BAB VI

KESIMPULAN DAN SARAN

6. 1 Kesimpulan

Berdasarkan hasil analisis yang telah dilakukan dalam mendeteksi kerusakan *bracing* pada portal bidang baja tipe *bracing* konsentrik, diperoleh beberapa kesimpulan sebagai berikut:

1. Metode matriks fleksibilitas dengan menggunakan vektor beban penentu lokasi kerusakan (VBPLK) dapat digunakan untuk mendeteksi kerusakan pada suatu portal bidang baja tipe *bracing* konsentrik lima lantai. VBPLK diperoleh dengan cara menghitung *Singular Value Decomposition* dari perbedaan matriks fleksibilitas pada kondisi tidak rusak dan rusak.
2. Variasi jumlah sensor mempengaruhi hasil deteksi kerusakan. Dengan lokasi kerusakan yang sama, semakin banyak jumlah sensor, hasil deteksi semakin akurat. Hal ini ditunjukkan pada kasus kerusakan 1, 2, 3, 4 dan 5. Pada kasus 3 dan 4 penggunaan sensor yang sedikit yaitu 2 buah dan 3 buah sensor ternyata tidak mampu mendeteksi kerusakan 3 buah *bracing*. Sedangkan pada kasus 5, penggunaan sensor sebanyak 5 buah memberikan indikasi yang lebih baik dibandingkan dengan kasus 3 dan 4 dengan lokasi *bracing* rusak yang sama.
3. Variasi penempatan sensor memberikan pengaruh yang cukup signifikan terhadap hasil deteksi.

Dengan jumlah sensor dan lokasi kerusakan yang sama, penempatan sensor yang jauh dari lokasi kerusakan memberikan hasil deteksi yang lebih akurat dibandingkan dengan penempatan sensor yang dekat dengan lokasi kerusakan. Hal ini ditunjukkan pada kasus kerusakan 5, 6 dan 7.

4. Metode matriks fleksibilitas dengan menggunakan vektor beban penentu lokasi kerusakan (VBPLK) dapat digunakan untuk mendeteksi kerusakan ganda (balok-*bracing* dan kolom- *bracing*) pada suatu portal bidang baja tipe *bracing* konsentrik lima lantai. Hal ini ditunjukkan pada kasus kerusakan 8 dan 9.
5. Normalisasi tegangan kumulatif (SRSS) memberikan indikasi yang baik untuk menentukan kerusakan struktur.
6. Perhitungan dengan analisis VBPLK mampu memberikan informasi yang benar, hal ini terbukti dengan sama besarnya nilai gaya-gaya batang yang dihitung dengan analisis VBPLK ataupun yang didapatkan dari analisis *software* ETABS.

6. 2 Saran

Dari Tugas Akhir yang telah disusun ini, penulis memberikan beberapa saran sebagai berikut:

1. Perlu dicoba metode matriks fleksibilitas dengan VBPLK dengan lebih banyak variasi jumlah dan penempatan sensor dan juga dilakukan terhadap tipe-tipe *bracing* yang lain.

2. Perlu dicoba metode matriks fleksibilitas dengan VBPLK untuk beberapa kombinasi kerusakan elemen struktur lain, seperti kerusakan kolom-balok-*bracing* sekaligus pada tipe-tipe *bracing* yang lain.
3. Perlu dilakukan studi eksperimental di laboratorium untuk dibandingkan hasilnya dengan hasil analisis numerik.
4. Perlu dicari metode normalisasi tegangan yang lain, sehingga mampu memberikan perbedaan yang signifikan antara batang yang rusak dan batang lain yang tidak rusak.

DAFTAR PUSTAKA

Adam, R.D., Cawley, P., Pye, C.j., and Stone, B.J., 1978, A Vibration Technique for Nondestructive Assessing the Integrity of Structures, *Journal of Mechanical Engineering Science*, 20, 93-100.

Aktan, A.E., Lee, K.L., Chuntawan, C. and Aksel, T., 1994, Modal Testing for Structural Identification and Condition Assessment of Constructed Facilities, *Proceedings of the 12th International Modal Analysis Conference*, Honolulu, Hawai, Vol.1, 462-468.

Arfiadi, Y., 1996, Pengembangan Program Bantu Simbolik untuk Analisis Struktur dengan Menggunakan Matlab, *Laporan Penelitian, Program Studi Teknik Sipil, Fakultas Teknik, Universitas Atma Jaya Yogyakarta.*

Arfiadi, Y., 2003a, Program Bantu untuk Pengajaran dan Pemahaman Metoda Matriks Kekakuan bagi Mahasiswa Teknik , *Lokakarya Sekitar Mekanika Rekayasa, Departemen Teknik Sipil, Fakultas Teknik Sipil dan Perencanaan*, Institut Teknologi Bandung, 21 Agustus.

Arfiadi, Y., 2003b, *Bahan Kuliah Dinamika Struktur*, Program Studi Teknik Sipil, Fakultas Teknik, Universitas Atma Jaya Yogyakarta.

Arfiadi, Y., 2009, Damage Detection of Frame Structures. *Laporan Penelitian, Universitas Atma Jaya Yogyakarta, Yogyakarta.*

Arfiadi, Y., 2011, *Analisis Struktur dengan Metode Matriks Kekakuan*, Cahaya Atma Pustaka, Yogyakarta.

Arfiadi, Y., 2012, Pengaruh Jumlah Sensor pada Deteksi Kerusakan Struktur dengan Metode Vektor Beban Penentu Lokasi Rusak, *Konteks 6*, Universitas Trisakti, Jakarta.

Arfiadi, Y. dan Wibowo, F.X.N., 2005, Damage Detection by Using Matrix Flexibility Approach, *Proceeding One Day Civil Engineering Seminar*, UPH, 19 Oktober, F1-F15 (in bahasa Indonesia).

Baker, K., 2005, *Singular Value Decomposition Tutorial*, 29 Maret 2005 (Revised January 14, 2013), diakses 3 Mei 2013, http://www.ling.ohio-state.edu/.../Singular_Value_Decomposition_Tutorial.pdf.

Bernal, D., 2002, Load Vectors for Damage Localization, *Journal of Engineering Mechanics*, Vol 128(1), pp. 7–14.

Bernal, D. and Gunes, B., 2000, An Examination of Instantaneous Frequency as a Damage Detection Tool, *14th Engineering Mechanics Conference*, Austin, TX.

Cawley, P. and Adams, R.D., 1979. The location of defects in structures from measurements of natural frequencies. *Journal of Strains Analysis*, 14, 49-57.

Clough, R.W. and Penzien, J., 1997, *Dynamics of Structures*, Penerbit Erlangga, Jakarta.

Deuklar, W.N., Modhera, C.D. and Patil, H.S., 2010, Buckling Restrained Braces for Building Structure, *International Journal of Research and Review in Applied Sciences*, Vol 4(4) September 2010, pp. 363-372.

Gao, Y., 2005, Structural health monitoring strategies for smart sensor networks, *PhD. Dissertation-University of Illinois at Urbana-Champaign*, Urbana, Illinois.

Gao, Y., Spencer, Jr., B.F. and Bernal, D., 2004, Experimental Verification of the Damage Locating Vector Method, *Proc. of the 1st International Workshop on Advanced Smart Materials and Smart Structures Technology*, Honolulu, Hawaii, January 12-14.

Gere, J.M. dan Weaver, W.Jr., 1983, *Matrix Algebra for Engineers Second Edition*, Wadsworth Inc, New York.

Gunes, B. dan Gunes, O., 2012, Structural Health Monitoring and Damage Assessment Part II: Application of the Damage Locating Vector (DLV) Method to the ASCE Benchmark Structure Experimental Data, *International Journal of Physical Sciences*, Vol 7(9), pp.1509-1515, 23 February 2012.

Iyer, H., 2005, The Effects of Shear Deformation in Rectangular and Wide Flange Sections, *Thesis of the Virginia Polytechnic Institute and State University*, Blacksburg, Virginia, 24 Februari 2005.

Keputusan Menteri Negara Lingkungan Hidup, 1996, *Baku Tingkat Getaran* (No.49 Tahun 1996), Menteri Negara Lingkungan Hidup.

Kim, J.H., Jeon, H.S. and Lee, C.W., 1992, Application of the Modal Assurance Criteria for Detecting Structural Faults, *Proceedings of the 10th International Modal Analysis Conference*, Las Vegas, Nevada, Vol.1, 536-540.

Koh, C.G., See, L.M., and Balendra, T., 1995, Damage Detection of Buildings: Numerical and Experimental Studies, *Journal of Structural Engineering, ASCE*, Vol.2, 1155-1160.

Liu, P.L., 1995, Identification and Damage Detection of Trusses Using Modal Data, *Journal of Structural Engineeering, ACSE*, Vol. 121, 599-608.

Pandey, A.K. and Biswas, M., 1994, Damage Detection in Structures Using Changes in Flexibility, *Journal of Sound and Vibration*, 169(1), pp. 3-17.

Pandey, A.K. and Biswas, M., 1995, Damage Diagnosis of Truss Structures by Estimation of Flexibility Change, *The International Journal of Analytical and Experimental Modal Analysis*, Vol 10(2), pp. 104–117.

Paz, M., 1987, *Structural Dynamics Theory and Computation, Second Edition*, Penerbit Erlangga, Jakarta.

Saputro, D.S.H., 2011, Deteksi Kerusakan Struktur pada Portal Bidang, *Laporan Tugas Akhir Sarjana Strata Satu-Program Studi Teknik Sipil Fakultas Teknik Universitas Atma Jaya Yogyakarta*, Yogyakarta.

Segui, W.T., 2007, *Steel Design, International Student Edition, Fourth Edition*, Penerbit Thomson, United States of America.

Setiyowati, N.A., Suswanto, B., dan Soewardojo, R., 2012, Studi Perbandingan Perilaku Profil Baja WF dan HSS sebagai *Bresing* pada SCBF Akibat Beban Lateral dengan Program Bantu *Finite Element Analysis*, *JURNAL TEKNIK ITS*, Vol. 1, No. 1, Sept. 2012, ISSN: 2301-9271.

Shi, Z.Y., Law, S.S., and Zhang, L.M., 2000a, Damage Localization by Directly Using Incomplete Mode Shape, *Journal of Engineering Mechanics*, Vol. 126, 656-660, Vol. 126(12), 1216-1223.

Shi, Z.Y., Law, S.S., and Zhang, L.M., 2000b, Structural Damage Detection from Modal Strain Energy Changes, *Journal of Engineering Mechanics*, Vol. 126, 656-660, Vol. 126(12), 1216-1223.

Shi, Z.Y., Law, S.S., and Zhang, L.M., 2002, Improved Damage Quantification from Elemental Modal Strain Energy Change, *Journal of Engineering Mechanics*, Vol. 126, 656-660, Vol. 128(5), 521-529.

Uang, C.M., Bruneau, M. dan Whittaker, A.S., 2009, *Seismic Design of Steel Structures*, Chapter 9, pp. 409-462.

Wang, C.K., 1983, *Intermediate Structural Analysis*, Mc Graw-Hill Company, New York.

Weaver, W.Jr. dan Gere, J.M., 1980, *Matrix Analysis of Framed Structures, Second Edition*, D. Van Nostrand Company, New York.

West, W.M., 1984, Illustration of the Use of Modal Assurance Criterion to Detect Strutural Changes in an Orbiter Test Specimen, *Proceedings Air Force Conference on Aircraft Structural Integrity*, pp. 1-6.

Lampiran 1: *Coding* Matlab Menghitung F_U Kasus Kerusakan 1

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);
n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);
n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);
n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);
n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);
n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);
k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);
k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];
id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];
id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
```

```
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);
Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);
Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);
m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);
m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);
M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);
M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);
Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);
Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(20,i);mode(35,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fu1=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 2: *Coding* Matlab Menghitung F_D Kasus Kerusakan 1

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);
n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);
n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);
n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);
n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);
n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);%//-
---damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
A40d=A2*0.5;%//----damage
member ----//
I1=5.536e-4;%m4
I2=2.176e-4;
I40d=I2*0.5;%//----damage
member ----//
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);
k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);
k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A40d,I40d,L40,f2,
vs); K40=kg(k40,T40);%//----
damage member ----//
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];
id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];
id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
%//----damage member ----//
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];
Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
```

```
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);
Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);
Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);%//
----damage member ----//
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);
m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);
m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A40d,L40);%//---
-damage member ----//
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);
M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);
M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);%//----
damage member ----//
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);
Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);
Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);%//
----damage member ----//
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(20,i);mode(35,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fd1=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 3: *Coding* Matlab Menghitung SVD Kasus Kerusakan 1

```
Fu1 =1.0e-004 *[0.0583    0.0685;0.0685    0.1173]
Fd1 =1.0e-004 *[0.0585    0.0674;0.0674    0.1252]

Fdel=Fu1-Fd1
[u,s,v]=svd(Fdel)
```

Lampiran 4: *Coding* Matlab Menghitung Gaya Batang Kasus Kerusakan 1

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);
n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);
n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);
n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);
n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);
n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
%//----damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);
k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);
k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];
id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];
id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
```

```
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);
Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);
Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);
m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);
m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);
M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);
M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);
Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);
Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks);
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder);

i=1:84;
pim=[mode(20,i);mode(35,i)];
v=sqrtm(mode'*Mr*mode);
wm=diag(w(1:84));
Fu1=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'

R=zeros(84,1);
R(20,1)=-0.9903;
R(35,1)=-0.1387;

U=solv(Ks,R);

u1=dissf(U,id1,T1);
u2=dissf(U,id2,T2);
u3=dissf(U,id3,T3);
u4=dissf(U,id4,T4);
u5=dissf(U,id5,T5);
u6=dissf(U,id6,T6);
u7=dissf(U,id7,T7);
u8=dissf(U,id8,T8);
u9=dissf(U,id9,T9);
u10=dissf(U,id10,T10);
u11=dissf(U,id11,T11);
u12=dissf(U,id12,T12);
u13=dissf(U,id13,T13);
u14=dissf(U,id14,T14);
u15=dissf(U,id15,T15);
u16=dissf(U,id16,T16);
u17=dissf(U,id17,T17);
u18=dissf(U,id18,T18);
u19=dissf(U,id19,T19);
u20=dissf(U,id20,T20);
u21=dissf(U,id21,T21);
u22=dissf(U,id22,T22);
u23=dissf(U,id23,T23);
u24=dissf(U,id24,T24);
u25=dissf(U,id25,T25);
u26=dissf(U,id26,T26);
u27=dissf(U,id27,T27);
u28=dissf(U,id28,T28);
u29=dissf(U,id29,T29);
u30=dissf(U,id30,T30);
u31=dissf(U,id31,T31);
u32=dissf(U,id32,T32);
u33=dissf(U,id33,T33);
u34=dissf(U,id34,T34);
u35=dissf(U,id35,T35);
```

```
u36=dissf(U,id36,T36);
u37=dissf(U,id37,T37);
u38=dissf(U,id38,T38);
u39=dissf(U,id39,T39);
u40=dissf(U,id40,T40);
u41=dissf(U,id41,T41);
u42=dissf(U,id42,T42);
u43=dissf(U,id43,T43);
u44=dissf(U,id44,T44);
u45=dissf(U,id45,T45);

So1=zeros(6,1);
So2=zeros(6,1);
So3=zeros(6,1);
So4=zeros(6,1);
So5=zeros(6,1);
So6=zeros(6,1);
So7=zeros(6,1);
So8=zeros(6,1);
So9=zeros(6,1);
So10=zeros(6,1);
So11=zeros(6,1);
So12=zeros(6,1);
So13=zeros(6,1);
So14=zeros(6,1);
So15=zeros(6,1);
So16=zeros(6,1);
So17=zeros(6,1);
So18=zeros(6,1);
So19=zeros(6,1);
So20=zeros(6,1);
So21=zeros(6,1);
So22=zeros(6,1);
So23=zeros(6,1);
So24=zeros(6,1);
So25=zeros(6,1);
So26=zeros(6,1);
So27=zeros(6,1);
So28=zeros(6,1);
So29=zeros(6,1);
So30=zeros(6,1);
So31=zeros(6,1);
So32=zeros(6,1);
So33=zeros(6,1);
So34=zeros(6,1);
So35=zeros(6,1);
So36=zeros(6,1);
So37=zeros(6,1);
So38=zeros(6,1);
So39=zeros(6,1);
So40=zeros(6,1);
So41=zeros(6,1);
So42=zeros(6,1);
So43=zeros(6,1);
So44=zeros(6,1);
So45=zeros(6,1);

S1=stref(k1,u1,So1)
S2=stref(k2,u2,So2)
S3=stref(k3,u3,So3)
S4=stref(k4,u4,So4)
S5=stref(k5,u5,So5)
S6=stref(k6,u6,So6)
S7=stref(k7,u7,So7)
S8=stref(k8,u8,So8)
S9=stref(k9,u9,So9)
S10=stref(k10,u10,So10)
S11=stref(k11,u11,So11)
S12=stref(k12,u12,So12)
S13=stref(k13,u13,So13)
S14=stref(k14,u14,So14)
S15=stref(k15,u15,So15)
S16=stref(k16,u16,So16)
S17=stref(k17,u17,So17)
S18=stref(k18,u18,So18)
S19=stref(k19,u19,So19)
S20=stref(k20,u20,So20)
S21=stref(k21,u21,So21)
S22=stref(k22,u22,So22)
S23=stref(k23,u23,So23)
S24=stref(k24,u24,So24)
S25=stref(k25,u25,So25)
S26=stref(k26,u26,So26)
S27=stref(k27,u27,So27)
S28=stref(k28,u28,So28)
S29=stref(k29,u29,So29)
S30=stref(k30,u30,So30)
S31=stref(k31,u31,So31)
S32=stref(k32,u32,So32)
S33=stref(k33,u33,So33)
S34=stref(k34,u34,So34)
S35=stref(k35,u35,So35)
S36=stref(k36,u36,So36)
S37=stref(k37,u37,So37)
S38=stref(k38,u38,So38)
S39=stref(k39,u39,So39)
S40=stref(k40,u40,So40)
S41=stref(k41,u41,So41)
S42=stref(k42,u42,So42)
S43=stref(k43,u43,So43)
S44=stref(k44,u44,So44)
S45=stref(k45,u45,So45)
```

Lampiran 5: *Output* Gaya-gaya Batang dari *software* Matlab Kasus 1

```
S1 =
    -0.0291
     0.0136
     0.0411
     0.0291
    -0.0136
     0.0404
S2 =
     0.0462
     0.0047
     0.0152
    -0.0462
    -0.0047
     0.0131
S3 =
     0.0111
     0.0117
     0.0347
    -0.0111
    -0.0117
     0.0355
S4 =
     0.0324
     0.0123
     0.0370
    -0.0324
    -0.0123
     0.0368
S5 =
    -0.3178
     0.0023
     0.0067
     0.3178
    -0.0023
     0.0070
S6 =
    -0.0034
     0.0124
     0.0371
     0.0034
    -0.0124
     0.0373
S7 =
    -0.0142
     0.0078
     0.0234
     0.0142
    -0.0078
     0.0235
S8 =
     0.0886
    -0.0012
    -0.0044
    -0.0886
     0.0012
    -0.0025
S9 =
    -0.0082
     0.0092
     0.0276
     0.0082
    -0.0092
     0.0275
S10 =
     0.0012
     0.0087
     0.0260
    -0.0012
    -0.0087
     0.0262
S11 =
    -0.0102
    -0.0011
    -0.0028
     0.0102
     0.0011
    -0.0036
S12 =
     0.0074
     0.0076
     0.0230
    -0.0074
    -0.0076
     0.0229
S13 =
     0.0088
     0.0069
     0.0202
    -0.0088
    -0.0069
     0.0209
S14 =
     0.0011
    -0.0019
    -0.0059
    -0.0011
     0.0019
    -0.0054
S15 =
    -0.0101
     0.0069
     0.0210
     0.0101
    -0.0069
     0.0201
S16 =
     0.0493
     0.0008
    -0.0000
    -0.0493
    -0.0008
     0.0030
S17 =
     0.9166
     0.0002
          0
    -0.9166
    -0.0002
     0.0005
S18 =
    -0.9337
    -0.0044
     0.0000
     0.9337
     0.0044
    -0.0153
S19 =
    -0.0478
    -0.0031
    -0.0000
     0.0478
     0.0031
    -0.0110
S20 =
     0.0357
    -0.0283
    -0.0440
    -0.0357
     0.0283
    -0.0549
S21 =
     0.3504
    -0.0346
    -0.0562
    -0.3504
     0.0346
    -0.0650
S22 =
    -0.2579
    -0.0181
    -0.0325
     0.2579
     0.0181
    -0.0307
S23 =
    -0.0361
    -0.0143
    -0.0245
     0.0361
     0.0143
    -0.0255
S24 =
     0.0234
     0.0041
     0.0179
    -0.0234
    -0.0041
    -0.0034
S25 =
     0.0146
     0.0065
     0.0215
    -0.0146
    -0.0065
     0.0014
S26 =
     0.0635
    -0.0113
    -0.0133
    -0.0635
     0.0113
    -0.0264
S27 =
    -0.0237
    -0.0108
    -0.0118
     0.0237
     0.0108
    -0.0261
S28 =
     0.0156
    -0.0101
    -0.0200
    -0.0156
     0.0101
S29 =
    -0.0153
    -0.0586
    -0.0103
    -0.0206
     0.0586
     0.0103
    -0.0154
S30 =
     0.0310
    -0.0012
    -0.0310
     0.0012
    -0.0054
S31 =
    -0.0145
    -0.0026
    -0.0014
     0.0145
     0.0026
    -0.0078
S32 =
     0.0069
    -0.0088
    -0.0107
    -0.0069
     0.0088
    -0.0202
S33 =
    -0.0171
    -0.0066
    -0.0081
     0.0171
     0.0066
    -0.0151
S34 =
     0.0202
    -0.0084
    -0.0140
    -0.0202
     0.0084
    -0.0156
S35 =
    -0.0069
    -0.0101
    -0.0151
     0.0069
     0.0101
    -0.0201
S36 =
     0.6652
     0.0000
     0.0000
    -0.6652
    -0.0000
     0.0000
S37 =
    -0.6343
     0.0000
     0.0000
     0.6343
    -0.0000
     0.0000
S38 =
     0.5069
     0.0000
     0.0000
    -0.5069
    -0.0000
     0.0000
S39 =
    -0.6899
     0.0000
     0.0000
     0.6899
    -0.0000
     0.0000
S40 =
    -0.0035
     0.0000
     0.0000
     0.0035
    -0.0000
     0.0000
S41 =
    -0.1508
     0.0000
     0.0000
     0.1508
    -0.0000
          0
S42 =
     0.0123
     0.0000
     0.0000
    -0.0123
    -0.0000
     0.0000
S43 =
     0.0403
     0.0000
     0.0000
    -0.0403
    -0.0000
     0.0000
S44 =
    -0.0227
     0.0000
     0.0000
     0.0227
    -0.0000
     0.0000
S45 =
     0.0166
     0.0000
     0.0000
    -0.0166
    -0.0000
     0.0000
```

Lampiran 6: *Output* Gaya-gaya Batang dari *software* ETABS Kasus 1

C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
LT5	C5	Min Value	-0.0069	-0.0089	0.0000	0.0000	0.0000	-0.0108
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0069	-0.0089	0.0000	0.0000	0.0000	0.0202
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C6	Min Value	0.0171	-0.0066	0.0000	0.0000	0.0000	-0.0081
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0171	-0.0066	0.0000	0.0000	0.0000	0.0151
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C7	Min Value	-0.0202	-0.0084	0.0000	0.0000	0.0000	-0.0140
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0202	-0.0084	0.0000	0.0000	0.0000	0.0156
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C8	Min Value	0.0069	-0.0101	0.0000	0.0000	0.0000	-0.0151
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0069	-0.0101	0.0000	0.0000	0.0000	0.0202
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C5	Min Value	-0.0156	-0.0101	0.0000	0.0000	0.0000	-0.0200
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0156	-0.0101	0.0000	0.0000	0.0000	0.0153
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C6	Min Value	0.0586	-0.0103	0.0000	0.0000	0.0000	-0.0206
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0586	-0.0103	0.0000	0.0000	0.0000	0.0154
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C7	Min Value	-0.0311	-0.0012	0.0000	0.0000	0.0000	0.0012
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0311	-0.0012	0.0000	0.0000	0.0000	0.0054
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C8	Min Value	0.0145	-0.0026	0.0000	0.0000	0.0000	-0.0014
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0145	-0.0026	0.0000	0.0000	0.0000	0.0078
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C5	Min Value	-0.0234	0.0041	0.0000	0.0000	0.0000	0.0034
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0234	0.0041	0.0000	0.0000	0.0000	0.0178
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C6	Min Value	-0.0145	0.0065	0.0000	0.0000	0.0000	-0.0014
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0145	0.0065	0.0000	0.0000	0.0000	0.0214
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C7	Min Value	-0.0635	-0.0113	0.0000	0.0000	0.0000	-0.0133
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0635	-0.0113	0.0000	0.0000	0.0000	0.0264
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C8	Min Value	0.0237	-0.0108	0.0000	0.0000	0.0000	-0.0118
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0237	-0.0108	0.0000	0.0000	0.0000	0.0261
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C5	Min Value	-0.0357	-0.0282	0.0000	0.0000	0.0000	-0.0440
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0357	-0.0282	0.0000	0.0000	0.0000	0.0549
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C6	Min Value	-0.3503	-0.0346	0.0000	0.0000	0.0000	-0.0561
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.3503	-0.0346	0.0000	0.0000	0.0000	0.0649
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C7	Min Value	0.2578	-0.0181	0.0000	0.0000	0.0000	-0.0325
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2578	-0.0181	0.0000	0.0000	0.0000	0.0307
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C8	Min Value	0.0361	-0.0143	0.0000	0.0000	0.0000	-0.0245
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0361	-0.0143	0.0000	0.0000	0.0000	0.0254
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C5	Min Value	-0.0493	0.0008	0.0000	0.0000	0.0000	-0.0030

		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0493	0.0008	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C6	Min Value	-0.9166	0.0002	0.0000	0.0000	0.0000	-0.0006
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.9166	0.0002	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C7	Min Value	0.9336	-0.0044	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.9336	-0.0044	0.0000	0.0000	0.0000	0.0152
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C8	Min Value	0.0478	-0.0031	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0478	-0.0031	0.0000	0.0000	0.0000	0.0110
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

B E A M F O R C E E N V E L O P E S

STORY	BEAM	ITEM	P	V2	V3	T	M2	M3
LT5	B4	Min Value	-0.0089	-0.0069	0.0000	0.0000	0.0000	-0.0202
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0089	-0.0069	0.0000	0.0000	0.0000	0.0210
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B5	Min Value	-0.0011	0.0019	0.0000	0.0000	0.0000	-0.0054
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0011	0.0019	0.0000	0.0000	0.0000	0.0059
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B6	Min Value	0.0101	-0.0069	0.0000	0.0000	0.0000	-0.0210
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0101	-0.0069	0.0000	0.0000	0.0000	0.0202
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B4	Min Value	-0.0012	-0.0087	0.0000	0.0000	0.0000	-0.0260
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0012	-0.0087	0.0000	0.0000	0.0000	0.0262
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B5	Min Value	0.0103	0.0011	0.0000	0.0000	0.0000	-0.0036
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0103	0.0011	0.0000	0.0000	0.0000	0.0028
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B6	Min Value	-0.0074	-0.0077	0.0000	0.0000	0.0000	-0.0230
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0074	-0.0077	0.0000	0.0000	0.0000	0.0229
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B4	Min Value	0.0142	-0.0078	0.0000	0.0000	0.0000	-0.0235
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0142	-0.0078	0.0000	0.0000	0.0000	0.0236
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B5	Min Value	-0.0886	0.0012	0.0000	0.0000	0.0000	-0.0025
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0886	0.0012	0.0000	0.0000	0.0000	0.0044
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B6	Min Value	0.0082	-0.0092	0.0000	0.0000	0.0000	-0.0276
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0082	-0.0092	0.0000	0.0000	0.0000	0.0275
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B4	Min Value	-0.0324	-0.0123	0.0000	0.0000	0.0000	-0.0370
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0324	-0.0123	0.0000	0.0000	0.0000	0.0368
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B5	Min Value	0.3179	-0.0023	0.0000	0.0000	0.0000	-0.0067
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3179	-0.0023	0.0000	0.0000	0.0000	0.0070
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B6	Min Value	0.0034	-0.0124	0.0000	0.0000	0.0000	-0.0371
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0034	-0.0124	0.0000	0.0000	0.0000	0.0372
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B4	Min Value	0.0291	-0.0136	0.0000	0.0000	0.0000	-0.0410

		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0291	-0.0136	0.0000	0.0000	0.0000	0.0403
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B5	Min Value	-0.0462	-0.0047	0.0000	0.0000	0.0000	-0.0152
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0462	-0.0047	0.0000	0.0000	0.0000	0.0131
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B6	Min Value	-0.0111	-0.0117	0.0000	0.0000	0.0000	-0.0346
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0111	-0.0117	0.0000	0.0000	0.0000	0.0355
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

B R A C E F O R C E E N V E L O P E S

STORY	BRACE	ITEM	P	V2	V3	T	M2	M3
LT5	D7	Min Value	0.0228	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0228	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	D8	Min Value	-0.0166	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0166	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D7	Min Value	-0.0123	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0123	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D8	Min Value	-0.0403	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0403	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D7	Min Value	0.0036	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0036	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D8	Min Value	0.1508	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1508	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D7	Min Value	-0.5070	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.5070	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D8	Min Value	0.6899	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.6899	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D7	Min Value	-0.6652	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.6652	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D8	Min Value	0.6344	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.6344	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

Lampiran 7: *Coding* Matlab Menghitung F_U Kasus Kerusakan 2

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
```

```
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(11,i);mode(20,i);m
ode(35,i);mode(44,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fu2=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 8: *Coding* Matlab Menghitung F_D Kasus Kerusakan 2

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);%//-
---damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);
```

```
E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
A40d=A2*0.5;%//----damage
member ----//
I1=5.536e-4;%m4
I2=2.176e-4;
I40d=I2*0.5;%//----damage
member ----//
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
```

```
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A40d,I40d,L40,f2,
vs); K40=kg(k40,T40);%//----
damage member ----//
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36
76];%//----damage member ---
-//
```

```
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);%//
----damage member ----//
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A40d,L40);%//---
-damage member ----//
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);%//----
damage member ----//
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);%//
----damage member ----//
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(11,i);mode(20,i);m
ode(35,i);mode(44,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fd2=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
im*inv(v))'
```

