

Sourcing of 98% pure postconsumer HDPE and PP Resins

We are presenting here the technologies that makes it possible to sort from MSW (municipal solid waste), at least a 98% pure, postconsumer stream of HDPE and PP resins for use in manufacturing for the TPE pellets.

These pellets will be blended in per Patented and Patent Pending Blending Technologies with rubber powder from End Of Life tires.

INPUT:

This project is based on the following considerations:

1. Postconsumer plastic shall be sourced, in the form of bales, from functional PRFs (plastic recuperating facilities), and very seldom from MRF (material recuperating facilities).
2. Potentially, sourced bales shall be of the illustrated composition mix as follows:

PET (1-2 -3-4 scenarios)	5%	3%	4%	6%	3%
HDPE (1-2-3-4 scenarios)	35%	38%	25%	31%	33%
PP (1-2-3-4 scenarios)	29%	27%	33%	31%	35%
LDPE (1-2-3-4 scenarios)	16%	17%	15%	18%	17%
PS (1-2-3-4 scenarios)	5%	4%	8%	1%	3%
PVC (1-2-3-4 scenarios)	4%	7%	6%	5%	5%
Non-packaging plastic (1-2-3-4 scenarios)	2%	1%	2%	2%	1%
Paper/Card	3%	2%	5%	4%	2%
Fines	1%	1%	2%	2%	1%
TOTAL	100%	100%	100%	100%	100%

This cross-section of mix is the result of many months of long analysis, visits to numerous PRF and even MRF operations in diverse countries, field surveys (from collections to waste depots to onward processing), and with hours of discussions with plastic waste recyclers.

****Please note that any further improvement on the composition of the sourced postconsumer plastic bales will only add to the plant's performance****

Based on the above mix, and considering that this shall not change in course of the EBM Plant(s) operation, or indeed only slightly including the amount of the contaminants, the amount of the postconsumer bales for sorting and obtaining of the required amount of approximately 35,000MT of at least 98% pure postconsumer HDPE and PP for TPE Operations will require the input of approximately **76.000 tons per year**.

SORTING OPERATIONS

- a. The Process will start with **sorting operation** . The heart of the sorting operation consists of the equipment listed below:
 - i. Shredder
 - ii. Bale de-wiring unit
 - iii. Screens
 - iv. Ballistic Separators
 - v. Overbelt magnets
 - vi. NIR optical units for sorting types of plastic
 - vii. Baler
 - viii. Compressor units
 - ix. More than 200 conveyor belts, including in-feed conveyors, sorting belt conveyors, acceleration conveyors, reversible conveyors, etc.
- b. The Plastics Plant is designed based on an hourly throughput of 13-14 tons.
 - i. 300 working days per year
 - ii. 3 shift operation
 - iii. 7,5 hours operation per shift = running time (8 h working time – 0,5 h break).

WASHING OPERATIONS

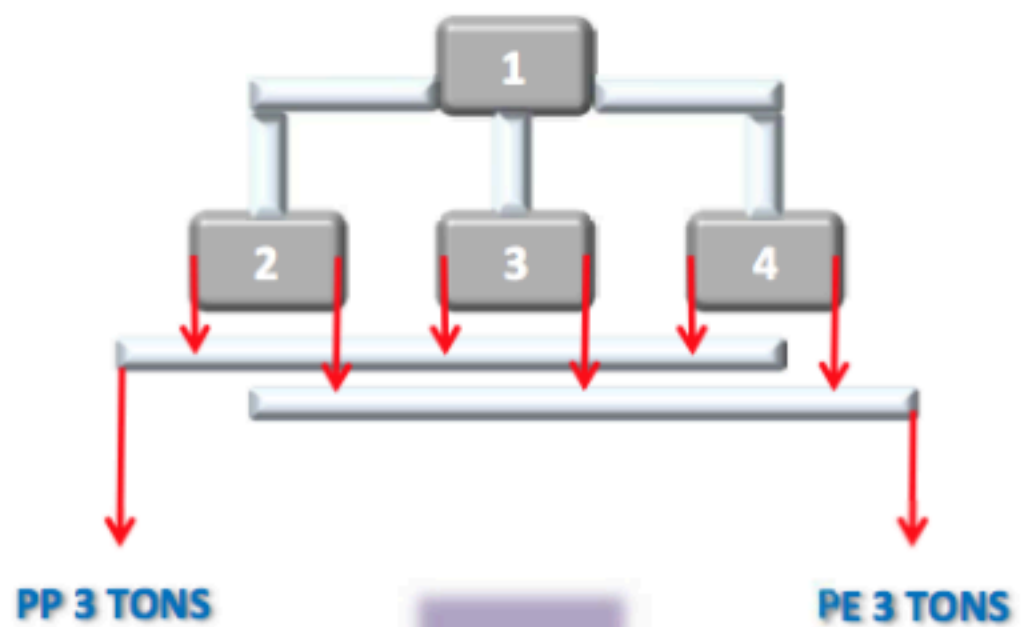
- c. Sorted postconsumer resins shall undergo complex washing cycle.

- d. Likewise there are considered 3 washing lines, of which 1 (one) for flexible plastic packaging (films – LDPE), and 2 (two) for rigid plastic materials (packaging, toys, etc., etc).
- e. The main difference between 2 rigid plastics washing lines and flexible packaging (films) is as below:

rigid #1	rigid #2	film
<ul style="list-style-type: none">• debaler• metal separation• wet granulator• friction washer• hot wash unit• rinising• density separation• mechanical drying• flake sorting• packing	<ul style="list-style-type: none">• debaler• metal separation• wet granulator• friction washer• hot wash unit• rinising• density separation• mechanical drying• flake sorting• packing	<ul style="list-style-type: none">• shredder• pre wash unit• wet granulator• friction washer• hot wash unit• rinising• density separation• mechanical drying• thermal drying• flake sorting• compacting• packing

