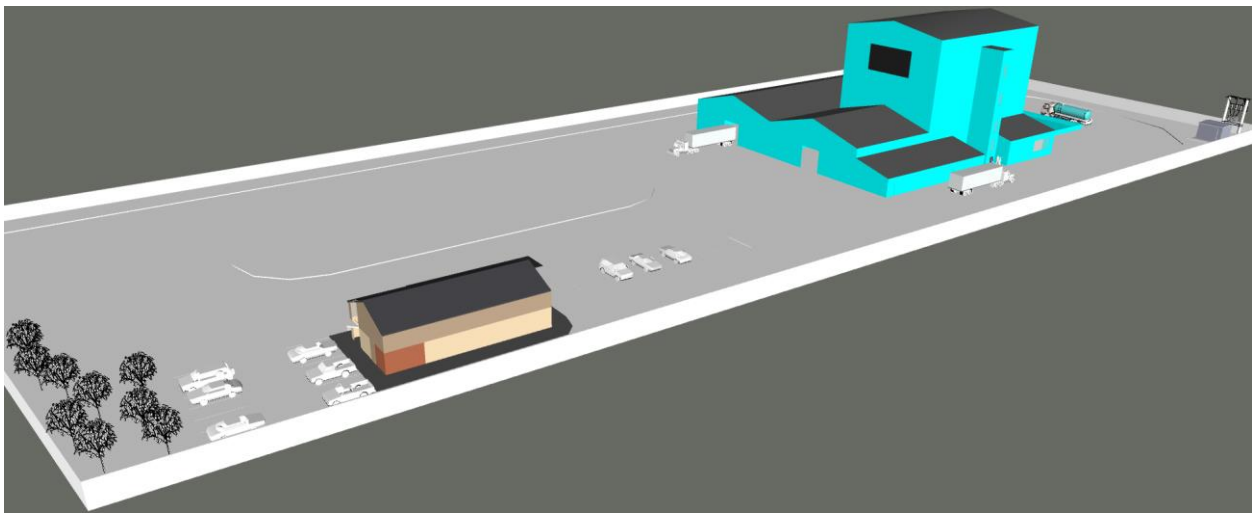
Introduction

TFTAK Estonia (Center of Food and Fermentation technologies)

Pre-design phase II, technological study for fish feed plant in Estonia

Project no.: 2201260-01



EMKF RAKENDUSKAVA 2014-2020

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Revision	Author	Date:	Description
A	Peter Sønderskov	23-08-2022	
B	Peter Sønderskov	29-08-2022	Crumbling option added

1 Introduction

This document covers process description of equipment to:

Project number:	220126-01
Title:	Fish feed plant Estonia
Process:	Pre-design phase II, technological study for fish feed plant in Estonia
Customer: (Referred to as: Customer)	TFTAK Estonia (Center of Food and Fermentation technologies)
Process Integration:	Process Integration ApS Godthåbsvej 21 8660 Skanderborg, Denmark Att.: Peter Sønderskov

The intention of this document is to create an overview of the technical requirement for the establishment of a 25,000 and a 50,000 tons per year fish feed plant. According to Regulation (EC) No 767/2009 on the marketing and use of feed. This set the frames and a pet food plant must be hygienic, safe and approved to manufacturer pet food. Also, Regulation (EC) No 183/2005 on feed hygiene acknowledges the importance of good hygiene practices. The approval by 3rd party can only be obtained by a pet food plant and not in combination with fish feed.
Therefore, only fish-feed plant is under consideration of this document.

Equipment is only described briefly to the extent necessary for understanding the overall operation.