Lampiran 9: *Coding* Matlab Menghitung SVD Kasus Kerusakan 2

```
Fu2 =1.0e-004 *[0.0244    0.0251    0.0279    0.0311;0.0251    0.0583    0.0685
0.0804;0.0279    0.0685    0.1173    0.1426;0.0311    0.0804    0.1426    0.2125]

Fd2 =1.0e-004 *[0.0244    0.0251    0.0277    0.0309;0.0251    0.0585    0.0674
0.0794;0.0277    0.0674    0.1252    0.1494;0.0309    0.0794    0.1494    0.2185]

Fdel=Fu2-Fd2
[u,s,v]=svd(Fdel)
```

Lampiran 10: *Coding* Matlab Menghitung Gaya Batang Kasus Kerusakan 2

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
```

```
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks);
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder);

i=1:84;
pim=[mode(11,i);mode(20,i);m
ode(35,i);mode(44,i)];
v=sqrtm(mode'*Mr*mode);
wm=diag(w(1:84));

Untuk VBPLK 1:
Fu2=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))';

R=zeros(84,1);
R(11,1)=-0.8267;
R(20,1)=-0.4834;
R(35,1)=0.1317;
R(44,1)=-0.2561;

Fu2=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))';

Untuk VBPLK 2:
R=zeros(84,1);
R(11,1)=-0.5612;
R(20,1)=0.7442;
R(35,1)=-0.1815;
R(44,1)=0.3135;

U=solv(Ks,R);

u1=dissf(U,id1,T1);
u2=dissf(U,id2,T2);
u3=dissf(U,id3,T3);
u4=dissf(U,id4,T4);
u5=dissf(U,id5,T5);
```

```
u6=dissf(U,id6,T6);
u7=dissf(U,id7,T7);
u8=dissf(U,id8,T8);
u9=dissf(U,id9,T9);
u10=dissf(U,id10,T10);
u11=dissf(U,id11,T11);
u12=dissf(U,id12,T12);
u13=dissf(U,id13,T13);
u14=dissf(U,id14,T14);
u15=dissf(U,id15,T15);

u16=dissf(U,id16,T16);
u17=dissf(U,id17,T17);
u18=dissf(U,id18,T18);
u19=dissf(U,id19,T19);
u20=dissf(U,id20,T20);
u21=dissf(U,id21,T21);
u22=dissf(U,id22,T22);
u23=dissf(U,id23,T23);
u24=dissf(U,id24,T24);
u25=dissf(U,id25,T25);
u26=dissf(U,id26,T26);
u27=dissf(U,id27,T27);
u28=dissf(U,id28,T28);
u29=dissf(U,id29,T29);
u30=dissf(U,id30,T30);
u31=dissf(U,id31,T31);
u32=dissf(U,id32,T32);
u33=dissf(U,id33,T33);
u34=dissf(U,id34,T34);
u35=dissf(U,id35,T35);

u36=dissf(U,id36,T36);
u37=dissf(U,id37,T37);
u38=dissf(U,id38,T38);
u39=dissf(U,id39,T39);
u40=dissf(U,id40,T40);
u41=dissf(U,id41,T41);
u42=dissf(U,id42,T42);
u43=dissf(U,id43,T43);
u44=dissf(U,id44,T44);
u45=dissf(U,id45,T45);

So1=zeros(6,1);
So2=zeros(6,1);
So3=zeros(6,1);
So4=zeros(6,1);
So5=zeros(6,1);
So6=zeros(6,1);
So7=zeros(6,1);
So8=zeros(6,1);
So9=zeros(6,1);
So10=zeros(6,1);
So11=zeros(6,1);
So12=zeros(6,1);
So13=zeros(6,1);
So14=zeros(6,1);
So15=zeros(6,1);
So16=zeros(6,1);
So17=zeros(6,1);
So18=zeros(6,1);
So19=zeros(6,1);
So20=zeros(6,1);
So21=zeros(6,1);
So22=zeros(6,1);
So23=zeros(6,1);
So24=zeros(6,1);
So25=zeros(6,1);
So26=zeros(6,1);
So27=zeros(6,1);
So28=zeros(6,1);
So29=zeros(6,1);
So30=zeros(6,1);
So31=zeros(6,1);
So32=zeros(6,1);
So33=zeros(6,1);
So34=zeros(6,1);
So35=zeros(6,1);
So36=zeros(6,1);
So37=zeros(6,1);
So38=zeros(6,1);
So39=zeros(6,1);
So40=zeros(6,1);
So41=zeros(6,1);
So42=zeros(6,1);
So43=zeros(6,1);
So44=zeros(6,1);
So45=zeros(6,1);

S1=stref(k1,u1,So1)
S2=stref(k2,u2,So2)
S3=stref(k3,u3,So3)
S4=stref(k4,u4,So4)
S5=stref(k5,u5,So5)
S6=stref(k6,u6,So6)
S7=stref(k7,u7,So7)
S8=stref(k8,u8,So8)
S9=stref(k9,u9,So9)
S10=stref(k10,u10,So10)
S11=stref(k11,u11,So11)
S12=stref(k12,u12,So12)
S13=stref(k13,u13,So13)
S14=stref(k14,u14,So14)
S15=stref(k15,u15,So15)

S16=stref(k16,u16,So16)
S17=stref(k17,u17,So17)
S18=stref(k18,u18,So18)
S19=stref(k19,u19,So19)
S20=stref(k20,u20,So20)
S21=stref(k21,u21,So21)
S22=stref(k22,u22,So22)
S23=stref(k23,u23,So23)
S24=stref(k24,u24,So24)
S25=stref(k25,u25,So25)
S26=stref(k26,u26,So26)
S27=stref(k27,u27,So27)
S28=stref(k28,u28,So28)
S29=stref(k29,u29,So29)
S30=stref(k30,u30,So30)
S31=stref(k31,u31,So31)
S32=stref(k32,u32,So32)
S33=stref(k33,u33,So33)
S34=stref(k34,u34,So34)
S35=stref(k35,u35,So35)

S36=stref(k36,u36,So36)
S37=stref(k37,u37,So37)
S38=stref(k38,u38,So38)
S39=stref(k39,u39,So39)
S40=stref(k40,u40,So40)
S41=stref(k41,u41,So41)
S42=stref(k42,u42,So42)
S43=stref(k43,u43,So43)
S44=stref(k44,u44,So44)
S45=stref(k45,u45,So45)
```

Lampiran 11: *Output* Gaya-gaya Batang dari *software* Matlab Kasus 2

```
Akibat VBPLK 1:
S1 =
    0.0245
   -0.0089
   -0.0270
   -0.0245
    0.0089
   -0.0267
S2 =
    0.1416
   -0.0024
   -0.0078
   -0.1416
    0.0024
   -0.0068
S3 =
   -0.0228
   -0.0079
   -0.0235
    0.0228
    0.0079
   -0.0237
S4 =
   -0.0219
   -0.0106
   -0.0320
    0.0219
    0.0106
   -0.0318
S5 =
    0.2012
   -0.0017
   -0.0047
   -0.2012
    0.0017
   -0.0056
S6 =
    0.0134
   -0.0110
   -0.0330
   -0.0134
    0.0110
   -0.0332
S7 =
    0.0163
   -0.0100
   -0.0299
   -0.0163
    0.0100
   -0.0299
S8 =
    0.0109
    0.0002
    0.0010
   -0.0109
   -0.0002
    0.0004
S9 =
   -0.0046
   -0.0099
   -0.0295
    0.0046
    0.0099
   -0.0296
S10 =
   -0.0080
   -0.0105
   -0.0315
    0.0080
    0.0105
   -0.0315
S11 =
    0.0950
    0.0002
    0.0007
   -0.0950
   -0.0002
    0.0008
S12 =
   -0.0000
   -0.0098
   -0.0293
    0.0000
    0.0098
   -0.0293
S13 =
   -0.0076
   -0.0073
   -0.0215
    0.0076
    0.0073
   -0.0224
S14 =
   -0.0193
    0.0023
    0.0075
    0.0193
   -0.0023
    0.0062
S15 =
    0.0099
   -0.0077
   -0.0236
   -0.0099
    0.0077
   -0.0227
S16 =
   -0.0473
   -0.0033
    0.0000
    0.0473
    0.0033
   -0.0114
S17 =
   -0.7418
   -0.0032
   -0.0000
    0.7418
    0.0032
   -0.0113
S18 =
    0.6947
   -0.0040
         0
   -0.6947
    0.0040
   -0.0140
S19 =
    0.0462
   -0.0041
         0
   -0.0462
    0.0041
   -0.0143
S20 =
   -0.0384
    0.0212
    0.0384
    0.0384
   -0.0212
    0.0360
S21 =
   -0.4562
    0.0254
    0.0458
    0.4562
   -0.0254
    0.0431
S22 =
    0.3399
    0.0222
    0.0443
   -0.3399
   -0.0222
    0.0333
S23 =
    0.0384
    0.0187
    0.0380
   -0.0384
   -0.0187
    0.0274
S24 =
   -0.0278
   -0.0007
   -0.0040
    0.0278
    0.0007
    0.0016
S25 =
   -0.1764
   -0.0024
   -0.0065
    0.1764
    0.0024
   -0.0018
S26 =
    0.1048
    0.0048
    0.0053
   -0.1048
   -0.0048
    0.0114
S27 =
    0.0274
    0.0052
    0.0058
   -0.0274
   -0.0052
    0.0125
S28 =
   -0.0178
    0.0156
    0.0283
    0.0178
   -0.0156
    0.0263
S29 =
   -0.0560
    0.0169
    0.0307
    0.0560
   -0.0169
    0.0286
S30 =
    0.0204
    0.0103
    0.0178
   -0.0204
   -0.0103
    0.0181
S31 =
    0.0175
    0.0099
    0.0170
   -0.0175
   -0.0099
    0.0175
S32 =
   -0.0073
    0.0076
    0.0051
    0.0073
   -0.0076
    0.0215
S33 =
    0.0056
    0.0049
    0.0022
   -0.0056
   -0.0049
    0.0149
S34 =
   -0.0317
    0.0080
    0.0104
    0.0317
   -0.0080
    0.0174
S35 =
    0.0077
    0.0099
    0.0118
   -0.0077
   -0.0099
    0.0227
S36 =
   -0.1430
   -0.0000
    0.1430
    0.0000
    0.0000
S37 =
    0.2386
   -0.0000
   -0.0000
   -0.2386
    0.0000
         0
S38 =
   -0.3411
   -0.0000
    0.3411
    0.0000
    0.0000
S39 =
    0.5720
   -0.0000
   -0.5720
    0.0000
    0.0000
S40 =
  1.0e-003 *
   -0.9081
         0
    0.0000
    0.9081
         0
    0.0000
S41 =
    0.1439
   -0.0000
   -0.0000
   -0.1439
    0.0000
   -0.0000
S42 =
   -0.1153
   -0.0000
   -0.0000
    0.1153
    0.0000
   -0.0000
S43 =
    0.1867
   -0.0000
   -0.0000
   -0.1867
    0.0000
   -0.0000
S44 =
    0.0430
   -0.0000
   -0.0000
   -0.0430
    0.0000
   -0.0000
S45 =
    0.0079
   -0.0000
    0.0000
   -0.0079
    0.0000
    0.0000
```

```
Akibat VBPLK
2:
S1 =
   -0.0144
    0.0119
    0.0359
    0.0144
   -0.0119
    0.0352
S2 =
    0.2797
    0.0039
    0.0125
   -0.2797
   -0.0039
    0.0109
S3 =
   -0.0086
    0.0107
    0.0316
    0.0086
   -0.0107
    0.0325
S4 =
    0.0181
    0.0105
    0.0315
   -0.0181
   -0.0105
    0.0315
S5 =
   -0.1852
    0.0006
    0.0026
    0.1852
   -0.0006
    0.0010
S6 =
    0.0086
    0.0093
    0.0281
   -0.0086
   -0.0093
    0.0280
S7 =
   -0.0146
    0.0093
    0.0280
    0.0146
   -0.0093
    0.0280
S8 =
   -0.0045
   -0.0003
   -0.0013
    0.0045
    0.0003
   -0.0004
S9 =
   -0.0011
    0.0103
    0.0309
    0.0011
   -0.0103
    0.0308
S10 =
    0.0064
    0.0098
    0.0295
   -0.0064
   -0.0098
    0.0296
S11 =
   -0.0775
   -0.0004
   -0.0012
    0.0775
    0.0004
   -0.0014
S12 =
    0.0012
    0.0098
    0.0294
   -0.0012
   -0.0098
    0.0294
S13 =
    0.0076
    0.0070
    0.0206
   -0.0076
   -0.0070
    0.0215
S14 =
    0.0151
   -0.0022
   -0.0071
   -0.0151
    0.0022
   -0.0062
S15 =
   -0.0103
    0.0079
    0.0241
    0.0103
   -0.0079
    0.0232
S16 =
    0.0485
   -0.0031
   -0.0000
   -0.0485
    0.0031
   -0.0107
S17 =
    0.8109
   -0.0040
         0
   -0.8109
    0.0040
   -0.0140
S18 =
   -0.9063
   -0.0118
   -0.0000
    0.9063
    0.0118
   -0.0413
S19 =
   -0.0480
   -0.0102
   -0.0000
    0.0480
    0.0102
   -0.0356
S20 =
    0.0367
   -0.0175
   -0.0252
   -0.0367
    0.0175
   -0.0360
S21 =
    0.2757
   -0.0216
   -0.0338
   -0.2757
    0.0216
   -0.0417

S22 =
   -0.3072
   -0.0029
   -0.0012
    0.3072
    0.0029
   -0.0090
S23 =
   -0.0373
   -0.0015
    0.0031
    0.0373
    0.0015
   -0.0085
S24 =
    0.0262
    0.0006
    0.0045
   -0.0262
   -0.0006
   -0.0024
S25 =
    0.1380
    0.0024
    0.0076
   -0.1380
   -0.0024
    0.0009
S26 =
   -0.0720
   -0.0104
   -0.0201
    0.0720
    0.0104
   -0.0163
S27 =
   -0.0279
   -0.0101
   -0.0195
    0.0279
    0.0101
   -0.0159
S28 =
    0.0169
   -0.0140
   -0.0255
   -0.0169
    0.0140
   -0.0235
S29 =
    0.0372
   -0.0151
   -0.0276
   -0.0372
    0.0151
   -0.0253
S30
   -0.0086
   -0.0087
   -0.0141
    0.0086
    0.0087
   -0.0165
S31 =
   -0.0177
   -0.0090
   -0.0149
    0.0177
    0.0090
   -0.0167
S32 =
    0.0070
   -0.0076
   -0.0060
   -0.0070
    0.0076
   -0.0206
S33 =
   -0.0078
   -0.0050
   -0.0031
    0.0078
    0.0050
   -0.0144
S34 =
    0.0298
   -0.0084
   -0.0115
   -0.0298
    0.0084
   -0.0179
S35 =
   -0.0079
   -0.0103
   -0.0127
    0.0079
    0.0103
   -0.0232
S36 =
    0.9077
         0
   -0.0000
   -0.9077
         0
   -0.0000
S37 =
   -0.7194
    0.0000
         0
    0.7194
   -0.0000
         0
S38 =
    0.3585
    0.0000
    0.0000
   -0.3585
   -0.0000
    0.0000
S39 =
   -0.2947
   -0.0000
   -0.0000
    0.2947
    0.0000
   -0.0000
S40 =
   -0.0018
    0.0000
    0.0000
    0.0018
   -0.0000
    0.0000
S41 =
   -0.1256
    0.0000
    0.0000
    0.1256
   -0.0000
    0.0000
S42 =
    0.0936
    0.0000
    0.0000
   -0.0936
   -0.0000
    0.0000

S43 =
   -0.1486
    0.0000
    0.0000
    0.1486
   -0.0000
         0
S44 =
   -0.0390
    0.0000
    0.0000
    0.0390
   -0.0000
    0.0000
S45 =
   -0.0028
    0.0000
    0.0000
    0.0028
   -0.0000
    0.0000
```

Lampiran 12: *Output* Gaya-gaya Batang dari *software* ETABS Kasus 2

C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
LT5	C5	Min Value	-0.0070	-0.0076	0.0000	0.0000	0.0000	-0.0060
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0070	-0.0076	0.0000	0.0000	0.0000	0.0206
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C6	Min Value	0.0078	-0.0050	0.0000	0.0000	0.0000	-0.0032
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0078	-0.0050	0.0000	0.0000	0.0000	0.0144
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C7	Min Value	-0.0298	-0.0084	0.0000	0.0000	0.0000	-0.0116
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0298	-0.0084	0.0000	0.0000	0.0000	0.0179
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C8	Min Value	0.0079	-0.0103	0.0000	0.0000	0.0000	-0.0127
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0079	-0.0103	0.0000	0.0000	0.0000	0.0232
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C5	Min Value	-0.0169	-0.0140	0.0000	0.0000	0.0000	-0.0255
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0169	-0.0140	0.0000	0.0000	0.0000	0.0235
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C6	Min Value	-0.0371	-0.0151	0.0000	0.0000	0.0000	-0.0275
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0371	-0.0151	0.0000	0.0000	0.0000	0.0252
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C7	Min Value	0.0086	-0.0087	0.0000	0.0000	0.0000	-0.0141
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0086	-0.0087	0.0000	0.0000	0.0000	0.0165
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C8	Min Value	0.0177	-0.0090	0.0000	0.0000	0.0000	-0.0149
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0177	-0.0090	0.0000	0.0000	0.0000	0.0167
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C5	Min Value	-0.0262	0.0006	0.0000	0.0000	0.0000	0.0025
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0262	0.0006	0.0000	0.0000	0.0000	0.0044
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C6	Min Value	-0.1379	0.0024	0.0000	0.0000	0.0000	-0.0009
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1379	0.0024	0.0000	0.0000	0.0000	0.0076
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C7	Min Value	0.0720	-0.0104	0.0000	0.0000	0.0000	-0.0201
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0720	-0.0104	0.0000	0.0000	0.0000	0.0163
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C8	Min Value	0.0280	-0.0101	0.0000	0.0000	0.0000	-0.0195
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0280	-0.0101	0.0000	0.0000	0.0000	0.0159
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C5	Min Value	-0.0367	-0.0175	0.0000	0.0000	0.0000	-0.0252
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0367	-0.0175	0.0000	0.0000	0.0000	0.0359
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C6	Min Value	-0.2756	-0.0215	0.0000	0.0000	0.0000	-0.0337
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2756	-0.0215	0.0000	0.0000	0.0000	0.0416
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C7	Min Value	0.3071	-0.0029	0.0000	0.0000	0.0000	-0.0013
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3071	-0.0029	0.0000	0.0000	0.0000	0.0090
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C8	Min Value	0.0373	-0.0016	0.0000	0.0000	0.0000	0.0030
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0373	-0.0016	0.0000	0.0000	0.0000	0.0085
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C5	Min Value	-0.0485	-0.0030	0.0000	0.0000	0.0000	0.0000

		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0485	-0.0030	0.0000	0.0000	0.0000	0.0106
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C6	Min Value	-0.8108	-0.0040	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.8108	-0.0040	0.0000	0.0000	0.0000	0.0139
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C7	Min Value	0.9063	-0.0118	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.9063	-0.0118	0.0000	0.0000	0.0000	0.0412
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C8	Min Value	0.0480	-0.0101	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0480	-0.0101	0.0000	0.0000	0.0000	0.0355
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

B E A M F O R C E E N V E L O P E S

STORY	BEAM	ITEM	P	V2	V3	T	M2	M3
LT5	B4	Min Value	-0.0076	-0.0070	0.0000	0.0000	0.0000	-0.0206
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0076	-0.0070	0.0000	0.0000	0.0000	0.0215
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B5	Min Value	-0.0151	0.0022	0.0000	0.0000	0.0000	-0.0062
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0151	0.0022	0.0000	0.0000	0.0000	0.0071
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B6	Min Value	0.0103	-0.0079	0.0000	0.0000	0.0000	-0.0241
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0103	-0.0079	0.0000	0.0000	0.0000	0.0232
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B4	Min Value	-0.0064	-0.0099	0.0000	0.0000	0.0000	-0.0295
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0064	-0.0099	0.0000	0.0000	0.0000	0.0296
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B5	Min Value	0.0775	0.0004	0.0000	0.0000	0.0000	-0.0014
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0775	0.0004	0.0000	0.0000	0.0000	0.0012
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B6	Min Value	-0.0012	-0.0098	0.0000	0.0000	0.0000	-0.0294
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0012	-0.0098	0.0000	0.0000	0.0000	0.0294
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B4	Min Value	0.0146	-0.0093	0.0000	0.0000	0.0000	-0.0280
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0146	-0.0093	0.0000	0.0000	0.0000	0.0280
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B5	Min Value	0.0045	0.0003	0.0000	0.0000	0.0000	-0.0004
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0045	0.0003	0.0000	0.0000	0.0000	0.0013
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B6	Min Value	0.0011	-0.0103	0.0000	0.0000	0.0000	-0.0309
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0011	-0.0103	0.0000	0.0000	0.0000	0.0308
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B4	Min Value	-0.0180	-0.0105	0.0000	0.0000	0.0000	-0.0315
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0180	-0.0105	0.0000	0.0000	0.0000	0.0315
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B5	Min Value	0.1852	-0.0006	0.0000	0.0000	0.0000	-0.0026
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1852	-0.0006	0.0000	0.0000	0.0000	0.0010
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B6	Min Value	-0.0086	-0.0094	0.0000	0.0000	0.0000	-0.0281
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0086	-0.0094	0.0000	0.0000	0.0000	0.0280
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B4	Min Value	0.0144	-0.0118	0.0000	0.0000	0.0000	-0.0359

		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0144	-0.0118	0.0000	0.0000	0.0000	0.0352
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B5	Min Value	-0.2798	-0.0039	0.0000	0.0000	0.0000	-0.0125
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2798	-0.0039	0.0000	0.0000	0.0000	0.0109
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B6	Min Value	0.0086	-0.0107	0.0000	0.0000	0.0000	-0.0316
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0086	-0.0107	0.0000	0.0000	0.0000	0.0325
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

B R A C E F O R C E E N V E L O P E S

STORY	BRACE	ITEM	P	V2	V3	T	M2	M3
LT5	D7	Min Value	0.0391	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0391	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	D8	Min Value	0.0028	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0028	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D7	Min Value	-0.0936	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0936	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D8	Min Value	0.1486	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1486	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D7	Min Value	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0019	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D8	Min Value	0.1256	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1256	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D7	Min Value	-0.3585	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.3585	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D8	Min Value	0.2947	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2947	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D7	Min Value	-0.9078	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.9078	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D8	Min Value	0.7195	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.7195	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
LT5	C5	Min Value	0.0073	0.0076	0.0000	0.0000	0.0000	-0.0215
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0073	0.0076	0.0000	0.0000	0.0000	0.0051
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C6	Min Value	-0.0056	0.0049	0.0000	0.0000	0.0000	-0.0149
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0056	0.0049	0.0000	0.0000	0.0000	0.0022
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C7	Min Value	0.0317	0.0080	0.0000	0.0000	0.0000	-0.0174
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0317	0.0080	0.0000	0.0000	0.0000	0.0104
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C8	Min Value	-0.0077	0.0099	0.0000	0.0000	0.0000	-0.0228
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0077	0.0099	0.0000	0.0000	0.0000	0.0119
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C5	Min Value	0.0178	0.0156	0.0000	0.0000	0.0000	-0.0263
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0178	0.0156	0.0000	0.0000	0.0000	0.0283
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C6	Min Value	0.0560	0.0169	0.0000	0.0000	0.0000	-0.0286
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0560	0.0169	0.0000	0.0000	0.0000	0.0307
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C7	Min Value	-0.0203	0.0103	0.0000	0.0000	0.0000	-0.0181
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0203	0.0103	0.0000	0.0000	0.0000	0.0178
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C8	Min Value	-0.0175	0.0099	0.0000	0.0000	0.0000	-0.0175
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0175	0.0099	0.0000	0.0000	0.0000	0.0170
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C5	Min Value	0.0278	-0.0007	0.0000	0.0000	0.0000	-0.0039
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0278	-0.0007	0.0000	0.0000	0.0000	-0.0016
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C6	Min Value	0.1764	-0.0024	0.0000	0.0000	0.0000	-0.0065
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1764	-0.0024	0.0000	0.0000	0.0000	0.0018
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C7	Min Value	-0.1048	0.0048	0.0000	0.0000	0.0000	-0.0114
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1048	0.0048	0.0000	0.0000	0.0000	0.0053
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C8	Min Value	-0.0274	0.0052	0.0000	0.0000	0.0000	-0.0126
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0274	0.0052	0.0000	0.0000	0.0000	0.0058
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C5	Min Value	0.0384	0.0212	0.0000	0.0000	0.0000	-0.0359
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0384	0.0212	0.0000	0.0000	0.0000	0.0384
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C6	Min Value	0.4561	0.0254	0.0000	0.0000	0.0000	-0.0430
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.4561	0.0254	0.0000	0.0000	0.0000	0.0458
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C7	Min Value	-0.3398	0.0221	0.0000	0.0000	0.0000	-0.0333
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.3398	0.0221	0.0000	0.0000	0.0000	0.0443
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C8	Min Value	-0.0384	0.0187	0.0000	0.0000	0.0000	-0.0274
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0384	0.0187	0.0000	0.0000	0.0000	0.0380
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C5	Min Value	0.0474	-0.0033	0.0000	0.0000	0.0000	0.0000

		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0474	-0.0033	0.0000	0.0000	0.0000	0.0114
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C6	Min Value	0.7417	-0.0032	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.7417	-0.0032	0.0000	0.0000	0.0000	0.0113
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C7	Min Value	-0.6947	-0.0040	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.6947	-0.0040	0.0000	0.0000	0.0000	0.0140
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C8	Min Value	-0.0463	-0.0041	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0463	-0.0041	0.0000	0.0000	0.0000	0.0143
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

B E A M F O R C E E N V E L O P E S

STORY	BEAM	ITEM	P	V2	V3	T	M2	M3
LT5	B4	Min Value	0.0076	0.0073	0.0000	0.0000	0.0000	-0.0224
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0076	0.0073	0.0000	0.0000	0.0000	0.0215
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B5	Min Value	0.0193	-0.0023	0.0000	0.0000	0.0000	-0.0075
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0193	-0.0023	0.0000	0.0000	0.0000	0.0062
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B6	Min Value	-0.0099	0.0077	0.0000	0.0000	0.0000	-0.0228
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0099	0.0077	0.0000	0.0000	0.0000	0.0236
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B4	Min Value	0.0080	0.0105	0.0000	0.0000	0.0000	-0.0315
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0080	0.0105	0.0000	0.0000	0.0000	0.0315
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B5	Min Value	-0.0950	-0.0003	0.0000	0.0000	0.0000	-0.0008
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0950	-0.0003	0.0000	0.0000	0.0000	0.0008
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B6	Min Value	0.0000	0.0098	0.0000	0.0000	0.0000	-0.0293
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0000	0.0098	0.0000	0.0000	0.0000	0.0293
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B4	Min Value	-0.0162	0.0100	0.0000	0.0000	0.0000	-0.0299
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0162	0.0100	0.0000	0.0000	0.0000	0.0299
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B5	Min Value	-0.0109	-0.0002	0.0000	0.0000	0.0000	-0.0010
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0109	-0.0002	0.0000	0.0000	0.0000	0.0004
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B6	Min Value	0.0046	0.0099	0.0000	0.0000	0.0000	-0.0296
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0046	0.0099	0.0000	0.0000	0.0000	0.0296
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B4	Min Value	0.0219	0.0106	0.0000	0.0000	0.0000	-0.0318
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0219	0.0106	0.0000	0.0000	0.0000	0.0320
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B5	Min Value	-0.2012	0.0017	0.0000	0.0000	0.0000	-0.0056
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2012	0.0017	0.0000	0.0000	0.0000	0.0047
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B6	Min Value	-0.0134	0.0110	0.0000	0.0000	0.0000	-0.0332
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0134	0.0110	0.0000	0.0000	0.0000	0.0330
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B4	Min Value	-0.0245	0.0089	0.0000	0.0000	0.0000	-0.0267

		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0245	0.0089	0.0000	0.0000	0.0000	0.0269
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B5	Min Value	-0.1417	0.0024	0.0000	0.0000	0.0000	-0.0068
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1417	0.0024	0.0000	0.0000	0.0000	0.0078
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B6	Min Value	0.0227	0.0079	0.0000	0.0000	0.0000	-0.0237
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0227	0.0079	0.0000	0.0000	0.0000	0.0234
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

B R A C E F O R C E E N V E L O P E S

STORY	BRACE	ITEM	P	V2	V3	T	M2	M3
LT5	D7	Min Value	-0.0430	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0430	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	D8	Min Value	-0.0079	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0079	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D7	Min Value	0.1153	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1153	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D8	Min Value	-0.1867	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1867	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D7	Min Value	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0009	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D8	Min Value	-0.1438	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1438	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D7	Min Value	0.3411	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3411	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D8	Min Value	-0.5721	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.5721	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D7	Min Value	0.1430	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1430	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D8	Min Value	-0.2386	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2386	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

Lampiran 13: *Coding* Matlab Menghitung F_U Kasus Kerusakan 3

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
```

```
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(23,i);mode(47,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fu3=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 14: *Coding* Matlab Menghitung F_D Kasus Kerusakan 3

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);%//---
-damage member ----//
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);%//-
---damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);%//-
---damage member ----//
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
Ad=A2*0.5;%//----damage
member ----//
I1=5.536e-4;%m4
I2=2.176e-4;
Id=I2*0.5;%//----damage
member ----//
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,Ad,Id,L36,f2,vs);
K36=kg(k36,T36);%//----
damage member ----//
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,Ad,Id,L40,f2,vs);
K40=kg(k40,T40);%//----
damage member ----//
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,Ad,Id,L44,f2,vs);
K44=kg(k44,T44);%//----
damage member ----//
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
```

```
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*Ad,L36);%//----
damage member ----//
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*Ad,L40);%//----
damage member ----//
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*Ad,L44);%//----
damage member ----//
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks);
[w,worder]=sort(sqrt(diag(ei
gval)))
mode=eigv(:,worder)

i=1:84;
pim=[mode(23,i);mode(47,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fd3=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 15: *Coding* Matlab Menghitung SVD Kasus Kerusakan 3

