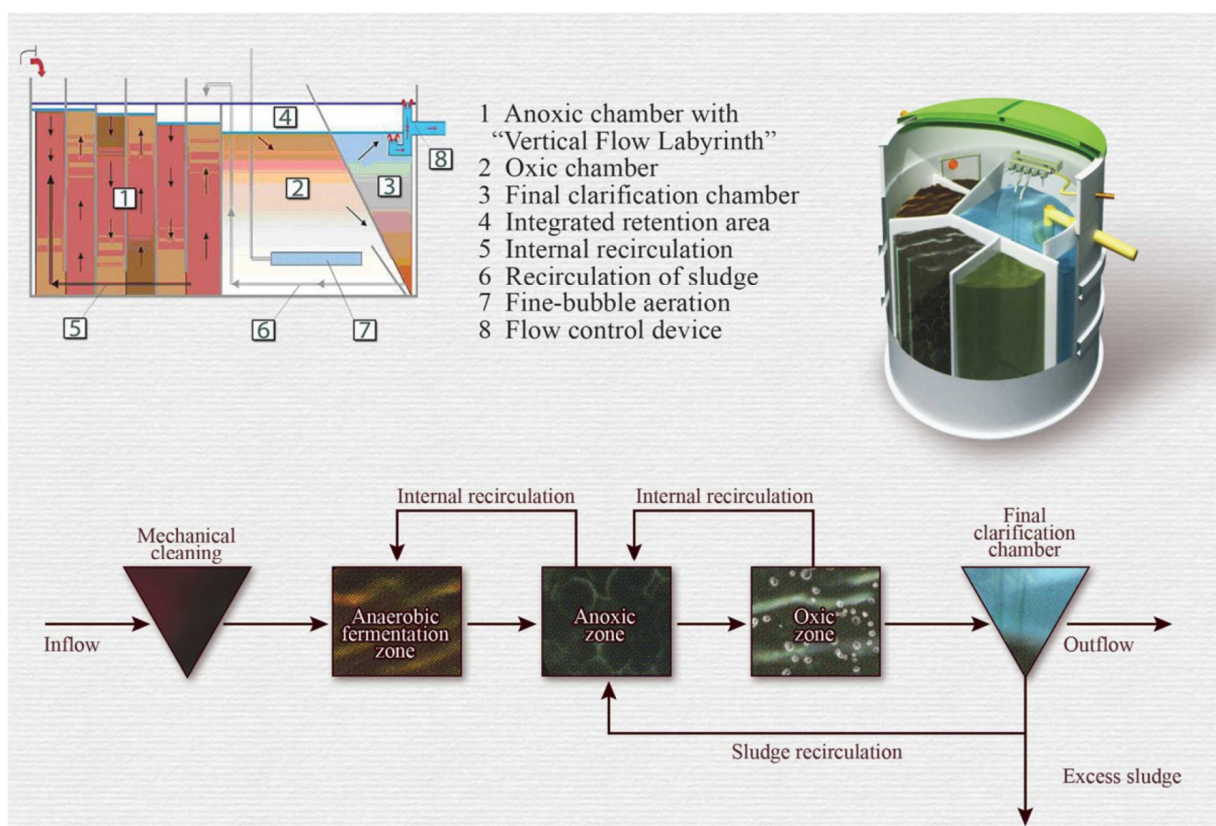


Presentation

Small typical WWTP projects with daily
flow 50-500 m³/d.

Short description of the technology „August VFL“

The compressed air through single-bubble aeration elements – diffusers (6)- is incorporated into aeration zone and into airlifts for circulation and re-circulation of the activation mixture. The air supply is from the only mechanism in the system – air blower (9). In the aeration zone proceed wastewater oxidation and nitrification processes. Further, the mixture of activated sludge flows into bottom of sedimentation section (7), where activated sludge by airlift is recycled into denitrification (non-aeration) or nitrification (aeration) zone of plant.



Small WWTP, up to 100 m³/d with plastic biological reactor

Small village WWTP with daily flow up to 100 m³/day may be equipped with plastic circular bioreactor, all biological treatment and sedimentation zones in one tank. The mechanical treatment chain, air blowers and control panel are placed in the prefabricated container. Only few construction works should be completed at construction: concrete plates under biological reactor and containers.

In the Table 1 possible WWTP sizes are shown.

