APPENDIX A: Selected accelerograms

Table A.1: Selected accelerograms (part 1/3)
Preglednica A.1: Izbrani akcelerogrami (del 1/3)

Record number	Earthquake	Station	Date	Direction	Scale factor	M	R [km]	$v_{s,30}$ [cm/s]	t_D [s]
1	Kocaeli	Bursa Iznik Karayollari 147. Sube Sefligi	1999-08-17	1	3.08	7.6	38	197	53.1
2	Kocaeli	Duzce Merkez Meteoroloji Istasyon	1999-08-17	2	0.77	7.6	10	282	27.2
3	Alkion	Korinthos-O.T.E.	1981-02-25	2	2.45	6.4	19	234	23.2
4	Van	Van Muradiye Meteoroloji Mudurlugu	2011-10-23	2	1.66	7.1	20	293	73.9
5	Van	Van Muradiye Meteoroloji Mudurlugu	2011-10-23	1	1.58	7.1	20	293	73.9
6	Kocaeli	Istanbul-Zeytinburnu	1999-08-17	1	2.41	7.6	47	230	122.1
7	Kocaeli	Istanbul-Zeytinburnu	1999-08-17	2	2.63	7.6	47	230	122.1
8	Friuli Earthquake 4th Shock	Buia	1976-09-15	1	3.42	6	11	254	26
9	Alkion	Korinthos-O.T.E.	1981-02-25	1	2.4	6.4	19	234	23.2
10	Duzce 3 (aftershock)	Sakarya Akyazi Orman Isletme Mudurlugu	2000-08-23	2	2.92	5.5	14	272	70.2

Table A.2: Selected accelerograms (part 2/3)

Preglednica A.2: Izbrani akcelerogrami (del 2/3)

Record number	Earthquake	Station	Date	Direction	Scale factor	M	R [km]	$v_{s,30}$ [cm/s]	t_D [s]
11	Kocaeli	Istanbul-Atakoy	1999-08-17	1	2.81	7.6	51	275	126.1
12	Kocaeli	Bolu Goynuk Goynuk Devlet Hastanesi	1999-08-17	2	2.35	7.6	31	348	25.5
13	Friuli Earthquake 3rd Shock	Buia	1976-09-15	1	2.62	5.9	10	254	26.5
14	Duzce	Duzce Merkez Meteoroloji Istasyon	1999-11-12	2	0.55	7.1	8	282	25.9
15	Adana Ceyhan	Adana Ceyhan Tarim Ilce Mudurlugu	1998-06-27	2	1.03	6.3	45	264	29.2
16	Izmit (aftershock)	Yarimca	1999-09-13	1	3.3	5.8	23	297	55.7
17	Adana Ceyhan	Adana Ceyhan Tarim Ilce Mudurlugu	1998-06-27	1	1.27	6.3	45	264	29.2
18	Umbria Marche	Gubbio Piana	1997-09-26	1	3.08	6	30	219	102.6
19	Friuli Earthquake 1st Shock	Codroipo	1976-05-06	2	3.24	6.4	42	275	41.4
20	Ishakli	Afyon Merkez Bayindirlik Ve Iskan	2002-02-03	2	2.99	6.5	47	226	136.1

Table A.3: Selected accelerograms (part 3/3)

Preglednica A.3: Izbrani akcelerogrami (del 3/3)

Record number	Earthquake	Station	Date	Direction	Scale factor	M	R [km]	$v_{s,30}$ [cm/s]	t_D [s]
21	Friuli Earthquake 3Rd Shock	Buia	1976-09-15	2	3	5.9	10	254	26.5
22	Duzce	Duzce Merkez Meteoroloji Istasyon	1999-11-12	1	0.7	7.1	8	282	25.9
23	Kocaeli	Istanbul-K.M.Pasa	1999-08-17	2	2.69	7.6	47	339	116.5
24	Spitak	Gukasian	1988-12-07	2	1.57	6.8	12	278	23
25	Alkion	Korinthos-O.T.E.	1981-02-24	1	1.22	6.6	10	234	33.9
26	Kocaeli	Duzce Merkez Meteoroloji Istasyon	1999-08-17	1	0.9	7.6	10	282	27.2
27	Friuli Earthquake 4th Shock	Buia	1976-09-15	2	3.1	6	11	254	26
28	Duzce	Bolu Merkez Bayindirlik Ve Iskan Mudurlugu	1999-11-12	1	0.38	7.1	6	294	54
29	Ishakli	Afyon Merkez Bayindirlik Ve Iskan	2002-02-03	1	2.49	6.5	47	226	136.1
30	Kocaeli	Bursa Iznik Karayollari 147. Sube Sefligi	1999-08-17	2	2.28	7.6	38	197	53.1

APPENDIX B: Results of parametric analysis considering *MM/N/F/2* parameters

In this appendix, the results of numerical analyses performed on precast structures with centrally positioned connections (*MM*), without silicone sealant (*N*), the bottom panel fixed to the foundation (*F*) and with the ratio factor $k = 2$ are gathered. Time history responses and distribution of forces and displacements along the height of the structure are shown for three characteristic structures *m60H5*, *m60H7* and *m60H*. To present the characteristic results, the response of structures subjected to ground motion no. 4 was chosen. It is the accelerogram that from all selected accelerograms has the response spectra the closest to EC8 response spectra in the period range of analysed structures.

B.1 Structure *m60H5* a_g = 0.25 g

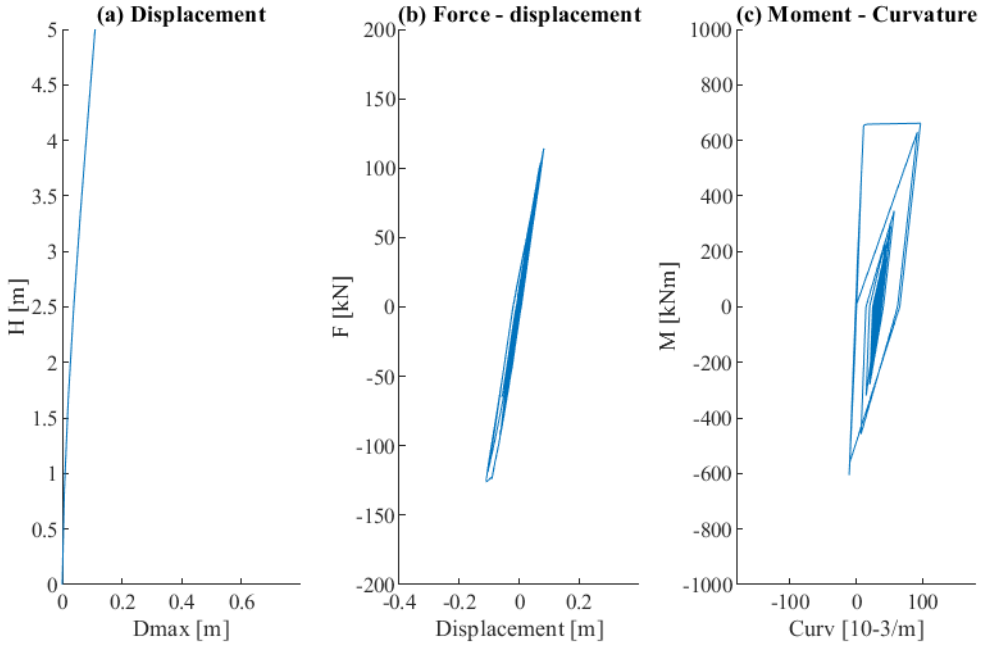

Figure B.1: Structure *m60H5* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika B.1: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

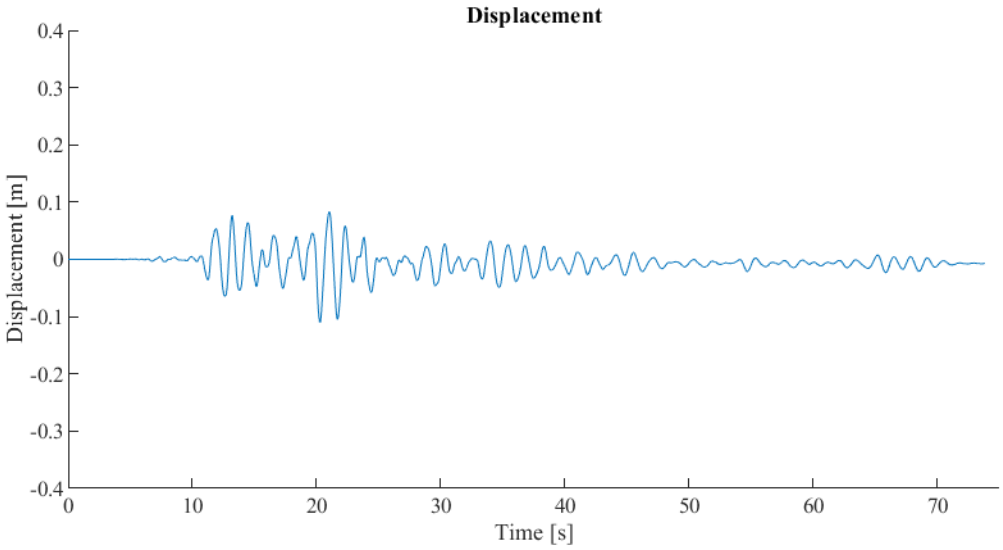

Figure B.2: Structure *m60H5* at a_g = 0.25 g: displacement response history at top of the column

Slika B.2: Montažna hala *m60H5* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