```
Fu3 =1.0e-004 *[0.0583    0.0804; 0.0804    0.2125]
Fd3 =1.0e-004 *[0.0650    0.0881; 0.0881    0.2247]

Fdel=Fu3-Fd3
[u,s,v]=svd(Fdel)
```

Lampiran 16: *Coding* Matlab Menghitung Gaya Batang Kasus Kerusakan 3

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
```

```
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks);
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder);

i=1:84;
pim=[mode(23,i);mode(47,i)];
v=sqrtm(mode'*Mr*mode);
wm=diag(w(1:84));
Fu3=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))';

R=zeros(84,1);
R(23,1)=0.8174;
R(47,1)=-0.5760;

U=solv(Ks,R);

u1=dissf(U,id1,T1);
u2=dissf(U,id2,T2);
u3=dissf(U,id3,T3);
u4=dissf(U,id4,T4);
u5=dissf(U,id5,T5);
u6=dissf(U,id6,T6);
u7=dissf(U,id7,T7);
u8=dissf(U,id8,T8);
u9=dissf(U,id9,T9);
u10=dissf(U,id10,T10);
u11=dissf(U,id11,T11);
u12=dissf(U,id12,T12);
u13=dissf(U,id13,T13);
u14=dissf(U,id14,T14);
u15=dissf(U,id15,T15);

u16=dissf(U,id16,T16);
u17=dissf(U,id17,T17);
u18=dissf(U,id18,T18);
u19=dissf(U,id19,T19);
```

```
u20=dissf(U,id20,T20);
u21=dissf(U,id21,T21);
u22=dissf(U,id22,T22);
u23=dissf(U,id23,T23);
u24=dissf(U,id24,T24);
u25=dissf(U,id25,T25);
u26=dissf(U,id26,T26);
u27=dissf(U,id27,T27);
u28=dissf(U,id28,T28);
u29=dissf(U,id29,T29);
u30=dissf(U,id30,T30);
u31=dissf(U,id31,T31);
u32=dissf(U,id32,T32);
u33=dissf(U,id33,T33);
u34=dissf(U,id34,T34);
u35=dissf(U,id35,T35);

u36=dissf(U,id36,T36);
u37=dissf(U,id37,T37);
u38=dissf(U,id38,T38);
u39=dissf(U,id39,T39);
u40=dissf(U,id40,T40);
u41=dissf(U,id41,T41);
u42=dissf(U,id42,T42);
u43=dissf(U,id43,T43);
u44=dissf(U,id44,T44);
u45=dissf(U,id45,T45);

So1=zeros(6,1);
So2=zeros(6,1);
So3=zeros(6,1);
So4=zeros(6,1);
So5=zeros(6,1);
So6=zeros(6,1);
So7=zeros(6,1);
So8=zeros(6,1);
So9=zeros(6,1);
So10=zeros(6,1);
So11=zeros(6,1);
So12=zeros(6,1);
So13=zeros(6,1);
So14=zeros(6,1);
So15=zeros(6,1);
So16=zeros(6,1);
So17=zeros(6,1);
So18=zeros(6,1);
So19=zeros(6,1);
So20=zeros(6,1);
So21=zeros(6,1);
So22=zeros(6,1);
So23=zeros(6,1);
So24=zeros(6,1);
So25=zeros(6,1);
So26=zeros(6,1);
So27=zeros(6,1);
So28=zeros(6,1);
So29=zeros(6,1);
So30=zeros(6,1);
So31=zeros(6,1);
So32=zeros(6,1);
So33=zeros(6,1);
So34=zeros(6,1);
So35=zeros(6,1);
So36=zeros(6,1);
So37=zeros(6,1);
So38=zeros(6,1);
So39=zeros(6,1);
So40=zeros(6,1);
So41=zeros(6,1);
So42=zeros(6,1);
So43=zeros(6,1);
So44=zeros(6,1);
So45=zeros(6,1);

S1=stref(k1,u1,So1)
S2=stref(k2,u2,So2)
S3=stref(k3,u3,So3)
S4=stref(k4,u4,So4)
S5=stref(k5,u5,So5)
S6=stref(k6,u6,So6)
S7=stref(k7,u7,So7)
S8=stref(k8,u8,So8)
S9=stref(k9,u9,So9)
S10=stref(k10,u10,So10)
S11=stref(k11,u11,So11)
S12=stref(k12,u12,So12)
S13=stref(k13,u13,So13)
S14=stref(k14,u14,So14)
S15=stref(k15,u15,So15)

S16=stref(k16,u16,So16)
S17=stref(k17,u17,So17)
S18=stref(k18,u18,So18)
S19=stref(k19,u19,So19)
S20=stref(k20,u20,So20)
S21=stref(k21,u21,So21)
S22=stref(k22,u22,So22)
S23=stref(k23,u23,So23)
S24=stref(k24,u24,So24)
S25=stref(k25,u25,So25)
S26=stref(k26,u26,So26)
S27=stref(k27,u27,So27)
S28=stref(k28,u28,So28)
S29=stref(k29,u29,So29)
S30=stref(k30,u30,So30)
S31=stref(k31,u31,So31)
S32=stref(k32,u32,So32)
S33=stref(k33,u33,So33)
S34=stref(k34,u34,So34)
S35=stref(k35,u35,So35)

S36=stref(k36,u36,So36)
S37=stref(k37,u37,So37)
S38=stref(k38,u38,So38)
S39=stref(k39,u39,So39)
S40=stref(k40,u40,So40)
S41=stref(k41,u41,So41)
S42=stref(k42,u42,So42)
S43=stref(k43,u43,So43)
S44=stref(k44,u44,So44)
S45=stref(k45,u45,So45)
```

Lampiran 17: *Output* Gaya-gaya Batang dari *software* Matlab pada Kasus Kerusakan 3

```
S1 =
   -0.0049
    0.0015
    0.0042
    0.0049
   -0.0015
    0.0045
S2 =
    0.0379
   -0.0019
   -0.0048
   -0.0379
    0.0019
   -0.0064
S3 =
   -0.0086
    0.0000
    0.0002
    0.0086
   -0.0000
   -0.0001
S4 =
   -0.0087
    0.0069
    0.0207
    0.0087
   -0.0069
    0.0207
S5 =
   -0.2549
    0.0001
    0.0003
    0.2549
   -0.0001
    0.0000
S6 =
    0.0267
    0.0065
    0.0195
   -0.0267
   -0.0065
    0.0195
S7 =
   -0.0020
    0.0112
    0.0338
    0.0020
   -0.0112
    0.0336
S8 =
    0.0105
    0.0023
    0.0055
   -0.0105
   -0.0023
    0.0082
S9 =
   -0.0025
    0.0133
    0.0399
    0.0025
   -0.0133
    0.0401
S10 =
    0.0024
    0.0114
   -0.0342
   -0.0024
   -0.0114
    0.0341
S11 =
    0.1812
    0.0003
   -0.0010
   -0.1812
   -0.0003
    0.0007
S12 =
   -0.0110
    0.0109
    0.0326
    0.0110
   -0.0109
    0.0328
S13 =
    0.0105
    0.0087
    0.0255
   -0.0105
   -0.0087
    0.0264
S14 =
   -0.0361
   -0.0025
   -0.0064
    0.0361
    0.0025
   -0.0084
S15 =
   -0.0051
    0.0068
    0.0208
    0.0051
   -0.0068
    0.0198
S16 =
    0.0396
    0.0027
   -0.0000
   -0.0396
   -0.0027
    0.0095
S17 =
    0.3361
    0.0033
    0.0000
   -0.3361
   -0.0033
    0.0116
S18 =
   -0.3509
   -0.0002
    0.0000
    0.3509
    0.0002
   -0.0006
S19 =
   -0.0375
   -0.0004
    0.0000
    0.0375
    0.0004
   -0.0015
S20 =
    0.0382
   -0.0022
   -0.0137
   -0.0382
    0.0022
    0.0060
S21 =
    0.5173
   -0.0011
   -0.0112
   -0.5173
    0.0011
    0.0072
S22 =
   -0.4443
    0.0108
    0.0069
    0.4443
   -0.0108
    0.0311
S23 =
   -0.0375
    0.0082
    0.0016
    0.0375
   -0.0082
    0.0270
S24 =
    0.0313
   -0.0109
   -0.0268
   -0.0313
    0.0109
   -0.0115
S25 =
    0.4449
   -0.0121
   -0.0283
   -0.4449
    0.0121
   -0.0141
S26 =
   -0.3622
   -0.0211
   -0.0505
    0.3622
    0.0211
   -0.0235
S27 =
   -0.0310
   -0.0186
   -0.0465
    0.0310
    0.0186
   -0.0186
S28 =
    0.0200
   -0.0129
   -0.0224
   -0.0200
    0.0129
   -0.0228
S29 =
    0.0800
   -0.0142
   -0.0250
   -0.0800
    0.0142
   -0.0248
S30 =
   -0.1473
   -0.0178
   -0.0246
    0.1473
    0.0178
   -0.0375
S31 =
   -0.0176
   -0.0161
   -0.0216
    0.0176
    0.0161
   -0.0347
S32 =
    0.0087
   -0.0105
   -0.0114
   -0.0087
    0.0105
   -0.0255
S33 =
   -0.0434
   -0.0087
   -0.0103
    0.0434
    0.0087
   -0.0200
S34 =
   -0.0075
   -0.0023
    0.0042
    0.0075
    0.0023
   -0.0124
S35 =
   -0.0068
   -0.0051
    0.0020
    0.0068
    0.0051
   -0.0198
S36 =
   -0.1241
    0.0000
    0.0000
   -0.0000
S37 =
    0.1492
   -0.0000
   -0.0000
   -0.1492
    0.0000
   -0.0000
S38 =
   -0.2038
   -0.0000
   -0.0000
    0.2038
    0.0000
   -0.0000
S39 =
    0.0575
         0
   -0.0000
   -0.0575
         0
   -0.0000
S40 =
    0.2148
    0.0000
   -0.0000
   -0.2148
   -0.0000
   -0.0000
S41 =
   -0.3794
   -0.0000
   -0.0000
    0.3794
    0.0000
   -0.0000
S42 =
    0.3625
    0.0000
   -0.0000
   -0.3625
   -0.0000
   -0.0000
S43 =
   -0.2338
         0
   -0.0000
    0.2338
         0
   -0.0000
S44 =
    0.0333
   -0.0000
   -0.0000
   -0.0333
    0.0000
   -0.0000
S45 =
    0.0641
    0.0000
    0.0000
   -0.0641
   -0.0000
         0
```

Lampiran 18: *Output* Gaya-gaya Batang dari *software* ETABS Kasus 3

ETABS v9.7.0 File:CASE 3 Units:KN-m May 15, 2013 8:27 PAGE 4

C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
LT5	C5	Min Value	-0.0087	-0.0105	0.0000	0.0000	0.0000	-0.0114
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0087	-0.0105	0.0000	0.0000	0.0000	0.0255
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C6	Min Value	0.0434	-0.0087	0.0000	0.0000	0.0000	-0.0103
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0434	-0.0087	0.0000	0.0000	0.0000	0.0200
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C7	Min Value	0.0075	-0.0024	0.0000	0.0000	0.0000	0.0042
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0075	-0.0024	0.0000	0.0000	0.0000	0.0124
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C8	Min Value	0.0068	-0.0051	0.0000	0.0000	0.0000	0.0019
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0068	-0.0051	0.0000	0.0000	0.0000	0.0198
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C5	Min Value	-0.0200	-0.0129	0.0000	0.0000	0.0000	-0.0224
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0200	-0.0129	0.0000	0.0000	0.0000	0.0228
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C6	Min Value	-0.0800	-0.0142	0.0000	0.0000	0.0000	-0.0250
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0800	-0.0142	0.0000	0.0000	0.0000	0.0248
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C7	Min Value	0.1472	-0.0177	0.0000	0.0000	0.0000	-0.0246
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1472	-0.0177	0.0000	0.0000	0.0000	0.0375
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C8	Min Value	0.0177	-0.0161	0.0000	0.0000	0.0000	-0.0216
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0177	-0.0161	0.0000	0.0000	0.0000	0.0347
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C5	Min Value	-0.0313	-0.0109	0.0000	0.0000	0.0000	-0.0268
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0313	-0.0109	0.0000	0.0000	0.0000	0.0115
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C6	Min Value	-0.4449	-0.0121	0.0000	0.0000	0.0000	-0.0283
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.4449	-0.0121	0.0000	0.0000	0.0000	0.0141
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C7	Min Value	0.3622	-0.0211	0.0000	0.0000	0.0000	-0.0505
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3622	-0.0211	0.0000	0.0000	0.0000	0.0234
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C8	Min Value	0.0310	-0.0186	0.0000	0.0000	0.0000	-0.0464
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0310	-0.0186	0.0000	0.0000	0.0000	0.0186
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C5	Min Value	-0.0382	-0.0022	0.0000	0.0000	0.0000	-0.0137
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0382	-0.0022	0.0000	0.0000	0.0000	-0.0060
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C6	Min Value	-0.5173	-0.0012	0.0000	0.0000	0.0000	-0.0112
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.5173	-0.0012	0.0000	0.0000	0.0000	-0.0072
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C7	Min Value	0.4443	0.0108	0.0000	0.0000	0.0000	-0.0310
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.4443	0.0108	0.0000	0.0000	0.0000	0.0069
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C8	Min Value	0.0375	0.0081	0.0000	0.0000	0.0000	-0.0269
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0375	0.0081	0.0000	0.0000	0.0000	0.0016
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C5	Min Value	-0.0397	0.0027	0.0000	0.0000	0.0000	-0.0095
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0397	0.0027	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C6	Min Value	-0.3360	0.0033	0.0000	0.0000	0.0000	-0.0115
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.3360	0.0033	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C7	Min Value	0.3508	-0.0002	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3508	-0.0002	0.0000	0.0000	0.0000	0.0006

		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C8	Min Value	0.0375	-0.0004	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0375	-0.0004	0.0000	0.0000	0.0000	0.0015
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 3 Units:KN-m May 15, 2013 8:27 PAGE 5

B E A M F O R C E E N V E L O P E S

STORY	BEAM	ITEM	P	V2	V3	T	M2	M3
LT5	B4	Min Value	-0.0105	-0.0087	0.0000	0.0000	0.0000	-0.0255
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0105	-0.0087	0.0000	0.0000	0.0000	0.0265
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B5	Min Value	0.0361	0.0025	0.0000	0.0000	0.0000	-0.0084
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0361	0.0025	0.0000	0.0000	0.0000	0.0064
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B6	Min Value	0.0051	-0.0068	0.0000	0.0000	0.0000	-0.0208
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0051	-0.0068	0.0000	0.0000	0.0000	0.0198
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B4	Min Value	-0.0024	-0.0114	0.0000	0.0000	0.0000	-0.0342
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0024	-0.0114	0.0000	0.0000	0.0000	0.0341
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B5	Min Value	-0.1812	-0.0003	0.0000	0.0000	0.0000	-0.0010
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1812	-0.0003	0.0000	0.0000	0.0000	0.0007
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B6	Min Value	0.0110	-0.0109	0.0000	0.0000	0.0000	-0.0326
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0110	-0.0109	0.0000	0.0000	0.0000	0.0328
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B4	Min Value	0.0020	-0.0112	0.0000	0.0000	0.0000	-0.0338
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0020	-0.0112	0.0000	0.0000	0.0000	0.0336
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B5	Min Value	-0.0105	-0.0023	0.0000	0.0000	0.0000	-0.0055
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0105	-0.0023	0.0000	0.0000	0.0000	0.0081
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B6	Min Value	0.0025	-0.0133	0.0000	0.0000	0.0000	-0.0399
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0025	-0.0133	0.0000	0.0000	0.0000	0.0401
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B4	Min Value	0.0087	-0.0069	0.0000	0.0000	0.0000	-0.0207
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0087	-0.0069	0.0000	0.0000	0.0000	0.0207
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B5	Min Value	0.2549	-0.0001	0.0000	0.0000	0.0000	-0.0003
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2549	-0.0001	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B6	Min Value	-0.0267	-0.0065	0.0000	0.0000	0.0000	-0.0195
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0267	-0.0065	0.0000	0.0000	0.0000	0.0195
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B4	Min Value	0.0049	-0.0015	0.0000	0.0000	0.0000	-0.0042
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0049	-0.0015	0.0000	0.0000	0.0000	0.0045
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B5	Min Value	-0.0379	0.0019	0.0000	0.0000	0.0000	-0.0064
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0379	0.0019	0.0000	0.0000	0.0000	0.0048
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B6	Min Value	0.0086	0.0000	0.0000	0.0000	0.0000	-0.0002
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0086	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 3 Units:KN-m May 15, 2013 8:27 PAGE 6

B R A C E F O R C E E N V E L O P E S

STORY	BRACE	ITEM	P	V2	V3	T	M2	M3
LT5	D7	Min Value	-0.0332	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0332	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT5	D8	Min Value	-0.0641	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0641	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D7	Min Value	-0.3625	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.3625	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D8	Min Value	0.2338	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2338	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D7	Min Value	-0.2148	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2148	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D8	Min Value	0.3795	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3795	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D7	Min Value	0.2039	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2039	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D8	Min Value	-0.0576	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0576	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D7	Min Value	0.1241	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1241	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D8	Min Value	-0.1492	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1492	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

Lampiran 19: *Coding* Matlab Menghitung F_U Kasus Kerusakan 4

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);

k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
```

```
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(11,i);mode(35,i);m
ode(59,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fu4=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 20: *Coding* Matlab Menghitung F_D Kasus Kerusakan 4

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);%//---
-damage member ----//
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);%//-
---damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);%//-
---damage member ----//
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
Ad=A2*0.5;%//----damage
member ----//
I1=5.536e-4;%m4
I2=2.176e-4;
Id=I2*0.5;%//----damage
member ----//
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,Ad,Id,L36,f2,vs);
K36=kg(k36,T36);%//----
damage member ----//
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,Ad,Id,L40,f2,vs);
K40=kg(k40,T40);%//----
damage member ----//
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,Ad,Id,L44,f2,vs);
K44=kg(k44,T44);%//----
damage member ----//
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
```

```
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*Ad,L36);%//----
damage member ----//
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*Ad,L40);%//----
damage member ----//
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*Ad,L44);%//----
damage member ----//
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks);
[w,worder]=sort(sqrt(diag(ei
gval)))
mode=eigv(:,worder)

i=1:84;
pim=[mode(11,i);mode(35,i);m
ode(59,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fd4=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 21: *Coding* Matlab Menghitung SVD Kasus Kerusakan 4

```
Fu4 =1.0e-004 *[0.0244    0.0279    0.0343;0.0279    0.1173    0.1691;0.0343    0.1691
0.3553]
Fd4 =1.0e-004 *[0.0336    0.0356    0.0420;0.0356    0.1320    0.1818;0.0420    0.1818
0.3745]

Fdel=Fu4-Fd4
[u,s,v]=svd(Fdel)
```

Lampiran 22: *Coding* Matlab Menghitung Gaya Batang Kasus Kerusakan 4

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
```

```
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks);
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder);

i=1:84;
pim=[mode(11,i);mode(35,i);m
ode(59,i)];
v=sqrtm(mode'*Mr*mode);
wm=diag(w(1:84));
Fu4=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))';

R=zeros(84,1);
R(11,1)=-0.5572;
R(35,1)=0.7585;
R(59,1)=-0.3379;

U=solv(Ks,R);

u1=dissf(U,id1,T1);
u2=dissf(U,id2,T2);
u3=dissf(U,id3,T3);
u4=dissf(U,id4,T4);
u5=dissf(U,id5,T5);
u6=dissf(U,id6,T6);
u7=dissf(U,id7,T7);
u8=dissf(U,id8,T8);
u9=dissf(U,id9,T9);
u10=dissf(U,id10,T10);
u11=dissf(U,id11,T11);
u12=dissf(U,id12,T12);
u13=dissf(U,id13,T13);
u14=dissf(U,id14,T14);
u15=dissf(U,id15,T15);

u16=dissf(U,id16,T16);
u17=dissf(U,id17,T17);
```

```
u18=dissf(U,id18,T18);
u19=dissf(U,id19,T19);
u20=dissf(U,id20,T20);
u21=dissf(U,id21,T21);
u22=dissf(U,id22,T22);
u23=dissf(U,id23,T23);
u24=dissf(U,id24,T24);
u25=dissf(U,id25,T25);
u26=dissf(U,id26,T26);
u27=dissf(U,id27,T27);
u28=dissf(U,id28,T28);
u29=dissf(U,id29,T29);
u30=dissf(U,id30,T30);
u31=dissf(U,id31,T31);
u32=dissf(U,id32,T32);
u33=dissf(U,id33,T33);
u34=dissf(U,id34,T34);
u35=dissf(U,id35,T35);

u36=dissf(U,id36,T36);
u37=dissf(U,id37,T37);
u38=dissf(U,id38,T38);
u39=dissf(U,id39,T39);
u40=dissf(U,id40,T40);
u41=dissf(U,id41,T41);
u42=dissf(U,id42,T42);
u43=dissf(U,id43,T43);
u44=dissf(U,id44,T44);
u45=dissf(U,id45,T45);

So1=zeros(6,1);
So2=zeros(6,1);
So3=zeros(6,1);
So4=zeros(6,1);
So5=zeros(6,1);
So6=zeros(6,1);
So7=zeros(6,1);
So8=zeros(6,1);
So9=zeros(6,1);
So10=zeros(6,1);
So11=zeros(6,1);
So12=zeros(6,1);
So13=zeros(6,1);
So14=zeros(6,1);
So15=zeros(6,1);
So16=zeros(6,1);
So17=zeros(6,1);
So18=zeros(6,1);
So19=zeros(6,1);
So20=zeros(6,1);
So21=zeros(6,1);
So22=zeros(6,1);
So23=zeros(6,1);
So24=zeros(6,1);
So25=zeros(6,1);
So26=zeros(6,1);
So27=zeros(6,1);
So28=zeros(6,1);
So29=zeros(6,1);
So30=zeros(6,1);
So31=zeros(6,1);
So32=zeros(6,1);
So33=zeros(6,1);
So34=zeros(6,1);
So35=zeros(6,1);
So36=zeros(6,1);
So37=zeros(6,1);
So38=zeros(6,1);
So39=zeros(6,1);
So40=zeros(6,1);
So41=zeros(6,1);
So42=zeros(6,1);
So43=zeros(6,1);
So44=zeros(6,1);
So45=zeros(6,1);

S1=stref(k1,u1,So1)
S2=stref(k2,u2,So2)
S3=stref(k3,u3,So3)
S4=stref(k4,u4,So4)
S5=stref(k5,u5,So5)
S6=stref(k6,u6,So6)
S7=stref(k7,u7,So7)
S8=stref(k8,u8,So8)
S9=stref(k9,u9,So9)
S10=stref(k10,u10,So10)
S11=stref(k11,u11,So11)
S12=stref(k12,u12,So12)
S13=stref(k13,u13,So13)
S14=stref(k14,u14,So14)
S15=stref(k15,u15,So15)

S16=stref(k16,u16,So16)
S17=stref(k17,u17,So17)
S18=stref(k18,u18,So18)
S19=stref(k19,u19,So19)
S20=stref(k20,u20,So20)
S21=stref(k21,u21,So21)
S22=stref(k22,u22,So22)
S23=stref(k23,u23,So23)
S24=stref(k24,u24,So24)
S25=stref(k25,u25,So25)
S26=stref(k26,u26,So26)
S27=stref(k27,u27,So27)
S28=stref(k28,u28,So28)
S29=stref(k29,u29,So29)
S30=stref(k30,u30,So30)
S31=stref(k31,u31,So31)
S32=stref(k32,u32,So32)
S33=stref(k33,u33,So33)
S34=stref(k34,u34,So34)
S35=stref(k35,u35,So35)

S36=stref(k36,u36,So36)
S37=stref(k37,u37,So37)
S38=stref(k38,u38,So38)
S39=stref(k39,u39,So39)
S40=stref(k40,u40,So40)
S41=stref(k41,u41,So41)
S42=stref(k42,u42,So42)
S43=stref(k43,u43,So43)
S44=stref(k44,u44,So44)
S45=stref(k45,u45,So45)
```

Lampiran 23: *Output* Gaya-gaya Batang dari *software* Matlab Kasus 4

