

# INTERNATIONAL CONFERENCE



The Second International Conference on  
Engineering and Technology Development

# 2<sup>nd</sup> ICETD 2013

27, 28, 29 August 2013, Bandar Lampung, Indonesia



**PROCEEDINGS**



In  
Cooperations  
With :



الجامعة الإسلامية العالمية  
INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA  
يؤيدوننا في العلم والابتكار ونظرا لما لنا من



Hosted by :

Faculty of Engineering and Faculty of Computer Science,  
Bandar Lampung University (UBL), Indonesia

# 2<sup>nd</sup> ICETD 2013

THE SECOND INTERNATIONAL CONFERENCE  
ON ENGINEERING AND TECHNOLOGY DEVELOPMENT

28 -30 January 2013  
Bandar Lampung University (UBL)  
Lampung, Indonesia

## PROCEEDINGS

Organized by:



Faculty of Computer Science and Faculty of Engineering  
Bandar Lampung University (UBL)  
Jl. Zainal Abidin Pagar Alam No.89 Labuhan Ratu, Bandar Lampung, Indonesia  
Phone: +62 721 36 666 25, Fax: +62 721 701 467  
website : [www.ubl.ac.id](http://www.ubl.ac.id)

## PREFACE

The Activities of the International Conference is in line and very appropriate with the vision and mission of Bandar Lampung University (UBL) to promote training and education as well as research in these areas.

On behalf of the Second International Conference on Engineering and Technology Development ( 2<sup>nd</sup> ICETD 2013) organizing committee, we are very pleased with the very good response especially from the keynote speaker and from the participans. It is noteworthy to point out that about 80 technical papers were received for this conference.

The participants of the conference come from many well known universities, among others : University Kebangsaan Malaysia – Malaysia, APTIKOM – Indonesia, Institut Teknologi sepuluh November – Indonesia, Surya Institute – Indonesia, International Islamic University – Malaysia, STMIK Mitra Lampung – lampung, Bandung Institut of Technology – Bandung, Lecture of The Malahayati University, B2TP – BPPT Researcher – lampung, Starch Technology Center – Lampung, Universitas Islam Indonesia – Indonesia, Politeknik Negeri Malang – Malang, University of Kitakyushu – Japan, Gadjah Mada University – Indonesia, Universitas Malahayati – Lampung, Lampung University – lampung, Starch Technology Center – Lampung, Universitas Riau – Riau, Hasanuddin University – Indonesia, Diponegoro University – Indonesia, King Abdulaziz University – Saudi Arabia, Parahyangan Catholic University – Indonesia , National Taiwan University– Taiwan, Surakarta Christian University – Indonesia, Sugijapranata Catholic University – Indonesia, Semarang University – Indonesia, University of Brawijaya – Indonesia, PPKIA Tarakanita Rahmawati – Indonesia, Kyushu University, Fukuoka – Japan, Science and Technology Beijing – China, Institut Teknologi Sepuluh Nopember – Surabaya, Researcher of Starch Technology Center, Universitas Muhammadiyah Metro – Metro, National University of Malaysia – Malaysia.

I would like to express my deepest gratitude to the International Advisory Board members, sponsor and also to all keynote speakers and all participants. I am also gratefull to all organizing committee and all of the reviewers who contribute to the high standard of the conference. Also I would like to express my deepest gratitude to the Rector of Bandar Lampung University (UBL) who give us endless support to these activities, so that the conference can be administrated on time

Bandar Lampung, 29 August 2013-08-26

Mustofa Usman, Ph.D  
2<sup>nd</sup> ICETD Chairman

# **PROCEEDINGS**

## **2<sup>nd</sup> ICETD 2013**

The Second International Conference  
On Engineering And Technology Development

**28 -30 January 2013**

### **INTERNATIONAL ADVISORY BOARD**

Y. M Barusman, Indonesia  
Ahmad F. Ismail, Malaysia  
Mustofa Usman, Indonesia  
Moses L. Singgih, Indonesia  
Andreas Dress, Germany  
Faiz A.M Elfaki, Malaysia  
Warsono, Indonesia  
Raihan Othman, Malaysia  
Zeng Bing Zen, China  
Tjin Swee Chuan, Singapore  
Khomsahrial R, Indonesia  
Rony Purba, Indonesia  
Alex Tribuana S, Indonesia  
Hon Wei Leong, Singapore  
Imad Khamis, USA  
Rozlan Alias, Malaysia  
Rudi Irawan, Indonesia  
Gusri Ibrahim, Indonesia  
Jamal I Daoud, Malaysia  
Riza Muhida, Indonesia  
Heri Riyanto, Indonesia  
Agus Wahyudi, Indonesia  
Lilies Widojoko, Indonesia