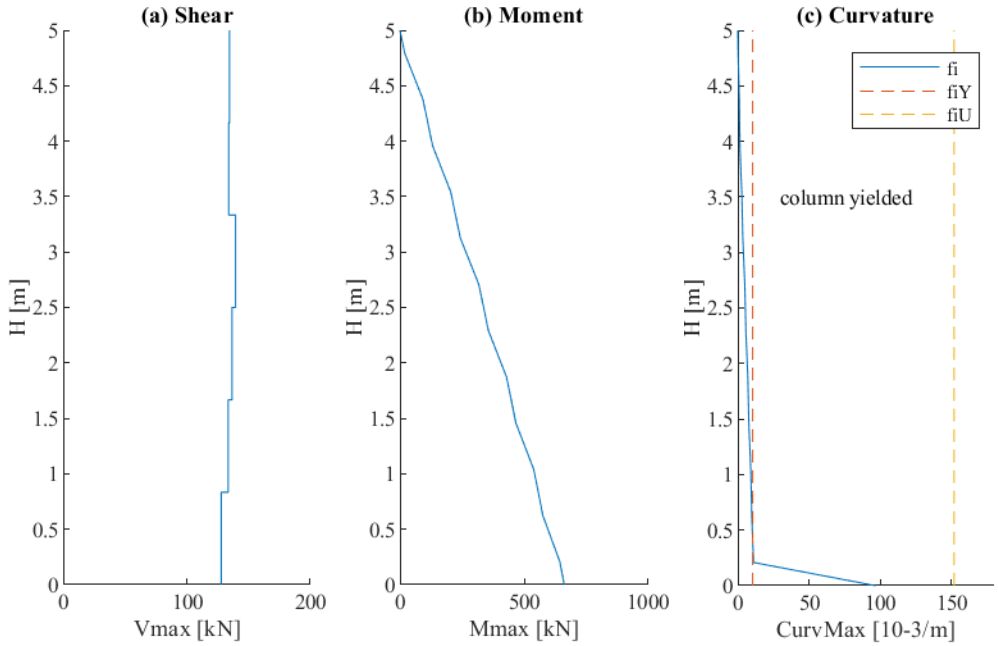

Figure B.3: Structure *m60H5* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika B.3: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

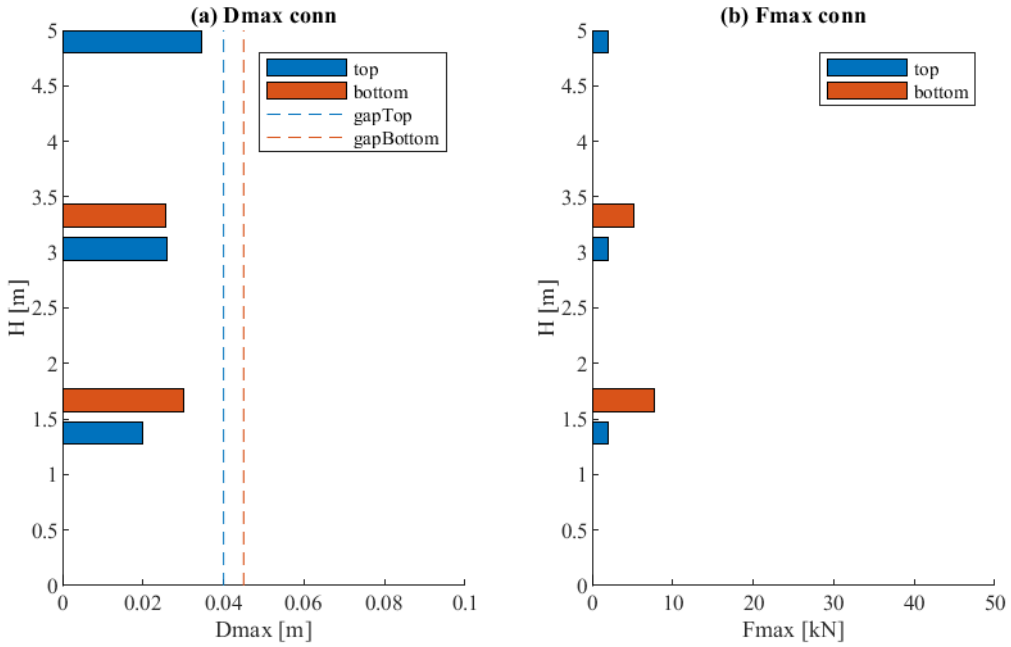

Figure B.4: Structure *m60H5* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika B.4: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

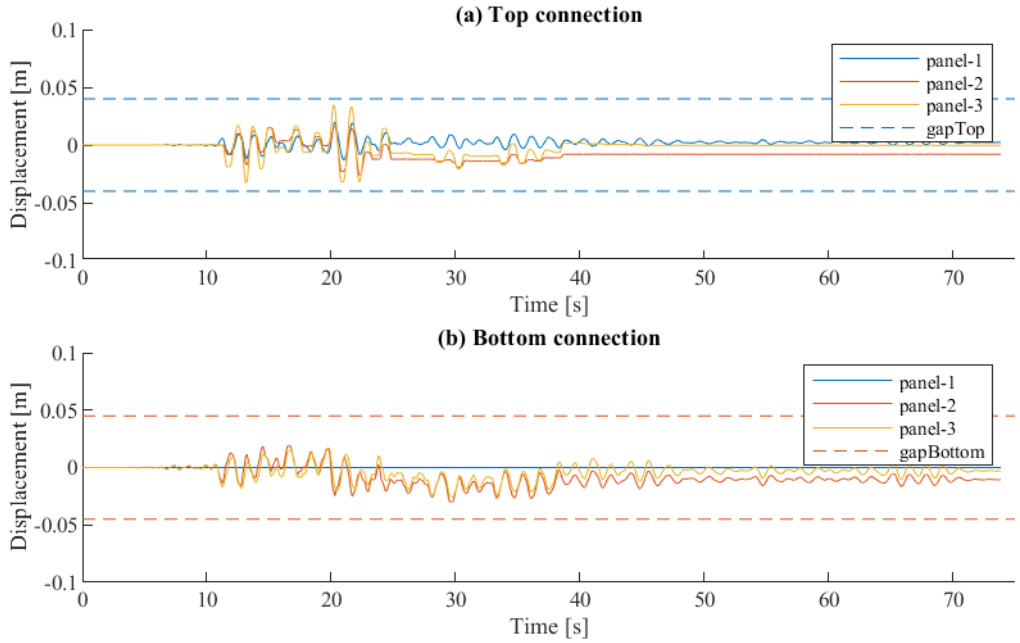

Figure B.5: Structure *m60H5* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika B.5: Montažna hala *m60H5* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

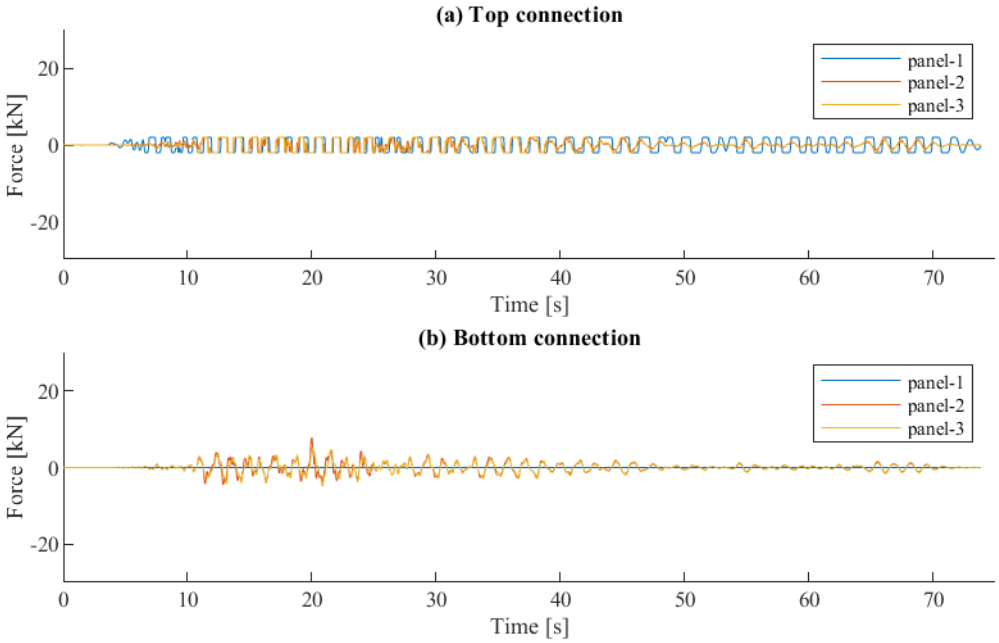

Figure B.6: Structure *m60H5* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika B.6: Montažna hala *m60H5* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