```
S1 =
    0.0069
   -0.0014
   -0.0044
   -0.0069
    0.0014
   -0.0043
S2 =
    0.1708
   -0.0007
   -0.0022
   -0.1708
    0.0007
   -0.0022
S3 =
   -0.0126
   -0.0013
   -0.0038
    0.0126
    0.0013
   -0.0039
S4 =
   -0.0014
   -0.0023
   -0.0071
    0.0014
    0.0023
   -0.0068
S5 =
    0.0087
   -0.0026
   -0.0065
   -0.0087
    0.0026
   -0.0089
S6 =
   -0.0026
   -0.0042
   -0.0126
    0.0026
    0.0042
   -0.0129
S7 =
   -0.0083
    0.0009
    0.0025
    0.0083
   -0.0009
    0.0026
S8 =
   -0.2344
   -0.0004
   -0.0012
    0.2344
    0.0004
   -0.0011
S9 =
    0.0225
    0.0010
    0.0031
   -0.0225
   -0.0010
    0.0030
S10 =
   -0.0023
    0.0044
    0.0132
    0.0023
   -0.0044
    0.0131
S11 =
    0.0139
    0.0017
    0.0041
   -0.0139
   -0.0017
    0.0061
S12 =
   -0.0058
    0.0061
    0.0183
    0.0058
   -0.0061
    0.0185
S13 =
    0.0070
    0.0043
    0.0130
   -0.0070
   -0.0043
    0.0130
S14 =
    0.1281
    0.0005
    0.0011
   -0.1281
   -0.0005
    0.0016
S15 =
   -0.0065
    0.0049
    0.0147
    0.0065
   -0.0049
    0.0149
S16 =
    0.0058
   -0.0019
         0
   -0.0058
    0.0019
   -0.0066
S17 =
   -0.0999
   -0.0019
    0.0000
    0.0999
    0.0019
   -0.0066
S18 =
    0.0426
   -0.0049
    0.0000
   -0.0426
    0.0049
   -0.0173
S19 =
   -0.0066
   -0.0048
   -0.0000
    0.0066
    0.0048
   -0.0169
S20 =
    0.0072
    0.0051
    0.0110
   -0.0072
   -0.0051
    0.0068
S21 =
   -0.0237
    0.0066
    0.0131
    0.0237
   -0.0066
    0.0100
S22 =
   -0.0367
    0.0094
    0.0233
    0.0367
   -0.0094
    0.0097
S23 =
   -0.0078
    0.0077
    0.0208
    0.0078
   -0.0077
    0.0062
S24 =
    0.0096
    0.0036
    0.0004
   -0.0096
   -0.0036
    0.0123
S25 =
    0.2729
    0.0050
    0.0034
   -0.2729
   -0.0050
    0.0142
S26 =
   -0.1941
    0.0129
    0.0118
    0.1941
   -0.0129
    0.0333
S27 =
   -0.0121
    0.0103
    0.0067
    0.0121
   -0.0103
    0.0293
S28 =
    0.0087
   -0.0047
   -0.0148
   -0.0087
    0.0047
   -0.0017
S29 =
    0.2989
   -0.0055
   -0.0156
   -0.2989
    0.0055
   -0.0035
S30 =
   -0.2219
   -0.0143
   -0.0353
    0.2219
    0.0143
   -0.0148
S31 =
   -0.0111
   -0.0123
   -0.0323
    0.0111
    0.0123
   -0.0107
S32 =
    0.0043
   -0.0070
   -0.0116
   -0.0043
    0.0070
   -0.0130
S33 =
    0.0621
   -0.0079
   -0.0137
   -0.0621
    0.0079
   -0.0141
S34 =
   -0.1098
   -0.0074
   -0.0096
    0.1098
    0.0074
   -0.0164
S35 =
   -0.0049
   -0.0065
   -0.0078
    0.0049
    0.0065
   -0.0149
S36 =
    0.1288
    0.0000
    0.0000
   -0.1288
   -0.0000
    0.0000
S37 =
   -0.0136
    0.0000
    0.0000
    0.0136
   -0.0000
    0.0000
S38 =
   -0.1663
   -0.0000
    0.0000
    0.1663
    0.0000
    0.0000
S39 =
    0.2873
   -0.0000
         0
   -0.2873
    0.0000
    0.0000
S40 =
   -0.3008
   -0.0000
    0.0000
    0.3008
    0.0000
    0.0000
S41 =
    0.1493
   -0.0000
   -0.0000
   -0.1493
    0.0000
   -0.0000
S42 =
    0.1003
    0.0000
   -0.0000
   -0.1003
   -0.0000
         0
S43 =
   -0.2484
    0.0000
         0
    0.2484
   -0.0000
         0
S44 =
    0.2268
   -0.0000
   -0.0000
   -0.2268
    0.0000
   -0.0000
S45 =
   -0.1310
    0.0000
    0.0000
    0.1310
   -0.0000
   -0.0000
```

C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
LT5	C5	Min Value	-0.0043	-0.0070	0.0000	0.0000	0.0000	-0.0116
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0043	-0.0070	0.0000	0.0000	0.0000	0.0130
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C6	Min Value	-0.0621	-0.0079	0.0000	0.0000	0.0000	-0.0137
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0621	-0.0079	0.0000	0.0000	0.0000	0.0141
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C7	Min Value	0.1098	-0.0074	0.0000	0.0000	0.0000	-0.0096
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1098	-0.0074	0.0000	0.0000	0.0000	0.0164
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C8	Min Value	0.0049	-0.0065	0.0000	0.0000	0.0000	-0.0078
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0049	-0.0065	0.0000	0.0000	0.0000	0.0149
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C5	Min Value	-0.0087	-0.0047	0.0000	0.0000	0.0000	-0.0148
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0087	-0.0047	0.0000	0.0000	0.0000	0.0017
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C6	Min Value	-0.2989	-0.0054	0.0000	0.0000	0.0000	-0.0156
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2989	-0.0054	0.0000	0.0000	0.0000	0.0035
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C7	Min Value	0.2219	-0.0143	0.0000	0.0000	0.0000	-0.0352
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2219	-0.0143	0.0000	0.0000	0.0000	0.0148
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C8	Min Value	0.0111	-0.0122	0.0000	0.0000	0.0000	-0.0322
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0111	-0.0122	0.0000	0.0000	0.0000	0.0107
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C5	Min Value	-0.0096	0.0036	0.0000	0.0000	0.0000	-0.0123
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0096	0.0036	0.0000	0.0000	0.0000	0.0004
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C6	Min Value	-0.2729	0.0050	0.0000	0.0000	0.0000	-0.0142
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2729	0.0050	0.0000	0.0000	0.0000	0.0034
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C7	Min Value	0.1941	0.0129	0.0000	0.0000	0.0000	-0.0332
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1941	0.0129	0.0000	0.0000	0.0000	0.0118
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C8	Min Value	0.0121	0.0103	0.0000	0.0000	0.0000	-0.0292
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0121	0.0103	0.0000	0.0000	0.0000	0.0067
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C5	Min Value	-0.0073	0.0051	0.0000	0.0000	0.0000	-0.0067
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0073	0.0051	0.0000	0.0000	0.0000	0.0109
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C6	Min Value	0.0237	0.0066	0.0000	0.0000	0.0000	-0.0099
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0237	0.0066	0.0000	0.0000	0.0000	0.0131
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C7	Min Value	0.0367	0.0094	0.0000	0.0000	0.0000	-0.0097
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0367	0.0094	0.0000	0.0000	0.0000	0.0232
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C8	Min Value	0.0078	0.0077	0.0000	0.0000	0.0000	-0.0062
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0078	0.0077	0.0000	0.0000	0.0000	0.0208
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C5	Min Value	-0.0058	-0.0019	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0058	-0.0019	0.0000	0.0000	0.0000	0.0066
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C6	Min Value	0.0999	-0.0019	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0999	-0.0019	0.0000	0.0000	0.0000	0.0066
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C7	Min Value	-0.0426	-0.0049	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0426	-0.0049	0.0000	0.0000	0.0000	0.0173
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT1	C8	Min Value	0.0066	-0.0048	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0066	-0.0048	0.0000	0.0000	0.0000	0.0169
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 4 Units:KN-m April 20, 2013 11:26 PAGE 5

B E A M F O R C E E N V E L O P E S

STORY	BEAM	ITEM	P	V2	V3	T	M2	M3
LT5	B4	Min Value	-0.0070	-0.0043	0.0000	0.0000	0.0000	-0.0130
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0070	-0.0043	0.0000	0.0000	0.0000	0.0130
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B5	Min Value	-0.1281	-0.0004	0.0000	0.0000	0.0000	-0.0011
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1281	-0.0004	0.0000	0.0000	0.0000	0.0016
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B6	Min Value	0.0065	-0.0049	0.0000	0.0000	0.0000	-0.0147
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0065	-0.0049	0.0000	0.0000	0.0000	0.0149
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B4	Min Value	0.0023	-0.0044	0.0000	0.0000	0.0000	-0.0132
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0023	-0.0044	0.0000	0.0000	0.0000	0.0131
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B5	Min Value	-0.0139	-0.0017	0.0000	0.0000	0.0000	-0.0041
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0139	-0.0017	0.0000	0.0000	0.0000	0.0061
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B6	Min Value	0.0058	-0.0061	0.0000	0.0000	0.0000	-0.0183
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0058	-0.0061	0.0000	0.0000	0.0000	0.0185
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B4	Min Value	0.0083	-0.0009	0.0000	0.0000	0.0000	-0.0025
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0083	-0.0009	0.0000	0.0000	0.0000	0.0026
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B5	Min Value	0.2344	0.0004	0.0000	0.0000	0.0000	-0.0011
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2344	0.0004	0.0000	0.0000	0.0000	0.0012
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B6	Min Value	-0.0225	-0.0010	0.0000	0.0000	0.0000	-0.0031
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0225	-0.0010	0.0000	0.0000	0.0000	0.0030
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B4	Min Value	0.0014	0.0023	0.0000	0.0000	0.0000	-0.0068
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0014	0.0023	0.0000	0.0000	0.0000	0.0071
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B5	Min Value	-0.0087	0.0026	0.0000	0.0000	0.0000	-0.0089
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0087	0.0026	0.0000	0.0000	0.0000	0.0065
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B6	Min Value	0.0026	0.0042	0.0000	0.0000	0.0000	-0.0129
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0026	0.0042	0.0000	0.0000	0.0000	0.0126
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B4	Min Value	-0.0069	0.0014	0.0000	0.0000	0.0000	-0.0043
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0069	0.0014	0.0000	0.0000	0.0000	0.0044
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B5	Min Value	-0.1708	0.0007	0.0000	0.0000	0.0000	-0.0022
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1708	0.0007	0.0000	0.0000	0.0000	0.0022
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B6	Min Value	0.0125	0.0013	0.0000	0.0000	0.0000	-0.0039
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0125	0.0013	0.0000	0.0000	0.0000	0.0038
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 4 Units:KN-m April 20, 2013 11:26 PAGE 6

B R A C E F O R C E E N V E L O P E S

STORY	BRACE	ITEM	P	V2	V3	T	M2	M3
LT5	D7	Min Value	-0.2268	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2268	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT5	D8	Min Value	0.1310	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1310	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D7	Min Value	-0.1003	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1003	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D8	Min Value	0.2484	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2484	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D7	Min Value	0.3009	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3009	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D8	Min Value	-0.1493	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1493	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D7	Min Value	0.1663	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1663	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D8	Min Value	-0.2873	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2873	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D7	Min Value	-0.1288	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1288	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D8	Min Value	0.0136	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0136	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

Lampiran 25: *Coding* Matlab Menghitung F_U Kasus Kerusakan 5

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
```

```
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(11,i);mode(23,i);m
ode(35,i);mode(47,i);mode(59
,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fu5=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 26: *Coding* Matlab Menghitung F_D Kasus Kerusakan 5

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);%//---
-damage member ----//
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);%//-
---damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);%//-
---damage member ----//
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
Ad=A2*0.5;%//----damage
member ----//
I1=5.536e-4;%m4
I2=2.176e-4;
Id=I2*0.5;%//----damage
member ----//
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,Ad,Id,L36,f2,vs);
K36=kg(k36,T36);%//----
damage member ----//
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,Ad,Id,L40,f2,vs);
K40=kg(k40,T40);%//----
damage member ----//
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,Ad,Id,L44,f2,vs);
K44=kg(k44,T44);%//----
damage member ----//
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
```

```
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*Ad,L36);%//----
damage member ----//
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*Ad,L40);%//----
damage member ----//
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*Ad,L44);%//----
damage member ----//
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks);
[w,worder]=sort(sqrt(diag(ei
gval)))
mode=eigv(:,worder)

i=1:84;
pim=[mode(11,i);mode(23,i);m
ode(35,i);mode(47,i);mode(59
,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fd5=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 27: *Coding* Matlab Menghitung SVD Kasus Kerusakan 5

```
Fu5 =1.0e-004 *[0.0244    0.0239    0.0279    0.0311    0.0343;0.0239    0.0583
0.0674    0.0804    0.0924;0.0279    0.0674    0.1173    0.1414    0.1691;0.0311
0.0804    0.1414    0.2125    0.2567;0.0343    0.0924    0.1691    0.2567    0.3553]

Fd5 =1.0e-004 *[0.0336    0.0316    0.0356    0.0389    0.0420;0.0316    0.0650
0.0752    0.0881    0.0999;0.0356    0.0752    0.1320    0.1547    0.1818;0.0389
0.0881    0.1547    0.2247    0.2694;0.0420    0.0999    0.1818    0.2694    0.3745]

Fdel=Fu5-Fd5
[u,s,v]=svd(Fdel)
```

Lampiran 28: *Coding* Matlab Menghitung Gaya Batang Kasus Kerusakan 5

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
```

```
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks);
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder);

i=1:84;
pim=[mode(11,i);mode(23,i);m
ode(35,i);mode(47,i);mode(59
,i)];
v=sqrtm(mode'*Mr*mode);
wm=diag(w(1:84));
Fu5=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))';

R=zeros(84,1);
R(11,1)=0.5532;
R(23,1)=-0.7414;
R(35,1)=0.2930;
R(47,1)=-0.2397;
R(59,1)=0.0325;

U=solv(Ks,R);

u1=dissf(U,id1,T1);
u2=dissf(U,id2,T2);
u3=dissf(U,id3,T3);
u4=dissf(U,id4,T4);
u5=dissf(U,id5,T5);
u6=dissf(U,id6,T6);
u7=dissf(U,id7,T7);
u8=dissf(U,id8,T8);
u9=dissf(U,id9,T9);
u10=dissf(U,id10,T10);
u11=dissf(U,id11,T11);
u12=dissf(U,id12,T12);
u13=dissf(U,id13,T13);
u14=dissf(U,id14,T14);
u15=dissf(U,id15,T15);
```

```
u16=dissf(U,id16,T16);
u17=dissf(U,id17,T17);
u18=dissf(U,id18,T18);
u19=dissf(U,id19,T19);
u20=dissf(U,id20,T20);
u21=dissf(U,id21,T21);
u22=dissf(U,id22,T22);
u23=dissf(U,id23,T23);
u24=dissf(U,id24,T24);
u25=dissf(U,id25,T25);
u26=dissf(U,id26,T26);
u27=dissf(U,id27,T27);
u28=dissf(U,id28,T28);
u29=dissf(U,id29,T29);
u30=dissf(U,id30,T30);
u31=dissf(U,id31,T31);
u32=dissf(U,id32,T32);
u33=dissf(U,id33,T33);
u34=dissf(U,id34,T34);
u35=dissf(U,id35,T35);

u36=dissf(U,id36,T36);
u37=dissf(U,id37,T37);
u38=dissf(U,id38,T38);
u39=dissf(U,id39,T39);
u40=dissf(U,id40,T40);
u41=dissf(U,id41,T41);
u42=dissf(U,id42,T42);
u43=dissf(U,id43,T43);
u44=dissf(U,id44,T44);
u45=dissf(U,id45,T45);

So1=zeros(6,1);
So2=zeros(6,1);
So3=zeros(6,1);
So4=zeros(6,1);
So5=zeros(6,1);
So6=zeros(6,1);
So7=zeros(6,1);
So8=zeros(6,1);
So9=zeros(6,1);
So10=zeros(6,1);
So11=zeros(6,1);
So12=zeros(6,1);
So13=zeros(6,1);
So14=zeros(6,1);
So15=zeros(6,1);
So16=zeros(6,1);
So17=zeros(6,1);
So18=zeros(6,1);
So19=zeros(6,1);
So20=zeros(6,1);
So21=zeros(6,1);
So22=zeros(6,1);
So23=zeros(6,1);
So24=zeros(6,1);
So25=zeros(6,1);
So26=zeros(6,1);
So27=zeros(6,1);
So28=zeros(6,1);
So29=zeros(6,1);
So30=zeros(6,1);
So31=zeros(6,1);
So32=zeros(6,1);
So33=zeros(6,1);
So34=zeros(6,1);
So35=zeros(6,1);
So36=zeros(6,1);
So37=zeros(6,1);
So38=zeros(6,1);
So39=zeros(6,1);
So40=zeros(6,1);
So41=zeros(6,1);
So42=zeros(6,1);
So43=zeros(6,1);
So44=zeros(6,1);
So45=zeros(6,1);

S1=stref(k1,u1,So1)
S2=stref(k2,u2,So2)
S3=stref(k3,u3,So3)
S4=stref(k4,u4,So4)
S5=stref(k5,u5,So5)
S6=stref(k6,u6,So6)
S7=stref(k7,u7,So7)
S8=stref(k8,u8,So8)
S9=stref(k9,u9,So9)
S10=stref(k10,u10,So10)
S11=stref(k11,u11,So11)
S12=stref(k12,u12,So12)
S13=stref(k13,u13,So13)
S14=stref(k14,u14,So14)
S15=stref(k15,u15,So15)

S16=stref(k16,u16,So16)
S17=stref(k17,u17,So17)
S18=stref(k18,u18,So18)
S19=stref(k19,u19,So19)
S20=stref(k20,u20,So20)
S21=stref(k21,u21,So21)
S22=stref(k22,u22,So22)
S23=stref(k23,u23,So23)
S24=stref(k24,u24,So24)
S25=stref(k25,u25,So25)
S26=stref(k26,u26,So26)
S27=stref(k27,u27,So27)
S28=stref(k28,u28,So28)
S29=stref(k29,u29,So29)
S30=stref(k30,u30,So30)
S31=stref(k31,u31,So31)
S32=stref(k32,u32,So32)
S33=stref(k33,u33,So33)
S34=stref(k34,u34,So34)
S35=stref(k35,u35,So35)

S36=stref(k36,u36,So36)
S37=stref(k37,u37,So37)
S38=stref(k38,u38,So38)
S39=stref(k39,u39,So39)
S40=stref(k40,u40,So40)
S41=stref(k41,u41,So41)
S42=stref(k42,u42,So42)
S43=stref(k43,u43,So43)
S44=stref(k44,u44,So44)
S45=stref(k45,u45,So45)
```

Lampiran 29: *Output* Gaya-gaya Batang dari *software* Matlab Kasus 5

```
S1 =
   -0.0066
    0.0041
    0.0126
    0.0066
   -0.0041
    0.0123
S2 =
   -0.2078
    0.0018
    0.0043
    0.2078
   -0.0018
    0.0064
S3 =
    0.0317
    0.0059
    0.0177
   -0.0317
   -0.0059
    0.0177
S4 =
    0.0006
    0.0057
    0.0171
   -0.0006
   -0.0057
    0.0170
S5 =
    0.2729
    0.0010
    0.0030
   -0.2729
   -0.0010
    0.0032
S6 =
   -0.0373
    0.0058
    0.0174
    0.0373
   -0.0058
    0.0176
S7 =
    0.0032
    0.0050
    0.0151
   -0.0032
   -0.0050
    0.0151
S8 =
   -0.1392
   -0.0005
   -0.0008
    0.1392
    0.0005
   -0.0020
S9 =
    0.0270
    0.0039
    0.0117
   -0.0270
   -0.0039
    0.0118
S10 =
   -0.0033
    0.0046
    0.0139
    0.0033
   -0.0046
    0.0138
S11 =
    0.0950
    0.0000
   -0.0005
   -0.0950
   -0.0000
    0.0006
S12 =
   -0.0135
    0.0055
    0.0166
    0.0135
   -0.0055
    0.0165
S13 =
    0.0058
    0.0041
    0.0119
   -0.0058
   -0.0041
    0.0124
S14 =
   -0.0296
   -0.0013
   -0.0031
    0.0296
    0.0013
   -0.0046
S15 =
   -0.0009
    0.0028
    0.0085
    0.0009
   -0.0028
    0.0081
S16 =
    0.0235
    0.0002
   -0.0000
   -0.0235
   -0.0002
    0.0008
S17 =
    0.4242
   -0.0001
   -0.0000
   -0.4242
    0.0001
   -0.0003
S18 =
   -0.3533
    0.0074
    0.0000
    0.3533
   -0.0074
    0.0260
S19 =
   -0.0239
    0.0070
   -0.0000
    0.0239
   -0.0070
    0.0243
S20 =
    0.0194
   -0.0063
   -0.0134
   -0.0194
    0.0063
   -0.0087
S21 =
    0.1749
   -0.0077
   -0.0163
   -0.1749
    0.0077
   -0.0108
S22 =
   -0.1982
   -0.0295
   -0.0501
    0.1982
    0.0295
   -0.0530
S23 =
   -0.0180
   -0.0247
   -0.0420
    0.0180
    0.0247
   -0.0444
S24 =
    0.0137
   -0.0057
   -0.0084
   -0.0137
    0.0057
   -0.0117
S25 =
    0.0167
   -0.0060
   -0.0091
   -0.0167
    0.0060
   -0.0118
S26 =
   -0.0635
    0.0159
    0.0324
    0.0635
   -0.0159
    0.0232
S27 =
   -0.0122
    0.0126
    0.0269
    0.0122
   -0.0126
    0.0171
S28 =
    0.0087
   -0.0025
   -0.0034
   -0.0087
    0.0025
   -0.0053
S29 =
    0.0225
   -0.0021
   -0.0025
   -0.0225
    0.0021
   -0.0049
S30 =
   -0.0078
   -0.0166
   -0.0329
    0.0078
    0.0166
   -0.0253
S31 =
   -0.0083
   -0.0144
   -0.0288
    0.0083
    0.0144
   -0.0216
S32 =
    0.0041
   -0.0058
   -0.0085
   -0.0041
    0.0058
   -0.0119
S33 =
   -0.0289
   -0.0051
   -0.0084
    0.0289
    0.0051
   -0.0093
S34 =
    0.0056
    0.0012
    0.0081
   -0.0056
   -0.0012
   -0.0039
S35 =
   -0.0028
   -0.0009
    0.0051
    0.0028
    0.0009
   -0.0081
S36 =
   -0.0023
   -0.0000
   -0.0000
    0.0023
    0.0000
   -0.0000
S37 =
   -0.1377
    0.0000
   -0.0000
    0.1377
   -0.0000
   -0.0000
S38 =
    0.3618
    0.0000
   -0.0000
   -0.3618
   -0.0000
         0
S39 =
   -0.3182
    0.0000
    0.0000
    0.3182
   -0.0000
   -0.0000
S40 =
    0.0049
    0.0000
    0.0000
   -0.0049
   -0.0000
    0.0000
S41 =
    0.0849
   -0.0000
   -0.0000
   -0.0849
    0.0000
   -0.0000
S42 =
    0.0844
    0.0000
    0.0000
   -0.0844
   -0.0000
    0.0000
S43 =
   -0.1142
    0.0000
    0.0000
    0.1142
   -0.0000
    0.0000
S44 =
   -0.0030
    0.0000
         0
    0.0030
   -0.0000
         0
S45 =
    0.0468
    0.0000
    0.0000
   -0.0468
   -0.0000
    0.0000
```

Lampiran 30: *Output* Gaya-gaya Batang dari *software* ETABS Kasus 5

C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
LT5	C5	Min Value	-0.0041	-0.0058	0.0000	0.0000	0.0000	-0.0085
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0041	-0.0058	0.0000	0.0000	0.0000	0.0119
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C6	Min Value	0.0290	-0.0051	0.0000	0.0000	0.0000	-0.0084
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0290	-0.0051	0.0000	0.0000	0.0000	0.0093
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C7	Min Value	-0.0056	0.0012	0.0000	0.0000	0.0000	0.0039
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0056	0.0012	0.0000	0.0000	0.0000	0.0081
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C8	Min Value	0.0028	-0.0009	0.0000	0.0000	0.0000	0.0051
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0028	-0.0009	0.0000	0.0000	0.0000	0.0081
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C5	Min Value	-0.0087	-0.0025	0.0000	0.0000	0.0000	-0.0034
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0087	-0.0025	0.0000	0.0000	0.0000	0.0053
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C6	Min Value	-0.0225	-0.0021	0.0000	0.0000	0.0000	-0.0026
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0225	-0.0021	0.0000	0.0000	0.0000	0.0049
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C7	Min Value	0.0078	-0.0166	0.0000	0.0000	0.0000	-0.0329
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0078	-0.0166	0.0000	0.0000	0.0000	0.0252
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C8	Min Value	0.0083	-0.0144	0.0000	0.0000	0.0000	-0.0288
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0083	-0.0144	0.0000	0.0000	0.0000	0.0216
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C5	Min Value	-0.0137	-0.0057	0.0000	0.0000	0.0000	-0.0084
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0137	-0.0057	0.0000	0.0000	0.0000	0.0116
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C6	Min Value	-0.0167	-0.0060	0.0000	0.0000	0.0000	-0.0091
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0167	-0.0060	0.0000	0.0000	0.0000	0.0118
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C7	Min Value	0.0634	0.0158	0.0000	0.0000	0.0000	-0.0231
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0634	0.0158	0.0000	0.0000	0.0000	0.0323
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C8	Min Value	0.0122	0.0125	0.0000	0.0000	0.0000	-0.0170
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0122	0.0125	0.0000	0.0000	0.0000	0.0268
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C5	Min Value	-0.0194	-0.0063	0.0000	0.0000	0.0000	-0.0134
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0194	-0.0063	0.0000	0.0000	0.0000	0.0087
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C6	Min Value	-0.1749	-0.0077	0.0000	0.0000	0.0000	-0.0163
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1749	-0.0077	0.0000	0.0000	0.0000	0.0108
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C7	Min Value	0.1982	-0.0294	0.0000	0.0000	0.0000	-0.0500
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1982	-0.0294	0.0000	0.0000	0.0000	0.0529
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C8	Min Value	0.0180	-0.0247	0.0000	0.0000	0.0000	-0.0420
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0180	-0.0247	0.0000	0.0000	0.0000	0.0444
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C5	Min Value	-0.0235	0.0002	0.0000	0.0000	0.0000	-0.0009
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0235	0.0002	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C6	Min Value	-0.4242	-0.0001	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.4242	-0.0001	0.0000	0.0000	0.0000	0.0003
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C7	Min Value	0.3533	0.0074	0.0000	0.0000	0.0000	-0.0260
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3533	0.0074	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT1	C8	Min Value	0.0239	0.0069	0.0000	0.0000	0.0000	-0.0243
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0239	0.0069	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 5 Units:KN-m May 15, 2013 8:30 PAGE 5

B E A M F O R C E E N V E L O P E S

STORY	BEAM	ITEM	P	V2	V3	T	M2	M3
LT5	B4	Min Value	-0.0058	-0.0041	0.0000	0.0000	0.0000	-0.0119
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0058	-0.0041	0.0000	0.0000	0.0000	0.0124
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B5	Min Value	0.0296	0.0013	0.0000	0.0000	0.0000	-0.0046
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0296	0.0013	0.0000	0.0000	0.0000	0.0031
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B6	Min Value	0.0009	-0.0028	0.0000	0.0000	0.0000	-0.0085
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0009	-0.0028	0.0000	0.0000	0.0000	0.0081
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B4	Min Value	0.0033	-0.0046	0.0000	0.0000	0.0000	-0.0139
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0033	-0.0046	0.0000	0.0000	0.0000	0.0138
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B5	Min Value	-0.0950	0.0000	0.0000	0.0000	0.0000	0.0005
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0950	0.0000	0.0000	0.0000	0.0000	0.0006
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B6	Min Value	0.0135	-0.0055	0.0000	0.0000	0.0000	-0.0166
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0135	-0.0055	0.0000	0.0000	0.0000	0.0165
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B4	Min Value	-0.0032	-0.0050	0.0000	0.0000	0.0000	-0.0151
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0032	-0.0050	0.0000	0.0000	0.0000	0.0151
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B5	Min Value	0.1392	0.0005	0.0000	0.0000	0.0000	-0.0020
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1392	0.0005	0.0000	0.0000	0.0000	0.0008
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B6	Min Value	-0.0269	-0.0039	0.0000	0.0000	0.0000	-0.0118
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0269	-0.0039	0.0000	0.0000	0.0000	0.0118
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B4	Min Value	-0.0006	-0.0057	0.0000	0.0000	0.0000	-0.0171
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0006	-0.0057	0.0000	0.0000	0.0000	0.0170
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B5	Min Value	-0.2730	-0.0010	0.0000	0.0000	0.0000	-0.0029
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2730	-0.0010	0.0000	0.0000	0.0000	0.0032
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B6	Min Value	0.0372	-0.0058	0.0000	0.0000	0.0000	-0.0174
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0372	-0.0058	0.0000	0.0000	0.0000	0.0175
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B4	Min Value	0.0066	-0.0041	0.0000	0.0000	0.0000	-0.0125
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0066	-0.0041	0.0000	0.0000	0.0000	0.0123
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B5	Min Value	0.2079	-0.0018	0.0000	0.0000	0.0000	-0.0043
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2079	-0.0018	0.0000	0.0000	0.0000	0.0064
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B6	Min Value	-0.0316	-0.0059	0.0000	0.0000	0.0000	-0.0176
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0316	-0.0059	0.0000	0.0000	0.0000	0.0177
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 5 Units:KN-m May 15, 2013 8:30 PAGE 6

B R A C E F O R C E E N V E L O P E S

STORY	BRACE	ITEM	P	V2	V3	T	M2	M3
LT5	D7	Min Value	0.0030	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0030	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT5	D8	Min Value	-0.0469	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0469	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D7	Min Value	-0.0844	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0844	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D8	Min Value	0.1142	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1142	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D7	Min Value	-0.0049	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0049	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D8	Min Value	-0.0849	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0849	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D7	Min Value	-0.3619	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.3619	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D8	Min Value	0.3183	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3183	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D7	Min Value	0.0023	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0023	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D8	Min Value	0.1376	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1376	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

Lampiran 31: *Coding* Matlab Menghitung F_U Kasus Kerusakan 6

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
```

```
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(20,i);mode(23,i);m
ode(32,i);mode(35,i);mode(44
,i);mode(47,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fu6=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 32: *Coding* Matlab Menghitung F_D Kasus Kerusakan 6

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);%//---
-damage member ----//
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);%//-
---damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);%//-
---damage member ----//
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
Ad=A2*0.5;%//----damage
member ----//
I1=5.536e-4;%m4
I2=2.176e-4;
Id=I2*0.5;%//----damage
member ----//
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,Ad,Id,L36,f2,vs);
K36=kg(k36,T36);%//----
damage member ----//
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,Ad,Id,L40,f2,vs);
K40=kg(k40,T40);%//----
damage member ----//
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,Ad,Id,L44,f2,vs);
K44=kg(k44,T44);%//----
damage member ----//
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
```