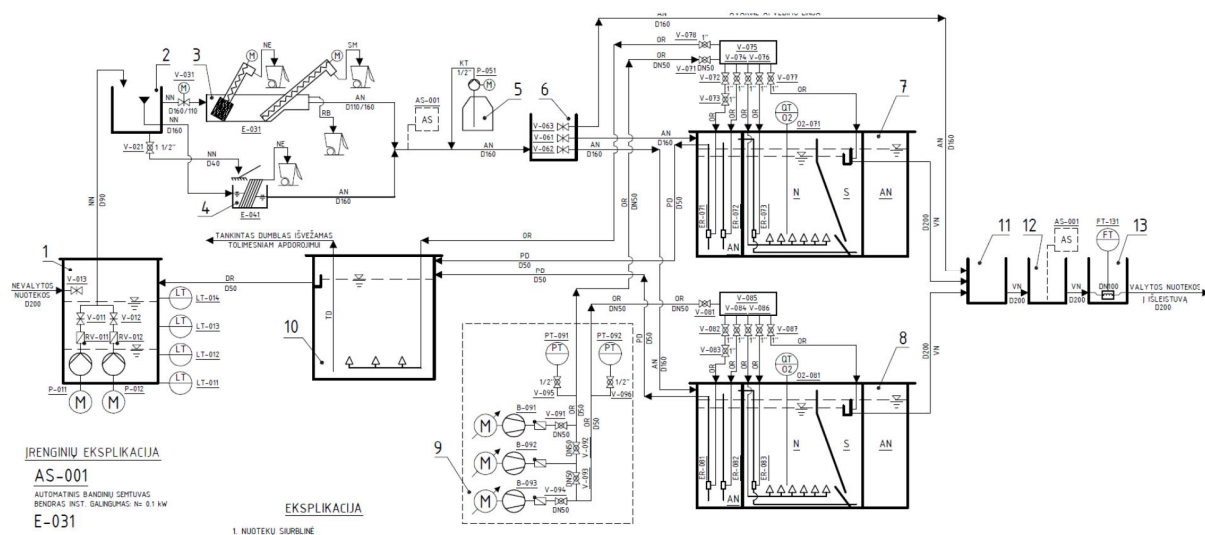
Table 1 : WWTP in plastic tanks:

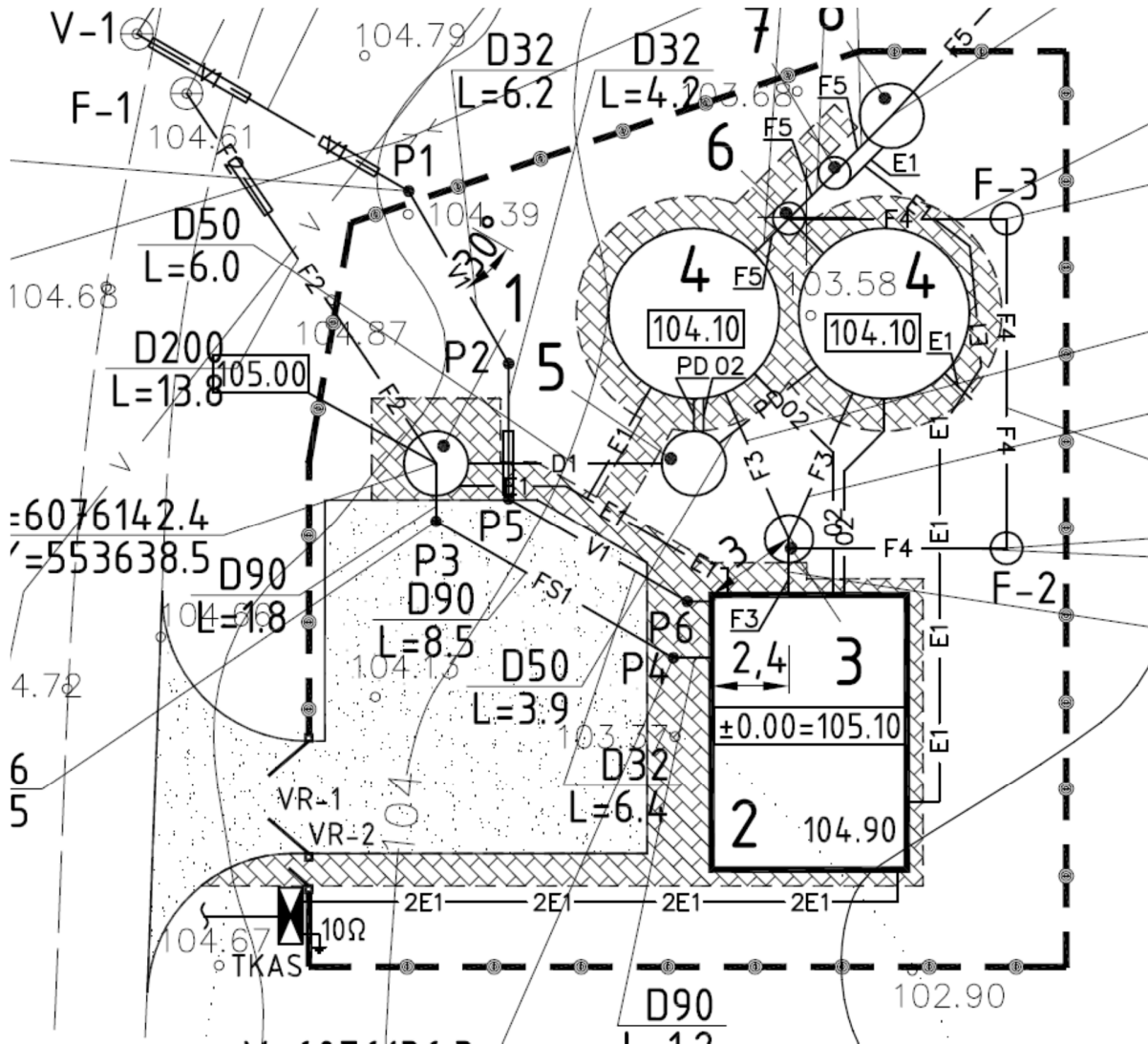
| TYPE | NUMBER OF REACTORS (psc) | DAILY LOAD WITH CONTAMINANTS (kg BOD ₅) | DAILY FLOW (m ³ /d) | SLUDGE PRODUCTION (m ³ /year) | ELECTRICITY CONSUMPTION (kWh/d) | TECHNICAL PARAMETERS | |
|--------|--------------------------|---|--------------------------------|--|---------------------------------|----------------------|-------|
| | | | | | | H(mm) | A(mm) |
| AT-300 | 2 | 18 | 45 | 75 | 48 | 3000 | 4500 |
| AT-400 | 2 | 24 | 60 | 100 | 66 | 3000 | 5000 |
| AT-500 | 2 | 30 | 75 | 125 | 80 | 3000 | 5300 |
| AT-600 | 3 | 36 | 90 | 150 | 99 | 3000 | 5000 |
| AT-750 | 3 | 45 | 112,5 | 187,5 | 120 | 3000 | 5300 |

An example of Kazokiskis village WWTP with biological N and F removal – 90 m³/d.