B.2 Structure *m60H7* a_g = 0.25 g

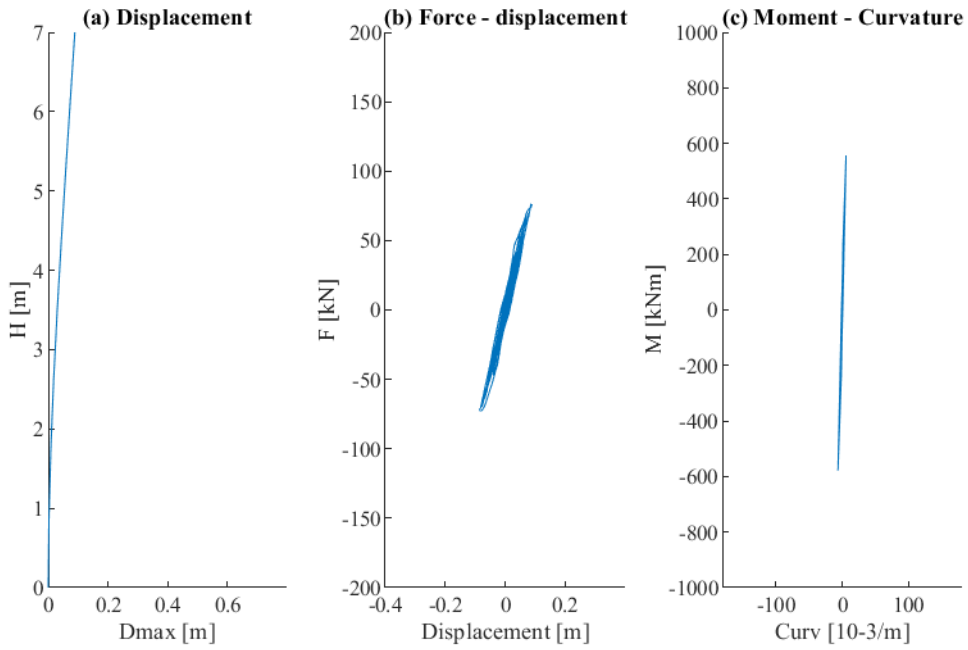

Figure B.7: Structure *m60H7* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika B.7: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

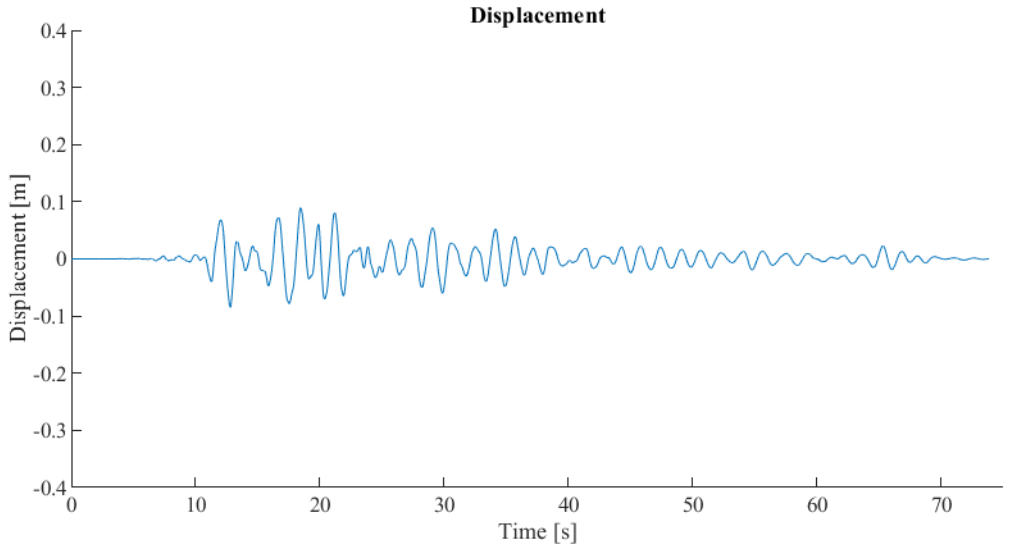

Figure B.8: Structure *m60H7* at a_g = 0.25 g: displacement response history at top of the column

Slika B.8: Montažna hala *m60H7* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

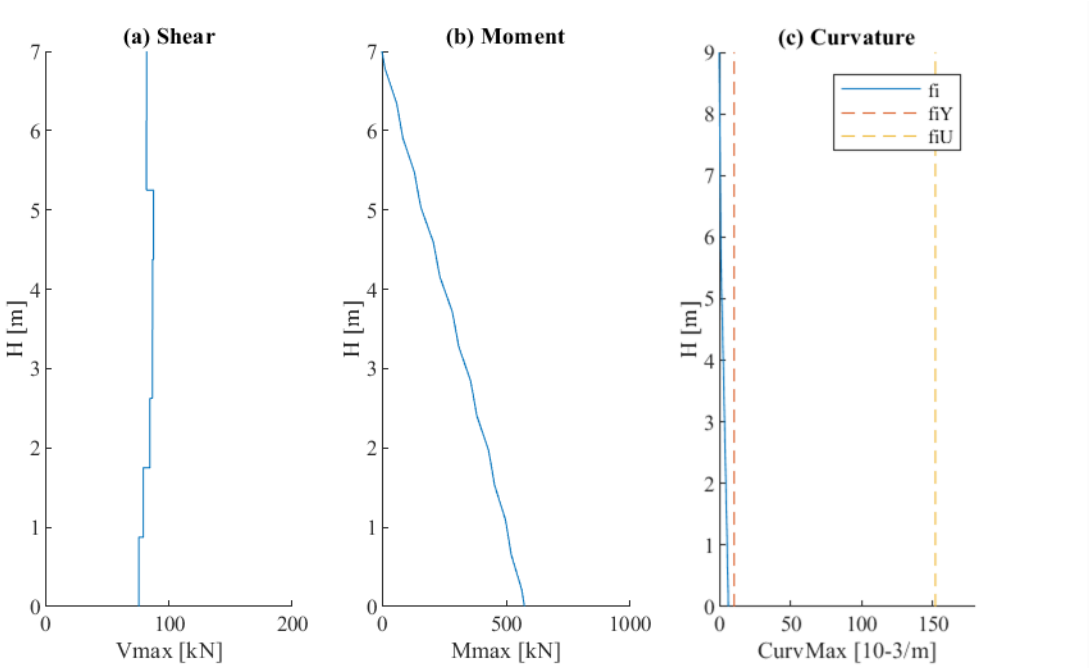

Figure B.9: Structure *m60H7* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika B.9: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

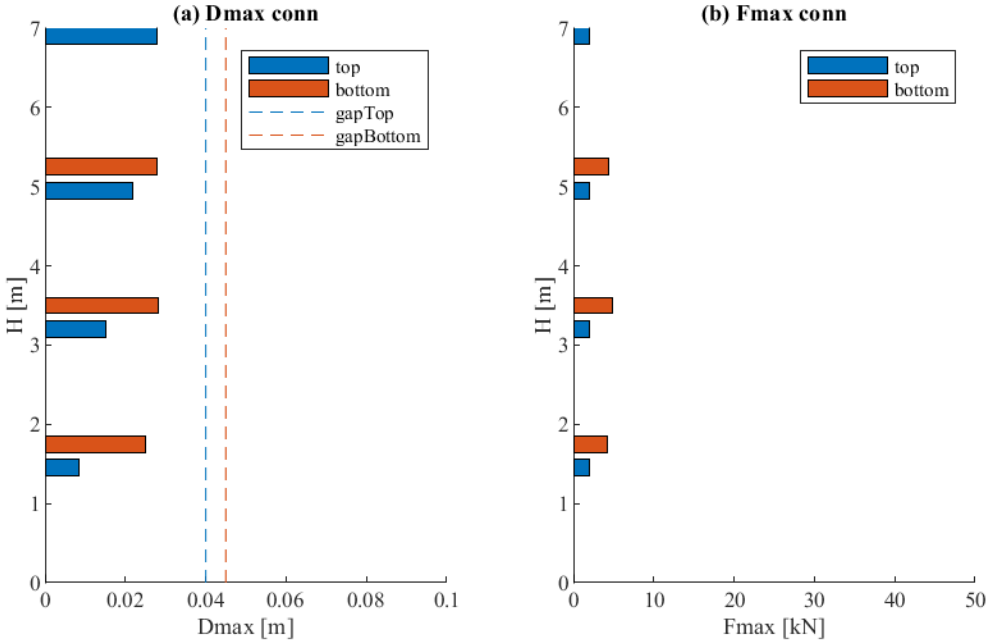

Figure B.10: Structure *m60H7* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika B.10: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

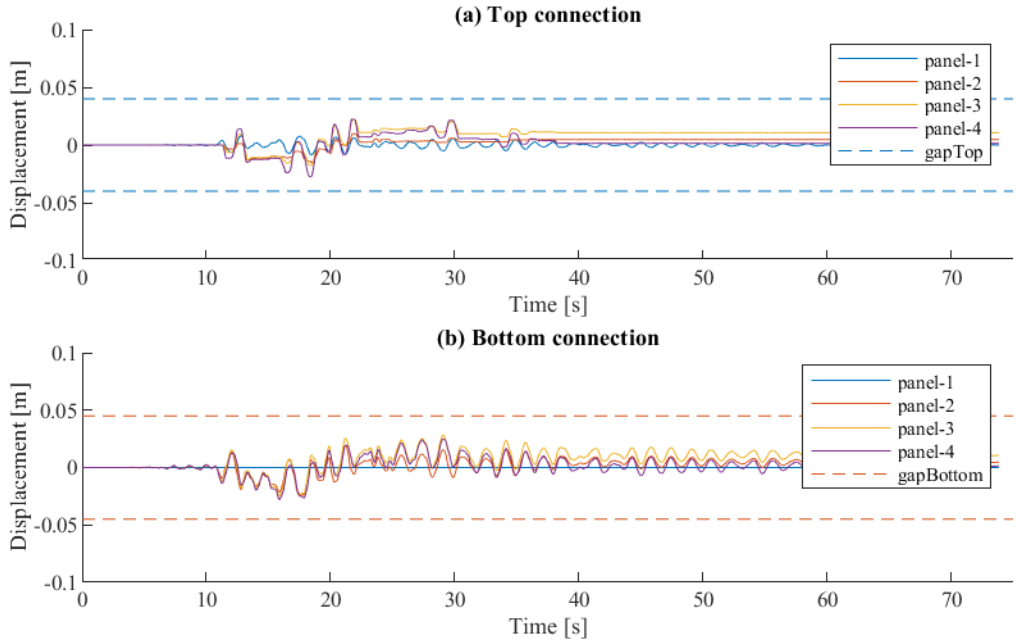

Figure B.11: Structure *m60H7* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika B.11: Montažna hala *m60H7* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