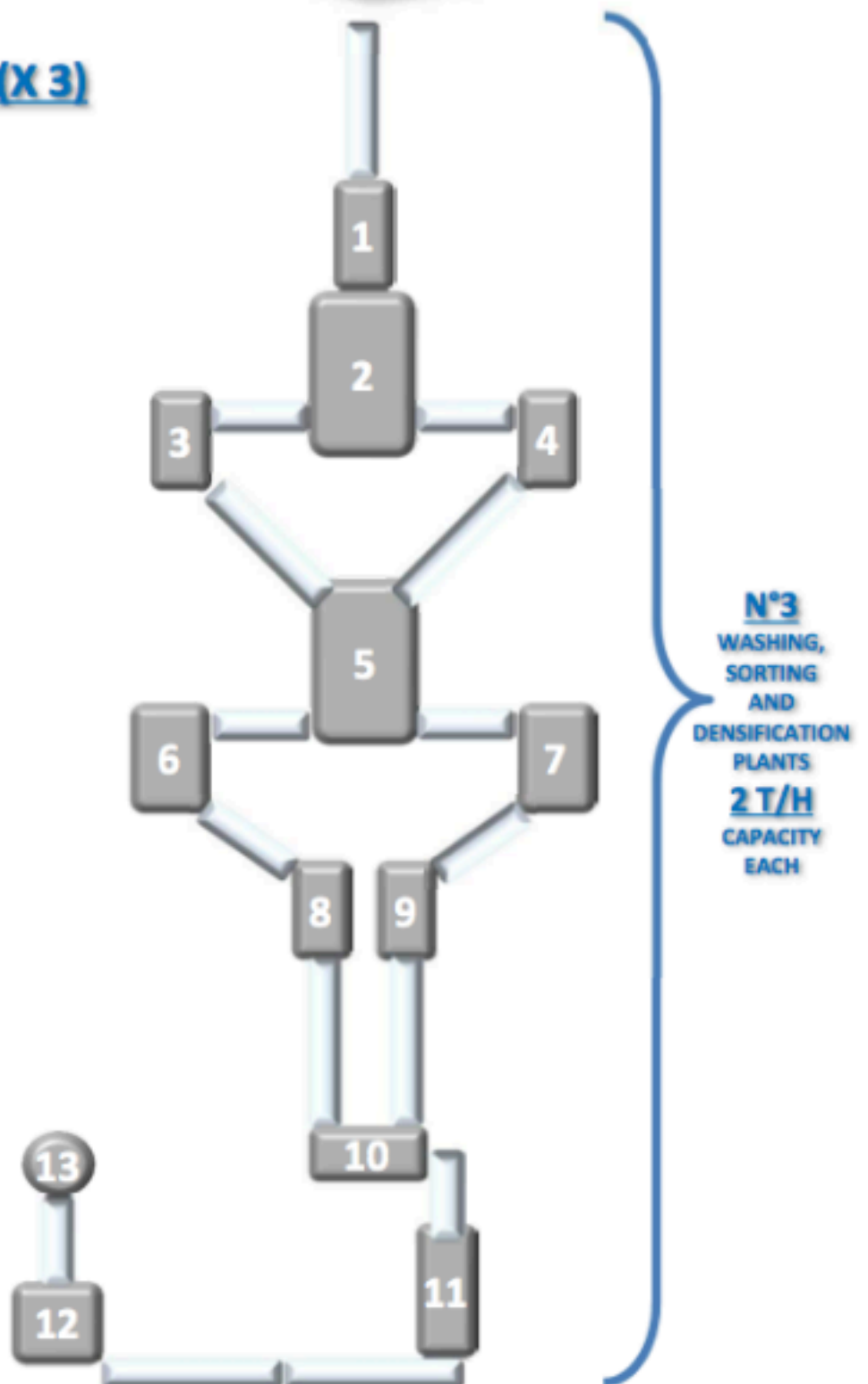
A) SORTING PLANT

1. SINGLE SHAFT GRINDER
2. OPTICAL SORTER
3. OPTICAL SORTER
4. OPTICAL SORTER



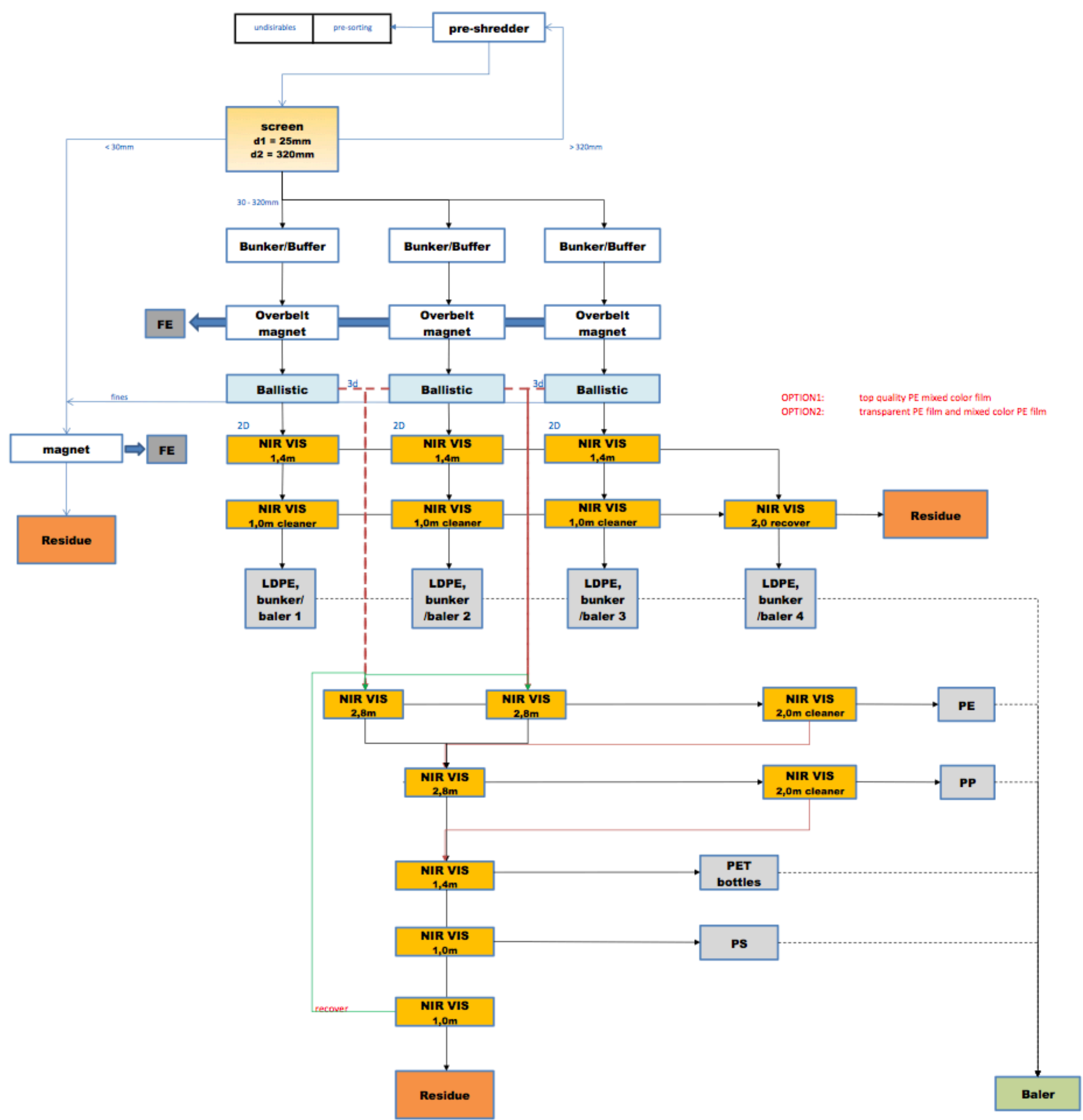
B) WASHING & DEC PLANT (X 3)