Total construction costs -240.000-290.000 Eur

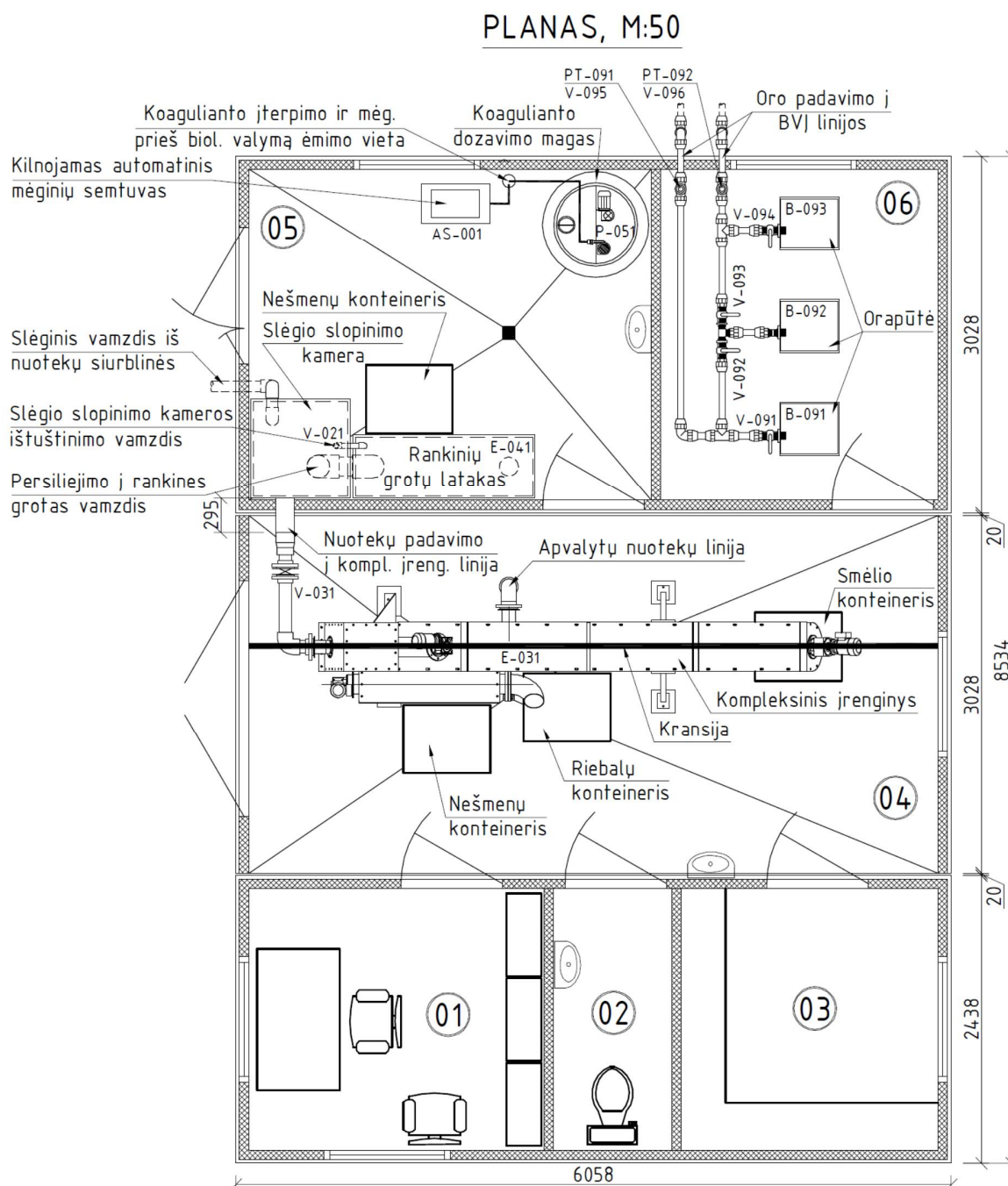
1. Technological scheme





3. WWTP treatment building explication

01-Operator room (if required); 02-WC; 03-Electric/automation room; 04-Complex mechanic treatment room; 05-Hand screens and aluminum sulphur dosing (if required); 06-Blower room



4. Project photos



WWTP site



Mechanical treatment unit



Control panel

Town WWTP, 100 -500 m3/d with concrete biological reactor

Town WWTP with daily flow up to 500 m³/day may be equipped with concrete rectangular bioreactor. all biological treatment (2 lines), sedimentation zones and sludge stabilization in one tank. The mechanical treatment chain, air blowers and control panel are placed in the prefabricated container building or light sandwich panel building.

In the Table 2 possible WWTP most common sizes are shown.

Table 2 : WWTP in plastic tanks:

Table 2: concrete bioreactors:

| TYPE | NUMBER OF REACTORS | | DAILY LOAD (kg BOD ₅) | DAILY FLOW (m ³ /d) | SLUDGE PRODUCTION (kg/d) | ELENERGY CONSUMPTION (kWh/d) | TECHNICAL PARAMETERS | | |
|---------|--------------------|------|--------------------------------------|-----------------------------------|-----------------------------|---------------------------------|----------------------|-----------|------------|
| | Min. | Max. | | | | | LENGTH (m) | WIDTH (m) | HEIGHT (m) |
| AT-1000 | 1 | 4 | 60 | 150 | 30 | 144 | 11 | 9 | 3,5 |
| AT-1500 | 1 | 6 | 90 | 225 | 45 | 195 | 12 | 9 | 4 |
| AT-2000 | 1 | 8 | 120 | 300 | 60 | 260 | 13 | 10 | 4 |
| AT-2500 | 1 | 10 | 150 | 375 | 75 | 300 | 12 | 12 | 4,5 |
| AT-3000 | 1 | 12 | 180 | 450 | 90 | 360 | 13 | 13 | 4,5 |
| AT-3500 | 1 | 14 | 210 | 525 | 105 | 421 | 14 | 13 | 4,5 |
| AT-4000 | 1 | 16 | 240 | 600 | 120 | 481 | 18 | 12 | 4,5 |
| AT-4500 | 1 | 18 | 270 | 675 | 135 | 534 | 18 | 13 | 4,5 |
| AT-5000 | 1 | 20 | 300 | 750 | 150 | 587 | 20 | 13 | 4,5 |