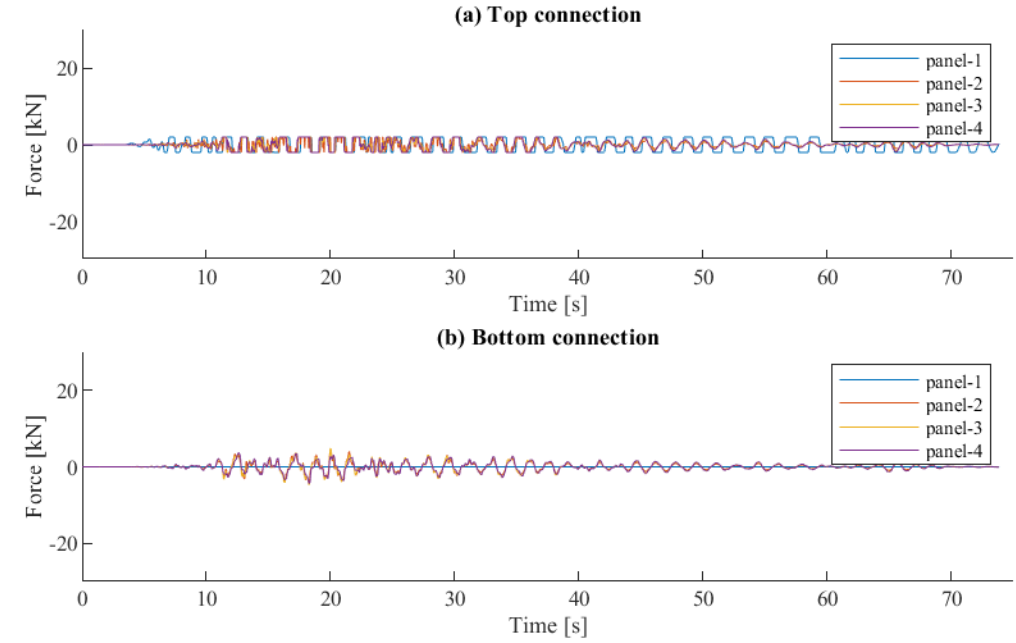

Figure B.12: Structure *m60H7* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika B.12: Montažna hala *m60H7* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

B.3 Structure *m60H9* a_g = 0.25 g

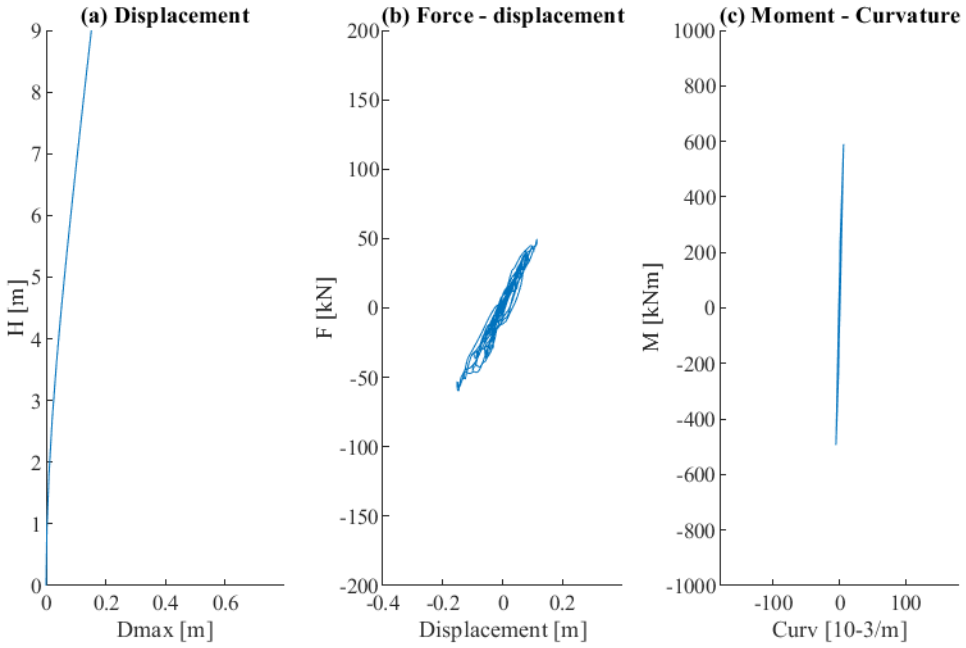

Figure B.13: Structure *m60H9* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika B.13: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

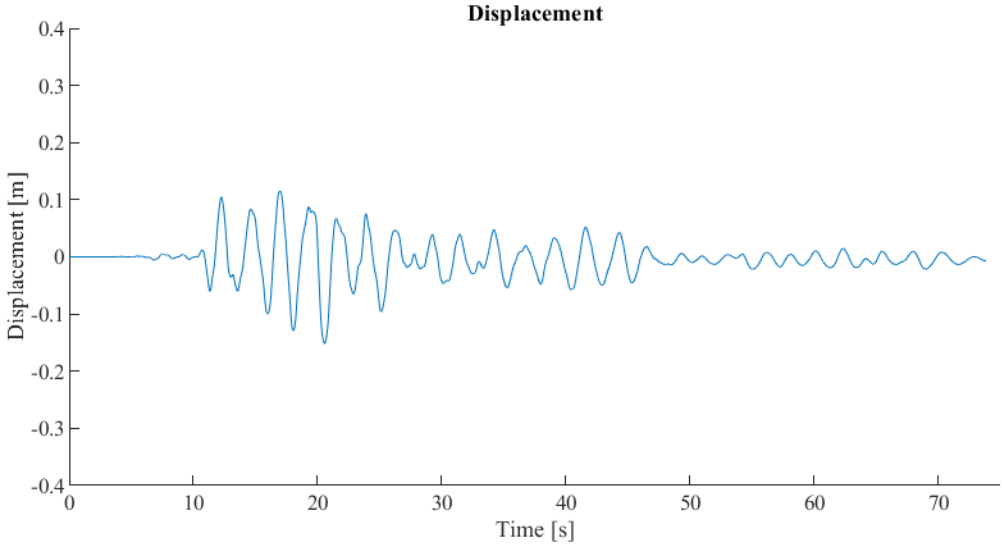

Figure B.14: Structure *m60H9* at a_g = 0.25 g: displacement response history at top of the column

Slika B.14: Montažna hala *m60H9* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

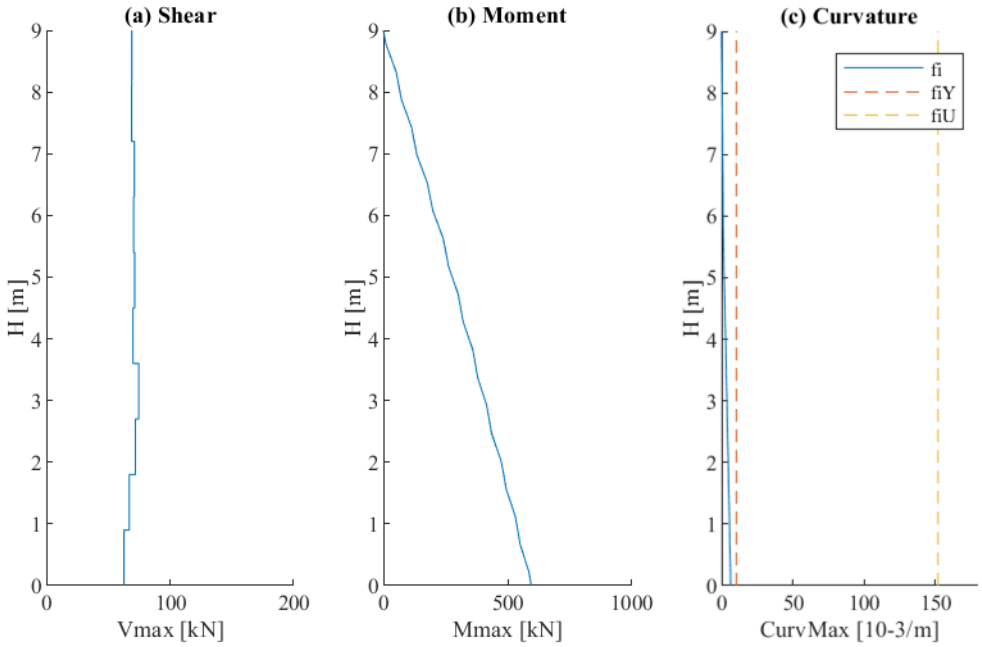

Figure B.15: Structure *m60H9* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika B.15: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