# **PROCEEDINGS**

## **2<sup>nd</sup> ICETD 2013**

The Second International Conference  
On Engineering And Technology Development

**28 -30 January 2013**

### **STEERING COMMITTEE**

#### **Executive Advisors**

Dr. M. Yusuf S. Barusman  
Andala R. P. Barusman, MA.Ec

#### **Chairman**

Mustofa Usman, Ph.D

#### **Co-Chairman**

Dr. Ir. Hery Riyanto, MT  
Ahmad Cucus, S.Kom., M.Kom

#### **Secretary**

Marzuki, S.Kom., M.Kom  
Maria Shusanti Febrianti, S.Kom., M.Kom

#### **Technical Committee**

Indyah Kumoro, ST. IAI  
Ardiansyah, ST., MT  
Sofiah Islamiah, ST. MT  
Taqwan Thamrin, ST., MSc  
Dina Ika Wahyuningsih, S.Kom  
Agus Sukoco, M.Kom  
Hj. Susilowati, ST. MT  
Haris Murwadi, ST, MT  
Robby Yuli Endra, S.Kom., M.Kom  
Fenty Ariani, S.Kom., M.Kom

#### **Treasure**

Samsul Bahri, SE  
Dian Agustina, SE

# **PROCEEDINGS**

## **2<sup>nd</sup> ICETD 2013**

The Second International Conference  
On Engineering And Technology Development

**28 -30 January 2013**

### **ORGANIZING COMMITTEE**

#### **Chair Person**

Dr. Ir. Hery Riyanto, MT

#### **Vice Chair Person**

Yuthsi Aprilinda, S.Kom., M.Kom

#### **Treasure**

Dian Agustina, S.E

#### **Secretary**

Aprizal, ST. MT

Ir. Tjejeng Sofyan, MM

Ir. Muhammad Zein, MT

Ir. Bambang Pratowo, MT

#### **Special Events**

Ir. Juniardi, MT

Ir. Indra Surya, MT

Ir. Sugito, MT

DR. Baginda Simaibang, M.Ed

Berry Salatar, S.Pd

Yanuar Dwi Prasetyo, S.Pd.I., M.A

#### **Receptionist**

Ir. Najamudin, MT

Kunarto, ST. MT

IB. Ilham Malik, ST. MT

Ir.A Ikhsan Karim, MT

Ir. Asikin, MT

Usman Rizal, ST., M.MSi

#### **Transportation and Acomodation**

Irawati, SE

Desi Puspita Sari, S.E

Tanto Lailam, S.H

Ilyas Sadad, S.T., M.T

**Publication and Documentation**

Ir. Indriati Agustina Gultom, M.M

Noning Verawati, S.Sos

Hesti, S.H

Rifandi Ritonga, SH

Violita, S.I.Kom

**Cosumption**

Dra. Yulfriwini, M.T

Wiwin Susanty, S.Kom., M.Kom

Fenty Ariani, S.Kom., M.Kom

Reni Nursyanti, S.Kom., M.Kom

Erlangga, S.Kom

Arnes Yuli Vandika, S.Kom

**Facility and Decoration**

Siti Rahma Wati, SE

Dina Ika Wahyuningsih, S.Kom

Zainal Abidin, SE

Ahyar Saleh, SE

Eko Suhardiyanto

Wagino

Sugimin

## Table Of Content

Organizing Committee .....	i
Table Of Content.....	v
Keynote Speaker	
1. Recent Advances in Biofuel Cell and Emerging Hybrid System <b>Abdul Aziz Ahmad and Raihan Othman</b> .....	1
2. Waste Utilization Study Tailing Gold Mine in Way Linggo-Lampung, as Fine Aggregate Materials for Producing Mortar Materials based on concept of Green Technology <b>Lilies Widodojoko &amp; Susilawati</b> .....	8
3. Infrastructure Health Monitoring System (SHM) Development, a Necessity for Maintance and Investigation <b>Prof. Dr. Priyo Suprobo, Faimun, Arie Febry</b> .....	17
4. Four Phases Quality Function Deployment (Qfd) By Considering Kano Concept, Time And Manufacturing Cost <b>Prof. Dr. Moses L Singgih, Dyah L. Trenggonowati, Putu D. Karningsih</b> ....	22