1. BBX BUFFER BOX
2. VLPE FLOATATION TANK
3. HRC WASHING MACHINE
4. HRC WASHING MACHINE
5. VLPE FLOATATION TANK
6. HSC SPIN DRYER
7. HSC SPIN DRYER
8. TK SQUEEZER
9. TK SQUEEZER
10. BBX BUFFER BOX
11. 1000XP DEC
12. GRANULATOR
13. DOSING SILO

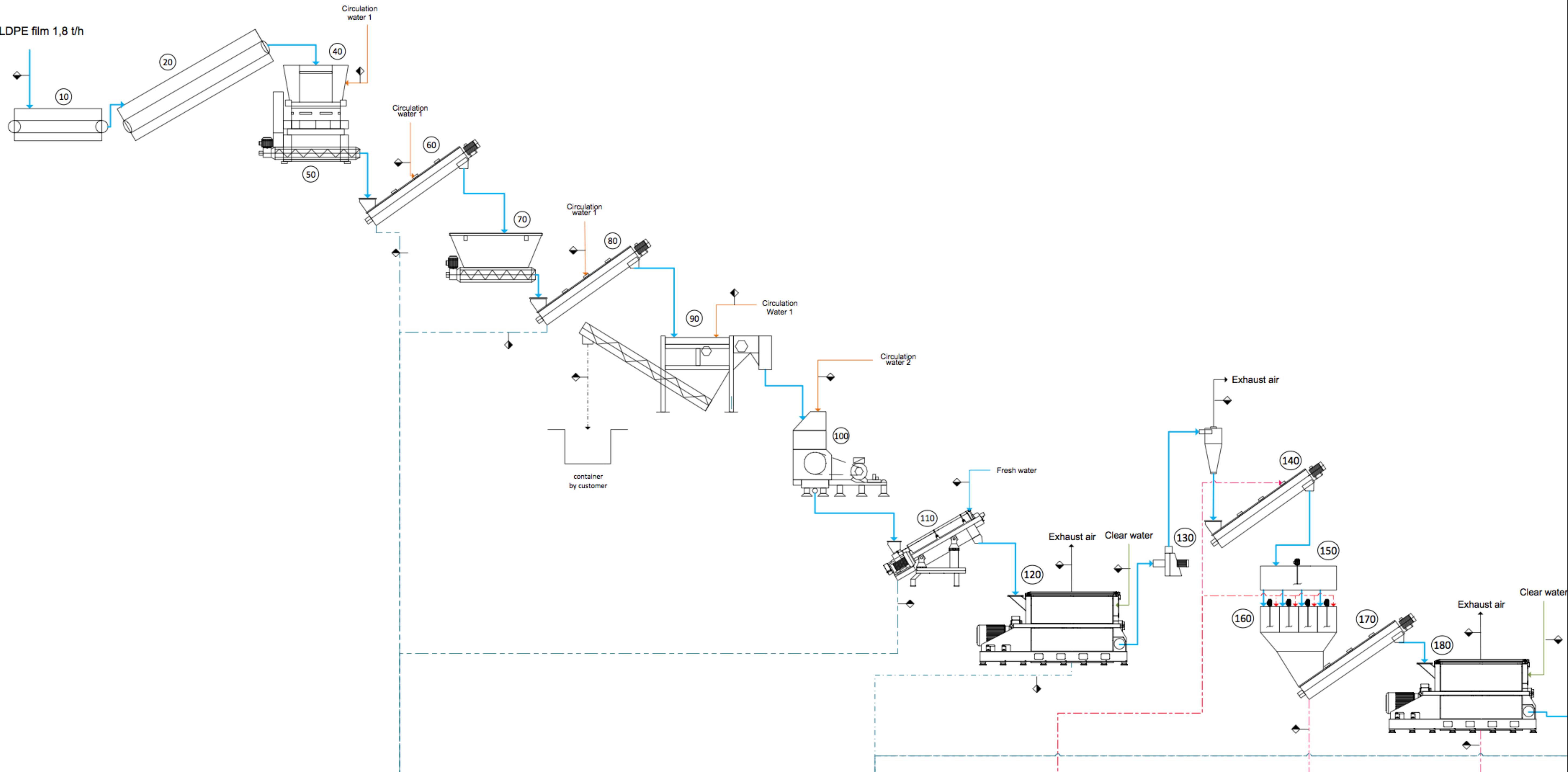


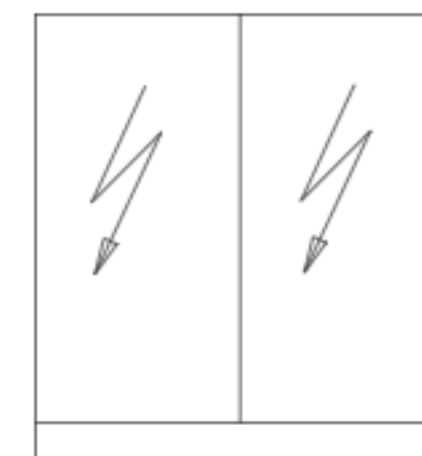
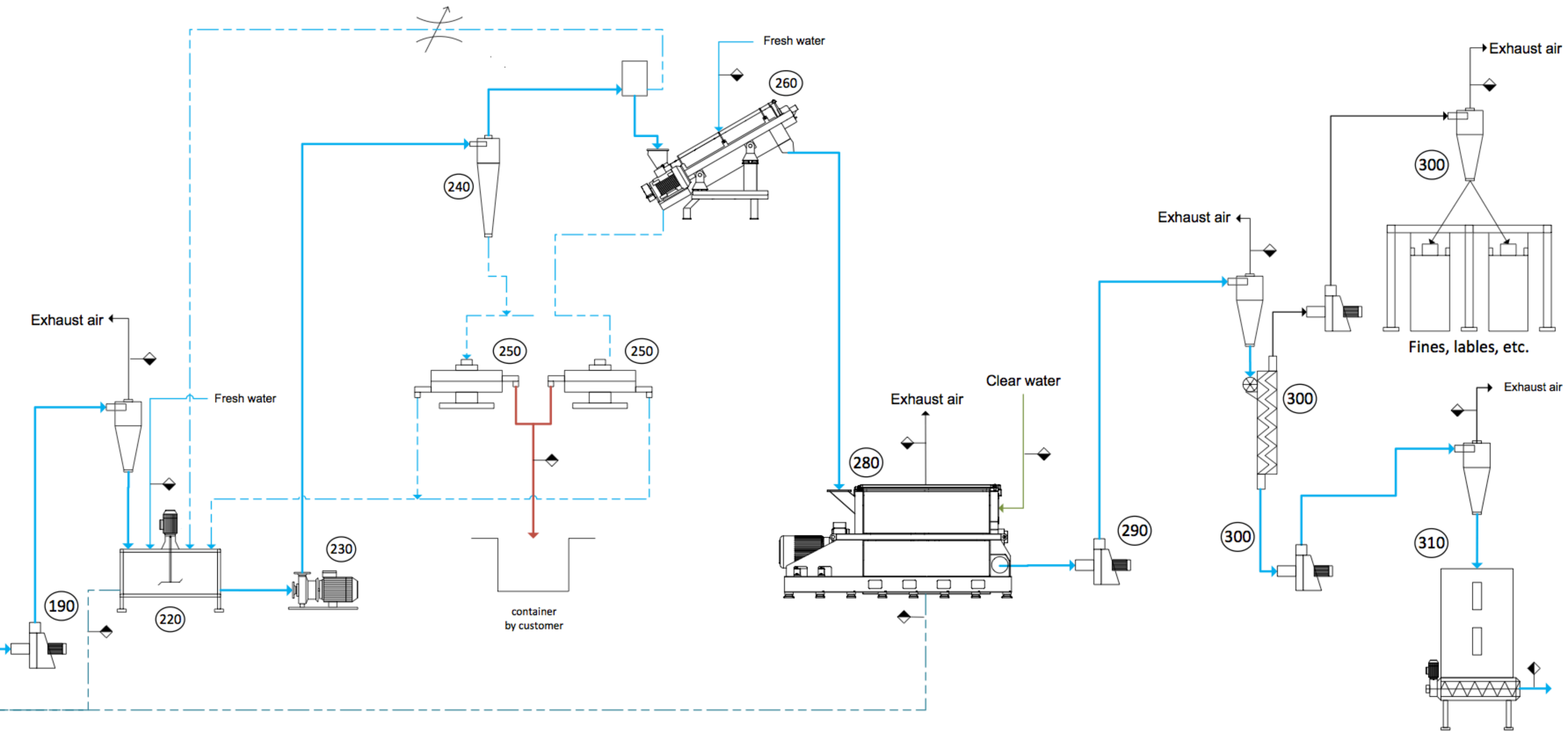
Flowchart Sorting Plant Mixed Plastic