1.1 Document history

Revision	Author (initials)	Date	Description
A	(Peter Sønderskov)	23-08-2022	First release
B	Peter Sønderskov	29-08-2022	Crumbling option added

1.2 Scope

The project "Pre-design and general scope definition" covers the Pre-design on a new extruded Fish feed factory. The Pre-design is focus on process related tasks in areas of the following:

- Raw Material intake and cleaning
- Dosing system and internal transport system
- Mixing- /Grinding system
- Micro dosing system
- Extruder and dryer system
- Coater and pellet cooler system
- Liquid, steam and condensate system and boiler room
- Sifting and storage system
- Packing line

Note: All Civil work, building auxiliary systems, electrical/automation, permits application, service platforms, Civil and electrical, environmental assessments is excluded from this project "Pre-design and general scope definition ".

1.3 Documentation

All the documentation is preliminary and cannot be used for construction.
Detailed design must be worked out by the selected equipment supplier/contractor during detailed engineering and in the execution phase of the project.

The documentation "Pre-design and general scope definition" is including the following tasks:

- General process description
- Design criteria
- General process design data and mass balance
- High level process flow diagram: from intake through mixing and grinding, pellet production process and packing line (all auxiliary flow and automation diagrams are excluded)
- Main equipment list (Sensors, indicators, are excluded)
- Estimation of requirements for electricity and power, high level list for main consumers above 7.5 kW
- General description of building requirements, dimension and overall sizing, Drawings of the process tower are excluded.
- First draft of site situation plan
- +/- 20% CAPEX Requirements for the production facility (all utility connection cost and land cost are excluded.) Building cost are based on estimation, not actual local cost.

Exclusions:

- ATEX evaluation
- Odor evaluation
- Any marked analysis
- MOTCOM list, I/O list, transformer, and power supply definition.
- Automation requirements
- Civil engineering and building works
- Topographic and geotechnical study, soil studies analysis, interpretation
- Cost for Civil work, engineering, and execution
- Local regulations and permits
- All permits and authority work
- Environmental assessments

1.4 Deliveries

The process description is based on the information from references mentioned in the following subsections.
Design criteria is based on state-of-the-art technology where not only the quality of process equipment is decisive but also it is developed with focus on cost reduction e.g. for raw material purchasing, manpower requirements, etc.
All technical information, data, performance data indicated in this document shall be for information purpose only and must not be considered as guaranteed performance figures.

This current Design criteria shall be seen in combination with these following documents:

- Flow Diagram Process 220126-01-1001B
- Flow Diagram Liquid addition 220126-01-1201A

1.5 Plant target

The plant is designed based on capacities and conditions settled with the Client and listed across the present document.