```
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*Ad,L36);%//----
damage member ----//
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*Ad,L40);%//----
damage member ----//
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*Ad,L44);%//----
damage member ----//
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(20,i);mode(23,i);m
ode(32,i);mode(35,i);mode(44
,i);mode(47,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fd6=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 33: *Coding* Matlab Menghitung SVD Kasus Kerusakan 6

```
Fu6=1.0e-004 *[0.0583    0.0505    0.0674    0.0685    0.0804    0.0803;0.0505
0.0583    0.0685    0.0674    0.0803    0.0804;0.0674    0.0685    0.1173    0.1095
0.1414    0.1426;0.0685    0.0674    0.1095    0.1173    0.1426    0.1414;0.0804
0.0803    0.1414    0.1426    0.2125    0.2045;0.0803    0.0804    0.1426    0.1414
0.2045    0.2125]

Fd6 =1.0e-004 *[0.0657    0.0572    0.0736    0.0744    0.0865    0.0864;0.0572
0.0650    0.0760    0.0752    0.0881    0.0881;0.0736    0.0760    0.1280    0.1218
0.1531    0.1539;0.0744    0.0752    0.1218    0.1320    0.1564    0.1547;0.0865
0.0881    0.1531    0.1564    0.2257    0.2170;0.0864    0.0881    0.1539    0.1547
0.2170    0.2247]

Fdel=Fu6-Fd6
[u,s,v]=svd(Fdel)
```

Lampiran 34: *Coding* Matlab Menghitung Gaya Batang Kasus Kerusakan 6

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);%//---
-damage member ----//
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);%//-
---damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);%//-
---damage member ----//
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];
```

```
Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks);
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder);

i=1:84;
pim=[mode(20,i);mode(23,i);m
ode(32,i);mode(35,i);mode(44
,i);mode(47,i)];
v=sqrtm(mode'*Mr*mode);
wm=diag(w(1:84));

Fu6=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))';

Untuk VBPLK 1:
R=zeros(84,1);
R(20)=-0.3074;
R(23)=0.6333;
R(32)=-0.2;
R(35)=0.5037;
R(44)=-0.1809;
R(47)=-0.4219;


Untuk VBPLK 2:
R=zeros(84,1);
R(20)=-0.452;
R(23)=0.5346;
R(32)=-0.0213;
R(35)=-0.5868;
R(44)=0.1823;
R(47)=0.3632;

U=solv(Ks,R);
```

```
u1=dissf(U,id1,T1);
u2=dissf(U,id2,T2);
u3=dissf(U,id3,T3);
u4=dissf(U,id4,T4);
u5=dissf(U,id5,T5);
u6=dissf(U,id6,T6);
u7=dissf(U,id7,T7);
u8=dissf(U,id8,T8);
u9=dissf(U,id9,T9);
u10=dissf(U,id10,T10);
u11=dissf(U,id11,T11);
u12=dissf(U,id12,T12);
u13=dissf(U,id13,T13);
u14=dissf(U,id14,T14);
u15=dissf(U,id15,T15);

u16=dissf(U,id16,T16);
u17=dissf(U,id17,T17);
u18=dissf(U,id18,T18);
u19=dissf(U,id19,T19);
u20=dissf(U,id20,T20);
u21=dissf(U,id21,T21);
u22=dissf(U,id22,T22);
u23=dissf(U,id23,T23);
u24=dissf(U,id24,T24);
u25=dissf(U,id25,T25);
u26=dissf(U,id26,T26);
u27=dissf(U,id27,T27);
u28=dissf(U,id28,T28);
u29=dissf(U,id29,T29);
u30=dissf(U,id30,T30);
u31=dissf(U,id31,T31);
u32=dissf(U,id32,T32);
u33=dissf(U,id33,T33);
u34=dissf(U,id34,T34);
u35=dissf(U,id35,T35);

u36=dissf(U,id36,T36);
u37=dissf(U,id37,T37);
u38=dissf(U,id38,T38);
u39=dissf(U,id39,T39);
u40=dissf(U,id40,T40);
u41=dissf(U,id41,T41);
u42=dissf(U,id42,T42);
u43=dissf(U,id43,T43);
u44=dissf(U,id44,T44);
u45=dissf(U,id45,T45);

So1=zeros(6,1);
So2=zeros(6,1);
So3=zeros(6,1);
So4=zeros(6,1);
So5=zeros(6,1);
So6=zeros(6,1);
So7=zeros(6,1);
So8=zeros(6,1);
So9=zeros(6,1);
So10=zeros(6,1);
So11=zeros(6,1);
So12=zeros(6,1);
So13=zeros(6,1);
So14=zeros(6,1);
So15=zeros(6,1);
So16=zeros(6,1);
So17=zeros(6,1);
So18=zeros(6,1);
So19=zeros(6,1);
So20=zeros(6,1);
So21=zeros(6,1);
So22=zeros(6,1);
So23=zeros(6,1);
So24=zeros(6,1);
So25=zeros(6,1);
So26=zeros(6,1);
So27=zeros(6,1);
So28=zeros(6,1);
So29=zeros(6,1);
So30=zeros(6,1);
So31=zeros(6,1);
So32=zeros(6,1);
So33=zeros(6,1);
So34=zeros(6,1);
So35=zeros(6,1);
So36=zeros(6,1);
So37=zeros(6,1);
So38=zeros(6,1);
So39=zeros(6,1);
So40=zeros(6,1);
So41=zeros(6,1);
So42=zeros(6,1);
So43=zeros(6,1);
So44=zeros(6,1);
So45=zeros(6,1);

S1=stref(k1,u1,So1)
S2=stref(k2,u2,So2)
S3=stref(k3,u3,So3)
S4=stref(k4,u4,So4)
S5=stref(k5,u5,So5)
S6=stref(k6,u6,So6)
S7=stref(k7,u7,So7)
S8=stref(k8,u8,So8)
S9=stref(k9,u9,So9)
S10=stref(k10,u10,So10)
S11=stref(k11,u11,So11)
S12=stref(k12,u12,So12)
S13=stref(k13,u13,So13)
S14=stref(k14,u14,So14)
S15=stref(k15,u15,So15)

S16=stref(k16,u16,So16)
S17=stref(k17,u17,So17)
S18=stref(k18,u18,So18)
S19=stref(k19,u19,So19)
S20=stref(k20,u20,So20)
S21=stref(k21,u21,So21)
S22=stref(k22,u22,So22)
S23=stref(k23,u23,So23)
S24=stref(k24,u24,So24)
S25=stref(k25,u25,So25)
S26=stref(k26,u26,So26)
S27=stref(k27,u27,So27)
S28=stref(k28,u28,So28)
S29=stref(k29,u29,So29)
S30=stref(k30,u30,So30)
S31=stref(k31,u31,So31)
S32=stref(k32,u32,So32)
S33=stref(k33,u33,So33)
S34=stref(k34,u34,So34)
S35=stref(k35,u35,So35)

S36=stref(k36,u36,So36)
S37=stref(k37,u37,So37)
S38=stref(k38,u38,So38)
S39=stref(k39,u39,So39)
S40=stref(k40,u40,So40)
S41=stref(k41,u41,So41)
S42=stref(k42,u42,So42)
S43=stref(k43,u43,So43)
S44=stref(k44,u44,So44)
S45=stref(k45,u45,So45)
```

Lampiran 35: *Output* Gaya-gaya Batang dari *software* Matlab Kasus 6

```
Akibat VBPLK
1:
S1 =
   -0.0083
    0.0030
    0.0090
    0.0083
   -0.0030
    0.0092
S2 =
    0.0408
   -0.0007
   -0.0014
   -0.0408
    0.0007
   -0.0029
S3 =
   -0.0033
    0.0017
    0.0052
    0.0033
   -0.0017
    0.0051
S4 =
   -0.0010
    0.0070
    0.0210
    0.0010
   -0.0070
    0.0210
S5 =
   -0.2630
   -0.0002
    0.0002
    0.2630
    0.0002
   -0.0012
S6 =
    0.0111
    0.0055
    0.0165
   -0.0111
   -0.0055
    0.0166
S7 =
   -0.0058
    0.0101
    0.0303
    0.0058
   -0.0101
    0.0301
S8 =
   -0.1896
    0.0016
    0.0035
    0.1896
   -0.0016
    0.0058
S9 =
    0.0114
    0.0116
    0.0348
   -0.0114
   -0.0116
    0.0350
S10 =
    0.0030
    0.0107
    0.0320
   -0.0030
   -0.0107
    0.0319
S11 =
    0.1060
         0.0005
         0.0012
        -0.1060
        -0.0005
         0.0021
S12 =
        -0.0159
         0.0109
         0.0326
         0.0159
        -0.0109
         0.0328
S13 =
         0.0098
         0.0081
         0.0239
        -0.0098
        -0.0081
         0.0248
S14 =
        -0.0191
        -0.0024
        -0.0065
         0.0191
         0.0024
        -0.0078
S15 =
        -0.0041
         0.0064
         0.0195
         0.0041
        -0.0064
         0.0187
S16 =
         0.0389
         0.0023
        -0.0000
        -0.0389
        -0.0023
         0.0081
S17 =
         0.3810
         0.0027
        -0.0000
        -0.3810
        -0.0027
         0.0093
S18 =
        -0.3973
        -0.0006
         0.0000
         0.3973
         0.0006
        -0.0022
S19 =
        -0.0361
        -0.0008
              0
         0.0361
         0.0008
        -0.0027
S20 =
         0.0358
        -0.0060
        -0.0171
        -0.0358
         0.0060
        -0.0039
S21 =
         0.4456
        -0.0061
        -0.0171
        -0.4456
         0.0061
        -0.0042
S22 =
        -0.3714
         0.0037
        -0.0001
         0.3714
        -0.0037
         0.0130
S23 =
        -0.0344
         0.0025
        -0.0023
         0.0344
        -0.0025
         0.0113
S24 =
         0.0288
        -0.0070
        -0.0171
        -0.0288
         0.0070
        -0.0074
S25 =
         0.4234
        -0.0072
        -0.0170
        -0.4234
         0.0072
        -0.0082
S26 =
        -0.2697
        -0.0091
        -0.0283
         0.2697
         0.0091
        -0.0034
S27 =
        -0.0289
        -0.0086
        -0.0278
         0.0289
         0.0086
        -0.0023
S28 =
         0.0188
        -0.0128
        -0.0229
        -0.0188
         0.0128
        -0.0218
S29 =
         0.1358
        -0.0141
        -0.0254
        -0.1358
         0.0141
        -0.0240
S30 =
        -0.1088
        -0.0225
        -0.0371
         0.1088
         0.0225
        -0.0417
S31 =
        -0.0173
        -0.0200
        -0.0327
         0.0173
         0.0200
        -0.0372
S32 =
         0.0081
        -0.0098
        -0.0103
        -0.0081
         0.0098
        -0.0239
S33 =
        -0.0319
        -0.0078
        -0.0091
         0.0319
         0.0078
        -0.0183
S34 =
         0.0008
        -0.0014
         0.0069
        -0.0008
         0.0014
        -0.0118
S35 =
        -0.0064
        -0.0041
         0.0044
         0.0064
         0.0041
        -0.0187
S36 =
  1.0e-004 *

    0.1984
    0.0000
    0.0000
   -0.1984
   -0.0000
    0.0000
S37 =
    0.0269
    0.0000
    0.0000
   -0.0269
   -0.0000
    0.0000
S38 =
   -0.0939
    0.0000
    0.0000
    0.0939
   -0.0000
    0.0000
S39 =
   -0.0561
    0.0000
    0.0000
    0.0561
   -0.0000
    0.0000
S40 =
    0.0022
    0.0000
    0.0000
   -0.0022
   -0.0000
    0.0000
S41 =
   -0.3071
    0.0000
    0.0000
    0.3071
   -0.0000
    0.0000
S42 =
    0.2805
    0.0000
   -0.0000
   -0.2805
        -0.0000
        -0.0000
S43 =
        -0.3371
         0.0000
         0.0000
         0.3371
        -0.0000
         0.0000
S44 =
         0.0158
         0.0000
         0.0000
        -0.0158
        -0.0000
         0.0000
S45 =
         0.0424
         0.0000
         0.0000
        -0.0424
        -0.0000
         0.0000
```

```
Akibat VBPLK
2:
S1 =
   -0.0069
   -0.0006
   -0.0019
    0.0069
    0.0006
   -0.0019
S2 =
    0.0475
    0.0001
    0.0016
   -0.0475
   -0.0001
   -0.0008
S3 =
   -0.0139
   -0.0027
   -0.0083
    0.0139
    0.0027
   -0.0082
S4 =
    0.0148
   -0.0033
   -0.0098
   -0.0148
    0.0033
   -0.0099
S5 =
   -0.3367
    0.0008
    0.0017
    0.3367
   -0.0008
    0.0029
S6 =
    0.0234
   -0.0024
   -0.0072
   -0.0234
    0.0024
   -0.0072
S7 =
   -0.0024
   -0.0069
   -0.0208
    0.0024
    0.0069
   -0.0207
S8 =
    0.2310
   -0.0007
   -0.0030
   -0.2310
    0.0007
   -0.0014
S9 =
   -0.0349
   -0.0058
   -0.0173
    0.0349
    0.0058
   -0.0174
S10 =
   -0.0011
   -0.0067
   -0.0201
    0.0011
    0.0067
   -0.0199
S11 =
   -0.0878
   -0.0009
   -0.0019
    0.0878
    0.0009
   -0.0036
S12 =
    0.0220
   -0.0084
   -0.0251
   -0.0220
    0.0084
   -0.0252
S13 =
   -0.0061
   -0.0051
   -0.0150
    0.0061
    0.0051
   -0.0156
S14
    0.0151
    0.0016
    0.0042
   -0.0151
   -0.0016
    0.0057
S15 =
    0.0008
   -0.0040
   -0.0124
   -0.0008
    0.0040
   -0.0119
S16 =
   -0.0226
    0.0017
    0.0000
    0.0226
   -0.0017
    0.0060
S17 =
   -0.2381
    0.0019
    0.0000
    0.2381
   -0.0019
    0.0066
S18 =
    0.2212
   -0.0031
         0
   -0.2212
    0.0031
   -0.0110
S19 =
    0.0234
   -0.0026
    0.0000
   -0.0234
    0.0026
   -0.0092
S20 =
   -0.0220
   -0.0052
   -0.0041
    0.0220
    0.0052
   -0.0142
S21 =
   -0.1730
   -0.0067
   -0.0064
    0.1730
    0.0067
   -0.0170
   -0.0129
    0.0252
S22 =
    0.2724
    0.0129
    0.0201
   -0.2724
   -0.0129
    0.0252
S23 =
    0.0206
    0.0112
    0.0174
   -0.0206
   -0.0112
    0.0219
S24 =
   -0.0187
    0.0095
    0.0240
    0.0187
   -0.0095
    0.0094
S25 =
   -0.2220
    0.0105
    0.0253
    0.2220
   -0.0105
    0.0114
S26 =
    0.2583
   -0.0155
   -0.0209
   -0.2583
    0.0155
   -0.0332
S27 =
    0.0182
   -0.0122
   -0.0148
   -0.0182
    0.0122
   -0.0277
S28 =
   -0.0118
    0.0072
    0.0113
    0.0118
   -0.0072
    0.0139
S29 =
   -0.1461
    0.0079
    0.0123
    0.1461
   -0.0079
    0.0154
S30 =
    0.0969
    0.0266
    0.0520
   -0.0969
   -0.0266
    0.0410
S31 =
    0.0124
    0.0227
    0.0452
   -0.0124
   -0.0227
    0.0344
S32 =
   -0.0051
    0.0061
    0.0063
    0.0051
   -0.0061
    0.0150
S33 =
    0.0220
    0.0051
    0.0064
   -0.0220
   -0.0051
    0.0115
S34 =
    0.0036
   -0.0016
   -0.0123
   -0.0036
    0.0016
    0.0067
S35 =
    0.0040
    0.0008
   -0.0092
   -0.0040
   -0.0008
    0.0119
S36 =
    0.0031
   -0.0000
   -0.0000
   -0.0031
    0.0000
   -0.0000
S37 =
    0.0288
   -0.0000
   -0.0000
   -0.0288
    0.0000
   -0.0000
S38 =
   -0.1017
   -0.0000
   -0.0000
    0.1017
    0.0000
   -0.0000
S39 =
   -0.0928
   -0.0000
   -0.0000
    0.0928
    0.0000
   -0.0000
S40 =
   -0.0037
   -0.0000
   -0.0000
    0.0037
    0.0000
   -0.0000
S41 =
   -0.0674
   -0.0000
   -0.0000
    0.0674
    0.0000
    0.0000
S42 =
   -0.2303
   -0.0000
    0.0000
    0.2303
    0.0000
    0.0000
S43 =
    0.3266
   -0.0000
    0.0000
   -0.3266
    0.0000
    0.0000
S44 =
   -0.0184
    0.0000
    0.0000
    0.0184
   -0.0000
    0.0000
S45 =
   -0.0304
         0
    0.0000
    0.0304
         0
    0.0000
```

Lampiran 36: *Output* Gaya-gaya Batang dari *software* ETABS Kasus 6

C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
LT5	C5	Min Value	-0.0081	-0.0098	0.0000	0.0000	0.0000	-0.0103
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0081	-0.0098	0.0000	0.0000	0.0000	0.0239
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C6	Min Value	0.0319	-0.0078	0.0000	0.0000	0.0000	-0.0091
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0319	-0.0078	0.0000	0.0000	0.0000	0.0183
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C7	Min Value	-0.0008	-0.0014	0.0000	0.0000	0.0000	0.0069
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0008	-0.0014	0.0000	0.0000	0.0000	0.0118
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C8	Min Value	0.0064	-0.0041	0.0000	0.0000	0.0000	0.0043
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0064	-0.0041	0.0000	0.0000	0.0000	0.0187
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C5	Min Value	-0.0188	-0.0127	0.0000	0.0000	0.0000	-0.0229
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0188	-0.0127	0.0000	0.0000	0.0000	0.0218
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C6	Min Value	-0.1358	-0.0141	0.0000	0.0000	0.0000	-0.0254
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1358	-0.0141	0.0000	0.0000	0.0000	0.0240
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C7	Min Value	0.1087	-0.0225	0.0000	0.0000	0.0000	-0.0371
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1087	-0.0225	0.0000	0.0000	0.0000	0.0416
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C8	Min Value	0.0173	-0.0199	0.0000	0.0000	0.0000	-0.0327
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0173	-0.0199	0.0000	0.0000	0.0000	0.0371
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C5	Min Value	-0.0288	-0.0070	0.0000	0.0000	0.0000	-0.0171
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0288	-0.0070	0.0000	0.0000	0.0000	0.0074
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C6	Min Value	-0.4233	-0.0072	0.0000	0.0000	0.0000	-0.0170
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.4233	-0.0072	0.0000	0.0000	0.0000	0.0082
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C7	Min Value	0.2696	-0.0091	0.0000	0.0000	0.0000	-0.0283
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2696	-0.0091	0.0000	0.0000	0.0000	0.0035
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C8	Min Value	0.0289	-0.0086	0.0000	0.0000	0.0000	-0.0278
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0289	-0.0086	0.0000	0.0000	0.0000	0.0023
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C5	Min Value	-0.0358	-0.0060	0.0000	0.0000	0.0000	-0.0171
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0358	-0.0060	0.0000	0.0000	0.0000	0.0039
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C6	Min Value	-0.4456	-0.0061	0.0000	0.0000	0.0000	-0.0171
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.4456	-0.0061	0.0000	0.0000	0.0000	0.0042
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C7	Min Value	0.3714	0.0037	0.0000	0.0000	0.0000	-0.0130
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3714	0.0037	0.0000	0.0000	0.0000	-0.0001
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C8	Min Value	0.0344	0.0025	0.0000	0.0000	0.0000	-0.0112
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0344	0.0025	0.0000	0.0000	0.0000	-0.0024
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C5	Min Value	-0.0389	0.0023	0.0000	0.0000	0.0000	-0.0081
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0389	0.0023	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C6	Min Value	-0.3809	0.0027	0.0000	0.0000	0.0000	-0.0093
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.3809	0.0027	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C7	Min Value	0.3972	-0.0006	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3972	-0.0006	0.0000	0.0000	0.0000	0.0022
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT1	C8	Min Value	0.0361	-0.0008	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0361	-0.0008	0.0000	0.0000	0.0000	0.0027
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 6 VBPLK 1 Units:KN-m April 20, 2013 12:07 PAGE 5

B E A M F O R C E E N V E L O P E S

STORY	BEAM	ITEM	P	V2	V3	T	M2	M3
LT5	B4	Min Value	-0.0098	-0.0081	0.0000	0.0000	0.0000	-0.0239
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0098	-0.0081	0.0000	0.0000	0.0000	0.0248
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B5	Min Value	0.0191	0.0024	0.0000	0.0000	0.0000	-0.0078
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0191	0.0024	0.0000	0.0000	0.0000	0.0065
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B6	Min Value	0.0041	-0.0064	0.0000	0.0000	0.0000	-0.0196
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0041	-0.0064	0.0000	0.0000	0.0000	0.0187
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B4	Min Value	-0.0030	-0.0107	0.0000	0.0000	0.0000	-0.0321
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0030	-0.0107	0.0000	0.0000	0.0000	0.0320
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B5	Min Value	-0.1060	-0.0005	0.0000	0.0000	0.0000	-0.0012
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1060	-0.0005	0.0000	0.0000	0.0000	0.0021
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B6	Min Value	0.0158	-0.0109	0.0000	0.0000	0.0000	-0.0326
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0158	-0.0109	0.0000	0.0000	0.0000	0.0328
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B4	Min Value	0.0057	-0.0101	0.0000	0.0000	0.0000	-0.0303
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0057	-0.0101	0.0000	0.0000	0.0000	0.0301
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B5	Min Value	0.1897	-0.0015	0.0000	0.0000	0.0000	-0.0035
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1897	-0.0015	0.0000	0.0000	0.0000	0.0058
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B6	Min Value	-0.0113	-0.0116	0.0000	0.0000	0.0000	-0.0348
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0113	-0.0116	0.0000	0.0000	0.0000	0.0350
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B4	Min Value	0.0010	-0.0070	0.0000	0.0000	0.0000	-0.0210
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0010	-0.0070	0.0000	0.0000	0.0000	0.0210
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B5	Min Value	0.2630	0.0002	0.0000	0.0000	0.0000	-0.0012
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2630	0.0002	0.0000	0.0000	0.0000	-0.0002
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B6	Min Value	-0.0111	-0.0055	0.0000	0.0000	0.0000	-0.0166
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0111	-0.0055	0.0000	0.0000	0.0000	0.0166
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B4	Min Value	0.0083	-0.0030	0.0000	0.0000	0.0000	-0.0090
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0083	-0.0030	0.0000	0.0000	0.0000	0.0092
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B5	Min Value	-0.0408	0.0007	0.0000	0.0000	0.0000	-0.0029
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0408	0.0007	0.0000	0.0000	0.0000	0.0014
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B6	Min Value	0.0033	-0.0017	0.0000	0.0000	0.0000	-0.0052
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0033	-0.0017	0.0000	0.0000	0.0000	0.0051
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 6 VBPLK 1 Units:KN-m April 20, 2013 12:07 PAGE 6

B R A C E F O R C E E N V E L O P E S

STORY	BRACE	ITEM	P	V2	V3	T	M2	M3
LT5	D7	Min Value	-0.0157	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0157	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT5	D8	Min Value	-0.0425	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0425	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D7	Min Value	-0.2805	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2805	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D8	Min Value	0.3371	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3371	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D7	Min Value	-0.0022	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0022	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D8	Min Value	0.3071	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3071	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D7	Min Value	0.0939	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0939	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D8	Min Value	0.0561	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0561	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D7	Min Value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D8	Min Value	-0.0269	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0269	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
LT5	C5	Min Value	0.0051	0.0061	0.0000	0.0000	0.0000	-0.0150
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0051	0.0061	0.0000	0.0000	0.0000	0.0063
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C6	Min Value	-0.0221	0.0051	0.0000	0.0000	0.0000	-0.0115
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0221	0.0051	0.0000	0.0000	0.0000	0.0064
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C7	Min Value	-0.0036	-0.0016	0.0000	0.0000	0.0000	-0.0123
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0036	-0.0016	0.0000	0.0000	0.0000	-0.0067
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C8	Min Value	-0.0041	0.0008	0.0000	0.0000	0.0000	-0.0119
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0041	0.0008	0.0000	0.0000	0.0000	-0.0092
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C5	Min Value	0.0118	0.0072	0.0000	0.0000	0.0000	-0.0138
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0118	0.0072	0.0000	0.0000	0.0000	0.0113
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C6	Min Value	0.1460	0.0079	0.0000	0.0000	0.0000	-0.0154
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1460	0.0079	0.0000	0.0000	0.0000	0.0123
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C7	Min Value	-0.0969	0.0265	0.0000	0.0000	0.0000	-0.0410
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0969	0.0265	0.0000	0.0000	0.0000	0.0519
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C8	Min Value	-0.0124	0.0227	0.0000	0.0000	0.0000	-0.0343
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0124	0.0227	0.0000	0.0000	0.0000	0.0451
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C5	Min Value	0.0187	0.0095	0.0000	0.0000	0.0000	-0.0094
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0187	0.0095	0.0000	0.0000	0.0000	0.0239
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C6	Min Value	0.2220	0.0105	0.0000	0.0000	0.0000	-0.0114
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2220	0.0105	0.0000	0.0000	0.0000	0.0252
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C7	Min Value	-0.2583	-0.0154	0.0000	0.0000	0.0000	-0.0208
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2583	-0.0154	0.0000	0.0000	0.0000	0.0332
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C8	Min Value	-0.0182	-0.0121	0.0000	0.0000	0.0000	-0.0147
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0182	-0.0121	0.0000	0.0000	0.0000	0.0277
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C5	Min Value	0.0220	-0.0052	0.0000	0.0000	0.0000	-0.0040
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0220	-0.0052	0.0000	0.0000	0.0000	0.0141
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C6	Min Value	0.1730	-0.0067	0.0000	0.0000	0.0000	-0.0063
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1730	-0.0067	0.0000	0.0000	0.0000	0.0170
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C7	Min Value	-0.2724	0.0129	0.0000	0.0000	0.0000	-0.0251
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2724	0.0129	0.0000	0.0000	0.0000	0.0201
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C8	Min Value	-0.0206	0.0112	0.0000	0.0000	0.0000	-0.0219
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0206	0.0112	0.0000	0.0000	0.0000	0.0173
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C5	Min Value	0.0226	0.0017	0.0000	0.0000	0.0000	-0.0059
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0226	0.0017	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C6	Min Value	0.2380	0.0019	0.0000	0.0000	0.0000	-0.0066
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2380	0.0019	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C7	Min Value	-0.2212	-0.0031	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2212	-0.0031	0.0000	0.0000	0.0000	0.0110

		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C8	Min Value	-0.0234	-0.0026	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0234	-0.0026	0.0000	0.0000	0.0000	0.0092
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 6 VBPLK 2 Units:KN-m April 20, 2013 12:04 PAGE 5

B E A M F O R C E E N V E L O P E S

STORY	BEAM	ITEM	P	V2	V3	T	M2	M3
LT5	B4	Min Value	0.0061	0.0051	0.0000	0.0000	0.0000	-0.0156
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0061	0.0051	0.0000	0.0000	0.0000	0.0150
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B5	Min Value	-0.0151	-0.0016	0.0000	0.0000	0.0000	-0.0042
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0151	-0.0016	0.0000	0.0000	0.0000	0.0057
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B6	Min Value	-0.0008	0.0041	0.0000	0.0000	0.0000	-0.0119
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0008	0.0041	0.0000	0.0000	0.0000	0.0124
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B4	Min Value	0.0011	0.0067	0.0000	0.0000	0.0000	-0.0199
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0011	0.0067	0.0000	0.0000	0.0000	0.0201
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B5	Min Value	0.0879	0.0009	0.0000	0.0000	0.0000	-0.0036
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0879	0.0009	0.0000	0.0000	0.0000	0.0019
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B6	Min Value	-0.0219	0.0084	0.0000	0.0000	0.0000	-0.0252
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0219	0.0084	0.0000	0.0000	0.0000	0.0251
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B4	Min Value	0.0023	0.0069	0.0000	0.0000	0.0000	-0.0207
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0023	0.0069	0.0000	0.0000	0.0000	0.0208
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B5	Min Value	-0.2310	0.0007	0.0000	0.0000	0.0000	-0.0014
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2310	0.0007	0.0000	0.0000	0.0000	0.0030
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B6	Min Value	0.0348	0.0058	0.0000	0.0000	0.0000	-0.0174
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0348	0.0058	0.0000	0.0000	0.0000	0.0173
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B4	Min Value	-0.0147	0.0033	0.0000	0.0000	0.0000	-0.0099
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0147	0.0033	0.0000	0.0000	0.0000	0.0098
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B5	Min Value	0.3368	-0.0008	0.0000	0.0000	0.0000	-0.0017
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3368	-0.0008	0.0000	0.0000	0.0000	0.0029
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B6	Min Value	-0.0233	0.0024	0.0000	0.0000	0.0000	-0.0072
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0233	0.0024	0.0000	0.0000	0.0000	0.0072
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B4	Min Value	0.0069	0.0006	0.0000	0.0000	0.0000	-0.0019
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0069	0.0006	0.0000	0.0000	0.0000	0.0019
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B5	Min Value	-0.0476	-0.0001	0.0000	0.0000	0.0000	-0.0016
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0476	-0.0001	0.0000	0.0000	0.0000	-0.0008
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B6	Min Value	0.0138	0.0027	0.0000	0.0000	0.0000	-0.0081
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0138	0.0027	0.0000	0.0000	0.0000	0.0083
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 6 VBPLK 2 Units:KN-m April 20, 2013 12:04 PAGE 6

B R A C E F O R C E E N V E L O P E S

STORY	BRACE	ITEM	P	V2	V3	T	M2	M3
LT5	D7	Min Value	0.0184	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0184	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT5	D8	Min Value	0.0304	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0304	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D7	Min Value	0.2304	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2304	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D8	Min Value	-0.3267	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.3267	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D7	Min Value	0.0037	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0037	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D8	Min Value	0.0674	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0674	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D7	Min Value	0.1017	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1017	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D8	Min Value	0.0928	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0928	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D7	Min Value	-0.0031	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0031	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D8	Min Value	-0.0288	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0288	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

Lampiran 37: *Coding* Matlab Menghitung F_U Kasus Kerusakan 7

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
```

```
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(14,i);mode(26,i);m
ode(38,i);mode(50,i);mode(62
,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fu7=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 38: *Coding* Matlab Menghitung F_D Kasus Kerusakan 7

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);%//---
-damage member ----//
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);%//-
---damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);%//-
---damage member ----//
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
Ad=A2*0.5;%//----damage
member ----//
I1=5.536e-4;%m4
I2=2.176e-4;
Id=I2*0.5;%//----damage
member ----//
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,Ad,Id,L36,f2,vs);
K36=kg(k36,T36);%//----
damage member ----//
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,Ad,Id,L40,f2,vs);
K40=kg(k40,T40);%//----
damage member ----//
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,Ad,Id,L44,f2,vs);
K44=kg(k44,T44);%//----
damage member ----//
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
```

```
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*Ad,L36);%//----
damage member ----//
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*Ad,L40);%//----
damage member ----//
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*Ad,L44);%//----
damage member ----//
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(14,i);mode(26,i);m
ode(38,i);mode(50,i);mode(62
,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fd7=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 39: *Coding* Matlab Menghitung SVD Kasus Kerusakan 7