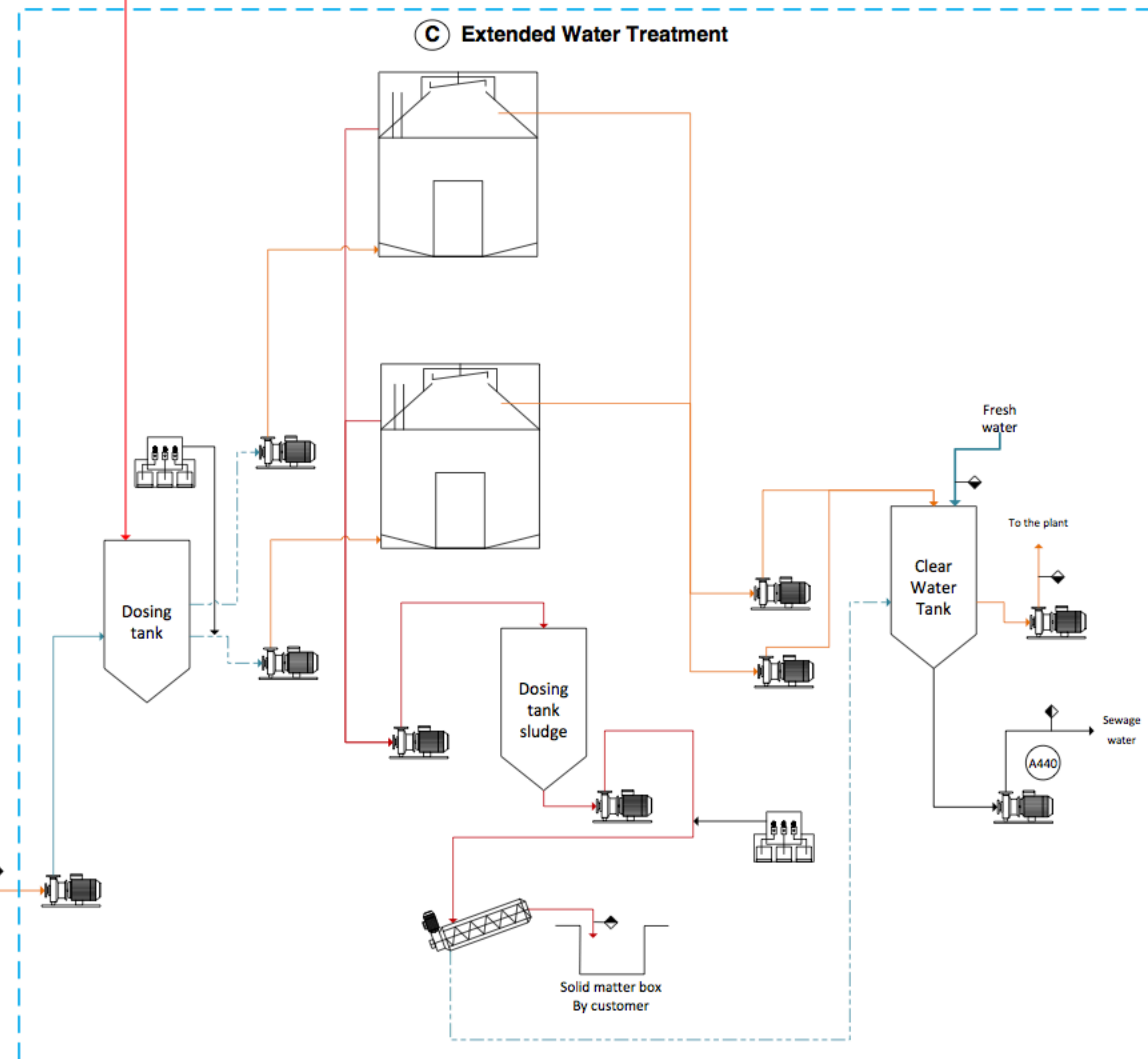
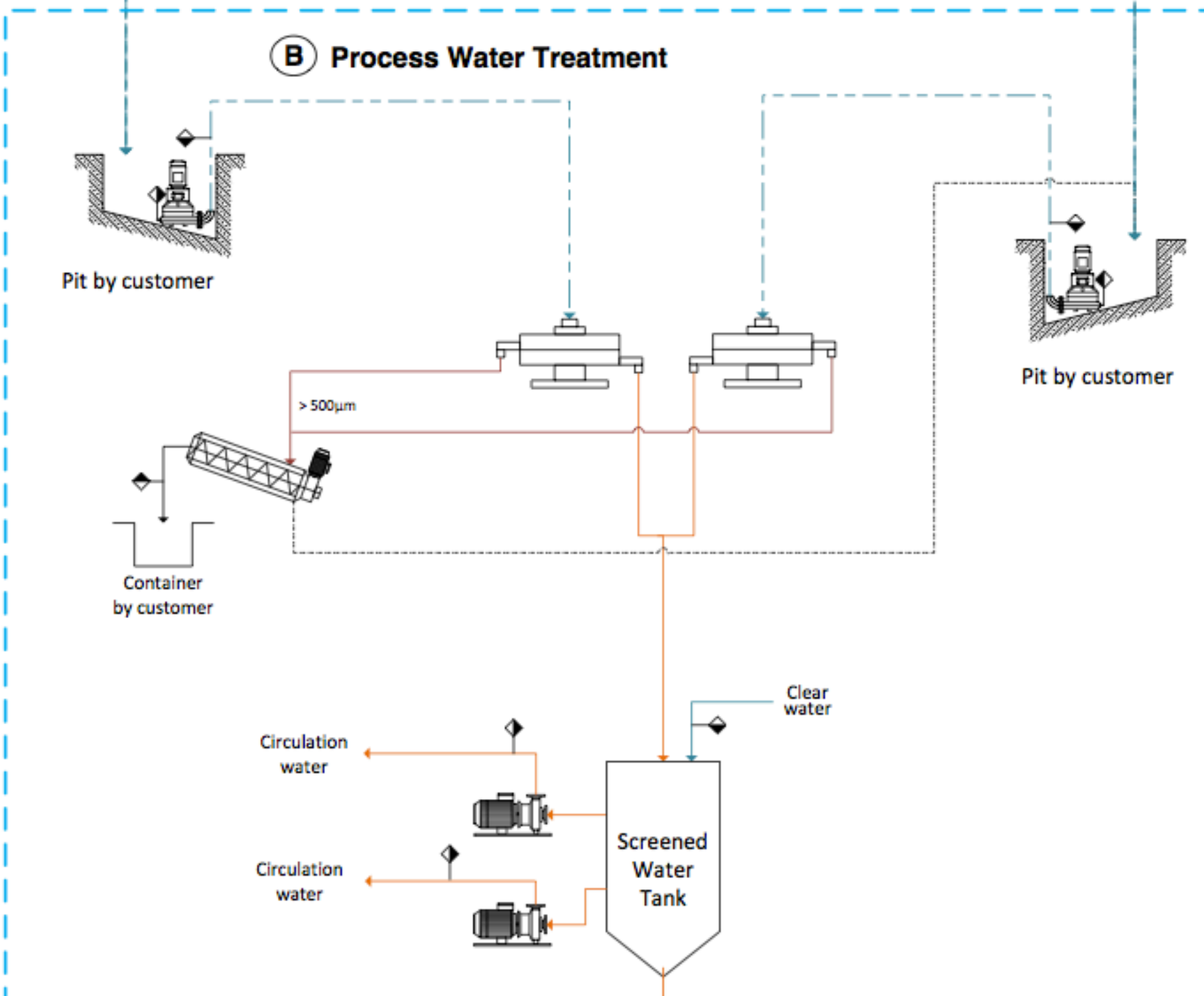
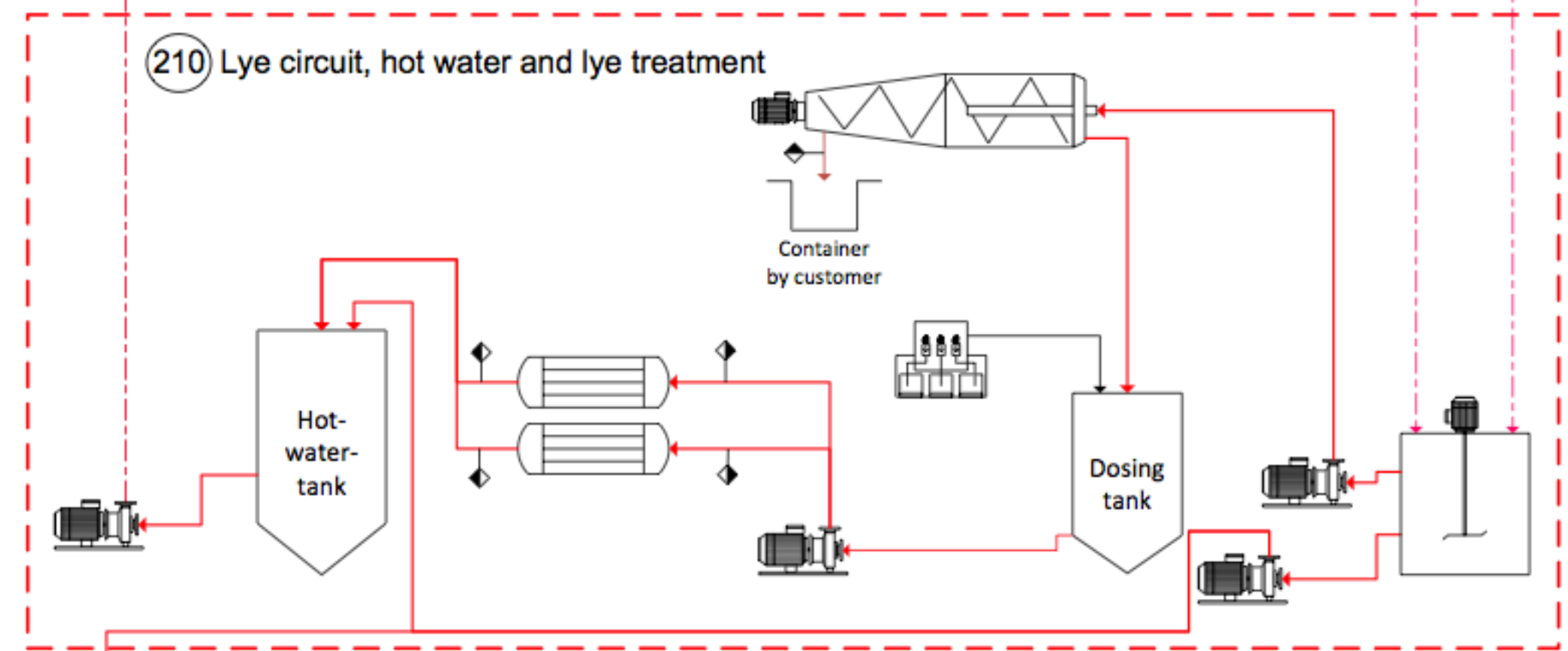
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Input LDPE film 1,8 t/h