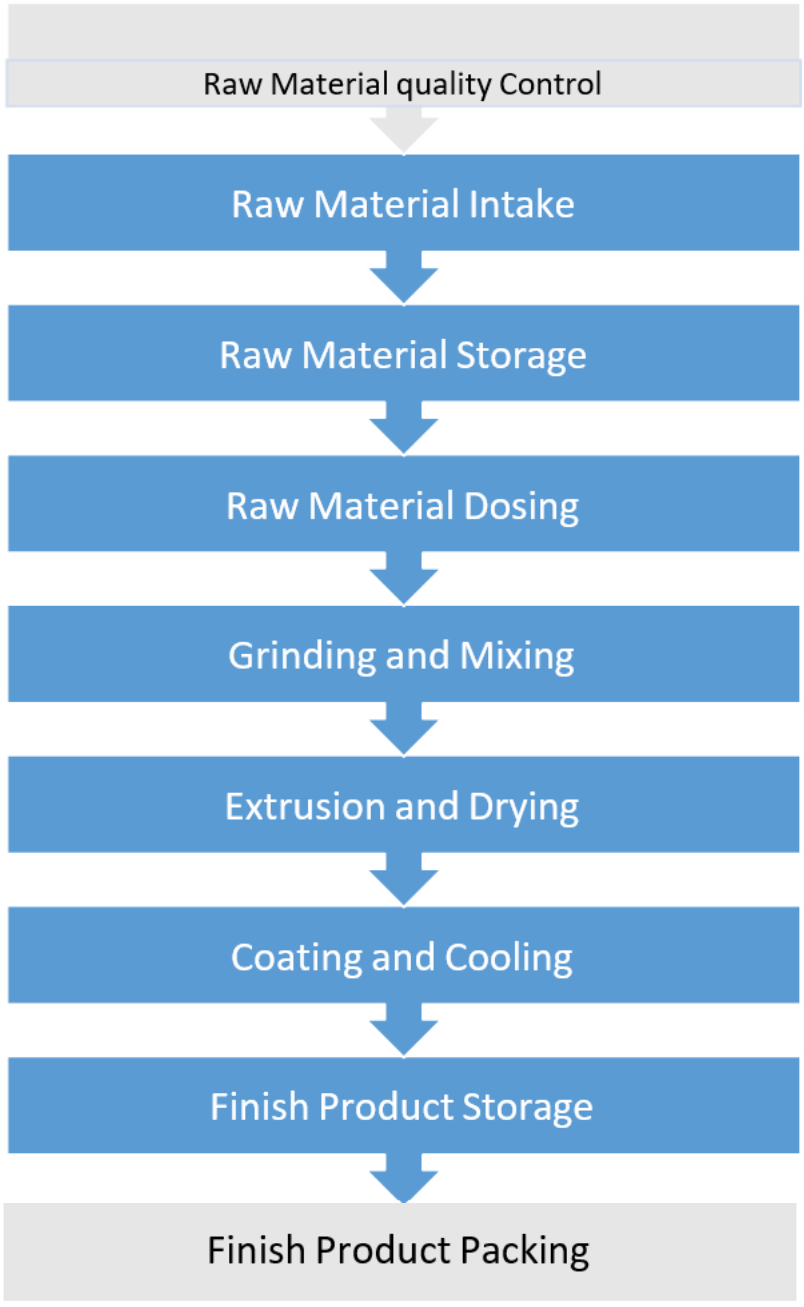
Production	Standard extruded Fish feed
Line capacity	1 line of up to 6 TPH and alternatively 12 TPH
Pellet size	Ø3-12 mm,
Oil content in finish product	Up to 25%,
Recipe	To be defined
Pellet density	335 - 650 kg/m3
Operating days/year	240 days
Operating hours	22 hours/day in three shifts
Annual production target	Up to 25,000 / 50,000 tons per year
Overall equipment effectiveness factor (OEE)	75% - 80%

Optional:
Crumbling of ø3-ø4 mm pellets

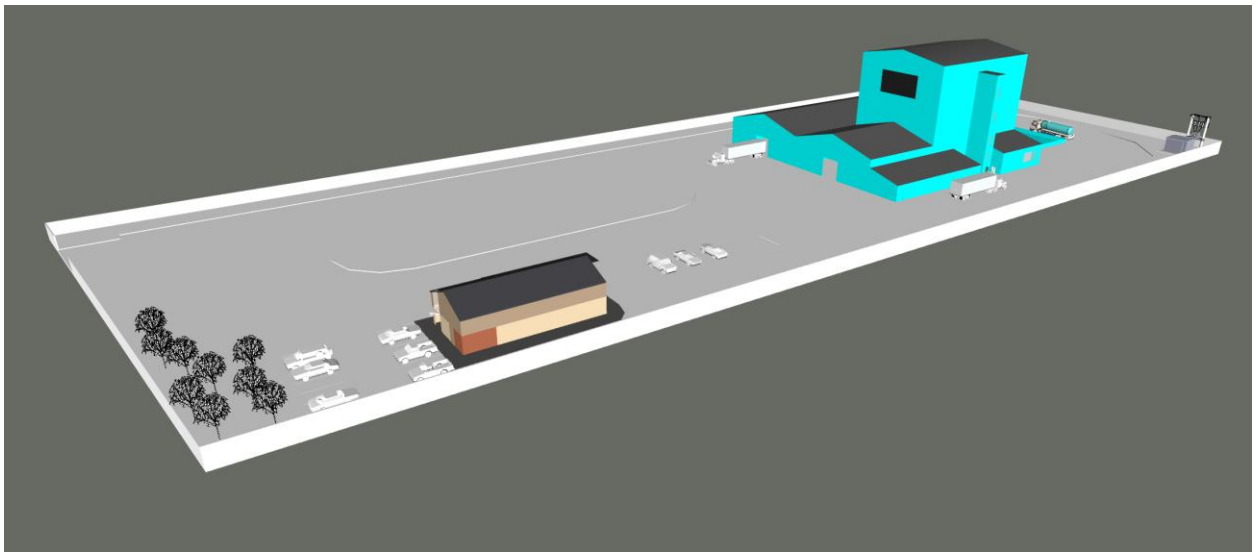
Output capacity	10 ton per hours
Output size:	1,200; 1,000; 700; 400 my
Oil content:	Up to 12%, mainly uncoated pellets