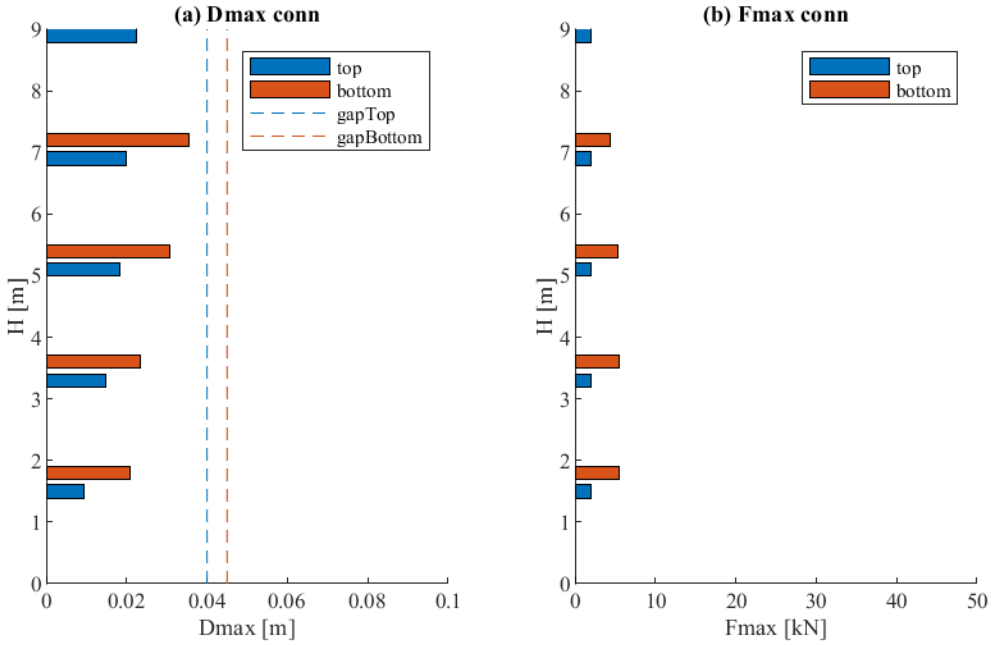

Figure B.16: Structure *m60H9* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika B.16: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

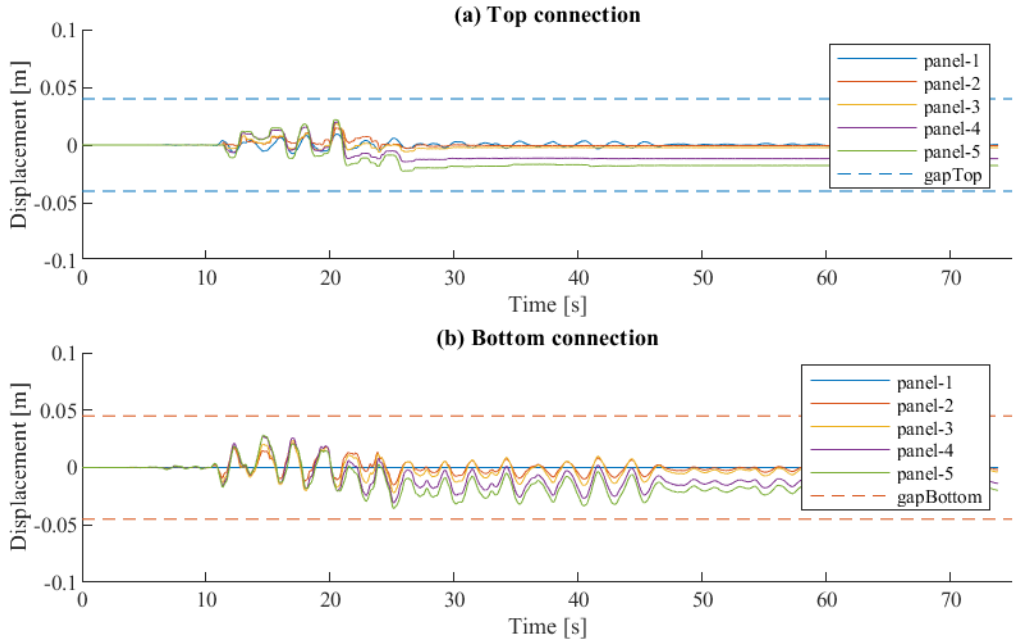

Figure B.17: Structure *m60H9* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika B.17: Montažna hala *m60H9* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

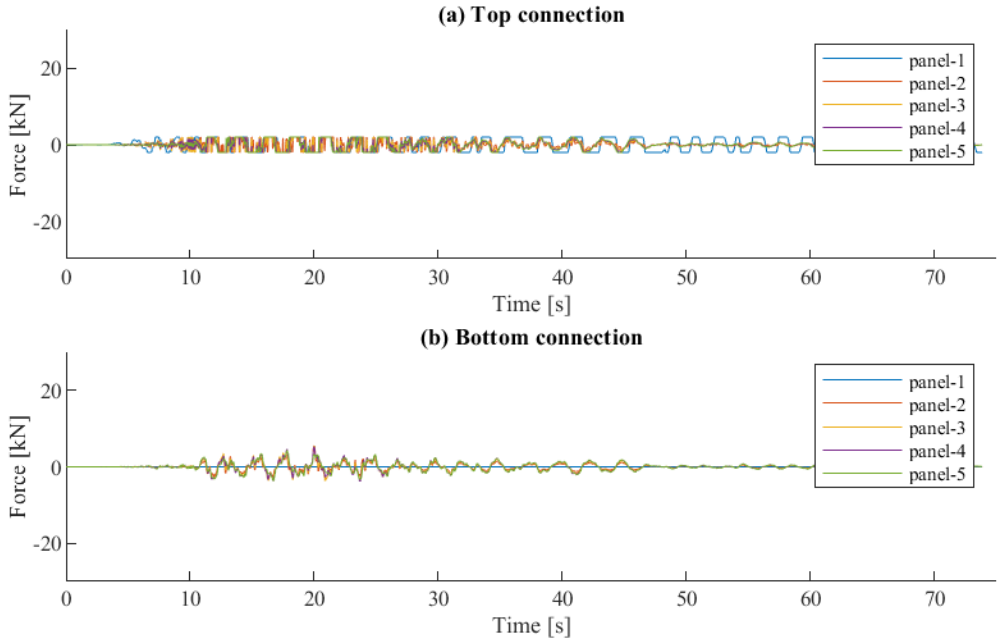

Figure B.18: Structure *m60H9* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika B.18: Montažna hala *m60H9* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

B.4 Structure *m60H5* a_g = 0.675 g

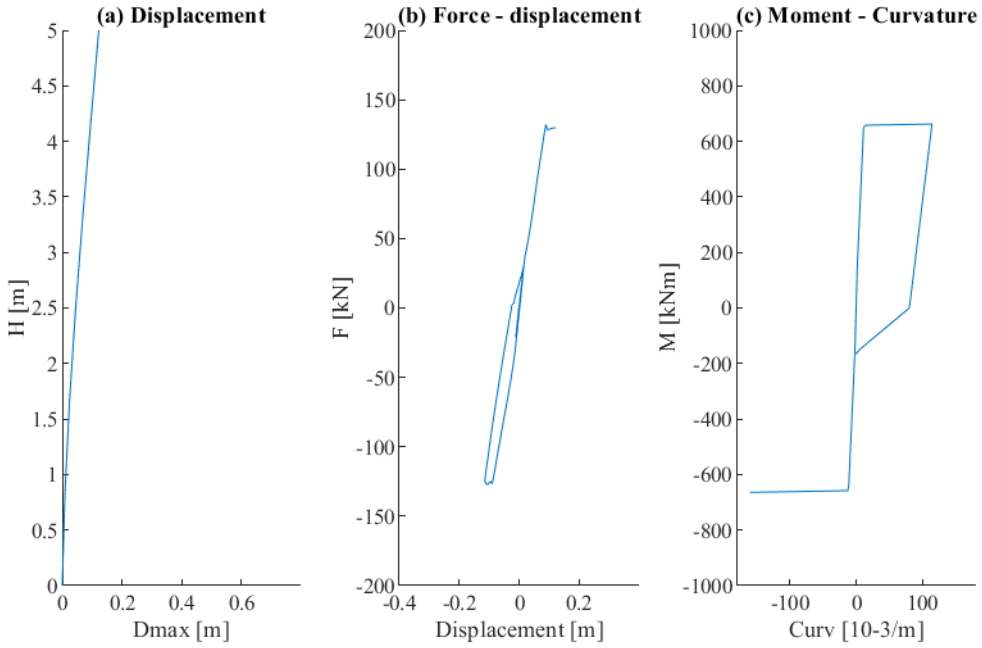

Figure B.19: Structure *m60H5* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika B.19: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

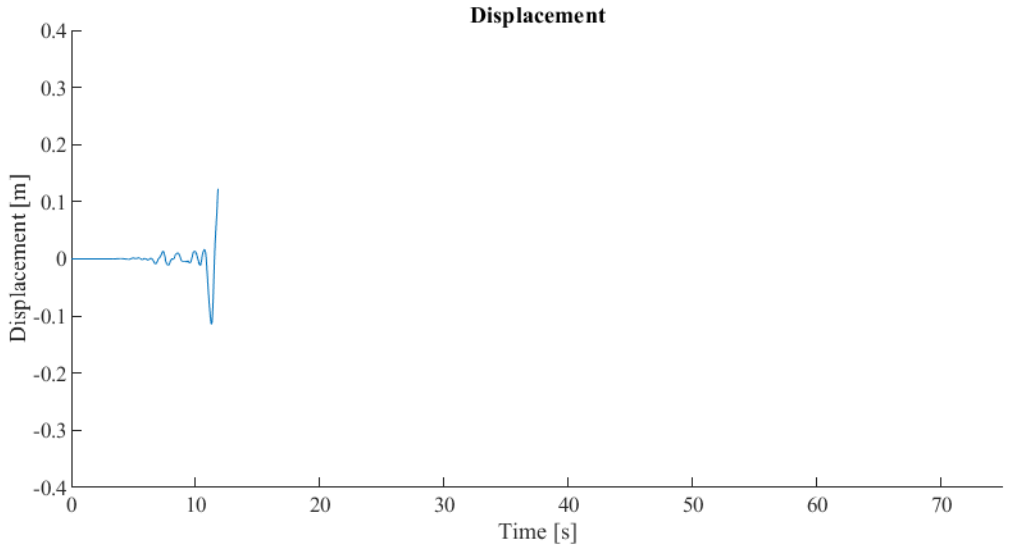

Figure B.20: Structure *m60H5* at a_g = 0.675 g: displacement response history at top of the column