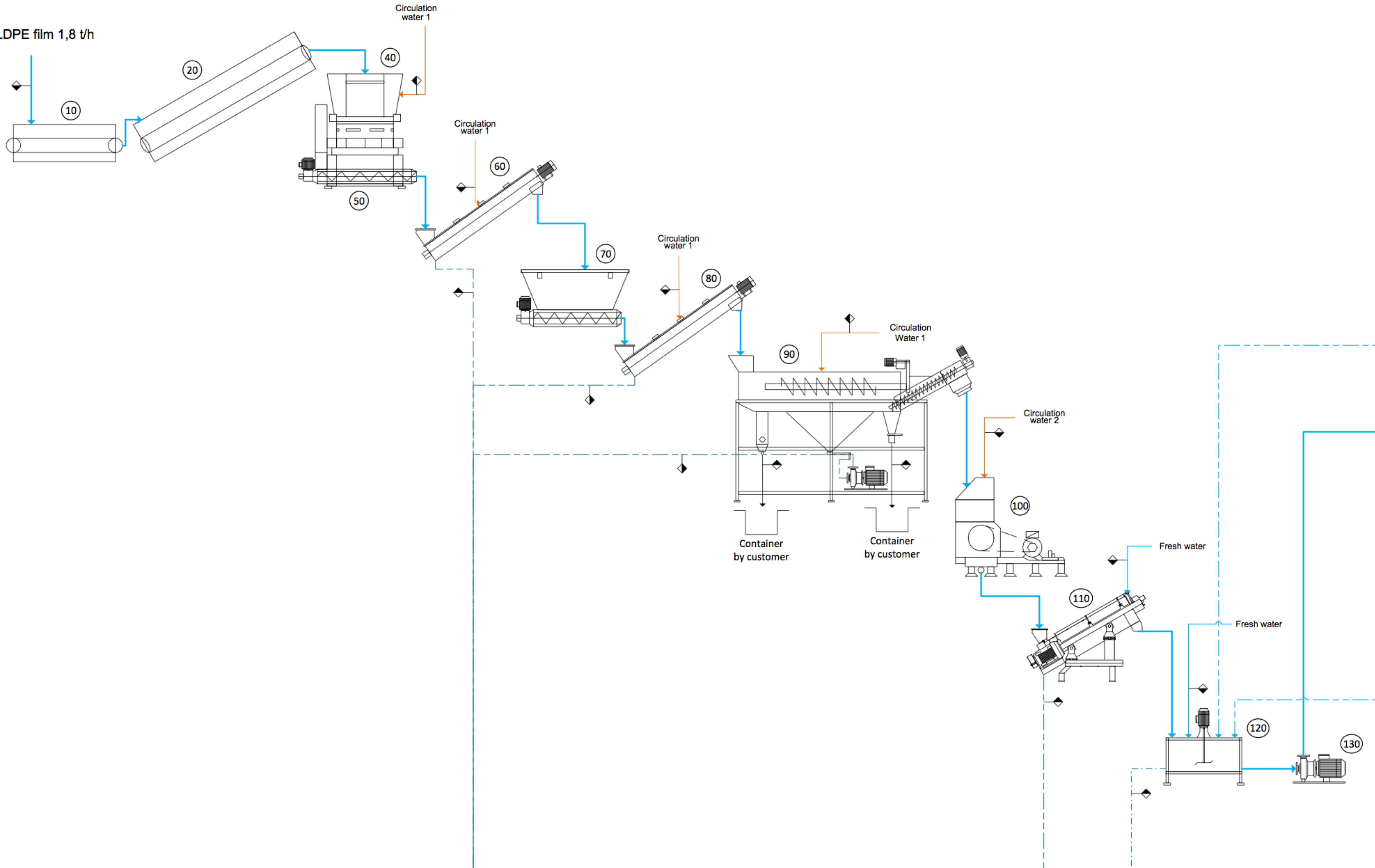
Flow Diagram Chart for HDPE and PP Hard Plastics