Speaker

1. Comparative Analysis for The Multi Period Degree Minimum Spanning Tree Problem  
**Wamiliana, Amanto, and Mustofa Usman**..... 39
2. Choosing The Right Software In Supporting The Successful of Enterprise ERP Implementation  
**Yodhie Yuniarthe, Idris Asmuni**..... 44
3. Climate Adaptive Technology In Maintaining Vernacularism Of Urban Kampong Case study: Kampung Adat (Indiginous) Mahmud, Bandung District, West Java  
**Marcus Gartiwa**..... 50
4. The Prospect Of Diesohol In Facing Fossil Fuel Crissis  
**M.C. Tri Atmodjo**..... 63
5. The Potential Of Agriculture And Forestry Biomass Wastes As Source Of Bioenergy  
**Hardoyo**..... 66
6. The Importance of Education Facility as Sustainable Urban Generation Tool  
**Fritz Akhmad Nuzir, Haris Murwadi and Bart Julien Dewancker** ..... 71
7. The implementation of Secton Method for Solving Systems of Non Linear Equations  
**Nur Rokhman** ..... 80
8. Quality Control Analysis Into Decrease The Level Defects On Coffee Product  
**Heri Wibowo, Sulastri and Emy Khikmawati** ..... 85
9. Public Transpotion Crisis In Bandar Lampung  
**Ida Bagus Ilham Malik** ..... 89
10. Geospatial Analysis of Land Use Change in Way Kuripan Watershed, Bandar Lampung City  
**Candra Hakim Van Rafi'1., Dyah Indriana Kusumastuti2., Dwi Jokowinarno**..... 99
11. Material Utilization Technology Of Agriculture And Forestry Waste  
**Hardoyo**..... 105
12. The Supply Chain System Of Cassava On The Tapioca Industry  
**Hardoyo**..... 108
13. Glass Technology In Natural Light Glasses On Aperture Element In The Architecture World  
**Muhammad Rija & MT Pedia Aldy** ..... 113

14. An Eksperimental Permeable Asphalt Pavement Using Local Material Domato Stone On Quality Of Porous Asphalt <b>Firdaus Chairuddin, Wihardi Tjaronge, Muhammad Ramli, Johannes Patanduk</b> .....	117
15. Coordination Of Architectural Concepts And Construction Systems <b>Eddy Hermanto.</b> .....	129
16. Seismic Assessment of RC Building Using Pushover Analysis <b>Riza Ainul Hakim.</b> .....	136
17. Viscosity and Liquidity Index Relation for Elucidating Mudflow Behavior <b>Budijanto Widjaja and Shannon Hsien-Heng Lee.</b> .....	143
18. The Use of Pozzolanic Material for Improving Quality of Strontium Liquid Waste Cementation in Saline Environment during Nuclear Waste Immobilization Process <b>Muhammad Yusuf, HayuTyasUtami, Tri SulistiyoHariNugroho, SusetyoHarioPutero</b> .....	148
19. Geospatial Analysis Of Land Use And Land Cover Changes For Discharge At Way Kualagaruntang Watershed In Bandar Lampung <b>Fieni Yuniarti, Dyah Indriana K, Dwi Joko Winarno.</b> .....	153
20. Wifi Network Design For High Performance <b>Heru Nurwarsito, , KasyfulAmron,BektiWidyaningsih</b> .....	161
21. Studi on The Efficiency Using Nature Materials in The Structural Elements of Reinforced Concrete Beam <b>Yasser , Herman Parung , M. Wihardi Tjaronge, Rudy Djamaluddin.</b> .....	167
22. The Research Of Slow Release Nitrogen Fertilizer Applied In Sugarcane (Saccharum Officinarum) For Green Energy Bioethanol <b>M.C. Tri Atmodjo, Agus Eko T. Nurul Rusdi, Sigit Setiadi, and Rina.</b> .....	179
23. Energy Utilization Technology Of Agriculture And Forestry Waste <b>Hardoyo.</b> .....	185
24. Implementation Of Fuzzy Inference System With Tsukamoto Method For Study Programme Selection <b>Fenty Ariani and Robby Yuli Endra.</b> .....	189
25. The Analysis of Video Conference With ITU Standarization (International Telecommunication Union) That Joining in Inherent At Bandar Lampung University <b>Maria Shusanti F, Happy Reksa</b> .....	201

