



**PERENCANAAN SISTEM PEMBUANGAN LIMBAH
DOMESTIK PERUMAHAN NELAYAN PUGER
DENGAN MODULAR SYSTEM
– SHALLOW SEWER**

SKRIPSI

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Domestic Waste Disposal System Design of Fisherman Residence in Puger with Modular System – Shallow Sewer Feri Ejin

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ABSTRACT

New residence of local fisherman will be built in Puger Kulon Village in the District of Puger, Jember. This area is quite densely populated with a density of 376 inhabitants/ha. The physical condition of this area is sandy soil, the spaces between houses are about 1-2 m, it is located near the river, approximately 200-300 m from the beach, and 1000 houses is being planned to be built on an area of 34.71 ha. On site waste water system (septic tank) is not suitable to be used in this area, because infiltration from the septic tank can easily penetrate into the soil and pollute ground water and rivers in this area. Three alternatives of wastewater pipe networks were scenario 1, scenario 2, scenario 3 then most effective and efficient will be selected pipeline scenario. Scenario number 1 was selected as the most effective and efficient shallow sewer pipeline system because scenario 1 has an average velocity of 0.6229 m/s, the smallest total energy loss of 0.279488, efficiency in pipe length of 47.3 % and ease of maintenance when clogging occur. The diameter of pipes in the pipeline is 75 mm. The smallest dimension for the pipelines connected to communal tanks is 100 mm, where as the biggest dimension is 250 mm. The shallow sewer system requires water as much as 0.001988 m³/s for flushing maintenance.

Key words: *residence of fisherman, shallow sewer, Puger Kulon.*

SUMMARY

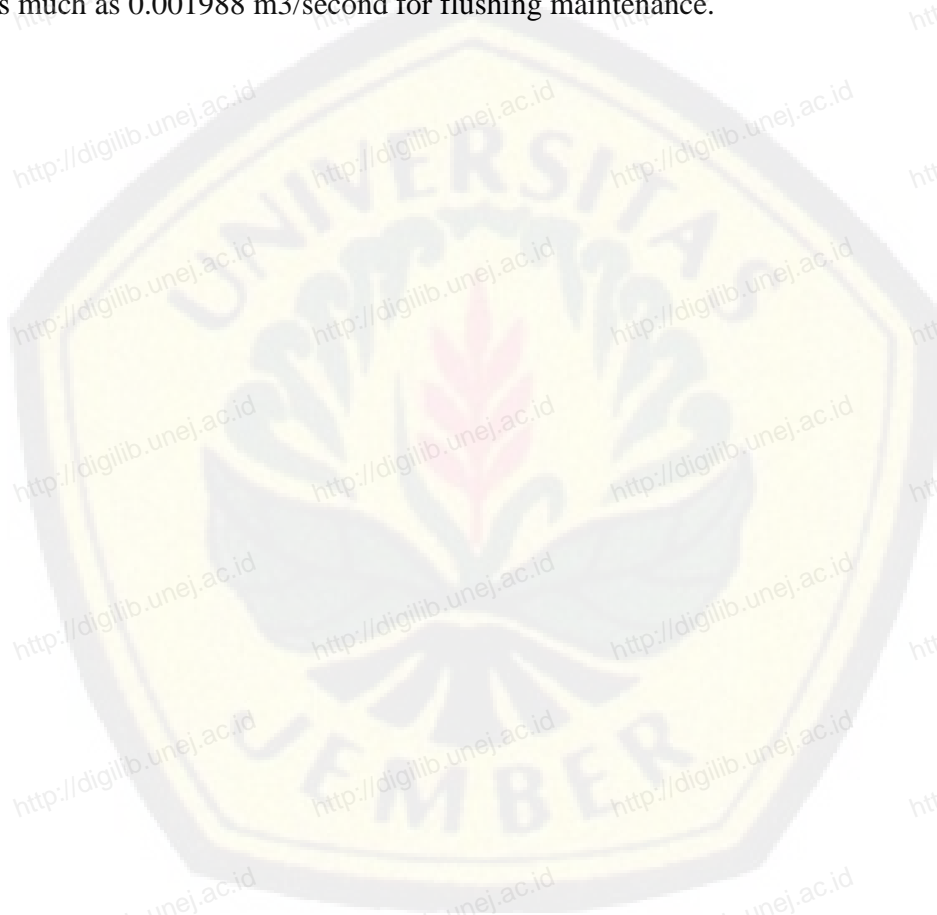
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Domestic waste water is wastewater from residential activities such as housing, schools, hotels, shops, and offices resulting from human activities such as human feces (*black water*), bath, kitchen, and laundry waste which can be processed together or separately. New residence of local fisherman will be built in Puger Kulon Village in the District of Puger, Jember. This area is quite densely populated with a density of 376 inhabitants/ha. The physical condition of this area is sandy soil, the spaces between houses are about 1-2 m, it is located near the river, approximately 200-300 m from the beach, and 1000 houses is being planned to be build on an area of 34.71 ha. On site waste water system (septic tank) is not suitable to be used in this area, because infiltration from the septic tank can easily penetrate into the soil and pollute ground water and rivers in this area. Domestic waste water system with a shallow sewer-modular system can be used as a solution to this problem. The purpose of this study is to determine an effective and efficient modular piping system for the disposal of domestic waste by using the shallow sewer method and to determine the appropriate diameter of pipes used.