Slika B.20: Montažna hala *m60H5* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

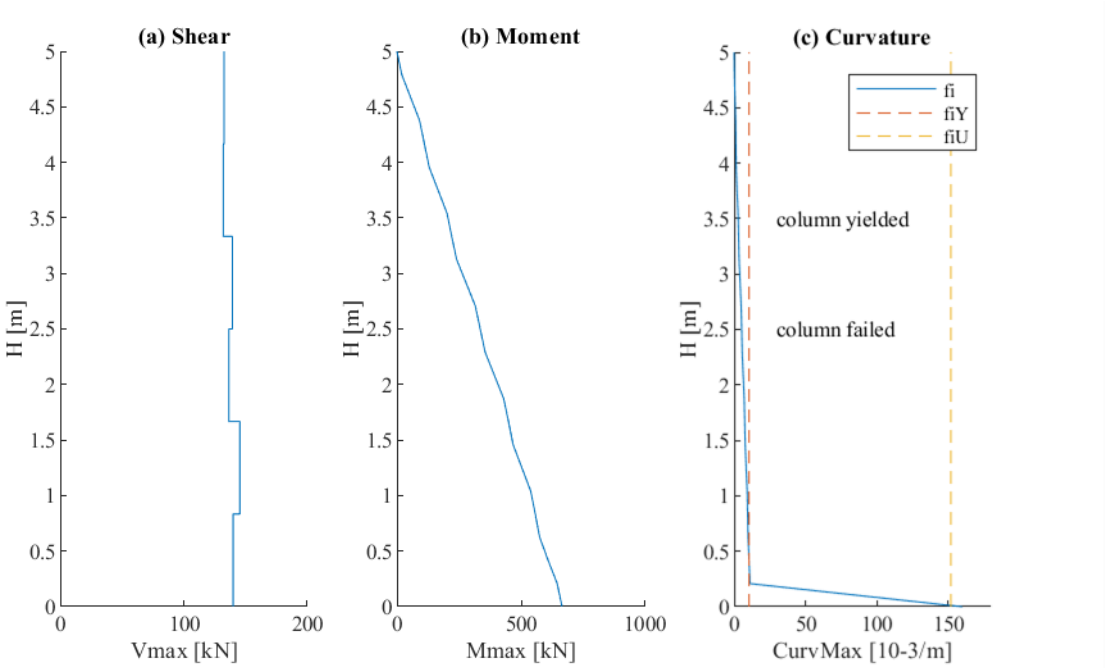

Figure B.21: Structure *m60H5* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika B.21: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

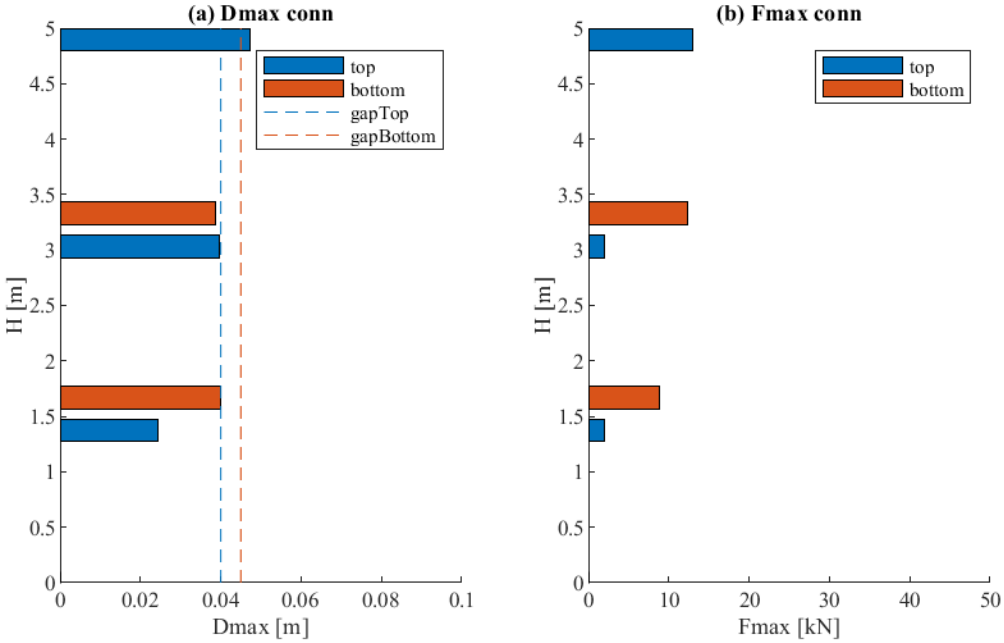

Figure B.22: Structure *m60H5* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika B.22: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

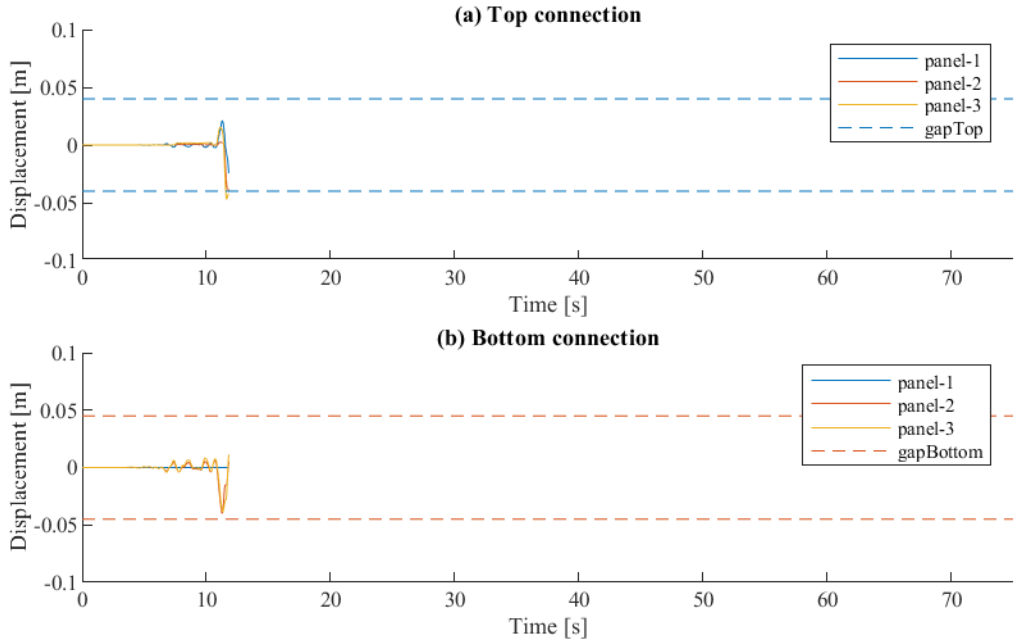

Figure B.23: Structure *m60H5* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika B.23: Montažna hala *m60H5* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

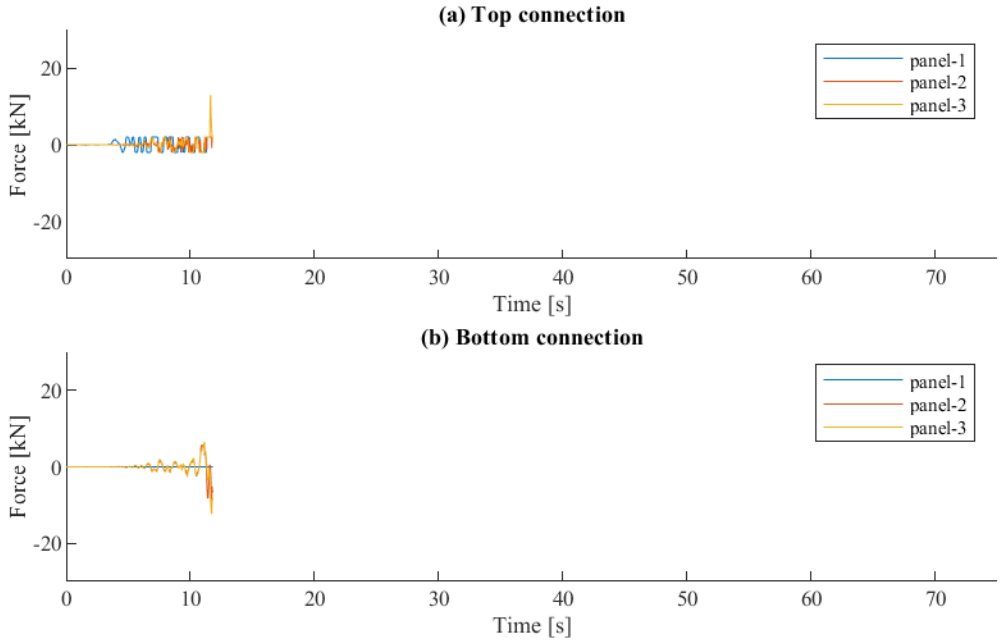

Figure B.24: Structure *m60H5* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika B.24: Montažna hala *m60H5* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