```
Fu7 =1.0e-004 *[0.0469    0.0260    0.0279    0.0318    0.0349;0.0260    0.0799
0.0693    0.0801    0.0924;0.0279    0.0693    0.1389    0.1434    0.1684;0.0318
0.0801    0.1434    0.2348    0.2575;0.0349    0.0924    0.1684    0.2575    0.3768]

Fd7 =1.0e-004 *[0.0557    0.0336    0.0353    0.0393    0.0424;0.0336    0.0868
0.0774    0.0881    0.1002;0.0353    0.0774    0.1530    0.1565    0.1808;0.0393
0.0881    0.1565    0.2473    0.2704;0.0424    0.1002    0.1808    0.2704    0.3958]

Fdel=Fu7-Fd7
[u,s,v]=svd(Fdel)
```

Lampiran 40: *Coding* Matlab Menghitung Gaya Batang Kasus Kerusakan 7

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);%//---
-damage member ----//
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);%//-
---damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);%//-
---damage member ----//
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];
```

```
Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks);
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder);

i=1:84;
pim=[mode(14,i);mode(26,i);m
ode(38,i);mode(50,i);mode(62
,i)];
v=sqrtm(mode'*Mr*mode);
wm=diag(w(1:84));
Fu7=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))';

Untuk VBPLK 1:
R=zeros(84,1);
R(14,1)=-0.4859;
R(26,1)=0.7740;
R(38,1)=0.1143;
R(50,1)=-0.3849;
R(62,1)=0.0607;

Untuk VBPLK 2:
R=zeros(84,1);
R(14,1)=0.2596;
R(26,1)=-0.2828;
R(38,1)=0.5862;
R(50,1)=-0.7049;
R(62,1)=0.1098;

U=solv(Ks,R);

u1=dissf(U,id1,T1);
u2=dissf(U,id2,T2);
u3=dissf(U,id3,T3);
u4=dissf(U,id4,T4);
```

```
u5=dissf(U,id5,T5);
u6=dissf(U,id6,T6);
u7=dissf(U,id7,T7);
u8=dissf(U,id8,T8);
u9=dissf(U,id9,T9);
u10=dissf(U,id10,T10);
u11=dissf(U,id11,T11);
u12=dissf(U,id12,T12);
u13=dissf(U,id13,T13);
u14=dissf(U,id14,T14);
u15=dissf(U,id15,T15);

u16=dissf(U,id16,T16);
u17=dissf(U,id17,T17);
u18=dissf(U,id18,T18);
u19=dissf(U,id19,T19);
u20=dissf(U,id20,T20);
u21=dissf(U,id21,T21);
u22=dissf(U,id22,T22);
u23=dissf(U,id23,T23);
u24=dissf(U,id24,T24);
u25=dissf(U,id25,T25);
u26=dissf(U,id26,T26);
u27=dissf(U,id27,T27);
u28=dissf(U,id28,T28);
u29=dissf(U,id29,T29);
u30=dissf(U,id30,T30);
u31=dissf(U,id31,T31);
u32=dissf(U,id32,T32);
u33=dissf(U,id33,T33);
u34=dissf(U,id34,T34);
u35=dissf(U,id35,T35);

u36=dissf(U,id36,T36);
u37=dissf(U,id37,T37);
u38=dissf(U,id38,T38);
u39=dissf(U,id39,T39);
u40=dissf(U,id40,T40);
u41=dissf(U,id41,T41);
u42=dissf(U,id42,T42);
u43=dissf(U,id43,T43);
u44=dissf(U,id44,T44);
u45=dissf(U,id45,T45);

So1=zeros(6,1);
So2=zeros(6,1);
So3=zeros(6,1);
So4=zeros(6,1);
So5=zeros(6,1);
So6=zeros(6,1);
So7=zeros(6,1);
So8=zeros(6,1);
So9=zeros(6,1);
So10=zeros(6,1);
So11=zeros(6,1);
So12=zeros(6,1);
So13=zeros(6,1);
So14=zeros(6,1);
So15=zeros(6,1);
So16=zeros(6,1);
So17=zeros(6,1);
So18=zeros(6,1);
So19=zeros(6,1);
So20=zeros(6,1);
So21=zeros(6,1);
So22=zeros(6,1);
So23=zeros(6,1);
So24=zeros(6,1);
So25=zeros(6,1);
So26=zeros(6,1);
So27=zeros(6,1);
So28=zeros(6,1);
So29=zeros(6,1);
So30=zeros(6,1);
So31=zeros(6,1);
So32=zeros(6,1);
So33=zeros(6,1);
So34=zeros(6,1);
So35=zeros(6,1);
So36=zeros(6,1);
So37=zeros(6,1);
So38=zeros(6,1);
So39=zeros(6,1);
So40=zeros(6,1);
So41=zeros(6,1);
So42=zeros(6,1);
So43=zeros(6,1);
So44=zeros(6,1);
So45=zeros(6,1);

S1=stref(k1,u1,So1)
S2=stref(k2,u2,So2)
S3=stref(k3,u3,So3)
S4=stref(k4,u4,So4)
S5=stref(k5,u5,So5)
S6=stref(k6,u6,So6)
S7=stref(k7,u7,So7)
S8=stref(k8,u8,So8)
S9=stref(k9,u9,So9)
S10=stref(k10,u10,So10)
S11=stref(k11,u11,So11)
S12=stref(k12,u12,So12)
S13=stref(k13,u13,So13)
S14=stref(k14,u14,So14)
S15=stref(k15,u15,So15)

S16=stref(k16,u16,So16)
S17=stref(k17,u17,So17)
S18=stref(k18,u18,So18)
S19=stref(k19,u19,So19)
S20=stref(k20,u20,So20)
S21=stref(k21,u21,So21)
S22=stref(k22,u22,So22)
S23=stref(k23,u23,So23)
S24=stref(k24,u24,So24)
S25=stref(k25,u25,So25)
S26=stref(k26,u26,So26)
S27=stref(k27,u27,So27)
S28=stref(k28,u28,So28)
S29=stref(k29,u29,So29)
S30=stref(k30,u30,So30)
S31=stref(k31,u31,So31)
S32=stref(k32,u32,So32)
S33=stref(k33,u33,So33)
S34=stref(k34,u34,So34)
S35=stref(k35,u35,So35)

S36=stref(k36,u36,So36)
S37=stref(k37,u37,So37)
S38=stref(k38,u38,So38)
S39=stref(k39,u39,So39)
S40=stref(k40,u40,So40)
S41=stref(k41,u41,So41)
S42=stref(k42,u42,So42)
S43=stref(k43,u43,So43)
S44=stref(k44,u44,So44)
S45=stref(k45,u45,So45)
```

Lampiran 41: *Output* Gaya-gaya Batang dari *software* Matlab Kasus 7

```
Akibat VBPLK
1:
S1 =
    0.0034
   -0.0018
   -0.0055
   -0.0034
    0.0018
   -0.0053
S2 =
    0.1656
   -0.0017
   -0.0043
   -0.1656
    0.0017
   -0.0057
S3 =
    0.4056
   -0.0055
   -0.0137
   -0.4056
    0.0055
   -0.0194
S4 =
   -0.0052
   -0.0005
   -0.0016
    0.0052
    0.0005
   -0.0015
S5 =
   -0.2347
   -0.0010
   -0.0025
    0.2347
    0.0010
   -0.0035
S6 =
   -0.6821
   -0.0033
   -0.0077
    0.6821
    0.0033
   -0.0120
S7 =
   -0.0035
    0.0022
    0.0066
    0.0035
   -0.0022
    0.0065
S8 =
   -0.0243
    0.0013
    0.0030
    0.0243
   -0.0013
    0.0048
S9 =
   -0.1326
    0.0075
    0.0186
    0.1326
   -0.0075
    0.0267
S10 =
    0.0032
    0.0027
    0.0082
   -0.0032
   -0.0027
    0.0081
S11 =
    0.1231
    0.0005
    0.0016
   -0.1231
   -0.0005
    0.0013
S12 =
    0.3562
    0.0025
    0.0075
   -0.3562
   -0.0025
    0.0076
S13 =
    0.0017
    0.0018
    0.0052
   -0.0017
   -0.0018
    0.0053
S14 =
   -0.0428
   -0.0006
   -0.0013
    0.0428
    0.0006
   -0.0024
S15 =
   -0.0472
   -0.0017
   -0.0023
    0.0472
    0.0017
   -0.0078
S16 =
    0.0043
    0.0004
    0.0000
   -0.0043
   -0.0004
    0.0013
S17 =
   -0.1044
    0.0007
    0.0000
    0.1044
   -0.0007
    0.0025
S18 =
    0.0438
   -0.0047
   -0.0000
   -0.0438
    0.0047
   -0.0165
S19 =
    0.0004
   -0.0219
   -0.0000
   -0.0004
    0.0219
   -0.0767
S20 =
    0.0061
    0.0038
    0.0042
   -0.0061
   -0.0038
    0.0092
S21 =
    0.1037
    0.0053
    0.0071
   -0.1037
   -0.0053
    0.0115
S22 =
   -0.0812
    0.0223
    0.0359
    0.0812
   -0.0223
    0.0423
S23 =
   -0.0051
    0.0584
    0.0961
    0.0051
   -0.0584
    0.1084
S24 =
    0.0067
   -0.0014
   -0.0075
   -0.0067
    0.0014
    0.0027
S25 =
    0.2274
   -0.0016
   -0.0074
   -0.2274
    0.0016
    0.0018
S26 =
   -0.1379
   -0.0116
   -0.0311
    0.1379
    0.0116
   -0.0095
S27 =
   -0.0084
   -0.0335
   -0.0964
    0.0084
    0.0335
   -0.0209
S28 =
    0.0045
   -0.0048
   -0.0094
   -0.0045
    0.0048
   -0.0075
S29 =
    0.0365
   -0.0058
   -0.0113
   -0.0365
    0.0058
   -0.0091
S30 =
   -0.0733
   -0.0099
   -0.0139
    0.0733
    0.0099
   -0.0208
S31 =
   -0.0008
   -0.0152
   -0.0058
    0.0008
    0.0152
   -0.0472
S32 =
    0.0018
   -0.0017
   -0.0007
   -0.0018
    0.0017
   -0.0052
S33 =
   -0.0291
   -0.0013
   -0.0005
    0.0291
    0.0013
   -0.0041
S34 =
   -0.0013
    0.0048
    0.0120
    0.0013
   -0.0048
    0.0047
S35 =
    0.0017
    0.0135
    0.0396
   -0.0017
   -0.0135
    0.0078
S36 =
   -0.0047
    0.0000
    0.0000
    0.0047
   -0.0000
    0.0000
S37 =
    0.1154
   -0.0000
    0.0000
   -0.1154
    0.0000
    0.0000
S38 =
   -0.2979
   -0.0000
         0
    0.2979
    0.0000
         0
S39 =
    0.2511
   -0.0000
   -0.0000
   -0.2511
    0.0000
    0.0000
S40 =
    0.0066
    0.0000
    0.0000
   -0.0066
   -0.0000
    0.0000
S41 =
   -0.1807
    0.0000
    0.0000
    0.1807
   -0.0000
         0
S42 =
    0.1999
    0.0000
    0.0000
   -0.1999
   -0.0000
    0.0000
S43 =
   -0.1340
    0.0000
   -0.0000
    0.1340
   -0.0000
   -0.0000
S44 =
  1.0e-003 *
    0.4533
         0
   -0.0000
   -0.4533
         0
   -0.0000
S45 =
    0.0530
    0.0000
   -0.0000
   -0.0530
   -0.0000
   -0.0000
```

```
Akibat VBPLK
2:
S1 =
   -0.0041
    0.0031
    0.0092
    0.0041
   -0.0031
    0.0092
S2 =
   -0.0815
    0.0004
    0.0007
    0.0815
   -0.0004
    0.0015
S3 =
   -0.2090
    0.0050
    0.0137
    0.2090
   -0.0050
    0.0164
S4 =
   -0.0042
    0.0059
    0.0178
    0.0042
   -0.0059
    0.0178
S5 =
    0.1028
    0.0002
    0.0008
   -0.1028
   -0.0002
    0.0001
S6 =
    0.1954
    0.0039
    0.0132
   -0.1954
   -0.0039
    0.0105
S7 =
    0.0003
    0.0078
    0.0233
   -0.0003
   -0.0078
    0.0232
S8 =
   -0.1951
    0.0008
    0.0020
    0.1951
   -0.0008
    0.0026
S9 =
   -0.4644
    0.0094
    0.0270
    0.4644
   -0.0094
    0.0296
S10 =
   -0.0010
    0.0078
    0.0236
    0.0010
   -0.0078
    0.0235
S11 =
    0.2295
    0.0004
    0.0008
   -0.2295
   -0.0004
    0.0015
S12 =
    0.6036
    0.0105
    0.0293
   -0.6036
   -0.0105
    0.0335
S13 =
    0.0083
    0.0063
    0.0186
   -0.0083
   -0.0063
    0.0193
S14 =
   -0.0744
   -0.0018
   -0.0044
    0.0744
    0.0018
   -0.0067
S15 =
   -0.0818
   -0.0005
    0.0039
    0.0818
    0.0005
   -0.0071
S16 =
    0.0309
    0.0005
   -0.0000
   -0.0309
   -0.0005
    0.0018
S17 =
    0.3869
    0.0005
    0.0000
   -0.3869
   -0.0005
    0.0017
S18 =
   -0.3616
    0.0034
   -0.0000
    0.3616
   -0.0034
    0.0118
S19 =
   -0.0283
    0.0118
    0.0000
    0.0283
   -0.0118
    0.0414
S20 =
    0.0278
   -0.0035
   -0.0111
   -0.0278
    0.0035
   -0.0013
S21 =
    0.2908
   -0.0037
   -0.0115
   -0.2908
    0.0037
   -0.0015
S22 =
   -0.3021
   -0.0145
   -0.0270
    0.3021
    0.0145
   -0.0238
S23 =
   -0.0233
   -0.0388
   -0.0578
    0.0233
    0.0388
   -0.0781
S24 =
    0.0219
   -0.0077
   -0.0164
   -0.0219
    0.0077
   -0.0105
S25 =
    0.2335
   -0.0082
   -0.0171
   -0.2335
    0.0082
   -0.0116
S26 =
   -0.2045
    0.0093
    0.0105
    0.2045
   -0.0093
    0.0219
S27 =
   -0.0194
    0.0486
    0.0676
    0.0194
   -0.0486
    0.1023
S28 =
    0.0142
   -0.0074
   -0.0128
   -0.0142
    0.0074
   -0.0130
S29 =
    0.0650
   -0.0079
   -0.0136
   -0.0650
    0.0079
   -0.0139
S30 =
   -0.0805
   -0.0293
   -0.0515
    0.0805
    0.0293
   -0.0512
S31 =
   -0.0099
   -0.0733
   -0.1319
    0.0099
    0.0733
   -0.1246
S32 =
    0.0063
   -0.0083
   -0.0106
   -0.0063
    0.0083
   -0.0186
S33 =
   -0.0606
   -0.0072
   -0.0103
    0.0606
    0.0072
   -0.0149
S34 =
    0.0018
    0.0066
    0.0204
   -0.0018
   -0.0066
    0.0027
S35 =
    0.0005
    0.0280
    0.0911
   -0.0005
   -0.0280
    0.0071
S36 =
  1.0e-003 *
    0.2432
    0.0000
    0.0000
   -0.2432
   -0.0000
    0.0000
S37 =
   -0.0557
    0.0000
    0.0000
    0.0557
   -0.0000
    0.0000
S38 =
    0.1405
    0.0000
    0.0000
   -0.1405
   -0.0000
         0
S39 =
   -0.1271
    0.0000
    0.0000
    0.1271
   -0.0000
    0.0000
S40 =
   -0.0019
    0.0000
    0.0000
    0.0019
   -0.0000
    0.0000
S41 =
   -0.0608
    0.0000
    0.0000
    0.0608
   -0.0000
   -0.0000
S42 =
    0.2874
    0.0000
    0.0000
   -0.2874
   -0.0000
    0.0000
S43 =
   -0.2651
    0.0000
    0.0000
    0.2651
   -0.0000
    0.0000
S44 =
  1.0e-003 *
   -0.9174
    0.0000
   -0.0000
    0.9174
   -0.0000
         0
S45 =
    0.1041
    0.0000
   -0.0000
   -0.1041
   -0.0000
   -0.0000
```

Lampiran 42: *Output* Gaya-gaya Batang dari *software* ETABS Kasus 7

C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
LT5	C5	Min Value	-0.0018	-0.0017	0.0000	0.0000	0.0000	-0.0007
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0018	-0.0017	0.0000	0.0000	0.0000	0.0052
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C6	Min Value	0.0291	-0.0013	0.0000	0.0000	0.0000	-0.0005
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0291	-0.0013	0.0000	0.0000	0.0000	0.0041
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C7	Min Value	0.0013	0.0048	0.0000	0.0000	0.0000	-0.0047
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0013	0.0048	0.0000	0.0000	0.0000	0.0120
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C8	Min Value	-0.0017	0.0135	0.0000	0.0000	0.0000	-0.0078
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0017	0.0135	0.0000	0.0000	0.0000	0.0395
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C5	Min Value	-0.0045	-0.0048	0.0000	0.0000	0.0000	-0.0094
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0045	-0.0048	0.0000	0.0000	0.0000	0.0075
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C6	Min Value	-0.0365	-0.0058	0.0000	0.0000	0.0000	-0.0113
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0365	-0.0058	0.0000	0.0000	0.0000	0.0091
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C7	Min Value	0.0733	-0.0099	0.0000	0.0000	0.0000	-0.0139
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0733	-0.0099	0.0000	0.0000	0.0000	0.0208
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C8	Min Value	0.0008	-0.0151	0.0000	0.0000	0.0000	-0.0058
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0008	-0.0151	0.0000	0.0000	0.0000	0.0472
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C5	Min Value	-0.0067	-0.0014	0.0000	0.0000	0.0000	-0.0075
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0067	-0.0014	0.0000	0.0000	0.0000	-0.0027
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C6	Min Value	-0.2274	-0.0016	0.0000	0.0000	0.0000	-0.0074
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2274	-0.0016	0.0000	0.0000	0.0000	-0.0018
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C7	Min Value	0.1380	-0.0116	0.0000	0.0000	0.0000	-0.0310
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1380	-0.0116	0.0000	0.0000	0.0000	0.0095
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C8	Min Value	0.0084	-0.0334	0.0000	0.0000	0.0000	-0.0962
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0084	-0.0334	0.0000	0.0000	0.0000	0.0208
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C5	Min Value	-0.0061	0.0038	0.0000	0.0000	0.0000	-0.0091
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0061	0.0038	0.0000	0.0000	0.0000	0.0042
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C6	Min Value	-0.1037	0.0053	0.0000	0.0000	0.0000	-0.0114
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1037	0.0053	0.0000	0.0000	0.0000	0.0070
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C7	Min Value	0.0812	0.0223	0.0000	0.0000	0.0000	-0.0422
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0812	0.0223	0.0000	0.0000	0.0000	0.0359
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C8	Min Value	0.0051	0.0583	0.0000	0.0000	0.0000	-0.1082
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0051	0.0583	0.0000	0.0000	0.0000	0.0959
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C5	Min Value	-0.0043	0.0004	0.0000	0.0000	0.0000	-0.0013
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0043	0.0004	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C6	Min Value	0.1044	0.0007	0.0000	0.0000	0.0000	-0.0025
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1044	0.0007	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C7	Min Value	-0.0439	-0.0047	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0439	-0.0047	0.0000	0.0000	0.0000	0.0165
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT1	C8	Min Value	-0.0004	-0.0219	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0004	-0.0219	0.0000	0.0000	0.0000	0.0765
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

B E A M F O R C E E N V E L O P E S

STORY	BEAM	ITEM	P	V2	V3	T	M2	M3
LT5	B4	Min Value	-0.0017	-0.0018	0.0000	0.0000	0.0000	-0.0052
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0017	-0.0018	0.0000	0.0000	0.0000	0.0053
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B5	Min Value	0.0428	0.0006	0.0000	0.0000	0.0000	-0.0024
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0428	0.0006	0.0000	0.0000	0.0000	0.0013
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B6	Min Value	0.0472	0.0017	0.0000	0.0000	0.0000	-0.0078
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0472	0.0017	0.0000	0.0000	0.0000	0.0023
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B4	Min Value	-0.0032	-0.0027	0.0000	0.0000	0.0000	-0.0082
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0032	-0.0027	0.0000	0.0000	0.0000	0.0081
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B5	Min Value	-0.1231	-0.0005	0.0000	0.0000	0.0000	-0.0016
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1231	-0.0005	0.0000	0.0000	0.0000	0.0013
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B6	Min Value	-0.3563	-0.0025	0.0000	0.0000	0.0000	-0.0075
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.3563	-0.0025	0.0000	0.0000	0.0000	0.0076
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B4	Min Value	0.0035	-0.0022	0.0000	0.0000	0.0000	-0.0066
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0035	-0.0022	0.0000	0.0000	0.0000	0.0065
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B5	Min Value	0.0242	-0.0013	0.0000	0.0000	0.0000	-0.0030
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0242	-0.0013	0.0000	0.0000	0.0000	0.0048
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B6	Min Value	0.1326	-0.0075	0.0000	0.0000	0.0000	-0.0186
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1326	-0.0075	0.0000	0.0000	0.0000	0.0266
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B4	Min Value	0.0052	0.0005	0.0000	0.0000	0.0000	-0.0015
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0052	0.0005	0.0000	0.0000	0.0000	0.0016
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B5	Min Value	0.2348	0.0010	0.0000	0.0000	0.0000	-0.0035
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2348	0.0010	0.0000	0.0000	0.0000	0.0025
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B6	Min Value	0.6822	0.0033	0.0000	0.0000	0.0000	-0.0120
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.6822	0.0033	0.0000	0.0000	0.0000	0.0077
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B4	Min Value	-0.0034	0.0018	0.0000	0.0000	0.0000	-0.0053
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0034	0.0018	0.0000	0.0000	0.0000	0.0055
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B5	Min Value	-0.1657	0.0016	0.0000	0.0000	0.0000	-0.0057
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1657	0.0016	0.0000	0.0000	0.0000	0.0042
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B6	Min Value	-0.4057	0.0055	0.0000	0.0000	0.0000	-0.0194
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.4057	0.0055	0.0000	0.0000	0.0000	0.0137
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

B R A C E F O R C E E N V E L O P E S

STORY	BRACE	ITEM	P	V2	V3	T	M2	M3
LT5	D7	Min Value	-0.0004	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0004	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT5	D8	Min Value	-0.0530	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0530	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D7	Min Value	-0.2000	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2000	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D8	Min Value	0.1341	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1341	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D7	Min Value	-0.0067	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0067	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D8	Min Value	0.1808	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1808	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D7	Min Value	0.2980	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2980	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D8	Min Value	-0.2512	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2512	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D7	Min Value	0.0047	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0047	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D8	Min Value	-0.1154	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1154	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
LT5	C5	Min Value	-0.0063	-0.0083	0.0000	0.0000	0.0000	-0.0106
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0063	-0.0083	0.0000	0.0000	0.0000	0.0186
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C6	Min Value	0.0606	-0.0072	0.0000	0.0000	0.0000	-0.0104
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0606	-0.0072	0.0000	0.0000	0.0000	0.0149
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C7	Min Value	-0.0018	0.0066	0.0000	0.0000	0.0000	-0.0027
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0018	0.0066	0.0000	0.0000	0.0000	0.0203
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C8	Min Value	-0.0005	0.0280	0.0000	0.0000	0.0000	-0.0070
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0005	0.0280	0.0000	0.0000	0.0000	0.0909
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C5	Min Value	-0.0142	-0.0074	0.0000	0.0000	0.0000	-0.0128
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0142	-0.0074	0.0000	0.0000	0.0000	0.0130
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C6	Min Value	-0.0650	-0.0079	0.0000	0.0000	0.0000	-0.0136
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0650	-0.0079	0.0000	0.0000	0.0000	0.0139
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C7	Min Value	0.0805	-0.0293	0.0000	0.0000	0.0000	-0.0515
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0805	-0.0293	0.0000	0.0000	0.0000	0.0511
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C8	Min Value	0.0100	-0.0732	0.0000	0.0000	0.0000	-0.1317
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0100	-0.0732	0.0000	0.0000	0.0000	0.1244
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C5	Min Value	-0.0219	-0.0077	0.0000	0.0000	0.0000	-0.0164
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0219	-0.0077	0.0000	0.0000	0.0000	0.0105
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C6	Min Value	-0.2335	-0.0082	0.0000	0.0000	0.0000	-0.0171
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2335	-0.0082	0.0000	0.0000	0.0000	0.0116
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C7	Min Value	0.2044	0.0092	0.0000	0.0000	0.0000	-0.0219
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2044	0.0092	0.0000	0.0000	0.0000	0.0105
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C8	Min Value	0.0194	0.0485	0.0000	0.0000	0.0000	-0.1021
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0194	0.0485	0.0000	0.0000	0.0000	0.0675
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C5	Min Value	-0.0278	-0.0035	0.0000	0.0000	0.0000	-0.0111
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0278	-0.0035	0.0000	0.0000	0.0000	0.0013
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C6	Min Value	-0.2907	-0.0037	0.0000	0.0000	0.0000	-0.0115
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2907	-0.0037	0.0000	0.0000	0.0000	0.0015
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C7	Min Value	0.3020	-0.0145	0.0000	0.0000	0.0000	-0.0270
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3020	-0.0145	0.0000	0.0000	0.0000	0.0238
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C8	Min Value	0.0233	-0.0388	0.0000	0.0000	0.0000	-0.0577
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0233	-0.0388	0.0000	0.0000	0.0000	0.0780
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C5	Min Value	-0.0309	0.0005	0.0000	0.0000	0.0000	-0.0018
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0309	0.0005	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C6	Min Value	-0.3869	0.0005	0.0000	0.0000	0.0000	-0.0017
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.3869	0.0005	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C7	Min Value	0.3615	0.0034	0.0000	0.0000	0.0000	-0.0118
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3615	0.0034	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT1	C8	Min Value	0.0283	0.0118	0.0000	0.0000	0.0000	-0.0413
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0283	0.0118	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 7 VBPLK 2 Units:KN-m April 20, 2013 12:35 PAGE 5