This research was conducted to select the most effective and efficient shallow sewer pipeline system (scenario 1, scenario 2, and scenario 3). The parameters used to select the pipelines are the flowrate of domestic waste, the slope of the channel, the velocity limits in the pipeline channel (0.5 m/s – 1.2 m/s), the smallest total energy loss, the dimension of pipes and efficiency of used pipe length, and the maintenance of the piping system.

Scenario number 1 was selected as the most effective and efficient shallow sewer pipeline system among the other scenarios as a result of this research. This was

concluded because scenario 1 has an average velocity of 0.6229 m/s, the smallest total energy loss of 0.279488, efficiency in pipe length of 47.3 % and ease of maintenance when clogging occur. The diameter of pipes in the pipeline is 75 mm. The smallest dimension for the pipelines connected to communal tanks is 100 mm, where as the biggest dimension is 250 mm. The shallow sewer system requires water as much as 0.001988 m³/second for flushing maintenance.



DAFTAR ISI

HALAMAN JUDUL	i
HALAMAN PERSEMBAHAN	ii
HALAMAN MOTO	iii
HALAMAN PERNYATAAN.....	iv
HALAMAN PEMBIMBINGAN.....	v
HALAMAN PENGESAHAN.....	vi
ABSTRAK	vii
RINGKASAN	viii
PRAKATA	x
DAFTAR ISI.....	xii
DAFTAR TABEL	xv
DAFTAR GAMBAR.....	xvi
DAFTAR LAMPIRAN	xvii
BAB 1. PENDAHULUAN	
1.1. Latar Belakang	1
1.2. Perumusan Masalah	2
1.3. Tujuan dan Manfaat	3
1.4. Batasan Masalah.....	3
BAB 2. TINJAUAN PUSTAKA	
2.1. Kondisi Umum Wilayah Studi	4
2.1.1 Umum	4
2.1.2 Wilayah Kabupaten Jember.....	4
2.2. Sistem Sanitasi.....	7
2.2.1 Limbah	7
2.2.2 Karakteristik Air Limbah	8
2.3. Sistem Pengolahan Air Limbah Domestik.....	9
2.3.1 Sistem Sanitasi Setempat.....	9

2.3.2 Sistem Sanitasi Terpusat.....	10
2.4. Sistem Penyaluran Air Limbah	13
2.5. Sistem Modular	14
2.5.1 Perpipaan Sistem Modular	14
2.5.2 Sistem <i>Small Bore Sewer</i>	14
2.5.3 Sistem <i>Shallow Sewer</i>	16
2.6. Aspek Penting Sistem Pengaliran.....	18
2.6.1 Kemiringan Saluran	18
2.6.2 Luas Penampang Melintang Saluran.....	21
2.6.3 Kondisi Pengaliran.....	22
2.6.4 Kekasaran Permukaan pada Saluran	23
2.6.5 Kecepatan Aliran dalam Pipa.....	24
2.7. Pola Jaringan Perpipaan	25
2.8. Komponen Sistem Perpipaan	27
2.9. Pipa Air Limbah.....	28
2.9.1 Jenis Pipa	28
2.9.2 Bahan dan Ukuran Pipa Penyalur Air Limbah.....	29
2.9.3 Letak Pipa Air Limbah.....	30
2.10. Penyambungan Pipa dan Menggambar Pipa	32
2.10.1 Cara Penyambungan.....	32
2.10.2 Gambar Perpipaan	32
2.11. Debit Air Limbah	33
2.12. Aliran Melalui Lubang	34
2.13. Waktu Pengosongan Tangki	36
BAB 3. METODE PENELITIAN	
3.1 Lokasi Penelitian.....	37
3.2 Langkah-langkah Penelitian.....	37
3.3 Kerangka Pengerjaan Penelitian	38

BAB 4. ANALISA DAN PEMBAHASAN

4.1. Lokasi Penelitian.....	41
4.2. Sistem Pengolahan Limbah Domestik	41
4.3. Sistem Modular	42
4.4. Potensi Limbah	43
4.4.1 Perhitungan Potensi Limbah	43
4.4.2 Penentuan Jumlah Tangki Komunal.....	44
4.5 Daerah Pelayanan dan Penentuan Blok.	47
4.6 Pemilihan Alternatif Jaringan Pipa	52
4.7 Perhitungan Kemiringan, Kecepatan, Dimensi Pipa dan Kehilangan Energi.....	53
4.7.1 Pemilihan Alternatif Jaringan Pipa.....	53
4.7.2 Jaringan Pipa ke Komunal.....	57
4.8 Dimensi Bak Penggelontor	60
4.9 Waktu Pengosongan Tangki	62
4.10 Teknik Pemeliharaan Saluran	63

BAB 5. KESIMPULAN DAN SARAN

5.1. Kesimpulan.....	64
5.2. Saran	64

DAFTAR PUSTAKA	65
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LAMPIRAN-LAMPIRAN