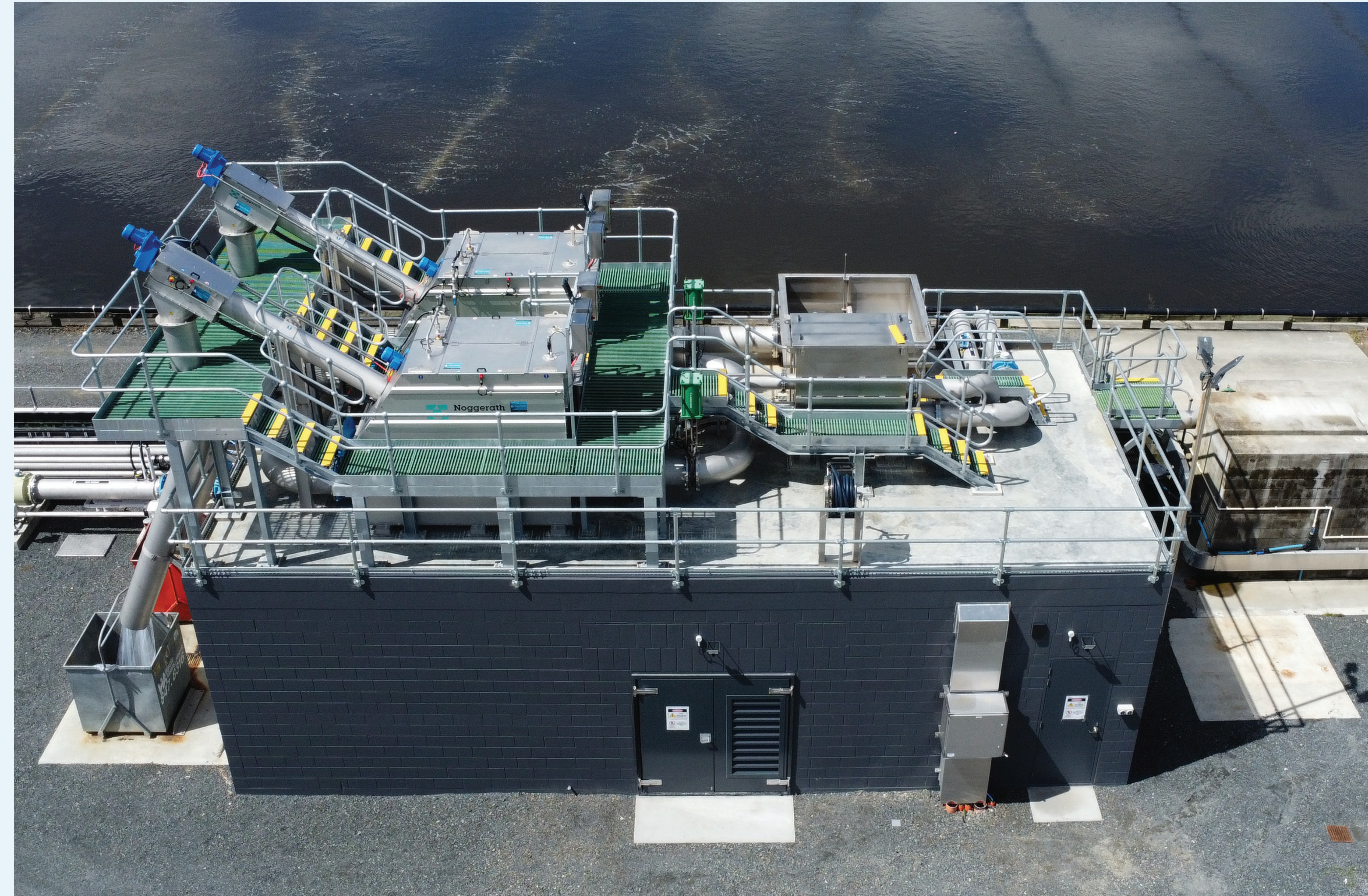


1 Inlet Works

Raw sewage entering the treatment plant can contain a variety of large debris, including wet wipes, food scraps and even jewellery! To prevent blockages and damage to the plant equipment, the first stage of treatment is to remove these items through a fine screening process. The solids are removed through a pair of fine screens, which removes any solids greater than 2mm.

During heavy rainfall, excess flows that cannot be handled by the main treatment process will overflow to the oxidation pond. The excess surge/storm water can be returned to the Inlet Works for future processing and reduction of the oxidation pond level.



Detail of rotary Inlet Screen.

② Membrane Aerated Biofilm Reactor Process

The biological process is the principal stage of treatment, where micro-organisms break down organic matter and remove nutrients such as nitrogen and phosphorus. This is achieved by passing the wastewater through oxygen rich (aerobic) and oxygen deficient (anoxic) biological zones. Each stage is designed to promote the growth of different types of micro-organisms supporting various biochemical reactions.

