

THESIS

**DISPLACEMENT-BASED SEISMIC DESIGN OF
IRREGULAR TYPE REINFORCED CONCRETE SPECIAL
MOMENT FRAME (RC-SMF)**



A F M SALMAN AKHTER
NPM : 165102548/PS/MTS

**PROGRAM STUDI MAGISTER TEKNIK SIPIL
PROGRAM PASCASARJANA
UNIVERSITAS ATMA JAYA JOGJAKARTA**

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UNIVERSITAS ATMA JAYA YOGYAKARTA

PROGRAM PASCASARJANA

PROGRAM STUDI MAGISTER TEKNIK SIPIL

ENDORSEMENT OF THESIS (PENGESAHAN TESIS)

Name : A F M Salman Akhter
Student No. : 165102548/PS/MTS
Concentration : Structure
Thesis Topic : DISPLACEMENT-BASED SEISMIC DESIGN OF
IRREGULAR TYPE REINFORCED CONCRETE SPECIAL
MOMENT FRAME (RC-SMF)

Name of Supervisor

Date

Signature

Prof. Ir. Yoyong Arfiadi, M.Eng., Ph.D.

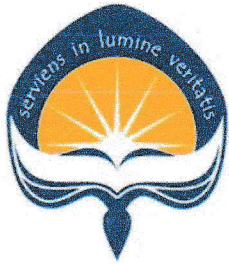
23/07/18
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Dr. Ir. AM. Ade Lisantono, M.Eng.

24/07/2018
.....

.....
.....



UNIVERSITAS ATMA JAYA YOGYAKARTA
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Name of Supervisor

Date

Signature

Prof. Ir. Yoyong Arfiadi, M.Eng., Ph.D.
Head (Ketua)

23/07/18

Dr. Ir. AM. Ade Lisantono, M.Eng.
Secretary (Sekretaris)

24/07/2018

Dr. Ir. Junaedi Utomo, M.Eng.
Member (Anggota)

23/7/18

Head of Program (Ketua Program Studi)



(Dr. Ir. Imam Basuki, M.T.)

STATEMENT OF AUTHENTICITY (PERNYATAAN KEASLIAN TESIS)

Name : A F M Salman Akhter
Student No. : 165102548/PS/MTS
Concentration : Structure
Thesis Topic : DISPLACEMENT-BASED SEISMIC DESIGN OF
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Yogyakarta, July 2018

A F M Salman Akhter

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Verily all praise is for Allah, we praise Him and seek His aid and ask for His forgiveness and we seek refuge with Allah from the evils of ourselves and our evil actions.

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Penulis

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ABSTRACT

Reinforced concrete Special Moment Frame (RC-SMF) with irregularity in dimension experiences large inelastic deformation under ground motion. The building code for designing structural elements generally is focused on satisfying the strength and serviceability. On the other hand, the displacement-based design (DBD) procedure is based on building performance level. This paper presents a devoted study of designing structural elements of 8 and 4 story RC-SMF with and without vertical irregularity using the DBD method. This method is mainly using energy-work balance concept with pre-selected yield mechanism and target drift. Moreover, a new lateral force distribution method is used in this study which accounts for inelastic dynamic response and higher mode effects. Strong column-weak beam mechanism is used to design beam and column, and beam moment capacity of each floor is calculated by equating external work to internal work approach. Furthermore, column design strength is taken as the combination of factored gravity loads and maximum expected strength of the beam. The time history analysis results show that story drift is below than the target drift and achieve the desired performance level. Moreover, the results also show lateral force distribution is very close to the lateral shear distribution which obtained from time history analysis.

Keywords: performance based design, work-energy concept, inelastic state later force distribution, nonlinear analysis.