities utilizing the best standards of sanitary design are able to be cleaned faster, with fewer chemicals, less labor and lower wastewater treatment costs. In many similar operations, yields are improved and product and waste is reduced. Higher asset utilization results, and product safety is enhanced.

These critical design elements are applicable to the design and construction of any land-based aquaculture facility, especially ones considering the integration of a downstream seafood processing operation. They are summarized as:

1. Creating site and facility elements that facilitate biosecurity, sanitary conditions and defense against intentional adulteration of products
2. Creating a lineal flow of product throughout the facility
3. Creating distinct hygienic zones of risk within the facility with secure entry requiring disinfection
4. Controlling the movement of personnel and material flows to reduce cross contamination
5. Controlling water accumulation throughout the site and facility
6. Controlling room temperature and humidity throughout the facility
7. Controlling room air flow and air quality throughout the facility
8. Ensuring that the building envelope facilitates sanitary conditions
9. Integrating RAS and other equipment into a spatial design that provides for accessible maintenance, cleaning and sanitation to microbiological levels
10. Utilizing construction methods that facilitate sanitary conditions and building materials made of compatible materials
11. Designing utility systems that prevent contamination and harborage areas for bacteria and moisture to collect



FOOD & BEVERAGE PROGRAM
FOOD PROCESS
ESTD 1983
HANSEN-RICE, INC.

PLAN
DESIGN
BUILD
MAINTAIN