With an MABR process, the oxygen rich and oxygen deficient stages happen within the same tank.

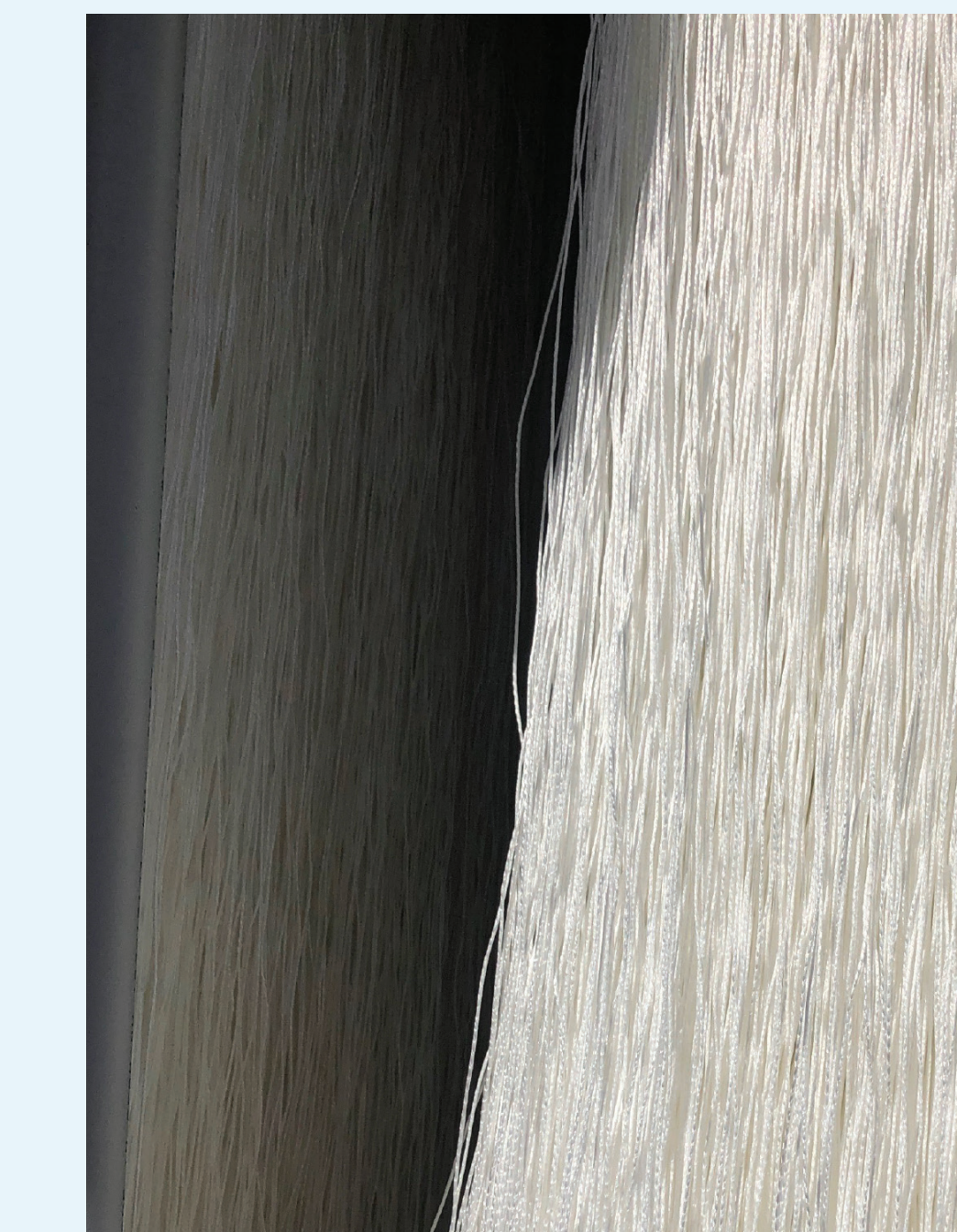


The splitter box weirs

③ Membrane Aerated Biofilm Reactor Cont...

Nitrifying micro-organisms attach themselves to the media and form a biofilm layer. The media breathes and transfers oxygen to the biofilm, without the use of bubbles, making it many times more energy efficient than a fine bubble aeration system.

Outside the biofilm layer that has formed on the fibre strands an oxygen deficient zone enabling a different type of micro-organism to thrive. Within the MABR tanks, nitrogen and phosphorous which are harmful to the receiving environments are targeted.