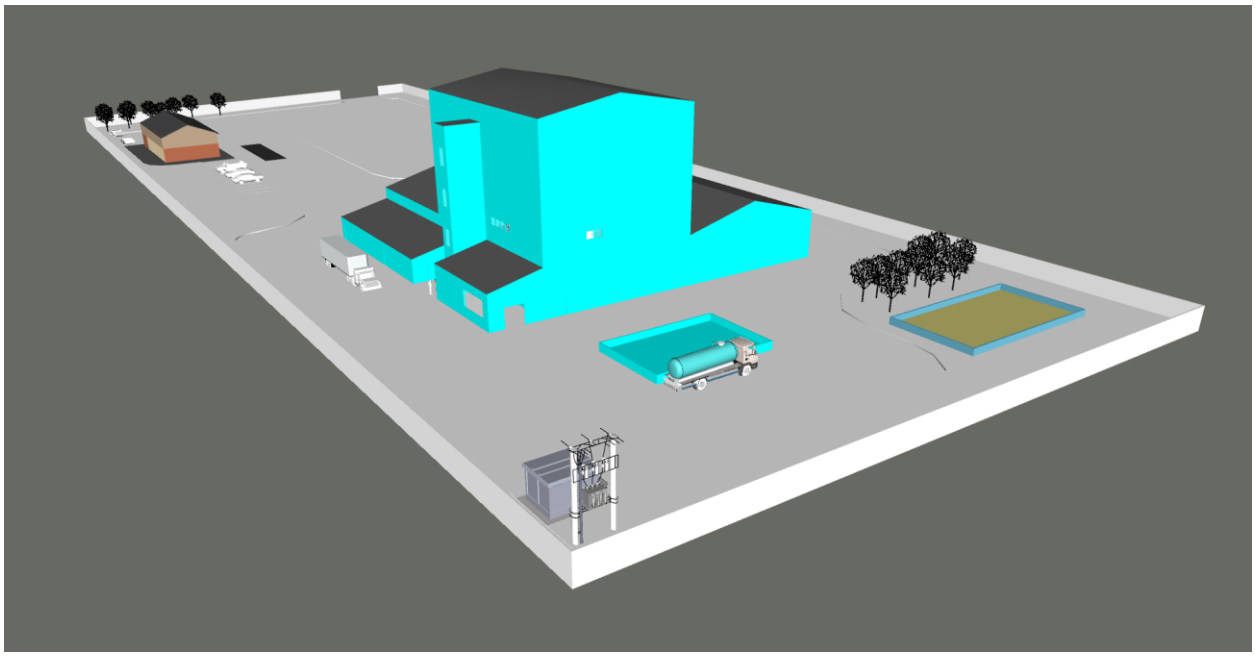
Block diagram

Schematic table of factory flow and the individual sub-processes demonstrates the product flow across the factory and the different stages of pellet production.