B.5 Structure *m60H7* a_g = 0.675 g

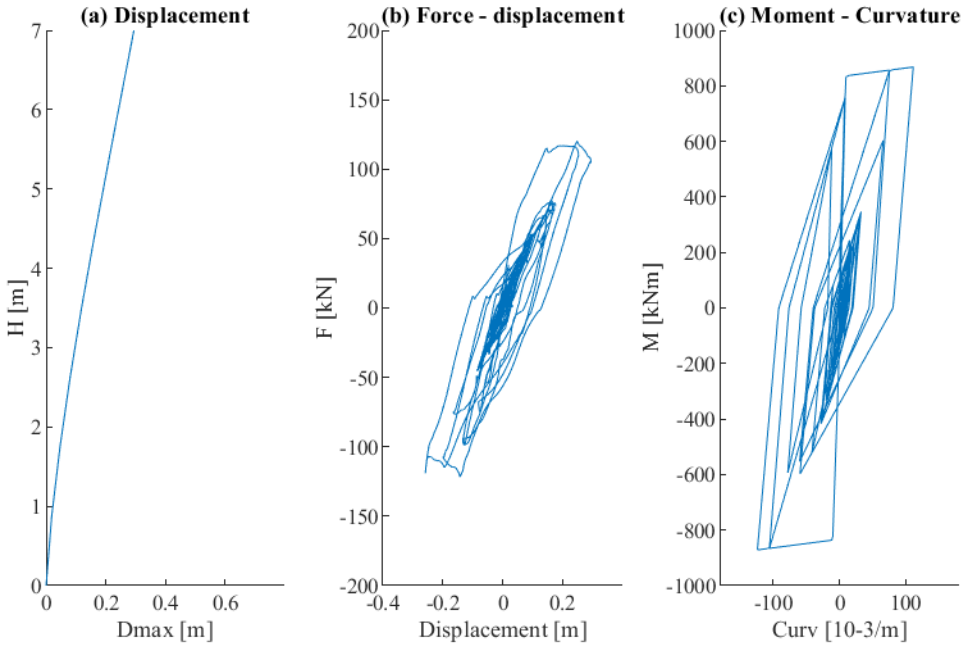

Figure B.25: Structure *m60H7* a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika B.25: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

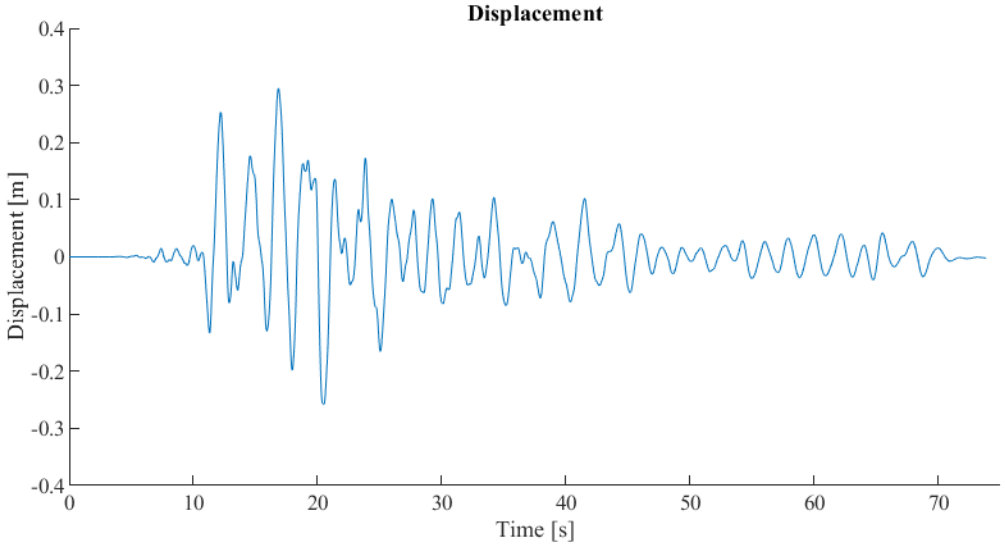

Figure B.26: Structure *m60H7* at a_g = 0.675 g: displacement response history at top of the column

Slika B.26: Montažna hala *m60H7* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

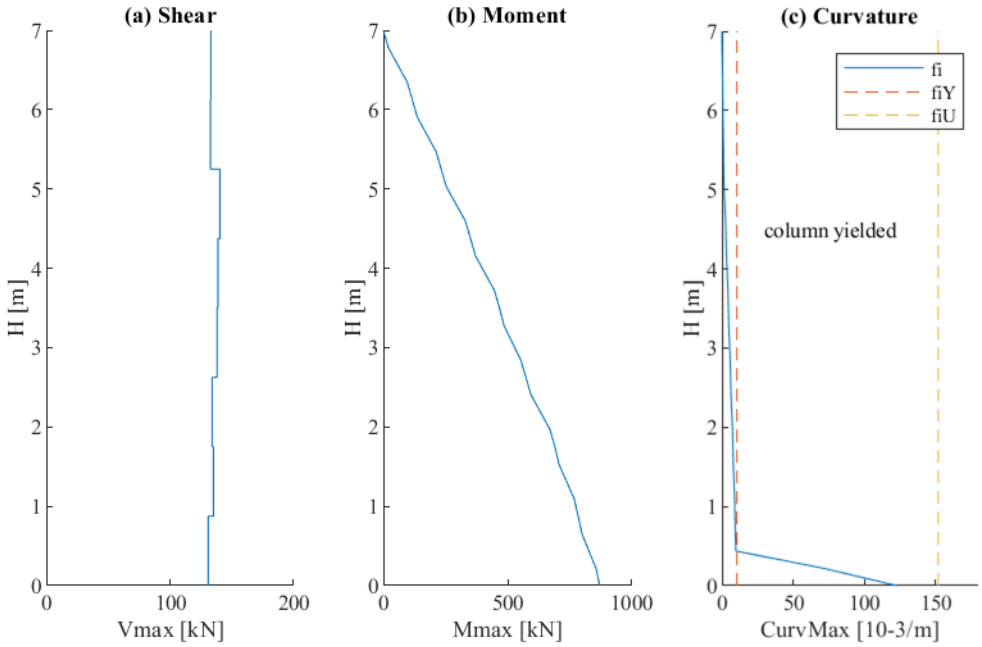

Figure B.27: Structure *m60H7* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika B.27: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

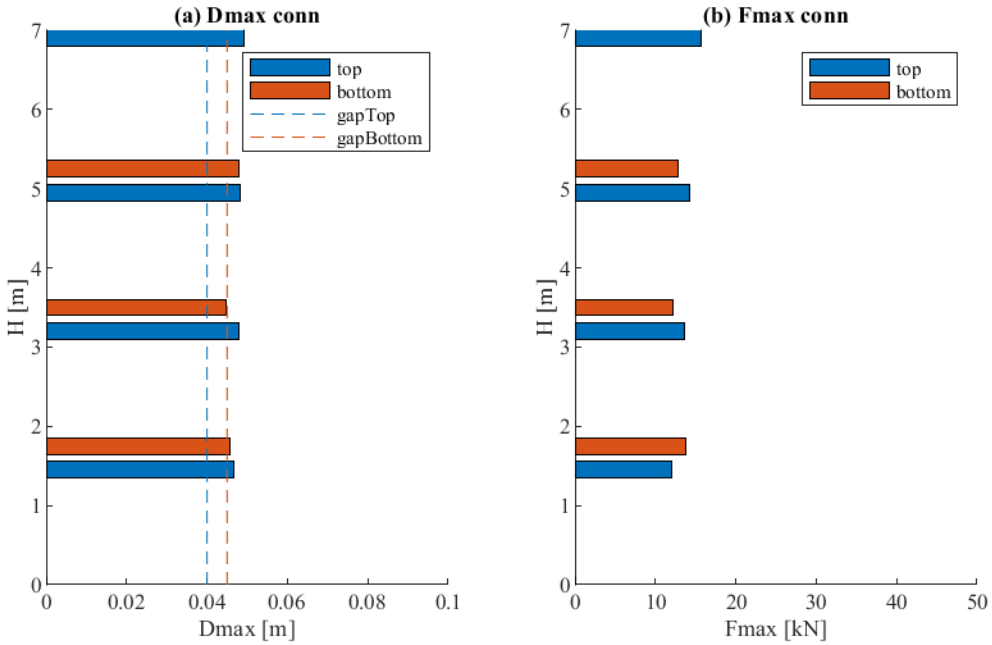

Figure B.28: Structure *m60H7* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika B.28: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