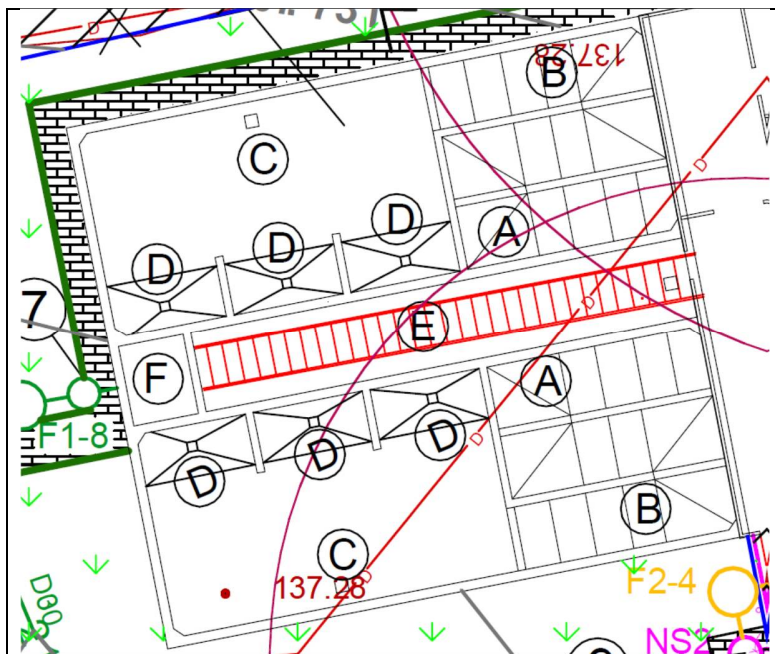
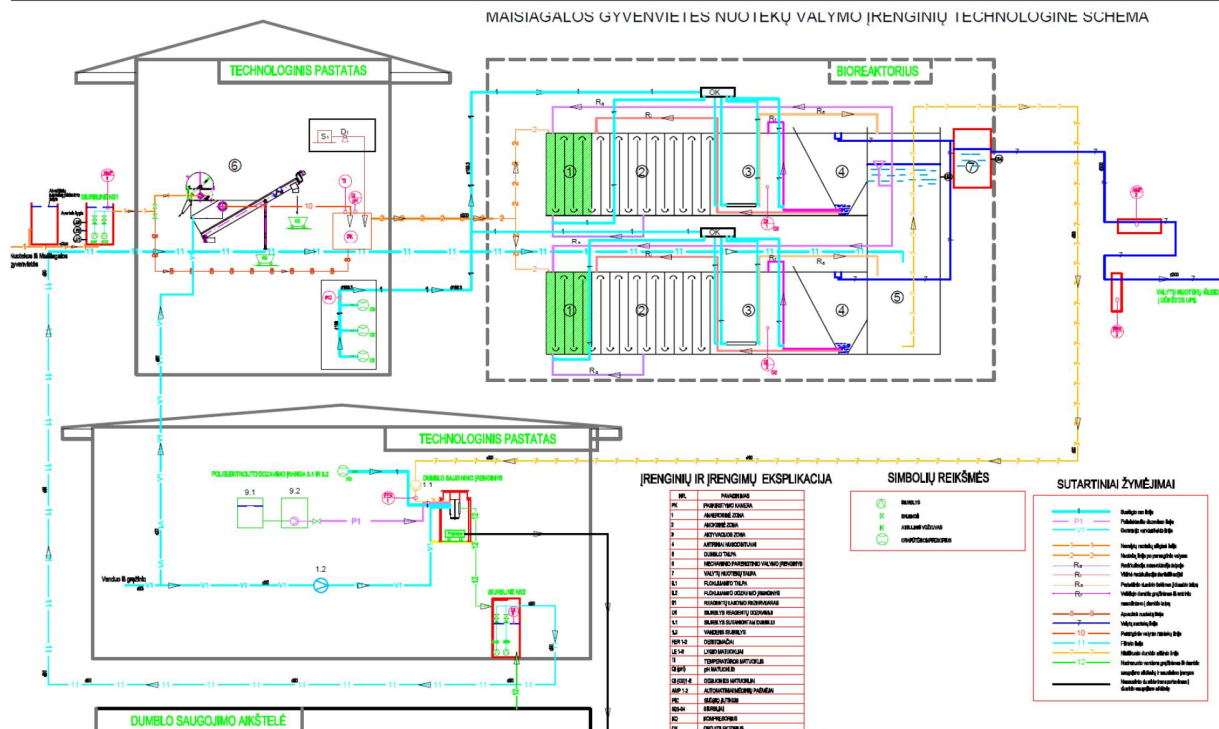
An example of Maisiagala town WWTP with biological N and F removal , sludge dewatering and sludge a covered storage area – 450 m³/d.