B E A M F O R C E E N V E L O P E S

STORY	BEAM	ITEM	P	V2	V3	T	M2	M3
LT5	B4	Min Value	-0.0083	-0.0063	0.0000	0.0000	0.0000	-0.0186
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0083	-0.0063	0.0000	0.0000	0.0000	0.0193
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B5	Min Value	0.0744	0.0018	0.0000	0.0000	0.0000	-0.0067
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0744	0.0018	0.0000	0.0000	0.0000	0.0044
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B6	Min Value	0.0818	0.0005	0.0000	0.0000	0.0000	-0.0070
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0818	0.0005	0.0000	0.0000	0.0000	-0.0040
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B4	Min Value	0.0010	-0.0078	0.0000	0.0000	0.0000	-0.0236
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0010	-0.0078	0.0000	0.0000	0.0000	0.0235
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B5	Min Value	-0.2296	-0.0004	0.0000	0.0000	0.0000	-0.0008
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2296	-0.0004	0.0000	0.0000	0.0000	0.0015
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B6	Min Value	-0.6038	-0.0105	0.0000	0.0000	0.0000	-0.0293
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.6038	-0.0105	0.0000	0.0000	0.0000	0.0335
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B4	Min Value	-0.0003	-0.0078	0.0000	0.0000	0.0000	-0.0233
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0003	-0.0078	0.0000	0.0000	0.0000	0.0232
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B5	Min Value	0.1952	-0.0008	0.0000	0.0000	0.0000	-0.0020
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1952	-0.0008	0.0000	0.0000	0.0000	0.0026
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B6	Min Value	0.4646	-0.0094	0.0000	0.0000	0.0000	-0.0270
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.4646	-0.0094	0.0000	0.0000	0.0000	0.0296
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B4	Min Value	0.0041	-0.0059	0.0000	0.0000	0.0000	-0.0178
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0041	-0.0059	0.0000	0.0000	0.0000	0.0178
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B5	Min Value	-0.1029	-0.0002	0.0000	0.0000	0.0000	-0.0008
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1029	-0.0002	0.0000	0.0000	0.0000	0.0001
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B6	Min Value	-0.1956	-0.0039	0.0000	0.0000	0.0000	-0.0132
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1956	-0.0039	0.0000	0.0000	0.0000	0.0105
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B4	Min Value	0.0041	-0.0031	0.0000	0.0000	0.0000	-0.0092
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0041	-0.0031	0.0000	0.0000	0.0000	0.0092
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B5	Min Value	0.0816	-0.0004	0.0000	0.0000	0.0000	-0.0007
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0816	-0.0004	0.0000	0.0000	0.0000	0.0015
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B6	Min Value	0.2090	-0.0050	0.0000	0.0000	0.0000	-0.0137
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2090	-0.0050	0.0000	0.0000	0.0000	0.0164
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 7 VBPLK 2 Units:KN-m April 20, 2013 12:35 PAGE 6

B R A C E F O R C E E N V E L O P E S

STORY	BRACE	ITEM	P	V2	V3	T	M2	M3
LT5	D7	Min Value	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT5	D8	Min Value	-0.1042	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1042	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D7	Min Value	-0.2875	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2875	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D8	Min Value	0.2652	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2652	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D7	Min Value	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0020	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D8	Min Value	0.0607	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0607	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D7	Min Value	-0.1405	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1405	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D8	Min Value	0.1271	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1271	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D7	Min Value	-0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0002	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D8	Min Value	0.0557	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0557	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

Lampiran 43: *Coding* Matlab Menghitung F_U Kasus Kerusakan 8

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
```

```
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(14,i);mode(26,i);m
ode(38,i);mode(50,i);mode(62
,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fu8=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 44: *Coding* Matlab Menghitung F_D Kasus Kerusakan 8

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);%//---
-damage member ----//
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);%//-
---damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);
```

```
E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
Ad=A2*0.5;%//----damage
member ----//
I1=5.536e-4;%m4
I2=2.176e-4;
Id=I2*0.5;%//----damage
member ----//
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,Ad,Id,L5,f2,vs);
K5=kg(k5,T5);%//----damage
member ----//
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
```

```
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,Ad,Id,L40,f2,vs);
K40=kg(k40,T40);%//----
damage member ----//
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
```

```
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*Ad,L5);%//----
damage member ----//
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*Ad,L40);%//----
damage member ----//
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(14,i);mode(26,i);m
ode(38,i);mode(50,i);mode(62
,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fd8=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 45: *Coding* Matlab Menghitung SVD Kasus Kerusakan 8

```
Fu8 =1.0e-004 *[0.0469    0.0260    0.0279    0.0318    0.0349; 0.0260    0.0799
0.0693    0.0801    0.0924; 0.0279    0.0693    0.1389    0.1434    0.1684; 0.0318
0.0801    0.1434    0.2348    0.2575; 0.0349    0.0924    0.1684    0.2575    0.3768]

Fd8 =1.0e-004 *[0.0470    0.0258    0.0276    0.0315    0.0346; 0.0258    0.0818
0.0710    0.0818    0.0941; 0.0276    0.0710    0.1463    0.1499    0.1748; 0.0315
0.0818    0.1499    0.2406    0.2631; 0.0346    0.0941    0.1748    0.2631    0.3823]
Fdel=Fu8-Fd8
[u,s,v]=svd(Fdel)
```

Lampiran 46: *Coding* Matlab Menghitung Gaya Batang Kasus Kerusakan 8

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);%//---
-damage member ----//
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);%//-
---damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);
```

```
E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
```

```
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];
```

```
Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks);
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder);

i=1:84;
pim=[mode(14,i);mode(26,i);m
ode(38,i);mode(50,i);mode(62
,i)];
v=sqrtm(mode'*Mr*mode);
wm=diag(w(1:84));
Fu8=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))';

R=zeros(84,1);
R(14,1)=0.1455;
R(26,1)=-0.1121;
R(38,1)=-0.6773;
R(50,1)=0.1206;
R(62,1)=0.7021;

U=solv(Ks,R);

u1=dissf(U,id1,T1);
u2=dissf(U,id2,T2);
u3=dissf(U,id3,T3);
u4=dissf(U,id4,T4);
u5=dissf(U,id5,T5);
u6=dissf(U,id6,T6);
u7=dissf(U,id7,T7);
u8=dissf(U,id8,T8);
u9=dissf(U,id9,T9);
u10=dissf(U,id10,T10);
u11=dissf(U,id11,T11);
u12=dissf(U,id12,T12);
u13=dissf(U,id13,T13);
```

```
u14=dissf(U,id14,T14);
u15=dissf(U,id15,T15);

u16=dissf(U,id16,T16);
u17=dissf(U,id17,T17);
u18=dissf(U,id18,T18);
u19=dissf(U,id19,T19);
u20=dissf(U,id20,T20);
u21=dissf(U,id21,T21);
u22=dissf(U,id22,T22);
u23=dissf(U,id23,T23);
u24=dissf(U,id24,T24);
u25=dissf(U,id25,T25);
u26=dissf(U,id26,T26);
u27=dissf(U,id27,T27);
u28=dissf(U,id28,T28);
u29=dissf(U,id29,T29);
u30=dissf(U,id30,T30);
u31=dissf(U,id31,T31);
u32=dissf(U,id32,T32);
u33=dissf(U,id33,T33);
u34=dissf(U,id34,T34);
u35=dissf(U,id35,T35);

u36=dissf(U,id36,T36);
u37=dissf(U,id37,T37);
u38=dissf(U,id38,T38);
u39=dissf(U,id39,T39);
u40=dissf(U,id40,T40);
u41=dissf(U,id41,T41);
u42=dissf(U,id42,T42);
u43=dissf(U,id43,T43);
u44=dissf(U,id44,T44);
u45=dissf(U,id45,T45);

So1=zeros(6,1);
So2=zeros(6,1);
So3=zeros(6,1);
So4=zeros(6,1);
So5=zeros(6,1);
So6=zeros(6,1);
So7=zeros(6,1);
So8=zeros(6,1);
So9=zeros(6,1);
So10=zeros(6,1);
So11=zeros(6,1);
So12=zeros(6,1);
So13=zeros(6,1);
So14=zeros(6,1);
So15=zeros(6,1);
So16=zeros(6,1);
So17=zeros(6,1);
So18=zeros(6,1);
So19=zeros(6,1);
So20=zeros(6,1);
So21=zeros(6,1);
So22=zeros(6,1);
So23=zeros(6,1);
So24=zeros(6,1);
So25=zeros(6,1);
So26=zeros(6,1);
So27=zeros(6,1);
So28=zeros(6,1);
So29=zeros(6,1);
So30=zeros(6,1);
So31=zeros(6,1);
So32=zeros(6,1);
So33=zeros(6,1);
So34=zeros(6,1);
So35=zeros(6,1);
So36=zeros(6,1);
So37=zeros(6,1);
So38=zeros(6,1);
So39=zeros(6,1);
So40=zeros(6,1);
So41=zeros(6,1);
So42=zeros(6,1);
So43=zeros(6,1);
So44=zeros(6,1);
So45=zeros(6,1);

S1=stref(k1,u1,So1)
S2=stref(k2,u2,So2)
S3=stref(k3,u3,So3)
S4=stref(k4,u4,So4)
S5=stref(k5,u5,So5)
S6=stref(k6,u6,So6)
S7=stref(k7,u7,So7)
S8=stref(k8,u8,So8)
S9=stref(k9,u9,So9)
S10=stref(k10,u10,So10)
S11=stref(k11,u11,So11)
S12=stref(k12,u12,So12)
S13=stref(k13,u13,So13)
S14=stref(k14,u14,So14)
S15=stref(k15,u15,So15)

S16=stref(k16,u16,So16)
S17=stref(k17,u17,So17)
S18=stref(k18,u18,So18)
S19=stref(k19,u19,So19)
S20=stref(k20,u20,So20)
S21=stref(k21,u21,So21)
S22=stref(k22,u22,So22)
S23=stref(k23,u23,So23)
S24=stref(k24,u24,So24)
S25=stref(k25,u25,So25)
S26=stref(k26,u26,So26)
S27=stref(k27,u27,So27)
S28=stref(k28,u28,So28)
S29=stref(k29,u29,So29)
S30=stref(k30,u30,So30)
S31=stref(k31,u31,So31)
S32=stref(k32,u32,So32)
S33=stref(k33,u33,So33)
S34=stref(k34,u34,So34)
S35=stref(k35,u35,So35)

S36=stref(k36,u36,So36)
S37=stref(k37,u37,So37)
S38=stref(k38,u38,So38)
S39=stref(k39,u39,So39)
S40=stref(k40,u40,So40)
S41=stref(k41,u41,So41)
S42=stref(k42,u42,So42)
S43=stref(k43,u43,So43)
S44=stref(k44,u44,So44)
S45=stref(k45,u45,So45)
```

Lampiran 47: *Output* Gaya-gaya Batang dari *software* Matlab Kasus 8

```
S1 =
    0.0072
   -0.0058
   -0.0175
   -0.0072
    0.0058
   -0.0176
S2 =
   -0.0470
    0.0005
    0.0016
    0.0470
   -0.0005
    0.0016
S3 =
   -0.1482
   -0.0057
   -0.0173
    0.1482
    0.0057
   -0.0169
S4 =
    0.0061
   -0.0118
   -0.0353
   -0.0061
    0.0118
   -0.0355
S5 =
    0.0187
    0.0011
    0.0027
   -0.0187
   -0.0011
    0.0038
S6 =
    0.1299
   -0.0082
   -0.0274
   -0.1299
    0.0082
   -0.0219
S7 =
    0.0096
   -0.0187
   -0.0562
   -0.0096
    0.0187
   -0.0561
S8 =
    0.1951
   -0.0004
   -0.0011
   -0.1951
    0.0004
   -0.0011
S9 =
    0.6194
   -0.0190
   -0.0565
   -0.6194
    0.0190
   -0.0577
S10 =
    0.0060
   -0.0233
   -0.0699
   -0.0060
    0.0233
   -0.0697
S11 =
   -0.0174
   -0.0017
   -0.0039
    0.0174
    0.0017
   -0.0060
S12 =
   -0.1057
   -0.0285
   -0.0814
    0.1057
    0.0285
   -0.0896
S13 =
   -0.0280
   -0.0199
   -0.0591
    0.0280
    0.0199
   -0.0605
S14 =
   -0.2649
    0.0022
    0.0074
    0.2649
   -0.0022
    0.0060
S15 =
   -0.6712
   -0.0234
   -0.0685
    0.6712
    0.0234
   -0.0720
S16 =
   -0.0795
   -0.0008
   -0.0000
    0.0795
    0.0008
   -0.0029
S17 =
   -0.7940
   -0.0011
   -0.0000
    0.7940
    0.0011
   -0.0037
S18 =
    0.8051
   -0.0002
    0.0000
   -0.8051
    0.0002
   -0.0006
S19 =
    0.0849
    0.0031
   -0.0000
   -0.0849
   -0.0031
    0.0109
S20 =
   -0.0737
    0.0063
    0.0205
    0.0737
   -0.0063
    0.0018
S21 =
   -0.7487
    0.0058
    0.0197
    0.7487
   -0.0058
    0.0006
S22 =
    0.7534
    0.0052
    0.0163
   -0.7534
   -0.0052
    0.0019
S23 =
    0.0792
    0.0058
    0.0060
   -0.0792
   -0.0058
    0.0143
S24 =
   -0.0619
    0.0124
    0.0335
    0.0619
   -0.0124
    0.0100
S25 =
   -0.7620
    0.0119
    0.0322
    0.7620
   -0.0119
    0.0096
S26 =
    0.6813
    0.0045
    0.0217
   -0.6813
   -0.0045
   -0.0060
S27 =
    0.0710
   -0.0120
    0.0075
   -0.0710
    0.0120
   -0.0495
S28 =
   -0.0432
    0.0220
    0.0462
    0.0432
   -0.0220
    0.0309
S29 =
   -0.5321
    0.0231
    0.0476
    0.5321
   -0.0231
    0.0333
S30 =
    0.4639
    0.0297
    0.0636
   -0.4639
   -0.0297
    0.0404
S31 =
    0.0519
    0.0459
    0.1072
   -0.0519
   -0.0459
    0.0534
S32 =
   -0.0199
    0.0280
    0.0390
    0.0199
   -0.0280
    0.0591
S33 =
   -0.1004
    0.0267
    0.0403
    0.1004
   -0.0267
    0.0531
S34 =
    0.1931
    0.0313
    0.0470
   -0.1931
   -0.0313
    0.0625
S35 =
    0.0234
    0.0309
    0.0362
   -0.0234
   -0.0309
    0.0720
S36 =
   -0.1192
    0.0000
    0.0000
    0.1192
   -0.0000
    0.0000
S37 =
    0.0866
   -0.0000
         0
   -0.0866
    0.0000
         0
S38 =
   -0.0159
         0
    0.0000
    0.0159
         0
    0.0000
S39 =
   -0.0042
   -0.0000
         0
    0.0042
    0.0000
    0.0000
S40 =
   -0.0033
   -0.0000
   -0.0000
    0.0033
    0.0000
   -0.0000
S41 =
    0.1455
   -0.0000
    0.0000
   -0.1455
    0.0000
    0.0000
S42 =
   -0.3473
   -0.0000
   -0.0000
    0.3473
    0.0000
   -0.0000
S43 =
    0.4653
   -0.0000
   -0.4653
    0.0000
   -0.0000
S44 =
   -0.4342
   -0.0000
    0.4342
    0.0000
   -0.0000
S45 =
    0.2433
   -0.0000
   -0.2433
    0.0000
   -0.0000
```

Lampiran 48: *Output* Gaya-gaya Batang dari *software* ETABS Kasus 8

C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
LT5	C5	Min Value	0.0199	0.0280	0.0000	0.0000	0.0000	-0.0591
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0199	0.0280	0.0000	0.0000	0.0000	0.0390
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C6	Min Value	0.1004	0.0267	0.0000	0.0000	0.0000	-0.0531
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1004	0.0267	0.0000	0.0000	0.0000	0.0403
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C7	Min Value	-0.1931	0.0313	0.0000	0.0000	0.0000	-0.0625
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1931	0.0313	0.0000	0.0000	0.0000	0.0470
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C8	Min Value	-0.0234	0.0309	0.0000	0.0000	0.0000	-0.0720
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0234	0.0309	0.0000	0.0000	0.0000	0.0363
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C5	Min Value	0.0432	0.0220	0.0000	0.0000	0.0000	-0.0309
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0432	0.0220	0.0000	0.0000	0.0000	0.0462
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C6	Min Value	0.5320	0.0231	0.0000	0.0000	0.0000	-0.0333
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.5320	0.0231	0.0000	0.0000	0.0000	0.0476
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C7	Min Value	-0.4639	0.0297	0.0000	0.0000	0.0000	-0.0404
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.4639	0.0297	0.0000	0.0000	0.0000	0.0635
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C8	Min Value	-0.0519	0.0458	0.0000	0.0000	0.0000	-0.0533
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0519	0.0458	0.0000	0.0000	0.0000	0.1071
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C5	Min Value	0.0619	0.0125	0.0000	0.0000	0.0000	-0.0100
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0619	0.0125	0.0000	0.0000	0.0000	0.0336
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C6	Min Value	0.7620	0.0119	0.0000	0.0000	0.0000	-0.0096
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.7620	0.0119	0.0000	0.0000	0.0000	0.0322
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C7	Min Value	-0.6813	0.0045	0.0000	0.0000	0.0000	0.0059
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.6813	0.0045	0.0000	0.0000	0.0000	0.0217
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C8	Min Value	-0.0710	-0.0119	0.0000	0.0000	0.0000	0.0076
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0710	-0.0119	0.0000	0.0000	0.0000	0.0494
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C5	Min Value	0.0737	0.0064	0.0000	0.0000	0.0000	-0.0018
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0737	0.0064	0.0000	0.0000	0.0000	0.0205
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C6	Min Value	0.7486	0.0058	0.0000	0.0000	0.0000	-0.0006
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.7486	0.0058	0.0000	0.0000	0.0000	0.0197
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C7	Min Value	-0.7533	0.0052	0.0000	0.0000	0.0000	-0.0019
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.7533	0.0052	0.0000	0.0000	0.0000	0.0163
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C8	Min Value	-0.0792	0.0058	0.0000	0.0000	0.0000	-0.0143
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0792	0.0058	0.0000	0.0000	0.0000	0.0061
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C5	Min Value	0.0796	-0.0008	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0796	-0.0008	0.0000	0.0000	0.0000	0.0030
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C6	Min Value	0.7939	-0.0011	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.7939	-0.0011	0.0000	0.0000	0.0000	0.0038
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C7	Min Value	-0.8050	-0.0002	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.8050	-0.0002	0.0000	0.0000	0.0000	0.0007
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT1	C8	Min Value	-0.0849	0.0031	0.0000	0.0000	0.0000	-0.0108
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0849	0.0031	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 8 Units:KN-m May 15, 2013 8:18 PAGE 5

B E A M F O R C E E N V E L O P E S

STORY	BEAM	ITEM	P	V2	V3	T	M2	M3
LT5	B4	Min Value	0.0280	0.0199	0.0000	0.0000	0.0000	-0.0605
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0280	0.0199	0.0000	0.0000	0.0000	0.0591
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B5	Min Value	0.2649	-0.0022	0.0000	0.0000	0.0000	-0.0074
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2649	-0.0022	0.0000	0.0000	0.0000	0.0060
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B6	Min Value	0.6712	0.0234	0.0000	0.0000	0.0000	-0.0720
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.6712	0.0234	0.0000	0.0000	0.0000	0.0685
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B4	Min Value	-0.0060	0.0233	0.0000	0.0000	0.0000	-0.0697
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0060	0.0233	0.0000	0.0000	0.0000	0.0699
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B5	Min Value	0.0174	0.0016	0.0000	0.0000	0.0000	-0.0059
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0174	0.0016	0.0000	0.0000	0.0000	0.0039
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B6	Min Value	0.1057	0.0285	0.0000	0.0000	0.0000	-0.0896
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1057	0.0285	0.0000	0.0000	0.0000	0.0814
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B4	Min Value	-0.0096	0.0187	0.0000	0.0000	0.0000	-0.0561
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0096	0.0187	0.0000	0.0000	0.0000	0.0562
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B5	Min Value	-0.1951	0.0003	0.0000	0.0000	0.0000	-0.0011
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1951	0.0003	0.0000	0.0000	0.0000	0.0010
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B6	Min Value	-0.6195	0.0190	0.0000	0.0000	0.0000	-0.0577
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.6195	0.0190	0.0000	0.0000	0.0000	0.0566
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B4	Min Value	-0.0061	0.0118	0.0000	0.0000	0.0000	-0.0355
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0061	0.0118	0.0000	0.0000	0.0000	0.0353
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B5	Min Value	-0.0186	-0.0011	0.0000	0.0000	0.0000	-0.0027
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0186	-0.0011	0.0000	0.0000	0.0000	0.0038
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B6	Min Value	-0.1299	0.0082	0.0000	0.0000	0.0000	-0.0219
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1299	0.0082	0.0000	0.0000	0.0000	0.0275
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B4	Min Value	-0.0072	0.0058	0.0000	0.0000	0.0000	-0.0176
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0072	0.0058	0.0000	0.0000	0.0000	0.0175
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B5	Min Value	0.0470	-0.0005	0.0000	0.0000	0.0000	-0.0016
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0470	-0.0005	0.0000	0.0000	0.0000	0.0016
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B6	Min Value	0.1482	0.0057	0.0000	0.0000	0.0000	-0.0169
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1482	0.0057	0.0000	0.0000	0.0000	0.0173
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 8 Units:KN-m May 15, 2013 8:18 PAGE 6

B R A C E F O R C E E N V E L O P E S

STORY	BRACE	ITEM	P	V2	V3	T	M2	M3
LT5	D7	Min Value	0.4341	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.4341	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT5	D8	Min Value	-0.2433	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2433	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D7	Min Value	0.3474	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.3474	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D8	Min Value	-0.4654	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.4654	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D7	Min Value	0.0032	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0032	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D8	Min Value	-0.1455	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1455	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D7	Min Value	0.0159	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0159	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D8	Min Value	0.0042	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0042	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D7	Min Value	0.1193	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1193	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D8	Min Value	-0.0866	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0866	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

Lampiran 49: *Coding* Matlab Menghitung F_U Kasus Kerusakan 9

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
```

```
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(14,i);mode(26,i);m
ode(38,i);mode(50,i);mode(62
,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fu9=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 50: *Coding* Matlab Menghitung F_D Kasus Kerusakan 9

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5);%//---
-damage member ----//
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);%//-
---damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);

E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
Adb=A2*0.5;%//----damage
member ----//
Adk=A1*0.5;%//----damage
member ----//
I1=5.536e-4;%m4
I2=2.176e-4;
Idb=I2*0.5;%//----damage
member ----//
Idk=I1*0.5;%//----damage
member ----//
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,Adk,Idk,L16,f1,vs
); K16=kg(k16,T16);%//----
damage member ----//
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);

k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,Adb,Idb,L40,f2,vs
); K40=kg(k40,T40);%//----
damage member ----//
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
```

```
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];

Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);
m16=mlf(rho*Adk,L16);%//---- damage member ----//
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*Adb,L40);%//---- damage member ----//
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks)
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder)

i=1:84;
pim=[mode(14,i);mode(26,i);m
ode(38,i);mode(50,i);mode(62
,i)]
v=sqrtm(mode'*Mr*mode)
wm=diag(w(1:84));
Fd9=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))'
```

Lampiran 51: *Coding* Matlab Menghitung SVD Kasus Kerusakan 9

```
Fu9 =1.0e-004 *[0.0469    0.0260    0.0279    0.0318    0.0349; 0.0260    0.0799
0.0693    0.0801    0.0924; 0.0279    0.0693    0.1389    0.1434    0.1684; 0.0318
0.0801    0.1434    0.2348    0.2575; 0.0349    0.0924    0.1684    0.2575    0.3768]

Fd9 =1.0e-004 *[0.0470    0.0260    0.0276    0.0316    0.0347; 0.0260    0.0801
0.0706    0.0814    0.0937; 0.0276    0.0706    0.1463    0.1499    0.1748; 0.0316
0.0814    0.1499    0.2406    0.2632; 0.0347    0.0937    0.1748    0.2632    0.3825]

Fdel=Fu9-Fd9
[u,s,v]=svd(Fdel)
```