26. The E-internal audit iso 9001:2008 based on accreditation form assessment matrix in study program for effectiveness of monitoring accreditation <b>Marzuki, Maria Shusanti F.</b> .....	207
27. The Developing Of e-Consultations For Effectiveness of Mentoring Academy <b>Ahmad Cucus, Endang K</b> .....	214
28. The Evaluation of information system performance in higher education case study with EUCS model at bandar lampung university <b>Reni Nursyanti, Erlangga.</b> .....	221
29. The Analysis Of History Collection System Based On AndroidSmartphone With Qr Code Using Qr CodeCase Study: Museum Lampung <b>Usman Rizal, Wiwin Susanty, Sutrisno.</b> .....	230
30. Application of Complaint Handling by Approach Model of ISO 10002 : 2004 to Increase Complaint Services <b>Agus Sukoco and Yuthsi Aprilinda.</b> .....	235
31. Towards Indonesian Cloud Campus <b>Taqwan Thamrin, Iing Lukman, Dina Ika Wahyuningsih</b> .....	252
32. Bridging Router to ADSL Modem for Stability Network Connection <b>Arnes Yuli Vandika and Ruri Koesliandana.</b> .....	257
33. The Effect of Use Styrofoam for Flexural Characteristics of Reinforced Concrete Beams <b>Yasser , Herman Parung, M. Wihardi Tjaronge, Rudy Djamaluddin</b> .....	261
34. The Estimation Of Bioethanol Yield From Some Cassava Variety <b>M.C. Tri Atmodjo</b> .....	273
35. Effect of Superficial Velocity of Pressure Difference on The Separation of Oil And Water by Using The T-Pipe Junctionl <b>Kms. Ridhuan and Indarto.</b> .....	277
36. The use of CRM for Customer Management at Cellular Telecommunications Industry <b>Ayu Kartika Puspa.</b> .....	293
37. Indonesian Puslit (Centre Of IT Solution) Website Analysis Using Webqual For Measuring Website Quality <b>Maria Shusanti Febrianti and Nurhayati.</b> .....	297
38. The E-internal audit iso 9001:2008 based on accreditation form assessment matrix in study program for effectiveness of monitoring accreditation <b>Marzuki, Maria Shusanti F.</b> .....	307

39. Enhancing Quality Software Through CMMI-ISO 9001:2008 and ISO 9126 <b>Agus Sukoco</b> .....	320
40. Value Analysis Of Passenger Car Equivalent Motorcycle (Case Study Kartini Road Bandar Lampung) <b>Juniardi, Aflah Efendi</b> .....	337
41. Alternative Analysis Of Flood Control Downstream Of Way Sekampung River <b>Sugito, Maulana Febramsyah.</b> .....	347
42. Analysis Of Fitness Facilities And Effective Use Of Crossing Road <b>Juniardi, Edi Haryanto.</b> .....	353
43. Study On Regional Development Work Environment Panjang Port Lands In Support Bandar Lampung City As A Service And Trade <b>Ir. A. Karim Iksan, MT, Yohn Ferry.</b> .....	359
44. Analytical And Experimental Study Bamboo Beam Concrete <b>Hery Riyanto, Sugito, Juli</b> .....	370
45. Comparative Analysis Of Load Factor Method Static And Dynamic Method (Case Study Akdp Bus Route Rajabasa - Bakauheni) <b>A. Ikhsan Karim, MT., Ahmad Zulkily.</b> .....	378
46. Optimization Utilization Of Water Resources dam Batutegei Using Method Of Linear Program <b>Aprizal, Hery Fitriyansyah</b> .....	386
47. Characteristics Generation Traffic Patterns And Movement In Residential Area (Case Study Way Kandis Residential Bandar Lampung) <b>Fery Hendi Jaya, Juniardi,</b> .....	392
48. Use Study On Slight Beam Reinforced Concrete Floor Plate in Lieu Of Secondary Beam <b>Hery Riyanto, Sugito, Lilies Widodjoko, Sjamsu Iskandar</b> .....	399
49. Observation Of The Effect Of Static Magnetic Field 0.1 Mt On A-Amylase Activity In Legume Germination <b>Rochmah Agustrina, Tundjung T. Handayani, and Sumardi.</b> .....	405
50. Effectiveness Analysis Of Applications Netsupport School 10 Based Iso / Iec 9126-4 Metrics Effectiveness <b>Ahmad Cucus, Nelcy Novelia</b> .....	413
51. Comparative Performance Analysis Of Banking For Implementing Internet Banking <b>Reza Kurniawan</b> .....	418