Total construction costs – 700.000-1.000.000 Eur

Main design parameters:

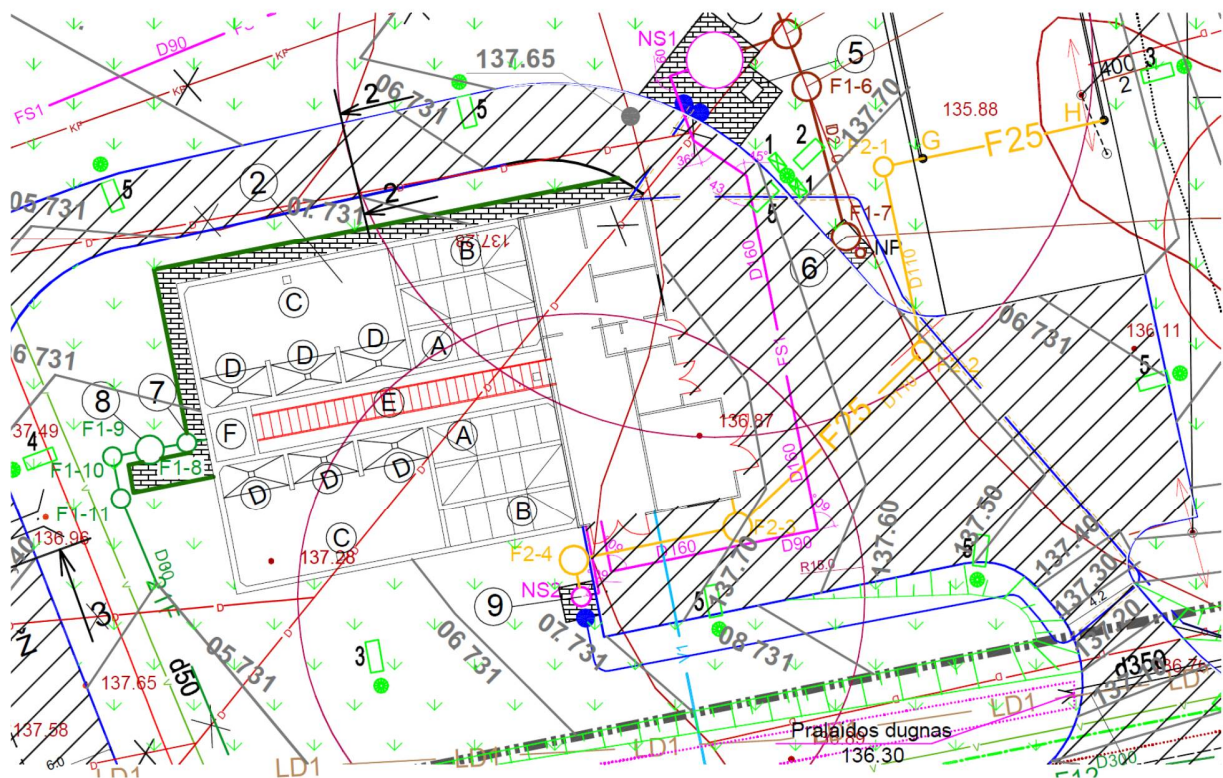
| Untreated water | Value | Dimension |
|--|--------------|----------------------|
| G.E. | 3760 | |
| COD | 506 | kg/d |
| BOD ₅ | 225 | kg/d |
| DM | 304 | kg/d |
| N _b | 40 | kg/d |
| P _b | 9,2 | kg/d |
| COD | 829,7 | mg/l |
| BOD ₅ | 369,5 | mg/l |
| DM | 498,0 | mg/l |
| N _b | 65,6 | mg/l |
| P _b | 15,1 | mg/l |
| Design flow | | |
| Average day flow | 460 | m ³ /d |
| Maximum day flow | 610 | m ³ /d |
| Maximum hour flow | 67,0 | m ³ /h |
| Treated water parameters | Value | Dimension |
| COD | 125 | mg/l |
| BOD ₅ | 10 | mg/l |
| DM | 20 | mg/l |
| N-NH ₄ | 1 | mg/l |
| N-NO ₃ | 15 | mg/l |
| N _{tot} | 20 | mg/l |
| P _{tot} | 2.0 | mg/l |
| Design patameters | | |
| Sludge age | 25 | d |
| Minimum temp. | 6 | °C |
| Max. temp. | 20 | °C |
| Average temp. | 13 | °C |
| Sludge concentration in the aeration chamber | 4.5 | kg DM/m ³ |

