

ABSTRAK

Gedung Universitas Sahid Jakarta merupakan suatu gedung bertingkat delapan yang memiliki jumlah penghuni mencapai 2968 orang yang terdiri dari mahasiswa, dosen, dan staff administrasi. Dalam kegiatannya, Kampus Universitas Sahid Jakarta menghasilkan air limbah yang berasal dari kegiatan domestik dan laboratorium. Air limbah yang dihasilkan oleh Kampus Universitas Sahid Jakarta belum memiliki unit pengolahan air limbah. Air limbah yang tidak diolah dengan baik akan menyebabkan pencemaran pada badan air. Selain berdampak negatif terhadap kesehatan, pencemaran badan air juga dapat menyebabkan berkurangnya sumber air bersih. Oleh sebab itu, perlu adanya perencanaan pembangunan Instalasi Pengolahan Air Limbah di Kampus Universitas Sahid Jakarta. Instalasi pengolahan yang digunakan untuk mengolah limbah cair dari Kampus Universitas Sahid Jakarta ialah Biofilter Anaerob-Aerob. Perencanaan pemilihan Biofilter Anaerob-Aerob berdasarkan pada kebutuhan lahan, pembangunan, pengoperasian, perawatan, biaya investasi, dan efisiensi. Dimensi dari masing – masing unit ialah (i) grease trap (2,05 m x 0,8 m x 1,15 m), (ii) bak ekualisasi (4,2 m x 2,2 m x 2,65 m), (iii) bak pengendap awal (1 m x 3 m x 2,5 m), (iv) bak anaerobic filter 4 kompartemen (3,2 m x 2,8 m x 2,5 m). (v) bak aerobic filter (2,5 m x 3 m x 2,5 m), (v) bak pengendap akhir (0,35 m x 3 m x 2,5 m), dan (vi) filter dengan tebal karbon aktif 50 cm, pasir silika 150 cm, gravel 10 cm, dan diameter tangki 1 m. Perencanaan dari Instalasi Pengolahan Air Limbah (IPAL) di Universitas Sahid | Jakarta diperkirakan menghasilkan COD : 20,82 mg/l, TSS : 5,74 mg/l, Ammonia : 5,25 mg/l, BOD : 2,02 mg/l, dan Minyak & lemak : 0,01 mg/l. Hasil dari pengolahan tersebut telah memenuhi baku mutu yang telah ditetapkan oleh pemerintah melalui Peraturan Menteri Lingkungan Hidup Dan Kehutanan RI Nomor 68 Tahun 2016 tentang baku mutu air limbah domestik.

Kata Kunci: Biofilter Anaerob-Aerob, Air limbah domestik, air limbah laboratorium, Kampus Universitas Sahid Jakarta

ABSTRACT

The Sahid University Jakarta building is an eight-storey building which has 2968 residents consisting of students, lecturers, and administrative staff. In its activities, the Sahid University Jakarta Campus produces wastewater from domestic and laboratory activities. The wastewater generated by the Sahid University Jakarta Campus does not yet have a wastewater treatment unit. Wastewater that is not properly treated will cause pollution to water bodies. Apart from having a negative impact on health, pollution of water bodies can also cause a reduction in clean water sources. Therefore, it is necessary to plan the construction of a Wastewater Treatment Plant at the Sahid University Jakarta Campus. The treatment plant used to treat liquid waste from the Sahid University Jakarta Campus is the Anaerobic-Aerobic Biofilter. Anaerobic-Aerobic Biofilter selection planning is based on land requirements, construction, operation, maintenance, investment costs, and efficiency. The dimensions of each unit are (i) grease trap (2.05 m x 0.8 m x 1.15 m), (ii) equalisation basin (4.2 m x 2.2 m x 2.65 m), (iii) initial settling basin (1 m x 3 m x 2.5 m), (iv) 4-compartment anaerobic filter basin (3.2 m x 2.8 m x 2.5 m). (v) aerobic filter basin (2.5 m x 3 m x 2.5 m), (v) final settling basin (0.35 m x 3 m x 2.5 m), and (vi) filter with 50 cm thick activated carbon, 150 cm silica sand, 10 cm gravel, and 1 m tank diameter. The planning of the Wastewater Treatment Plant (WWTP) at Sahid University Jakarta is estimated to produce COD: 20.82 mg/l, TSS: 5.74 mg/l, Ammonia: 5.25 mg/l, BOD: 2.02 mg/l, and Oil & grease: 0.01 mg/l. The results of the treatment have met the quality standards set by the government through the Regulation

of the Indonesian Minister of Environment and Forestry Number 68 of 2016 concerning domestic wastewater quality standards.

Keywords: Anaerobic-Aerobic Biofilter, Domestic wastewater, laboratory wastewater, Sahid University Jakarta