INUNDATION IN LAKSDA ADISUCIPTO ROAD: SOUTH OF NOLOGATEN AREA ANALYSIS

Final Project Report

as a requirement to obtain Barchelor 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

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STATEMENT

I signed below stating that the final project with the title:

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It is the result of my own work and not a result of plagiarism of other people's work. Ideas, research data, and quotes directly or non-directly derived from the writings or ideas of others expressly provided in this Final Project. If it is proven later that this Final Project is the result of plagiarism, the graduation certificate that I received will be canceled and returned to Universitas Atma Jaya Yogyakarta.

Yogyakarta, August 30, 2019

Who made the remarks,

Lioba Evita Anikusuma

APPROVAL

Final Project Report

INUNDATION IN LAKSDA ADISUCIPTO ROAD: SOUTH OF NOLOGATEN AREA ANALYSIS

by:

LIOBA EVITA ANIKUSUMA

Student ID Number: 141315584

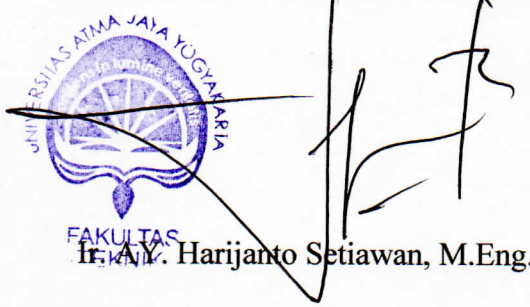
has been approved by,

Yogyakarta, September 6, 2019

Supervisor,

Agatha Padma Laksitaningtyas, S.T., M.Eng.

Department of Civil Engineering Chairman,



Ir. A.Y. Harijanto Setiawan, M.Eng., Ph.D.

APPROVAL OF EXAMINER

Final Project Report

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By :

Lioba Evita Anikusuma

Student ID Number : 14 13 15584

Has been examined and approved by:

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Chairperson :	Agatha Padma L., S.T., M.Eng.		9-9-2019
Member :	Ir. AY. Harijanto Setiawan, M.Eng., Ph.D.		9/9/2019
Member :	Dr. Ir. J. Dwijoko Ansusanto, M.T.		6-9-2019

ACKNOWLEDGEMENTS

This final project report titled “Inundation In Laksda Adisucipto Road: South Of Nologaten Area Analysis” is aimed to be represented as the requirement to finish the study in undergraduate program (S-1) in International Civil Engineering Program, Department of Civil Engineering, Faculty of Engineering, Universitas Atma Jaya Yogyakarta. For the completion of this final project, Author would like to express gratitude towards:

1. Sushardjanti Felasari, S.T., M.Sc.CAED., Ph.D., as the Dean of Engineering Faculty of Universitas Atma Jaya Yogyakarta.
2. Ir. A.Y. Harijanto Setiawan, M.Eng., Ph.D. , as the head of Civil Engineering Department of Universitas Atma Jaya Yogykarta.
3. Johan Ardianto, S.T., M.Eng., as the Coordinator of International Civil Engineering Program.
4. Agatha Padma Laksitaningtyas, S.T., M.Eng., as supervisor for advices, encouragement, support, patientness, and kindness during the counseling and everything in the process during finishing this final project.
5. All the lectures and staffs in the Civil Engineering Department, especially in International Civil Engineering Program who helps to develops the credibility, knowledge, and helpfulness from the beginning of becoming student until finishing the studies.

6. Bapak, Ibuk, Vani, Mbak Ranti, Simak, and all my family members who give love, encouragement, support, listen to all the grudges, and believe in every steps that author take in author's life.
7. ICEP members batch 2014 who support and fight with me in the battlefield of accomplishing every assignments from the lecturer, give strength, togetherness in understanding the courses and every group project, and sharing the happiness in daily life during the days of being student in ICEP .
8. ICEP members all batch who support and together with the author to develop social life of being ICEP student.
9. All of author's friends from Teater Lilin, HMS 2015/2016, SS KSI 2017/2018, all colleagues in UAJY, organizations/committee outside author's student life, and all the people who helps the author which is hard to be mentioned one by one as the people who encourage the author to develop personality, grow the mindset, give processes, and be able to have social life when author still in the process of students life until finishing this final project.

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

Yogyakarta, August 2019

The Author

Lioba Evita Anikusuma

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A	=	service area (m^2, Ha)
A_c	=	cross-sectional area perpendicular to the direction flow/canal area (m^2)
As	=	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	=	Rt – Tt
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)

Rm = number of ranking values from the data set group A

Rt = hydrologic variable series rank

S = land slope (m/m)

S = slope (m/m)

S, σ_n, σ= 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)

Tt = time rank

U_1, U_2 = statistics parameters

V = flow average velocity in the canal (m/s)

$\overline{x}$ = average value

$\overline{x}_1$ = average of first sample set

$\overline{x}_2$ = 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

yT = 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