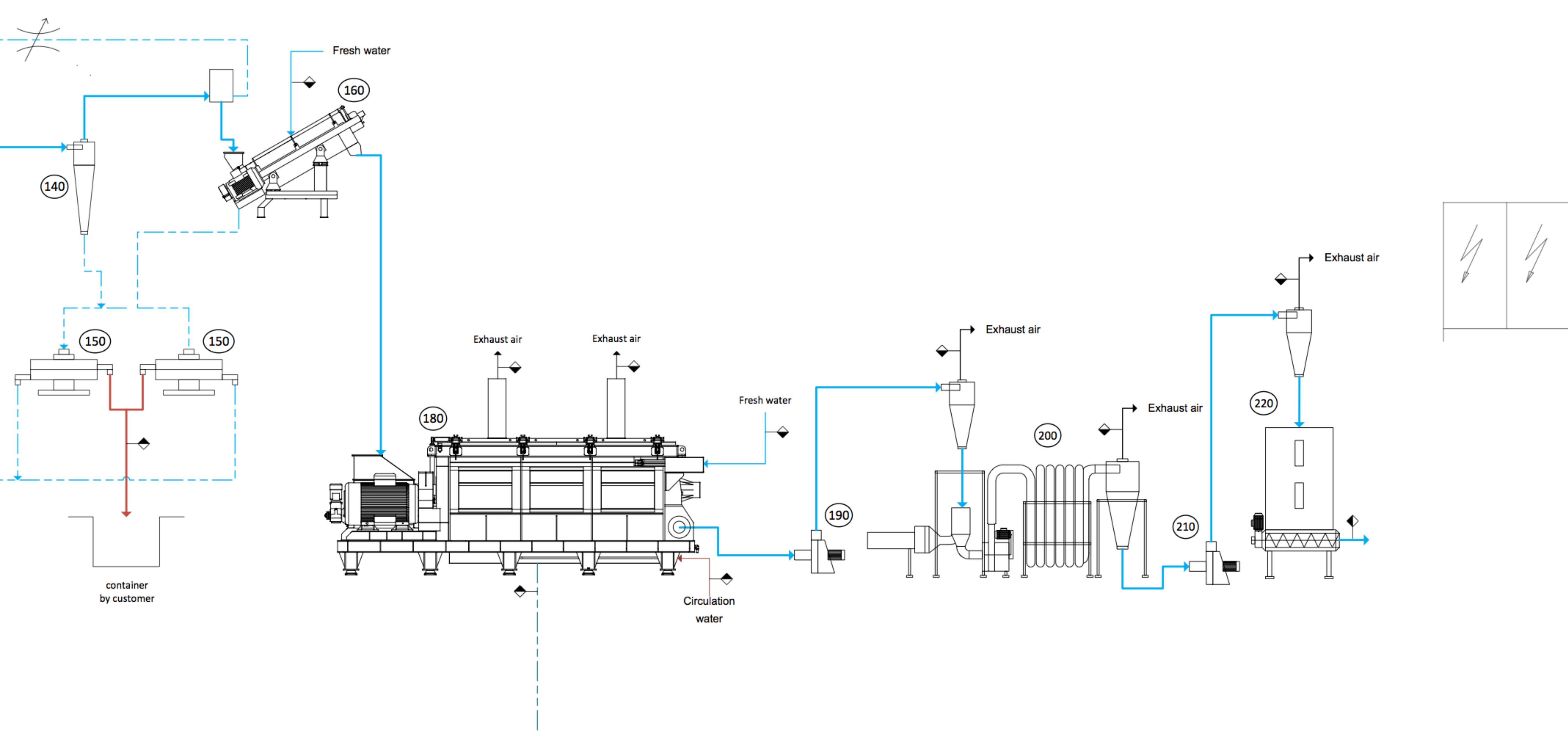
A) Washing Line

Pos. 10	Horizontal Conveyor Belt
Pos. 20	Inclined Conveyor Belt
Pos. 40	Wet-Shredder EWS 60/210
Pos. 50	Discharge and dewatering screw
Pos. 60	Wash and conveying screw
Pos. 70	Material buffer unit
Pos. 80	Wash and conveying screw
Pos. 90	Prewashing tank/ Heavy contamination separator SA 180/200
Pos. 100	Wet Grinder SMS 80/160-FX7-3 SB3
Pos. 110	Friction Washer FA 60/300
Pos. 120	Mechanical dryer, T 2016 PA
Pos. 130	Material transport system MFT 75/500
Pos. 140	Hot-wash reaction unit
Pos. 150	Hot-wash buffer unit
Pos. 160	Hot-wash agitating tank, type EB 10-4H
Pos. 170	Discharge screw
Pos. 180	Mechanical dryer, type T 2016 PA
Pos. 190	Material transport system, MFT 75/500
Pos. 210	Lye circuit, hot water and lye treatment
Pos. 220	Turbowasher TBW15
Pos. 230	Pressure Pump
Pos. 240	Hydrocyclone D550
Pos. 250	Vibrating screening units
Pos. 260	Friction washer FA 60/300
Pos. 280	Mechanical dryer, type T 2016 PA
Pos. 290	Material transport system, MFT 75/500
Pos. 300	Air separation unit, type SZS2-800/270
Pos. 310	Silo HRS 20/2100