## ALTERNATIVE ANALYSIS OF FLOOD CONTROL DOWNSTREAM OF WAY SEKAMPUNG RIVER

Sugito, Maulana Febramsyah

Master of Civil Engineering, Graduate School, University of Bandar Lampung, Jl. Zaenal  
Abidin Pagar Alam 26 Bandar Lampung, 35142, Indonesia

**Abstract-***Downstream part of the watershed is an area of lowland Sekampung with +3.00 to +4.00 elevation above sea level. Area located between the border regions of South Lampung regency and East Lampung. Originally this area was flooded reservoir area, the Swamp Sragi and surrounding areas, but along with the development of this area is used as a residential area, pertaniandan pond area for the people around the area. Padatahun 2002 River Way Sekampung experience overflow caused flooding in downstream areas which suffered losses of up to 38 billion rupiah. In this study analyzed the incidence of flooding that may occur based on rainfall data available. Based on the results of the input stream and cross sectional design flood discharge is seen that when the flood began when the river reaches flood discharge Q50-year anniversary.*

*In this study flood control analysis performed on the three methods are: the construction of levees, making retention ponds and dredge rivers. The third input method results in HEC RAS 3.1.3 shows that building levees to reduce flooding by 32%, on a flood retention pond can be reduced up to 45% and normalization of the river is only able to reduce flooding by 20%. Most effective flood management recommendation is to build two retention ponds and technical cost reduction by flooding.*

**Keywords:** *Floods, Levees, Retention Pool, Normalization River, Investment Costs*

## INTRODUCTION

Way Sekampung is the largest river in the province of Lampung flow region covers three districts namely: East Lampung and South Lampung regency Tanggamus. With high intensity rainfall River Way Sekampung often cause flooding to the area - the area through which the flow. Natural conditions that cause decreased function Way Sekampung is the main factor for the flood event. Where the River Way Sekampung no longer have the capacity to normal reservoir, the decrease in the capacity of certain moments when the rain came down with a high intensity and a very long time the incident was unavoidable flooding occurred in the area around the river.

## RESEARCH OBJECTIVES

The study objectives are:

- a. Minimize flood inundation that occurred in River Way Sekampung with river flow regulation.
- b. Recommend technical handling a proposal / concept in river flood Way Sekampung Downstream.

## LITERATURE REVIEW

### 1. Steady flow

Components in the model used to calculate the water surface profile in steady flow conditions (steady). This system can be used on a channel, network or a large network of small channels including channels and other. Steady component of the flow can be modeled on the condition of subcritical flow, supercritical, and the combined system water level profile.

Basic computer calculations based on the solution of one-dimensional energy. Energy lost due to friction (Manning

equation) and the constriction and dilation (additional coefficients of the change in speed). Momentum equations useful in situations where the water surface profile changes abruptly. These situations include the combined flow calculation system (example: water jump) or flow on the bridge and changes in water level at the confluence of the channel (the flow at the intersection).

### 2. Unsteady flow

Components to be developed for the flow is not steady subcritical flow calculations. Hydraulic calculations for cross-sections, bridges, culverts and other hydraulic structures that were developed for the steady flow component coupled with no steady flow calculations. Components for steady flow is not used to model the hydraulic reservoir and relationship with catch.