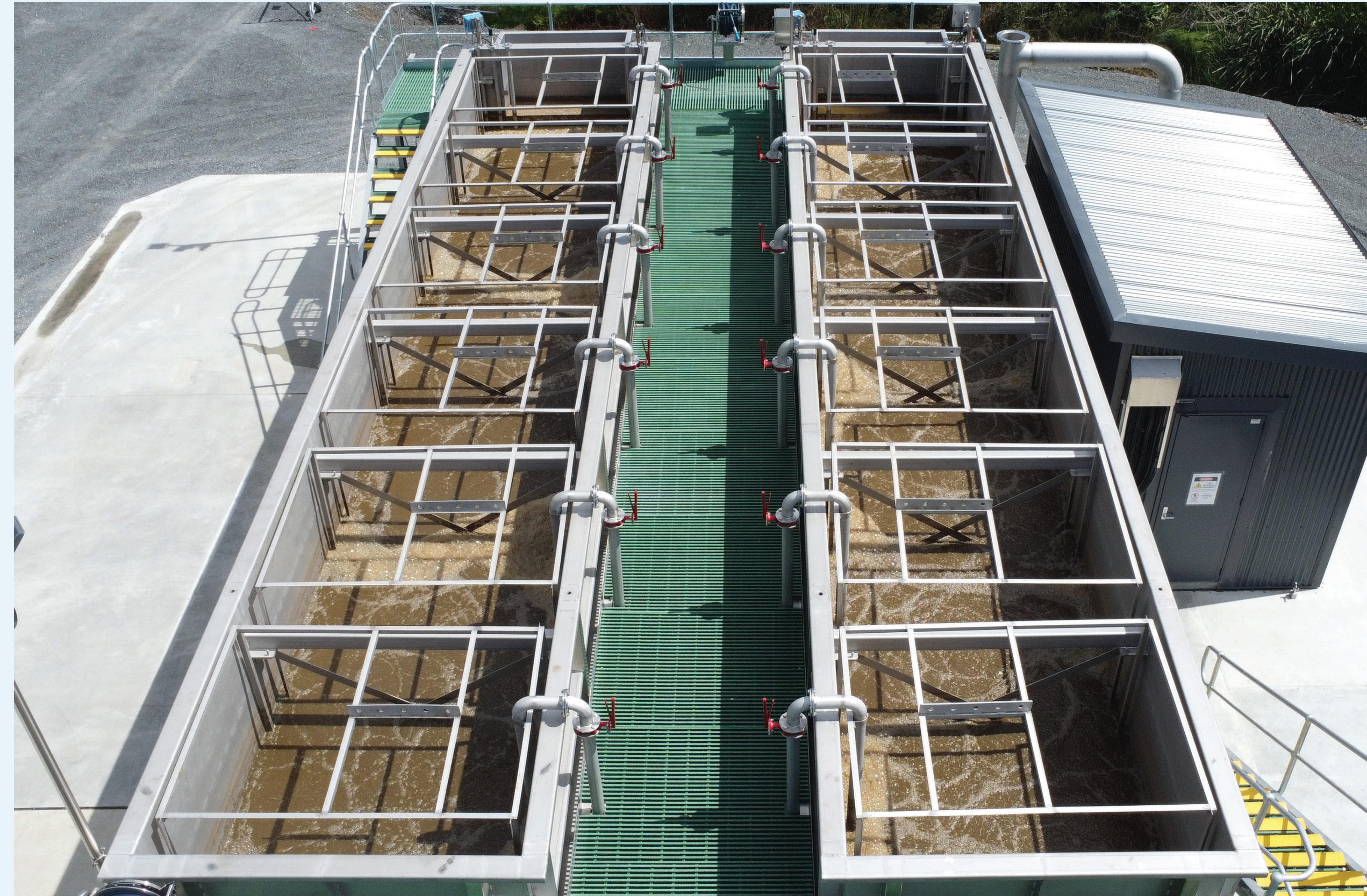


MABR membrane fibre



④ Aeration Process

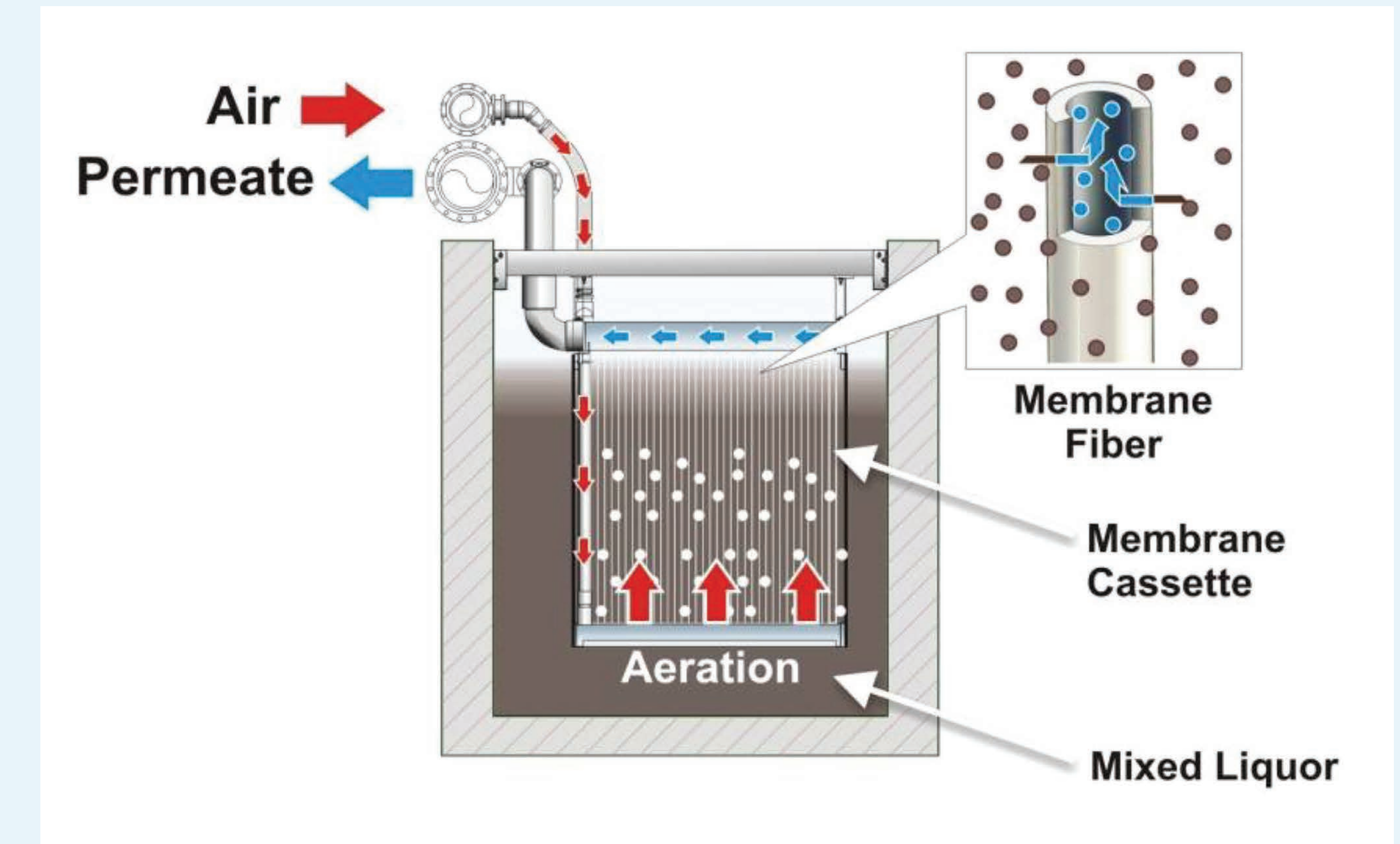
Following the MABR process are our two aerobic tanks, which are fitted with fine bubble diffusers. The air supply for the aerobic system will be delivered by Process blowers (duty/standby), to all necessary valves and instrumentation required for automatic operation. If additional aerobic volume is required in the future, additional tanks can be added.



The blower room

⑤ MBR Process & Tertiary Treatment

From the biological process, concentrated wastewater (referred to as mixed liquor) is transferred into the MBR tanks. Each MBR tank contains cassettes made of many hollow fibres which filter the mixed liquor to produce clear and odourless water referred to as permeate (filtered down to 0.02 microns). Although the permeate has the appearance of clean drinking water, some bacteria and viruses may still be present.



MBR membrane fibres

⑥ MBR Process & Tertiary Treatment

Return Activated Sludge (RAS) consists of the excess mixed liquor that is not filtered through the hollow fibre membranes. This is returned to the biological process to maintain the micro-organism population within the system.

The effluent pump station receives the permeate from the MBR plant. The effluent is pumped through an ultraviolet (UV) disinfection system to deactivate any remaining micro-organisms and is discharged. Short-wavelength ultraviolet light affects bacteria, viruses, and protozoa by rendering them incapable of reproducing and causing infection. To improve efficiency of the water usage at this site, clear permeate water is recycled within the system to use as the supply water to clean the inlet screens and site wash-down hoses.



Treated water released into Stream.

Final Effluent Compliance Results Te Kauwhata MABR WWTP:

cBOD5	Total Kjeldahl Nitrogen	Total Nitrogen	Total Phosphorus	Total Suspended Solids	Turbidity
1.000 mg/L	1.030 mg/L	1.800 mg/L	2.830 mg/L	2.200 mg/L	>0.1NTU