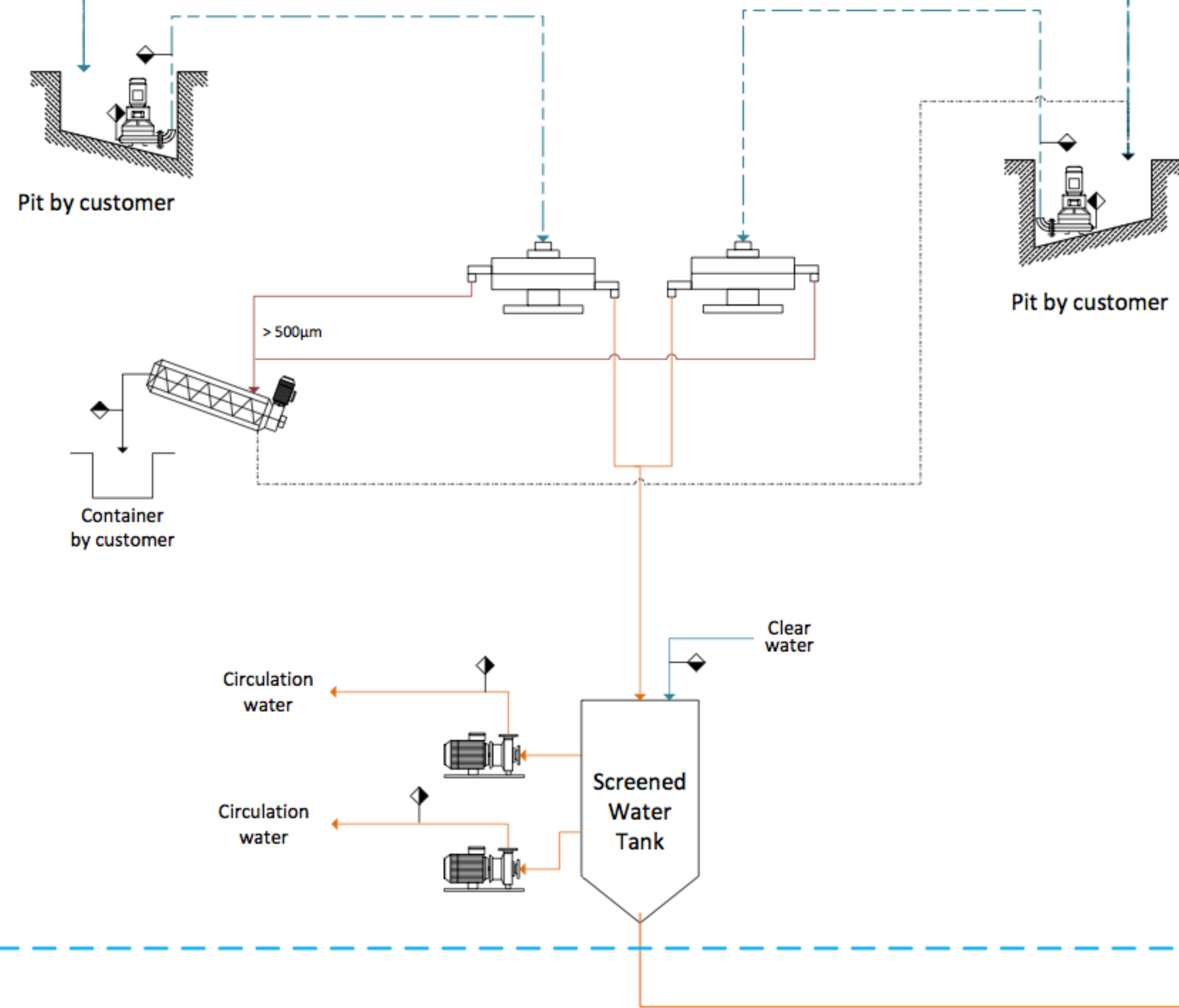
B) Process Water Treatment

C) Extended Water Treatment

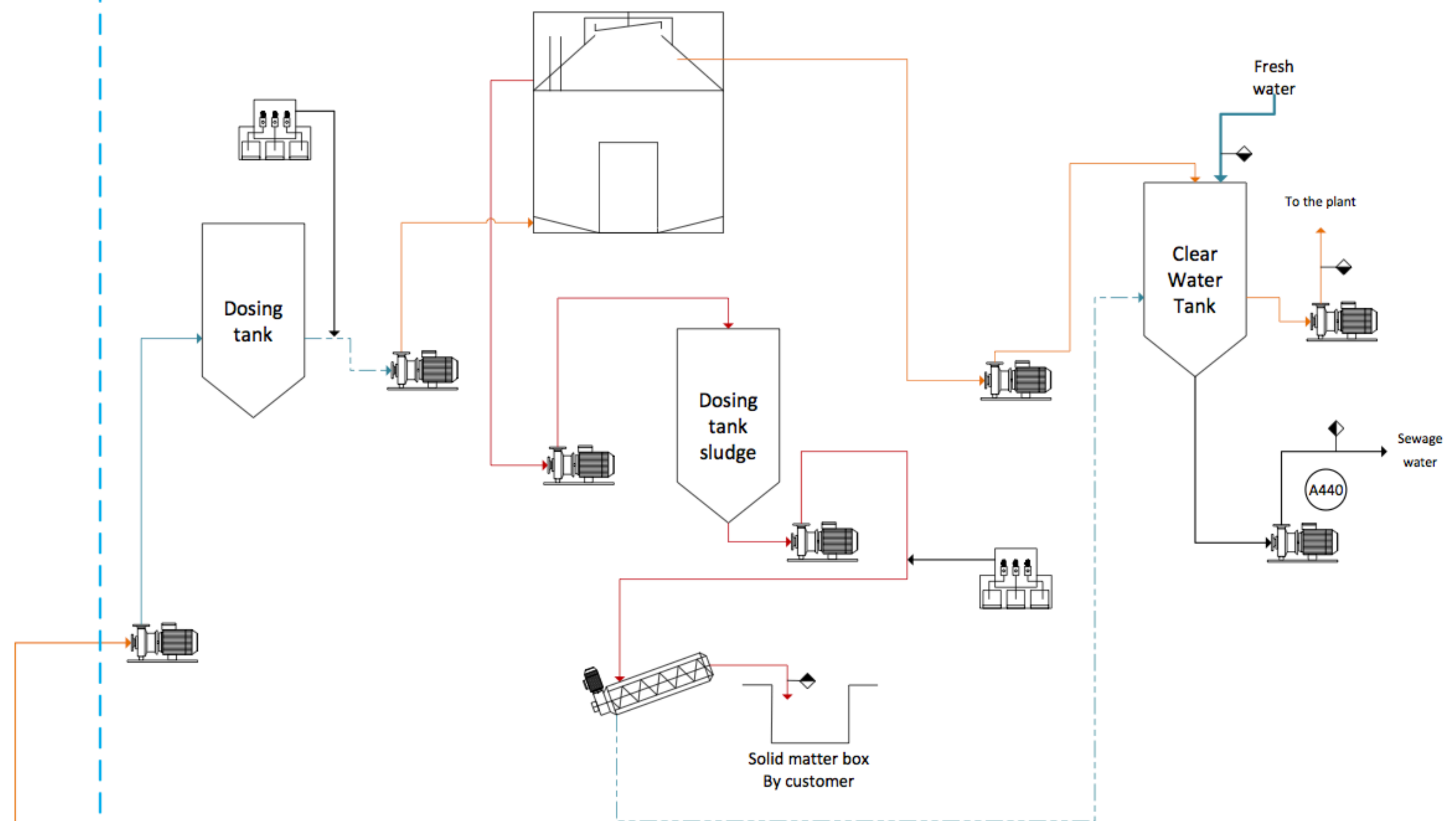




B Process Water Treatment



C Extended Water Treatment



Flow Diagram Chart for LDPE Film Washing

A) Washing Line

Pos. 10	Horizontal Conveyor Belt
Pos. 20	Inclined Conveyor Belt
Pos. 40	Wet-Shredder EWS 60/210
Pos. 50	Discharge and dewatering screw
Pos. 60	Wash and conveying screw
Pos. 70	Material buffer unit
Pos. 80	Wash and conveying screw
Pos. 90	Pre-washing unit VWE 700/2
Pos. 100	Wet Grinder SMS 80/160-FX7-2
Pos. 110	Friction Washer FA 60/300
Pos. 120	Turbowasher TBW15
Pos. 330	Pressure Pump
Pos. 440	Hydrocyclone D550
Pos. 150	Vibrating screening units
Pos. 160	Friction washer FA 60/300
Pos. 180	Mechanical dryer T2015S
Pos. 190	Material transport system RMFT 75/500
Pos. 200	Thermal drying unit TNT 1000/400
Pos. 210	Material transport system RMFT 75/500
Pos. 220	Silo HRS 20/2100

B) Process Water Treatment

C) Extended Water Treatment