### 3. Water Front profile on Steady Flow

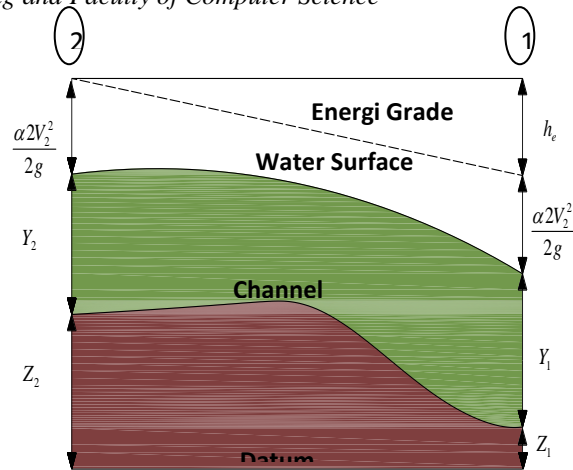
HEC - RAS can calculate water surface profiles for one-dimensional flow gradually lasting change on natural and artificial channels. Subcritical flow, supercritical, and the combined system flow water surface profiles can be analyzed

### 4. Basic equations

### 5.

Water surface profiles are computed from a cross-section to the next cross-section energy equation solved by the so-called

*Metode Step Standar*



Energy equation can be seen as follows:

$$Y_2 + Z_2 + \frac{\alpha_2 v_2^2}{2g} = Y_1 + Z_1 + \frac{\alpha_1 v_1^2}{2g} + h_e$$

Gambar 1. Parameter Penyusunan Persamaan Energi

Figur 1. Energy lines

Information :

$Y_1, Y_2$  = high depth on cross-section 1 and 2 (m)

$Z_1, z_2$  = channel base elevation at cross-section 1 and 2 (m)

$\alpha_1, \alpha_2$  = speed coefficient

$v_1, v_2$  = speed (m/dt)

$g$  = gravitasi (m/det<sup>2</sup>)

$h_e$  = loss of energy (m)

Head loss ( $h_e$ ) between 2 cross section due to friction caused by the loss and loss due to narrowing or widening.

Head loss equation is as follows:

$$h_e = L + \bar{S}_f \left[ \frac{\alpha_2 v_2^2}{2g} - \frac{\alpha_1 v_1^2}{2g} \right] \quad (2)$$

Information :

$H_e$  = Head loss (m)

$L$  = friction length field of 2 points observation (m)

$C$  = Loss coefficient due constriction and dilation

$\alpha_1, \alpha_2$  = speed coefficient

$V_1, V_2$  = speed (m/det)

G = gravitasi (m/det<sup>2</sup>)

A = wet cross-sectional area (cross  
section) sub area

R = hydraulic radius for the sub area

### **Calculation of the discharge cross-section in each stream section**

Determination of total discharge and velocity coefficients for a cross section requires the division of the flow into the units because the flow velocity is not distributed evenly. In the HEC-RAS approach used is the division of the area on the levee area using constraints n values that exist in the cross-section (location where the value of n changes) as the basis for the division. Discharge is calculated within each sub-area in the levee Manning formula is used (in metric units) are as follows:

$$Q = k \cdot S_f^{1/2} \quad (3)$$

$$k = \frac{1,486}{n} AR^{2/3} \quad (4)$$

Keterangan :

Q = discharge

K = drainage coefficient for the sub-area

$S_f$  = slope of the riverbed

n = Manning roughness coefficient for  
sub area

## **METHODOLOGY**

### **1. Data Collection**

Data obtained from secondary data in the form of daily rainfall data and data on river elevation. Detailed data required in this study are as follows:

#### **a. Rainfall Data**

Rainfall data obtained from local observation stations obtained from Dinas PU Lampung Province Irrigation Station Unit One Village Seputih River Region, namely Argoguruh Station, Gedong Tataan, Jabung, Pagelaran and Palas Jaya. These data taken 13 years to determine the rainfall observations and debit plan in accordance with the plan of the steps in the flow chart scrutiny.

#### **b. Map Location of Study**

Maps used in this study is a map of the location and area of flood inundation maps that occurred in the area of the River Way Sekampung area of sub-watershed particularly Way Sekampung Downstream.

#### **c. River Elevation Data**

River elevation data specific to the needs of the use of HEC-RAS 3.1.3 software in simulation of flood events based on discharge plan with the elevation of the river can be seen the river flow profiles used in this study.

### **2. Data analysis**

The data has been collected and then transferred into a spreadsheet for easy



classification and code data, to facilitate data analysis stages.

Data analysis includes the presentation of the data into tables, graphs and pictures, then do the calculations to describe the data obtained. This analysis includes the calculation of hydrology, hydraulics, and economic analysis of levee stability.

## RESULTS OF RESEARCH

In this study conducted an analysis of the planned flood mitigation methods will be used. The method is planned to be analyzed is the method of construction of the levee, making retention ponds and dredge rivers dredging the river bed.