Lampiran 52: *Coding* Matlab Menghitung Gaya Batang Kasus Kerusakan 9

```
n1=coor(0,0);
n2=coor(6,0);
n3=coor(12,0);
n4=coor(18,0);

n5=coor(0,3.5);
n6=coor(6,3.5);
n7=coor(12,3.5);
n8=coor(18,3.5);

n9=coor(0,7);
n10=coor(6,7);
n11=coor(12,7);
n12=coor(18,7);

n13=coor(0,10.5);
n14=coor(6,10.5);
n15=coor(12,10.5);
n16=coor(18,10.5);

n17=coor(0,14);
n18=coor(6,14);
n19=coor(12,14);
n20=coor(18,14);

n21=coor(0,17.5);
n22=coor(6,17.5);
n23=coor(12,17.5);
n24=coor(18,17.5);

[L1,T1]=memf(n5,n6);
[L2,T2]=memf(n6,n7);
[L3,T3]=memf(n7,n8);
[L4,T4]=memf(n9,n10);
[L5,T5]=memf(n10,n11);
[L6,T6]=memf(n11,n12);
[L7,T7]=memf(n13,n14);
[L8,T8]=memf(n14,n15);
[L9,T9]=memf(n15,n16);
[L10,T10]=memf(n17,n18);
[L11,T11]=memf(n18,n19);
[L12,T12]=memf(n19,n20);
[L13,T13]=memf(n21,n22);
[L14,T14]=memf(n22,n23);
[L15,T15]=memf(n23,n24);
[L16,T16]=memf(n1,n5); %//--
--damage member ----//
[L17,T17]=memf(n2,n6);
[L18,T18]=memf(n3,n7);
[L19,T19]=memf(n4,n8);
[L20,T20]=memf(n5,n9);
[L21,T21]=memf(n6,n10);
[L22,T22]=memf(n7,n11);
[L23,T23]=memf(n8,n12);
[L24,T24]=memf(n9,n13);
[L25,T25]=memf(n10,n14);
[L26,T26]=memf(n11,n15);
[L27,T27]=memf(n12,n16);
[L28,T28]=memf(n13,n17);
[L29,T29]=memf(n14,n18);
[L30,T30]=memf(n15,n19);
[L31,T31]=memf(n16,n20);
[L32,T32]=memf(n17,n21);
[L33,T33]=memf(n18,n22);
[L34,T34]=memf(n19,n23);
[L35,T35]=memf(n20,n24);
[L36,T36]=memf(n2,n7);
[L37,T37]=memf(n3,n6);
[L38,T38]=memf(n6,n11);
[L39,T39]=memf(n7,n10);
[L40,T40]=memf(n10,n15);%//-
---damage member ----//
[L41,T41]=memf(n11,n14);
[L42,T42]=memf(n14,n19);
[L43,T43]=memf(n15,n18);
[L44,T44]=memf(n18,n23);
[L45,T45]=memf(n19,n22);
```

```
E=2e8;%kN/m2
A1=0.0144;%m2%Kolom
A2=0.0121;%Balok dan bracing
I1=5.536e-4;%m4
I2=2.176e-4;
r=78.5; %kN/m3
vs=0.3;
f1=2.884;%Kolom
f2=3.975;%Balok dan bracing

k1=klfs(E,A2,I2,L1,f2,vs);
K1=kg(k1,T1);
k2=klfs(E,A2,I2,L2,f2,vs);
K2=kg(k2,T2);
k3=klfs(E,A2,I2,L3,f2,vs);
K3=kg(k3,T3);
k4=klfs(E,A2,I2,L4,f2,vs);
K4=kg(k4,T4);
k5=klfs(E,A2,I2,L5,f2,vs);
K5=kg(k5,T5);
k6=klfs(E,A2,I2,L6,f2,vs);
K6=kg(k6,T6);
k7=klfs(E,A2,I2,L7,f2,vs);
K7=kg(k7,T7);
k8=klfs(E,A2,I2,L8,f2,vs);
K8=kg(k8,T8);
k9=klfs(E,A2,I2,L9,f2,vs);
K9=kg(k9,T9);
k10=klfs(E,A2,I2,L10,f2,vs);
K10=kg(k10,T10);
k11=klfs(E,A2,I2,L11,f2,vs);
K11=kg(k11,T11);
k12=klfs(E,A2,I2,L12,f2,vs);
K12=kg(k12,T12);
k13=klfs(E,A2,I2,L13,f2,vs);
K13=kg(k13,T13);
k14=klfs(E,A2,I2,L14,f2,vs);
K14=kg(k14,T14);
k15=klfs(E,A2,I2,L15,f2,vs);
K15=kg(k15,T15);

k16=klfs(E,A1,I1,L16,f1,vs);
K16=kg(k16,T16);
k17=klfs(E,A1,I1,L17,f1,vs);
K17=kg(k17,T17);
k18=klfs(E,A1,I1,L18,f1,vs);
K18=kg(k18,T18);
k19=klfs(E,A1,I1,L19,f1,vs);
K19=kg(k19,T19);
k20=klfs(E,A1,I1,L20,f1,vs);
K20=kg(k20,T20);
k21=klfs(E,A1,I1,L21,f1,vs);
K21=kg(k21,T21);
k22=klfs(E,A1,I1,L22,f1,vs);
K22=kg(k22,T22);
k23=klfs(E,A1,I1,L23,f1,vs);
K23=kg(k23,T23);
k24=klfs(E,A1,I1,L24,f1,vs);
K24=kg(k24,T24);
k25=klfs(E,A1,I1,L25,f1,vs);
K25=kg(k25,T25);
k26=klfs(E,A1,I1,L26,f1,vs);
K26=kg(k26,T26);
k27=klfs(E,A1,I1,L27,f1,vs);
K27=kg(k27,T27);
k28=klfs(E,A1,I1,L28,f1,vs);
K28=kg(k28,T28);
k29=klfs(E,A1,I1,L29,f1,vs);
K29=kg(k29,T29);
k30=klfs(E,A1,I1,L30,f1,vs);
K30=kg(k30,T30);
k31=klfs(E,A1,I1,L31,f1,vs);
K31=kg(k31,T31);
k32=klfs(E,A1,I1,L32,f1,vs);
K32=kg(k32,T32);
```

```
k33=klfs(E,A1,I1,L33,f1,vs);
K33=kg(k33,T33);
k34=klfs(E,A1,I1,L34,f1,vs);
K34=kg(k34,T34);
k35=klfs(E,A1,I1,L35,f1,vs);
K35=kg(k35,T35);

k36=klfs(E,A2,I2,L36,f2,vs);
K36=kg(k36,T36);
k37=klfs(E,A2,I2,L37,f2,vs);
K37=kg(k37,T37);
k38=klfs(E,A2,I2,L38,f2,vs);
K38=kg(k38,T38);
k39=klfs(E,A2,I2,L39,f2,vs);
K39=kg(k39,T39);
k40=klfs(E,A2,I2,L40,f2,vs);
K40=kg(k40,T40);
k41=klfs(E,A2,I2,L41,f2,vs);
K41=kg(k41,T41);
k42=klfs(E,A2,I2,L42,f2,vs);
K42=kg(k42,T42);
k43=klfs(E,A2,I2,L43,f2,vs);
K43=kg(k43,T43);
k44=klfs(E,A2,I2,L44,f2,vs);
K44=kg(k44,T44);
k45=klfs(E,A2,I2,L45,f2,vs);
K45=kg(k45,T45);

dof=84;

id1=[5 6 7 8 9 10];
id2=[8 9 10 11 12 13];
id3=[11 12 13 14 15 16];
id4=[17 18 19 20 21 22];
id5=[20 21 22 23 24 25];
id6=[23 24 25 26 27 28];
id7=[29 30 31 32 33 34];
id8=[32 33 34 35 36 37];
id9=[35 36 37 38 39 40];
id10=[41 42 43 44 45 46];
id11=[44 45 46 47 48 49];
id12=[47 48 49 50 51 52];
id13=[53 54 55 56 57 58];
id14=[56 57 58 59 60 61];
id15=[59 60 61 62 63 64];

id16=[0 0 1 5 6 7];
id17=[0 0 2 8 9 10];
id18=[0 0 3 11 12 13];
id19=[0 0 4 14 15 16];
id20=[5 6 7 17 18 19];
id21=[8 9 10 20 21 22];
id22=[11 12 13 23 24 25];
id23=[14 15 16 26 27 28];
id24=[17 18 19 29 30 31];
id25=[20 21 22 32 33 34];
id26=[23 24 25 35 36 37];
id27=[26 27 28 38 39 40];
id28=[29 30 31 41 42 43];
id29=[32 33 34 44 45 46];
id30=[35 36 37 47 48 49];
id31=[38 39 40 50 51 52];
id32=[41 42 43 53 54 55];
id33=[44 45 46 56 57 58];
id34=[47 48 49 59 60 61];
id35=[50 51 52 62 63 64];

id36=[0 0 65 11 12 68];
id37=[0 0 66 8 9 67];
id38=[8 9 69 23 24 72];
id39=[11 12 70 20 21 71];
id40=[20 21 73 35 36 76];
id41=[23 24 74 32 33 75];
id42=[32 33 77 47 48 80];
id43=[35 36 78 44 45 79];
id44=[44 45 81 59 60 84];
id45=[47 48 82 56 57 83];
```

```
Ks=assf(K1,id1,dof);
Ks=Ks+assf(K2,id2,dof);
Ks=Ks+assf(K3,id3,dof);
Ks=Ks+assf(K4,id4,dof);
Ks=Ks+assf(K5,id5,dof);
Ks=Ks+assf(K6,id6,dof);
Ks=Ks+assf(K7,id7,dof);
Ks=Ks+assf(K8,id8,dof);
Ks=Ks+assf(K9,id9,dof);
Ks=Ks+assf(K10,id10,dof);
Ks=Ks+assf(K11,id11,dof);
Ks=Ks+assf(K12,id12,dof);
Ks=Ks+assf(K13,id13,dof);
Ks=Ks+assf(K14,id14,dof);
Ks=Ks+assf(K15,id15,dof);

Ks=Ks+assf(K16,id16,dof);
Ks=Ks+assf(K17,id17,dof);
Ks=Ks+assf(K18,id18,dof);
Ks=Ks+assf(K19,id19,dof);
Ks=Ks+assf(K20,id20,dof);
Ks=Ks+assf(K21,id21,dof);
Ks=Ks+assf(K22,id22,dof);
Ks=Ks+assf(K23,id23,dof);
Ks=Ks+assf(K24,id24,dof);
Ks=Ks+assf(K25,id25,dof);
Ks=Ks+assf(K26,id26,dof);
Ks=Ks+assf(K27,id27,dof);
Ks=Ks+assf(K28,id28,dof);
Ks=Ks+assf(K29,id29,dof);
Ks=Ks+assf(K30,id30,dof);
Ks=Ks+assf(K31,id31,dof);
Ks=Ks+assf(K32,id32,dof);
Ks=Ks+assf(K33,id33,dof);
Ks=Ks+assf(K34,id34,dof);
Ks=Ks+assf(K35,id35,dof);

Ks=Ks+assf(K36,id36,dof);
Ks=Ks+assf(K37,id37,dof);
Ks=Ks+assf(K38,id38,dof);
Ks=Ks+assf(K39,id39,dof);
Ks=Ks+assf(K40,id40,dof);
Ks=Ks+assf(K41,id41,dof);
Ks=Ks+assf(K42,id42,dof);
Ks=Ks+assf(K43,id43,dof);
Ks=Ks+assf(K44,id44,dof);
Ks=Ks+assf(K45,id45,dof);

rho=8.002;

m1=mlf(rho*A2,L1);
m2=mlf(rho*A2,L2);
m3=mlf(rho*A2,L3);
m4=mlf(rho*A2,L4);
m5=mlf(rho*A2,L5);
m6=mlf(rho*A2,L6);
m7=mlf(rho*A2,L7);
m8=mlf(rho*A2,L8);
m9=mlf(rho*A2,L9);
m10=mlf(rho*A2,L10);
m11=mlf(rho*A2,L11);
m12=mlf(rho*A2,L12);
m13=mlf(rho*A2,L13);
m14=mlf(rho*A2,L14);
m15=mlf(rho*A2,L15);

m16=mlf(rho*A1,L16);
m17=mlf(rho*A1,L17);
m18=mlf(rho*A1,L18);
m19=mlf(rho*A1,L19);
m20=mlf(rho*A1,L20);
m21=mlf(rho*A1,L21);
m22=mlf(rho*A1,L22);
m23=mlf(rho*A1,L23);
m24=mlf(rho*A1,L24);
m25=mlf(rho*A1,L25);
m26=mlf(rho*A1,L26);
m27=mlf(rho*A1,L27);
m28=mlf(rho*A1,L28);
m29=mlf(rho*A1,L29);
m30=mlf(rho*A1,L30);
m31=mlf(rho*A1,L31);
m32=mlf(rho*A1,L32);
m33=mlf(rho*A1,L33);
m34=mlf(rho*A1,L34);
m35=mlf(rho*A1,L35);

m36=mlf(rho*A2,L36);
m37=mlf(rho*A2,L37);
m38=mlf(rho*A2,L38);
m39=mlf(rho*A2,L39);
m40=mlf(rho*A2,L40);
m41=mlf(rho*A2,L41);
m42=mlf(rho*A2,L42);
m43=mlf(rho*A2,L43);
m44=mlf(rho*A2,L44);
m45=mlf(rho*A2,L45);

M1=kg(m1,T1);
M2=kg(m2,T2);
M3=kg(m3,T3);
M4=kg(m4,T4);
M5=kg(m5,T5);
M6=kg(m6,T6);
M7=kg(m7,T7);
M8=kg(m8,T8);
M9=kg(m9,T9);
M10=kg(m10,T10);
M11=kg(m11,T11);
M12=kg(m12,T12);
M13=kg(m13,T13);
M14=kg(m14,T14);
M15=kg(m15,T15);

M16=kg(m16,T16);
M17=kg(m17,T17);
M18=kg(m18,T18);
M19=kg(m19,T19);
M20=kg(m20,T20);
M21=kg(m21,T21);
M22=kg(m22,T22);
M23=kg(m23,T23);
M24=kg(m24,T24);
M25=kg(m25,T25);
M26=kg(m26,T26);
M27=kg(m27,T27);
M28=kg(m28,T28);
M29=kg(m29,T29);
M30=kg(m30,T30);
M31=kg(m31,T31);
M32=kg(m32,T32);
M33=kg(m33,T33);
M34=kg(m34,T34);
M35=kg(m35,T35);

M36=kg(m36,T36);
M37=kg(m37,T37);
M38=kg(m38,T38);
M39=kg(m39,T39);
M40=kg(m40,T40);
M41=kg(m41,T41);
M42=kg(m42,T42);
M43=kg(m43,T43);
M44=kg(m44,T44);
M45=kg(m45,T45);

Mr=assf(M1,id1,dof);
Mr=Mr+assf(M2,id2,dof);
Mr=Mr+assf(M3,id3,dof);
Mr=Mr+assf(M4,id4,dof);
Mr=Mr+assf(M5,id5,dof);
Mr=Mr+assf(M6,id6,dof);
Mr=Mr+assf(M7,id7,dof);
Mr=Mr+assf(M8,id8,dof);
Mr=Mr+assf(M9,id9,dof);
Mr=Mr+assf(M10,id10,dof);
Mr=Mr+assf(M11,id11,dof);
Mr=Mr+assf(M12,id12,dof);
Mr=Mr+assf(M13,id13,dof);
Mr=Mr+assf(M14,id14,dof);
Mr=Mr+assf(M15,id15,dof);

Mr=Mr+assf(M16,id16,dof);
Mr=Mr+assf(M17,id17,dof);
Mr=Mr+assf(M18,id18,dof);
Mr=Mr+assf(M19,id19,dof);
Mr=Mr+assf(M20,id20,dof);
Mr=Mr+assf(M21,id21,dof);
Mr=Mr+assf(M22,id22,dof);
Mr=Mr+assf(M23,id23,dof);
Mr=Mr+assf(M24,id24,dof);
Mr=Mr+assf(M25,id25,dof);
Mr=Mr+assf(M26,id26,dof);
Mr=Mr+assf(M27,id27,dof);
Mr=Mr+assf(M28,id28,dof);
Mr=Mr+assf(M29,id29,dof);
Mr=Mr+assf(M30,id30,dof);
Mr=Mr+assf(M31,id31,dof);
Mr=Mr+assf(M32,id32,dof);
Mr=Mr+assf(M33,id33,dof);
Mr=Mr+assf(M34,id34,dof);
Mr=Mr+assf(M35,id35,dof);

Mr=Mr+assf(M36,id36,dof);
Mr=Mr+assf(M37,id37,dof);
Mr=Mr+assf(M38,id38,dof);
Mr=Mr+assf(M39,id39,dof);
Mr=Mr+assf(M40,id40,dof);
Mr=Mr+assf(M41,id41,dof);
Mr=Mr+assf(M42,id42,dof);
Mr=Mr+assf(M43,id43,dof);
Mr=Mr+assf(M44,id44,dof);
Mr=Mr+assf(M45,id45,dof);

[eigv,eigval]=eig(Mr\Ks);
[w,worder]=sort(sqrt(diag(ei
gval)));
mode=eigv(:,worder);

i=1:84;
pim=[mode(14,i);mode(26,i);m
ode(38,i);mode(50,i);mode(62
,i)];
v=sqrtm(mode'*Mr*mode);
wm=diag(w(1:84));
Fu9=(pim*inv(v))*inv(wm^2)*(
pim*inv(v))';

R=zeros(84,1);
R(14,1)=-0.5730;
R(26,1)=0.2071;
R(38,1)=-0.3429;
R(50,1)=0.6382;
R(62,1)=-0.3222;

U=solv(Ks,R);

u1=dissf(U,id1,T1);
u2=dissf(U,id2,T2);
u3=dissf(U,id3,T3);
u4=dissf(U,id4,T4);
u5=dissf(U,id5,T5);
u6=dissf(U,id6,T6);
u7=dissf(U,id7,T7);
u8=dissf(U,id8,T8);
u9=dissf(U,id9,T9);
u10=dissf(U,id10,T10);
u11=dissf(U,id11,T11);
u12=dissf(U,id12,T12);
u13=dissf(U,id13,T13);
```

```
u14=dissf(U,id14,T14);
u15=dissf(U,id15,T15);

u16=dissf(U,id16,T16);
u17=dissf(U,id17,T17);
u18=dissf(U,id18,T18);
u19=dissf(U,id19,T19);
u20=dissf(U,id20,T20);
u21=dissf(U,id21,T21);
u22=dissf(U,id22,T22);
u23=dissf(U,id23,T23);
u24=dissf(U,id24,T24);
u25=dissf(U,id25,T25);
u26=dissf(U,id26,T26);
u27=dissf(U,id27,T27);
u28=dissf(U,id28,T28);
u29=dissf(U,id29,T29);
u30=dissf(U,id30,T30);
u31=dissf(U,id31,T31);
u32=dissf(U,id32,T32);
u33=dissf(U,id33,T33);
u34=dissf(U,id34,T34);
u35=dissf(U,id35,T35);

u36=dissf(U,id36,T36);
u37=dissf(U,id37,T37);
u38=dissf(U,id38,T38);
u39=dissf(U,id39,T39);
u40=dissf(U,id40,T40);
u41=dissf(U,id41,T41);
u42=dissf(U,id42,T42);
u43=dissf(U,id43,T43);
u44=dissf(U,id44,T44);
u45=dissf(U,id45,T45);

So1=zeros(6,1);
So2=zeros(6,1);
So3=zeros(6,1);
So4=zeros(6,1);
So5=zeros(6,1);
So6=zeros(6,1);
So7=zeros(6,1);
So8=zeros(6,1);
So9=zeros(6,1);
So10=zeros(6,1);
So11=zeros(6,1);
So12=zeros(6,1);
So13=zeros(6,1);
So14=zeros(6,1);
So15=zeros(6,1);
So16=zeros(6,1);
So17=zeros(6,1);
So18=zeros(6,1);
So19=zeros(6,1);
So20=zeros(6,1);
So21=zeros(6,1);
So22=zeros(6,1);
So23=zeros(6,1);
So24=zeros(6,1);
So25=zeros(6,1);
So26=zeros(6,1);
So27=zeros(6,1);
So28=zeros(6,1);
So29=zeros(6,1);
So30=zeros(6,1);
So31=zeros(6,1);
So32=zeros(6,1);
So33=zeros(6,1);
So34=zeros(6,1);
So35=zeros(6,1);
So36=zeros(6,1);
So37=zeros(6,1);
So38=zeros(6,1);
So39=zeros(6,1);
So40=zeros(6,1);
So41=zeros(6,1);
So42=zeros(6,1);
So43=zeros(6,1);
So44=zeros(6,1);
So45=zeros(6,1);

S1=stref(k1,u1,So1)
S2=stref(k2,u2,So2)
S3=stref(k3,u3,So3)
S4=stref(k4,u4,So4)
S5=stref(k5,u5,So5)
S6=stref(k6,u6,So6)
S7=stref(k7,u7,So7)
S8=stref(k8,u8,So8)
S9=stref(k9,u9,So9)
S10=stref(k10,u10,So10)
S11=stref(k11,u11,So11)
S12=stref(k12,u12,So12)
S13=stref(k13,u13,So13)
S14=stref(k14,u14,So14)
S15=stref(k15,u15,So15)

S16=stref(k16,u16,So16)
S17=stref(k17,u17,So17)
S18=stref(k18,u18,So18)
S19=stref(k19,u19,So19)
S20=stref(k20,u20,So20)
S21=stref(k21,u21,So21)
S22=stref(k22,u22,So22)
S23=stref(k23,u23,So23)
S24=stref(k24,u24,So24)
S25=stref(k25,u25,So25)
S26=stref(k26,u26,So26)
S27=stref(k27,u27,So27)
S28=stref(k28,u28,So28)
S29=stref(k29,u29,So29)
S30=stref(k30,u30,So30)
S31=stref(k31,u31,So31)
S32=stref(k32,u32,So32)
S33=stref(k33,u33,So33)
S34=stref(k34,u34,So34)
S35=stref(k35,u35,So35)

S36=stref(k36,u36,So36)
S37=stref(k37,u37,So37)
S38=stref(k38,u38,So38)
S39=stref(k39,u39,So39)
S40=stref(k40,u40,So40)
S41=stref(k41,u41,So41)
S42=stref(k42,u42,So42)
S43=stref(k43,u43,So43)
S44=stref(k44,u44,So44)
S45=stref(k45,u45,So45)
```

Lampiran 53: *Output* Gaya-gaya Batang dari *software* Matlab Kasus 9

```
S1 =
    0.0014
    0.0010
    0.0030
   -0.0014
   -0.0010
    0.0029
S2 =
    0.1719
    0.0004
    0.0016
   -0.1719
   -0.0004
    0.0007
S3 =
    0.5125
   -0.0007
   -0.0010
   -0.5125
    0.0007
   -0.0032
S4 =
    0.0036
   -0.0006
   -0.0019
   -0.0036
    0.0006
   -0.0019
S5 =
   -0.0837
   -0.0004
   -0.0013
    0.0837
    0.0004
   -0.0013
S6 =
   -0.1233
   -0.0009
   -0.0023
    0.1233
    0.0009
   -0.0033
S7 =
   -0.0036
   -0.0008
   -0.0023
    0.0036
    0.0008
   -0.0022
S8 =
    0.1207
   -0.0008
   -0.0022
   -0.1207
    0.0008
   -0.0028
S9 =
    0.2464
   -0.0023
   -0.0057
   -0.2464
    0.0023
   -0.0083
S10 =
   -0.0014
    0.0005
    0.0016
    0.0014
   -0.0005
    0.0016
S11 =
   -0.2141
    0.0000
    0.0001
    0.2141
   -0.0000
    0.0000
S12 =
   -0.5470
   -0.0001
    0.0004
    0.5470
    0.0001
   -0.0010
S13 =
    0.0017
    0.0009
    0.0027
   -0.0017
   -0.0009
    0.0025
S14 =
    0.1530
   -0.0009
    0.0038
S15 =
    0.2848
    0.0086
    0.0200
   -0.2848
   -0.0086
    0.0315
S16 =
    0.0010
   -0.0017
         0
   -0.0010
    0.0017
   -0.0060
S17 =
    0.0015
   -0.0019
    0.0000
   -0.0015
    0.0019
   -0.0067
S18 =
   -0.0566
   -0.0065
    0.0000
    0.0566
    0.0065
   -0.0226
S19 =
   -0.0045
   -0.0194
   -0.0000
    0.0045
    0.0194
   -0.0679
S20 =
    0.0000
   -0.0003
    0.0030
   -0.0000
    0.0003
   -0.0041
S21 =
   -0.0525
   -0.0006
    0.0023
    0.0525
    0.0006
   -0.0043
S22 =
    0.0273
    0.0122
    0.0229
   -0.0273
   -0.0122
    0.0198
S23 =
   -0.0053
    0.0411
    0.0710
    0.0053
   -0.0411
    0.0730
S24 =
    0.0006
    0.0033
    0.0060
   -0.0006
   -0.0033
    0.0054
S25 =
   -0.0014
    0.0041
    0.0074
    0.0014
   -0.0041
    0.0069
S26 =
   -0.0062
   -0.0101
   -0.0162
    0.0062
    0.0101
   -0.0193
S27 =
   -0.0062
   -0.0427
   -0.0697
    0.0062
    0.0427
   -0.0797
S28 =
    0.0014
   -0.0004
   -0.0031
   -0.0014
    0.0004
    0.0018
S29 =
    0.0976
   -0.0001
   -0.0025
   -0.0976
    0.0001
    0.0021
S30 =
   -0.0594
    0.0179
    0.0277
    0.0594
   -0.0179
    0.0349
S31 =
   -0.0085
    0.0538
    0.0880
    0.0085
   -0.0538
    0.1003
S32 =
    0.0009
   -0.0017
   -0.0034
   -0.0009
    0.0017
   -0.0027
S33 =
    0.0870
   -0.0022
   -0.0039
   -0.0870
    0.0022
   -0.0038
S34 =
   -0.0593
   -0.0169
   -0.0354
    0.0593
    0.0169
   -0.0239
S35 =
   -0.0086
   -0.0374
   -0.0993
    0.0086
    0.0374
   -0.0315
S36 =
    0.2685
    0.0000
    0.0000
   -0.2685
   -0.0000
    0.0000
S37 =
   -0.1521
    0.0000
    0.0000
    0.1521
   -0.0000
    0.0000
S38 =
   -0.0437
   -0.0000
   -0.0000
    0.0437
    0.0000
   -0.0000
S39 =
    0.1042
   -0.0000
   -0.0000
   -0.1042
    0.0000
   -0.0000
S40 =
    0.0022
   -0.0000
   -0.0000
   -0.0022
    0.0000
   -0.0000
S41 =
    0.0237
   -0.0000
   -0.0000
   -0.0237
    0.0000
   -0.0000
S42 =
   -0.1725
   -0.0000
    0.0000
    0.1725
    0.0000
    0.0000
S43 =
    0.1109
    0.0000
   -0.1109
   -0.0000
    0.0000
S44 =
    0.1330
    0.0000
         0
   -0.1330
   -0.0000
    0.0000
S45 =
   -0.1726
    0.0000
    0.0000
    0.1726
   -0.0000
    0.0000
```

Lampiran 54: *Output* Gaya-gaya Batang dari *software* ETABS Kasus 9

C O L U M N F O R C E E N V E L O P E S

STORY	COLUMN	ITEM	P	V2	V3	T	M2	M3
LT5	C5	Min Value	-0.0009	-0.0017	0.0000	0.0000	0.0000	-0.0034
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0009	-0.0017	0.0000	0.0000	0.0000	0.0027
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C6	Min Value	-0.0870	-0.0022	0.0000	0.0000	0.0000	-0.0038
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0870	-0.0022	0.0000	0.0000	0.0000	0.0038
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C7	Min Value	0.0593	-0.0169	0.0000	0.0000	0.0000	-0.0353
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0593	-0.0169	0.0000	0.0000	0.0000	0.0239
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	C8	Min Value	0.0086	-0.0373	0.0000	0.0000	0.0000	-0.0991
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0086	-0.0373	0.0000	0.0000	0.0000	0.0315
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C5	Min Value	-0.0014	-0.0004	0.0000	0.0000	0.0000	-0.0031
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0014	-0.0004	0.0000	0.0000	0.0000	-0.0018
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C6	Min Value	-0.0976	-0.0001	0.0000	0.0000	0.0000	-0.0025
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0976	-0.0001	0.0000	0.0000	0.0000	-0.0021
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C7	Min Value	0.0595	0.0179	0.0000	0.0000	0.0000	-0.0348
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0595	0.0179	0.0000	0.0000	0.0000	0.0277
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	C8	Min Value	0.0085	0.0537	0.0000	0.0000	0.0000	-0.1001
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0085	0.0537	0.0000	0.0000	0.0000	0.0878
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C5	Min Value	-0.0006	0.0033	0.0000	0.0000	0.0000	-0.0054
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0006	0.0033	0.0000	0.0000	0.0000	0.0060
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C6	Min Value	0.0014	0.0041	0.0000	0.0000	0.0000	-0.0069
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0014	0.0041	0.0000	0.0000	0.0000	0.0074
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C7	Min Value	0.0062	-0.0101	0.0000	0.0000	0.0000	-0.0162
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0062	-0.0101	0.0000	0.0000	0.0000	0.0192
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	C8	Min Value	0.0062	-0.0426	0.0000	0.0000	0.0000	-0.0696
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0062	-0.0426	0.0000	0.0000	0.0000	0.0796
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C5	Min Value	0.0000	-0.0003	0.0000	0.0000	0.0000	0.0030
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0000	-0.0003	0.0000	0.0000	0.0000	0.0041
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C6	Min Value	0.0525	-0.0006	0.0000	0.0000	0.0000	0.0022
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0525	-0.0006	0.0000	0.0000	0.0000	0.0043
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C7	Min Value	-0.0273	0.0122	0.0000	0.0000	0.0000	-0.0198
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0273	0.0122	0.0000	0.0000	0.0000	0.0228
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	C8	Min Value	0.0052	0.0411	0.0000	0.0000	0.0000	-0.0728
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0052	0.0411	0.0000	0.0000	0.0000	0.0709
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C5	Min Value	-0.0010	-0.0017	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0010	-0.0017	0.0000	0.0000	0.0000	0.0060
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C6	Min Value	-0.0015	-0.0019	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0015	-0.0019	0.0000	0.0000	0.0000	0.0067
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	C7	Min Value	0.0566	-0.0064	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0566	-0.0064	0.0000	0.0000	0.0000	0.0225
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT1	C8	Min Value	0.0045	-0.0194	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0045	-0.0194	0.0000	0.0000	0.0000	0.0677
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 9 Units:KN-m May 15, 2013 8:22 PAGE 5

B E A M F O R C E E N V E L O P E S

STORY	BEAM	ITEM	P	V2	V3	T	M2	M3
LT5	B4	Min Value	-0.0017	-0.0009	0.0000	0.0000	0.0000	-0.0027
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0017	-0.0009	0.0000	0.0000	0.0000	0.0025
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B5	Min Value	-0.1531	-0.0009	0.0000	0.0000	0.0000	-0.0013
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1531	-0.0009	0.0000	0.0000	0.0000	0.0038
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT5	B6	Min Value	-0.2849	-0.0086	0.0000	0.0000	0.0000	-0.0200
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2849	-0.0086	0.0000	0.0000	0.0000	0.0315
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B4	Min Value	0.0014	-0.0005	0.0000	0.0000	0.0000	-0.0016
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0014	-0.0005	0.0000	0.0000	0.0000	0.0016
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B5	Min Value	0.2142	0.0000	0.0000	0.0000	0.0000	-0.0001
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.2142	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	B6	Min Value	0.5472	0.0001	0.0000	0.0000	0.0000	-0.0010
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.5472	0.0001	0.0000	0.0000	0.0000	-0.0004
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B4	Min Value	0.0036	0.0008	0.0000	0.0000	0.0000	-0.0022
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0036	0.0008	0.0000	0.0000	0.0000	0.0023
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B5	Min Value	-0.1208	0.0008	0.0000	0.0000	0.0000	-0.0028
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1208	0.0008	0.0000	0.0000	0.0000	0.0021
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	B6	Min Value	-0.2466	0.0023	0.0000	0.0000	0.0000	-0.0083
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2466	0.0023	0.0000	0.0000	0.0000	0.0057
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B4	Min Value	-0.0036	0.0006	0.0000	0.0000	0.0000	-0.0019
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0036	0.0006	0.0000	0.0000	0.0000	0.0019
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B5	Min Value	0.0838	0.0004	0.0000	0.0000	0.0000	-0.0013
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0838	0.0004	0.0000	0.0000	0.0000	0.0013
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	B6	Min Value	0.1234	0.0009	0.0000	0.0000	0.0000	-0.0033
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1234	0.0009	0.0000	0.0000	0.0000	0.0023
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B4	Min Value	-0.0014	-0.0010	0.0000	0.0000	0.0000	-0.0030
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0014	-0.0010	0.0000	0.0000	0.0000	0.0029
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B5	Min Value	-0.1720	-0.0004	0.0000	0.0000	0.0000	-0.0016
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1720	-0.0004	0.0000	0.0000	0.0000	0.0007
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	B6	Min Value	-0.5126	0.0007	0.0000	0.0000	0.0000	-0.0032
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.5126	0.0007	0.0000	0.0000	0.0000	0.0010
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

ETABS v9.7.0 File:CASE 9 Units:KN-m May 15, 2013 8:22 PAGE 6

B R A C E F O R C E E N V E L O P E S

STORY	BRACE	ITEM	P	V2	V3	T	M2	M3
LT5	D7	Min Value	-0.1330	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1330	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD

LT5	D8	Min Value	0.1727	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1727	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D7	Min Value	0.1726	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1726	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT4	D8	Min Value	-0.1110	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1110	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D7	Min Value	-0.0023	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0023	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT3	D8	Min Value	-0.0237	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.0237	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D7	Min Value	0.0438	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.0438	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT2	D8	Min Value	-0.1042	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.1042	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D7	Min Value	-0.2686	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	-0.2686	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
LT1	D8	Min Value	0.1521	0.0000	0.0000	0.0000	0.0000	0.0000
		Min Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD
		Max Value	0.1521	0.0000	0.0000	0.0000	0.0000	0.0000
		Max Case	DEAD	DEAD	DEAD	DEAD	DEAD	DEAD