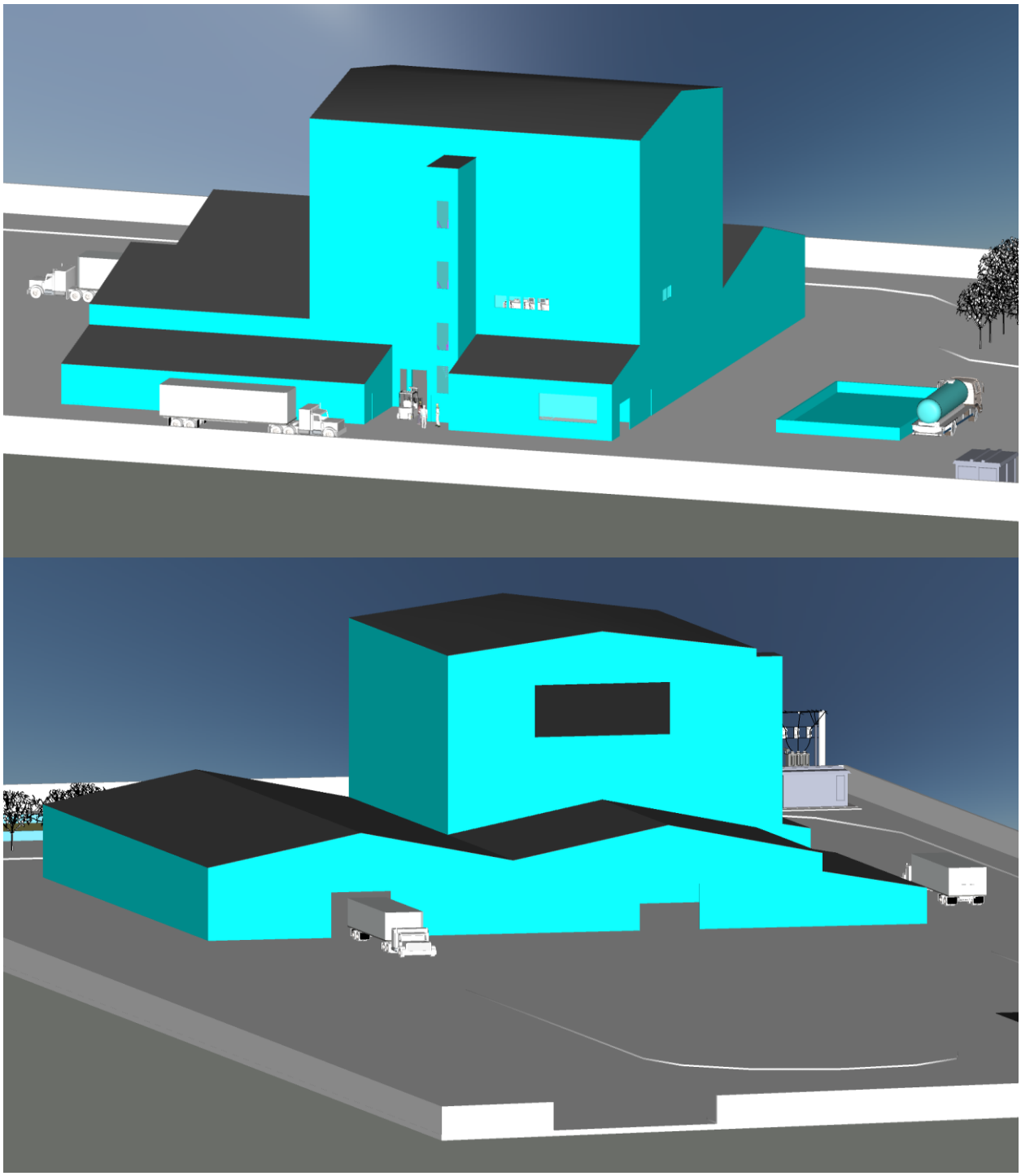


Examples site layout





Examples process building layout



Examples Internal process layout