### 3. Flood Prevention with Levee

Surveillance embankment height is determined by the provisions contained in table 2.6 are based on the value of flood discharge. Based on the results of running Hec Ras 3.1.3 for flood discharge when repeated 2, 5, 10, 50 and 100 years has a maximum flow and minimum flow m<sup>3</sup>/sec 2208.99 1138.83 m<sup>3</sup>/sec.

Based on the value of discharge between 500-2000 m<sup>3</sup>/sec adalah 1 m high levee surveillance and to discharge 2000-5000 m<sup>3</sup>/sec used 1.2 m high levee surveillance.

As for the subsequent calculations, the width of the dike lighthouse is determined by the width of the table 3.7 mercu embankment to discharge between 500-2000 m<sup>3</sup>/sec planned about 4 m and to discharge between 2000-5000 m<sup>3</sup>/sec summit planned levee width 5 m.

Levee to be built on the riverside of the runoff occurs. Based on the results of running the program HEC RAS 3.1.3 overflowing river had begun at the time of the flood discharge Q50 year to cross 23-11.4, while the cross under 11.4 despite relatively safe from flooding for up to Q100 year flood discharge.

Planning results back levee height entered into the program HEC RAS 3.1.3 to determine the water surface profile after being added to the levee on the right and left of the cliff and the river levee know the security given to the dangers of flooding.

Levee conditions are safe from the danger of flooding if the elevation levee is greater than the water level. Graphics capabilities using the levee on the river after 23 to Q50-year cross can be seen in the picture below.

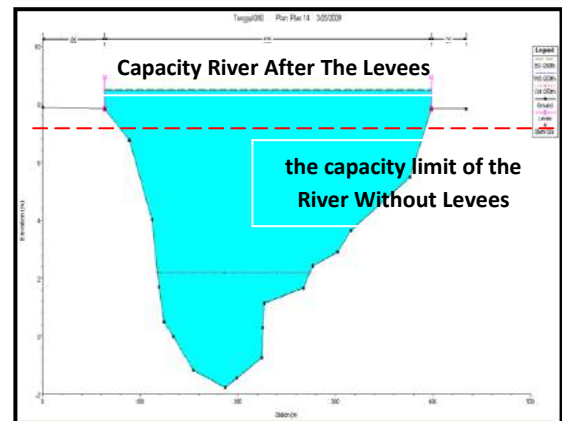


Figure 2. the condition cross-section in After levee

### 4. Flood Prevention With Retention Pool

A retention pool is able to reduce up to 45.901% flood to flood the Q50 and 45.894% for the flooding that occurred in Q100. Retention Pool B has the ability to reduce up to 37.945% and 29.27% for Q50 on Q100. Hal This occurs because the area around the pool Retention B has a greater volume of flood pool is designed so that only reduce flooding and up to 37.945% 29.277% only

