DETAILED ENGINEERING DESIGN (DED) SISTEM PENYEDIAAN AIR MINUM IBU KOTA KECAMATAN TANJUNG RAYA KABUPATEN AGAM

TUGAS AKHIR

Sebagai salah satu syarat untuk menyelesaikan
Program Strata-1 pada
Jurusan Teknik Lingkungan
Fakultas Teknik Universitas Andalas

Oleh:

ELSYA ALVIONITA

1710942026

Pembimbing:

Dr. Eng. DENNY HELARD

JURUSAN TEKNIK LINGKUNGAN

FAKULTAS TEKNIK – UNIVERSITAS ANDALAS

PADANG

2022

ABSTRAK

Sistem Penyediaan Air Minum di Kecamatan Tanjung Raya melayani 70,89% dari total penduduk. Pelayanan tersebut diantaranya 20,71% melalui sistem perpipaan PDAM (SPAM IKK Tanjung Raya), 34,97% perpipaan non-PDAM dan 15,22% nonperpipaan. Permasalahan eksisting SPAM IKK Tanjung Raya yang terdiri dari intake yang tidak sesuai dengan spesifikasi yang tertuang pada SNI 7829:2012, ketidaksesuaian sistem pengolahan dengan PermenPUPR No27 Tahun 2016 serta dimensi perpipaan distribusi eksisting yang tidak mampu melayani daerah pelayanan mengharuskan dilaksanakannya penyusunan Detailed Engineering Design SPAM IKK Tanjung Raya. Untuk mendukung peningkatan pelayanan, perlu adanya peningkatan kapasitas reservoir menjadi 1.297 m^3. Periode desain direncanakan 5 tahun (2021-2025) dengan meningkatkan pelayanan menjadi 100% yakni 55,27% melalui perpipaan PDAM, 41,74 melalui perpipaan non PDAM dan 2,33% nonperpipaan. Melalui pertimbangan kondisi topogarfi dan administrasi Kecamatan Tanjung Raya, SPAM IKK Tanjung Raya melayani Nagari Maninjau, Nagari Bayur, Nagari Duo Koto, Nagari Paninjauan, Nagari Koto Kaciak, Nagari Koto Gadang, dan Nagari Sungai Batang. Pembangunan SPAM meliputi intake, sistem transmisi, Instalasi Pengolahan Air Minum (IPAM) dan sistem distribusi. Air baku memanfaatkan air permukaan Batang Sarasah dengan debit pengambilan sebesar 50 l/detik. Sistem transmisi direncanakan sepanjang 162 m menggunakan jenis GIP DN 200 mm. Unit produksi menggunakan pengolahan lengkap meliputi koagulasi-flokulasi, sedimentasi, filtrasi dan desinfeksi. Jaringan distribusi menggunakan sistem cabang dengan pengaliran gravitasi. Sistem distribusi dilengkapi dengan Pipa HDPE DN 300 mm (9.025 m), DN 200 mm (4.145,8 m) dan DN 150 mm (3.593,6 m). Rencana anggaran biaya pembangunan SPAM direncanakan sebesar Rp23.580.000.000,00.

Kata kunci: *Detailed Engineering Design, Sistem Penyediaan Air Minum, Kecamatan Tanjung Raya, Pengolahan lengkap, Reservoir*

ABSTRACT

Water Supply System (WSS) in Tanjung Raya Subdistrict is able to serve about 70,89% amount of the total population. The service consists of 20,71% through PDAM piping system, 34,97% non-PDAM piping system, and 15,22% non-pipeline system. Several circumstances in WSS of Tanjung Raya District Capital such as unqualified intake to SNI 7820:2012, the discrepancy of treatment plant according to Minister of Public Works and Public Housing Regulation No.27 Of 2016, and incompetence of pipe's dimension to deliver water to a farthermost point in service area causing the importance to form Detailed Engineering Design of WSS of Tanjung Raya District Capital. To support service improvement, it is necessary to increase the capacity of the reservoir to 1.297 m^3. Design period is planned for 5 year (2021-2025) with increased serving percentage to 100% which consist of 55,27% through PDAM piping system, 41,74% non-PDAM piping system, and 2,99% non-pipeline at the end of period. According to the consideration of topography and administrative condition of Tanjung Raya Subdistrict, WSS of Tanjung Raya District Capital able to serve Nagari Maninjau, Nagari Bayur, Nagari Duo Koto, Nagari Paninjauan, Nagari Koto Kaciak, Nagari Koto Gadang, and Nagari Sungai. SPAM construction consists of intake, transmission system, Water Treatment Plant (WTP), and distribution system. Raw water utilizes surface water from Batang Sarasah with 50 l/s intake debit. The transmission system is planned for 162 m using GIP DN 200 mm. The Treatment Plant consists of coagulation-flocculation, sedimentation, filtration, and disinfection. Distribution network using branch system with gravity flow. Distribution system fitted with HDPE pipe DN 300 mm (9.025 m), DN 200 mm (4.145,8 m) and DN 150 mm (3.593,6 m). Construction budget plan amounts Rp23.580.000.000,00.

Keyword: *Detailed Engineering Design, Water Supply System, Subdistrict Tanjung Raya, Complete Treatment Plant, Reservoir*