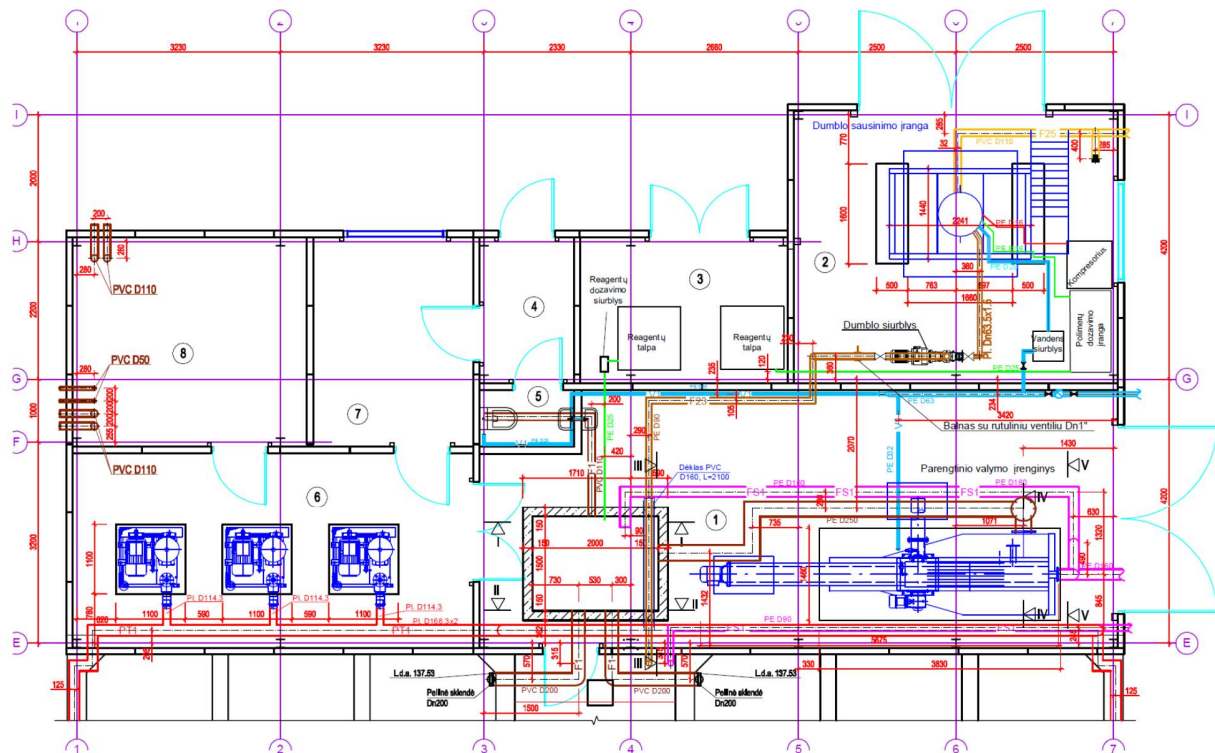
1. Technological scheme



2. WWTP Plan

NS1-Inlet pumping station; 2- Biological reactors; 3-Technological building with mechanical treatment
4-Biological reactors; 5-Sludge stabilization tank; 6-Treated water chamber
7-Automatic sampler; 8-Wastewater flow meter.





4. Project photos



Biologic reactor and mechanical treatment building



Biological reactor



Aeration zone and secondary clarifiers



Air blowers



Mechanical treatment unit with screens, grit and grease removing



WWTP control panel and electric room



Inlet pumping station with average tank



Sludge dewatering equipment and polymer preparation unit