## CONCLUSION

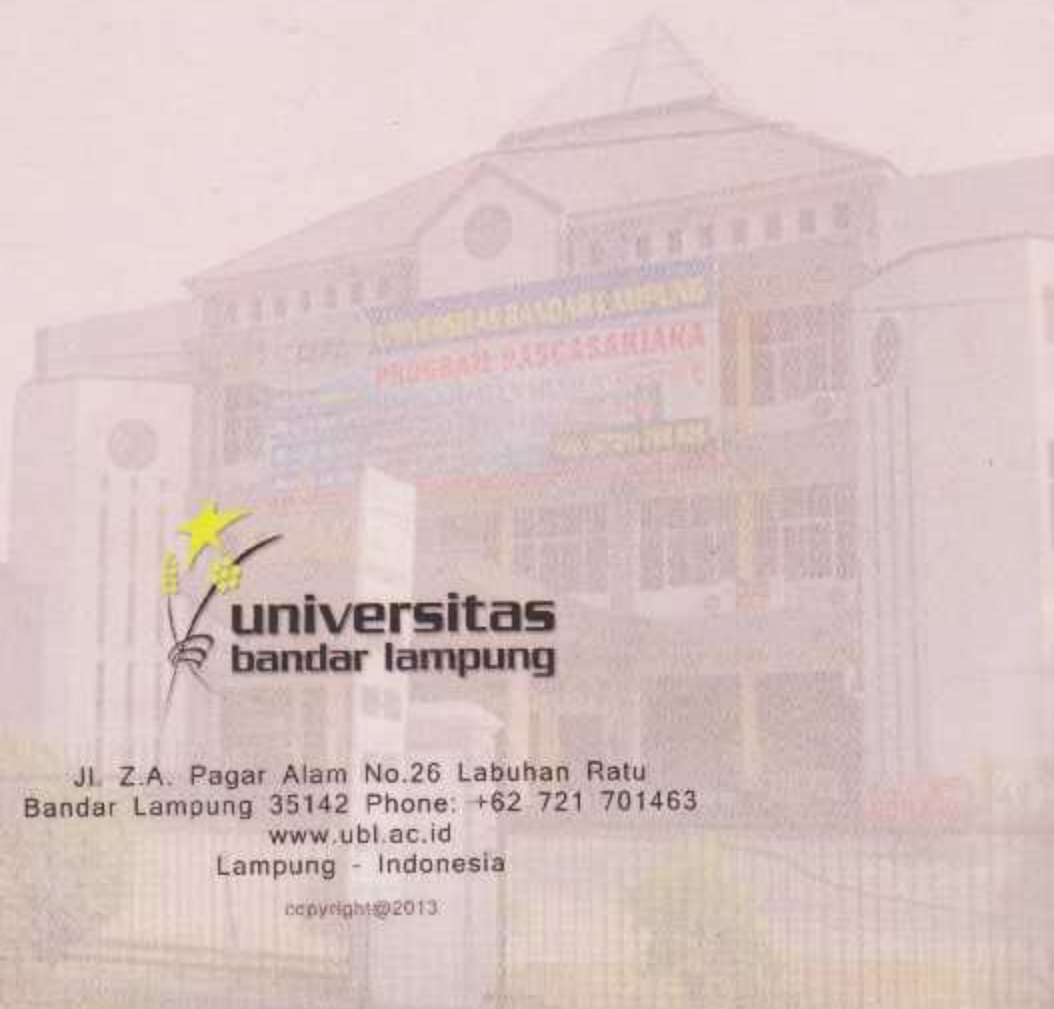
Based on the results of our study on the incidence of flooding in the lower reaches of the River Way Sekampung we can conclude the following:

1. Method of handling the flood levee could reduce flooding by 32% maximum. Manufacture of Retention pool is able to reduce up to 45% while the River Normalization only reduce flooding with a maximum value of 20% reduction.
2. Based on the results of the simulation with the program HEC RAS 3.1.3 handling most have economic value and be able to provide optimum value reduction of 45% is to create a retention pool.
3. Having made retention pool and streams in the planned percentage reduction normalize flooding able to reach 65%

7. Sudjardwadi, (1990) Irrigation theory and practice, between the University of Science and Engineering Center, UGM, Yogyakarta.
8. Sunggono, (1984 ), Soil Mechanics, Publisher Nova, Bandung.
9. Soemarto,C.D (1995), Engineering Hydrology, National Business, Surabaya.
10. Soewarno ( 1995), Hydrology, Applications Statistical Methods for Data Analysis (volumes I and II), Publisher Nova, Bandung.
11. Sosrodarsono, S and Takeda, K (2003), Hydrology for Water, Pradnya Paramita ,Jakarta
12. Sosrodarsono, S and Tominaga, M (1994), Repair and setting River. Pradnya Paramita, Jakarta.

## REFERENCES

1. Anggrahini 2005, Open Channel Hydraulics, Publisher Srikandi, Surabaya.
2. Asdak, C (1995), Hydrology and watershed management, Gadjah Mada University Press, Yogyakarta.
3. Kodoatie, R and Sjarief , R (2005), Integrated Water Resources Management, Publisher Andi, Yogyakarta.
4. Loebis ,J ( 1992) Plans for Building Flood Water, the Foundation Board of Public Works Publisher Jakarta.
5. Maryono, A ( 2007), River restoration, Gadjah Mada University Press Yogyakarta.
6. Mulyanto, H.R ( 2006), River function and its properties, Graha Ilmu, Yogyakarta.



**universitas  
bandar lampung**

Jl. Z.A. Pagar Alam No.26 Labuhan Ratu  
Bandar Lampung 35142 Phone: +62 721 701463  
[www.ubl.ac.id](http://www.ubl.ac.id)  
Lampung - Indonesia

copyright © 2013