

# **INUNDATION IN LAKSDA ADISUCIPTO ROAD: SOUTH OF NOLOGATEN AREA ANALYSIS**

Final Project Report  
as a requirement to obtain Bachelor degree from  
Universitas Atma Jaya Yogyakarta

by:

LIOBA EVITA ANIKUSUMA

Student ID Number: 141315584



**INTERNATIONAL CIVIL ENGINEERING PROGRAM  
DEPARTMENT OF CIVIL ENGINEERING  
FACULTY OF ENGINEERING  
UNIVERSITAS ATMA JAYA YOGYAKARTA  
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## STATEMENT

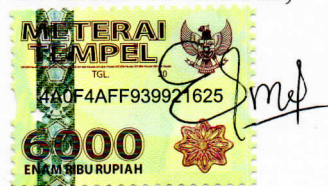
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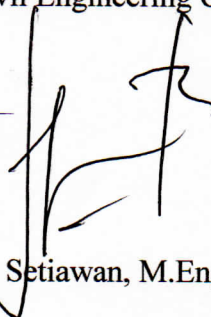
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Author understand that this final project report have space for further improvement. Due to this very reason, any suggestion and critics will be accepted.

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The Author

Lioba Evita Anikusuma

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## LIST OF NOTATIONS

A	=	service area ( $m^2$ , Ha)
$A_c$	=	cross-sectional area perpendicular to the direction flow/canal area ( $m^2$ )
$A_s$	=	total area each segment ( $m^2$ )
C	=	runoff coefficient
CK	=	kurtosis coefficient
CS	=	skewness coefficient
CV	=	variance coefficient
df	=	degree of freedom
$d_i$	=	difference between $X_i$ rank and $X_{i+1}$
dt	=	$R_t - T_t$
F	=	F comparison
$H_1$	=	height difference of base canal (m);
$H_d$	=	height difference (m)
$H_e$	=	end of segment height (m)
$H_u$	=	upstream height (m)
I	=	rainfall intensity (m/s, mm/hr)
Inf	=	Infiltration well needed
K	=	impervious coefficient (m/hr)
KP	=	correlation coefficient
KS	=	serial correlation coefficient
$K_T$	=	frequency factors



- L = length of canal (km)
- $L_1$  = distance between stations (km)
- n = manning roughness coefficient
- N, n = amount of data
- $N_1, n_1$  = amount of first sample data
- $N_2, n_2$  = amount of second sample data
- P = canal wetted perimeter (m)
- $P_1$  = rainfall data in comparator station (mm)
- $P_x$  = missing rainfall data in x station (mm)
- $Q_c$  = canal discharge ( $m^3/s$ )
- $Q_e$  = existing discharge ( $m^3/s$ )
- $Q_p$  = design discharge ( $m^3/s$ )
- R = hydraulic radius (m)
- $R_{24}$  = maximum rainfall in 24 hours (mm)
- $R_m$  = number of ranking values from the data set group A
- $R_t$  = hydrologic variable series rank
- S = land slope (m/m)
- S = slope (m/m)
- S,  $\sigma_n$ ,  $\sigma$  = standard deviation
- $S_1$  = standard deviation of first data sample
- $S_2$  = standard deviation of second data sample
- $S_b$  = base slope (m/m)
- $S_n$  = reduced variance standard deviation, deviation correction

$S_y$	=	standard deviation of $y_i$
$t$	=	t-variable calculated
$t_c$	=	time concentration (hour)
$T_t$	=	time rank
$U_1, U_2$	=	statistics parameters
$V$	=	flow average velocity in the canal (m/s)
$\bar{x}$	=	average value
$\bar{x}_1$	=	average of first sample set
$\bar{x}_2$	=	average of second sample set
$X_T$	=	estimated value expected to occur with T-annual return period
$\bar{y}$	=	average of $y_i$
$Y_n$	=	reduced variance mean, average of $Y_T$
$y_T$	=	logarithm value of $x$ in T return period
$y^T$	=	reduced variance
$Z$	=	data test calculated (depend on the calculated test)

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## **ABSTRACT**

**INUNDATION IN LAKSDA ADISUCIPTO ROAD: SOUTH OF NOLOGATEN AREA ANALYSIS**, Lioba Evita Anikusuma, Student ID Number 14.13.15584, year 2019, Hydraulic Engineering, International Civil Engineering Program, Department of Civil Engineering, Faculty of Engineering, Universitas Atma Jaya Yogyakarta.

In Laksda Adisucipto Road, especially South of Nologaten Area, inundation frequently happened. Analyzing drainage canal capacity is conducted to identify existing drainage condition due to inundation problem. The analysis is done by comparing design discharge in 2, 5, and 10 years return period with existing discharge from segments area and research area. Result of segments area discharge is 14, 15, and 16 segments are inadequate in 2, 5, and 10 years return period. Research area discharge result shows that research canal is inadequate to accommodate water from research area in 2, 5, and 10 years return period. Based on result combined from both calculation, infiltration wells and drainage canal renovation can be implemented to solve the inundation problem. Infiltration wells are able to be placed in 11 segments area. Drainage canal renovation result shows increasing of canal dimension can be done in one trajectory segment (E2, F1, F3, and F5 segments) and research canal.

**Keywords:** inundation, canal, drainage