
PREFACE

Only by Grace of the Lord, Christ Jesus, the authors can finish this final thesis report as a compulsory requirement to obtain the bachelor degree on time. It is a four months process that has been a new experience for the authors. The authors realize that the authors will not be able to make it without the help and encouragements from another people.

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The Authors

ABSTRACT

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*Drinking Water Pump Station in the Netherlands and Recommendations
for Indonesia's Improvement*

Drinking water is the basic need in the human life but as a developing country, Indonesia is still suffering the lack access to safe drinking water whereas The Netherlands is one of the countries in the world which can supply potable drinking water. This thesis' objective is to give recommendations for improving the drinking water pump station in Indonesia with The Netherlands as an example.

Firstly, the thesis discuss about the drinking water pump station in the Netherlands. In the Netherlands, there are 233 pumping stations with their supply area which provide for a 24 hours per day supply of water from the taps. They take the raw water from both groundwater and surface water and treat the raw water based on its characteristic. To be able to accommodate the treatment of raw water, the drinking water pump station is designed by using a coarse to fine approach in order to get more precise detailed design and make the changeability of design be possible. The design of drinking water pump station in the Netherlands passes through some phases; identification, definition, preliminary design, final design, detailed design, and building.

Moreover, the final thesis comes up with the design process of one of drinking water pump stations in the Netherlands; De Punt, Groningen. This pump station is renovated because the amount of abstracted groundwater is decreased and mechanical installation at the pump station is very old. Attention is paid to the treatment process of drinking water and the process of designing and the growth of the design of each building. Five buildings are designed considered to the boundary condition. They are intake and raw water pump station (*inlaatwerk*), filtration and disinfection pump building (*filtratie desinfectie pompgebouw*), clean water reservoir (*reinwater reservoir*), treatment of backwash water and sludge (*slibverwerking*), and groundwater pump station (*pompgebouw groundwater*). Besides the final design of each buildings is drawn up, the cost estimation of the

buildings are calculated, and the phase procedure of renovating are also considered in this part.

Then drinking water pump station in Indonesia is discussed in the chapter IV to be compared with the Netherlands' condition. At present, there are around 300 PDAM throughout Indonesia that abstract the raw water - from 201 river, 248 springs, and 91 artesis but only surface water gets the treatment. The drinking water produced by drinking water pump station in Indonesia is still not reliable to drink without boiling first. The reasons are the most of the source are contaminated, the standard regulation is not strict, the water companies function poorly and sometimes not at all, and the plants are badly designed and maintained even the design procedure is regulated by Government Regulation number 16 in 2005.

Therefore some recommendations are addressed in order to improve the drinking water pump station in the last part of this final thesis. Interdisciplinary engineering management process that evolves and verifies an integrated, life-cycle balanced set of system solutions should be implemented to design a drinking water pump station.

Keywords: drinking water pump station, drinking water treatment, design phases, system engineering process

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