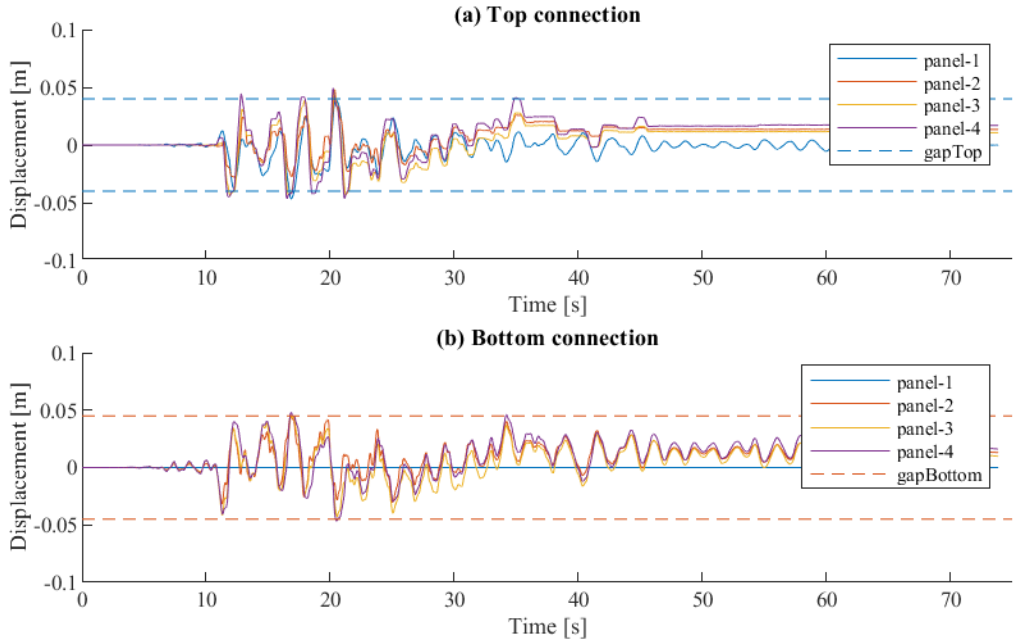

Figure B.29: Structure *m60H7* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika B.29: Montažna hala *m60H7* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

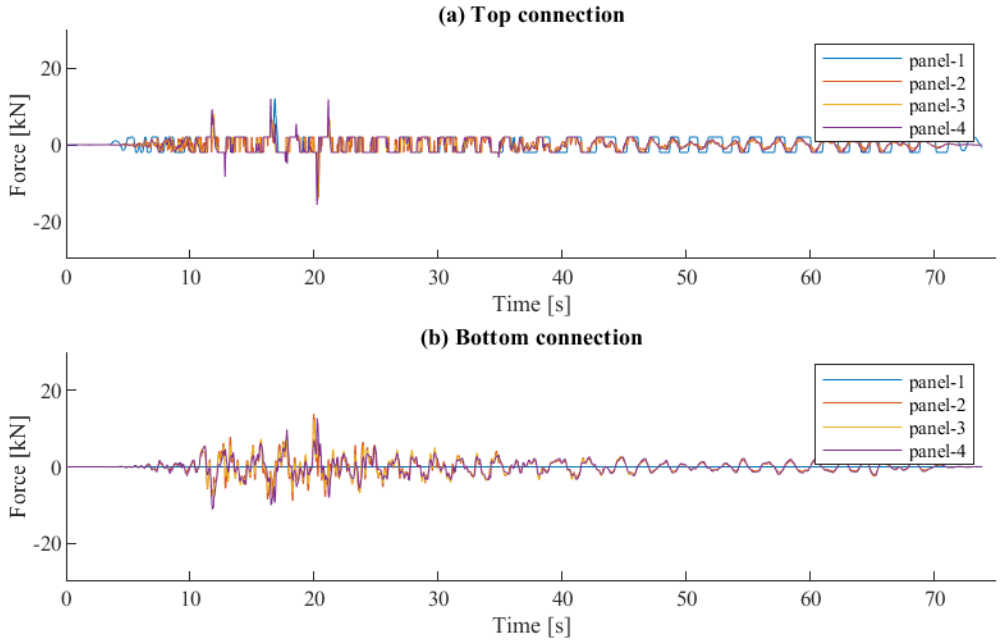

Figure B.30: Structure *m60H7* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika B.30: Montažna hala *m60H7* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

B.6 Structure *m60H9* a_g = 0.675 g

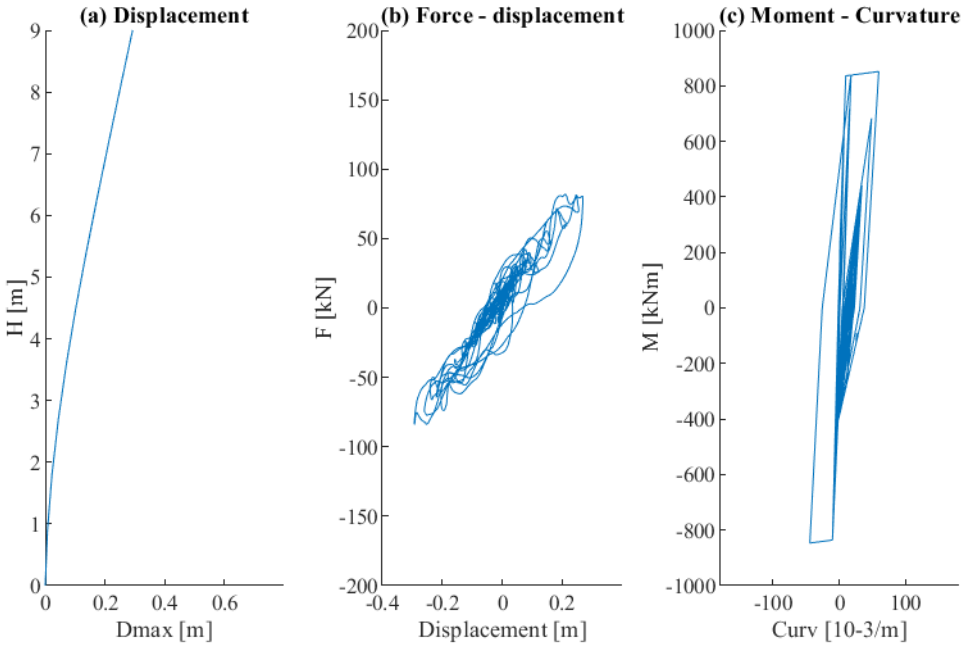

Figure B.31: Structure *m60H9* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika B.31: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

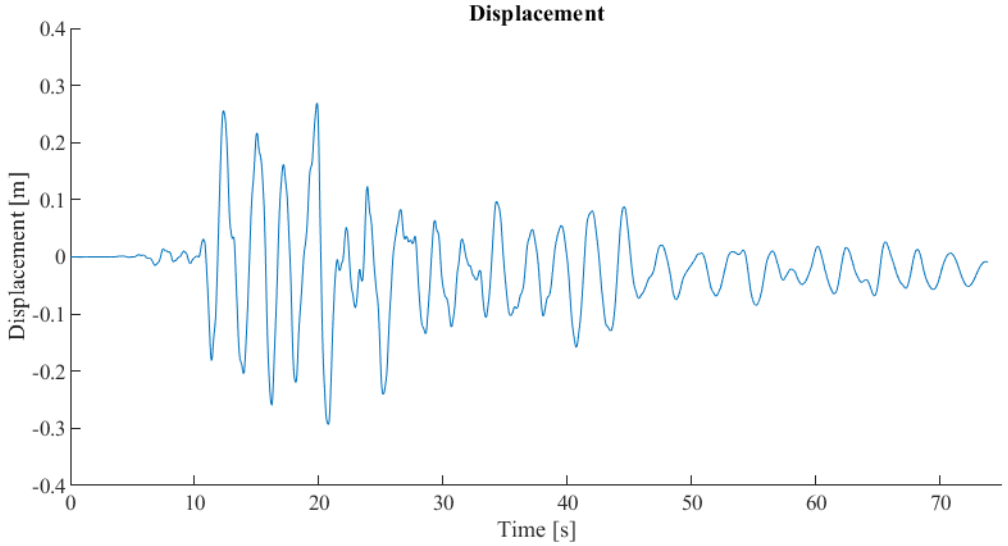

Figure B.32: Structure *m60H9* at a_g = 0.675 g: displacement response history at top of the column

Slika B.32: Montažna hala *m60H9* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

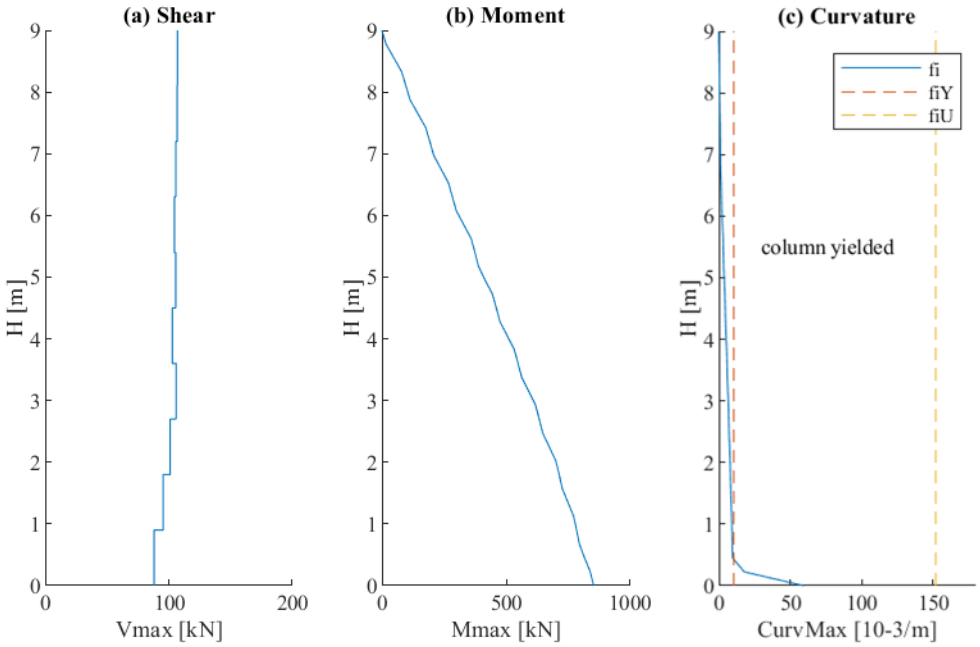

Figure B.33: Structure *m60H9* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika B.33: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

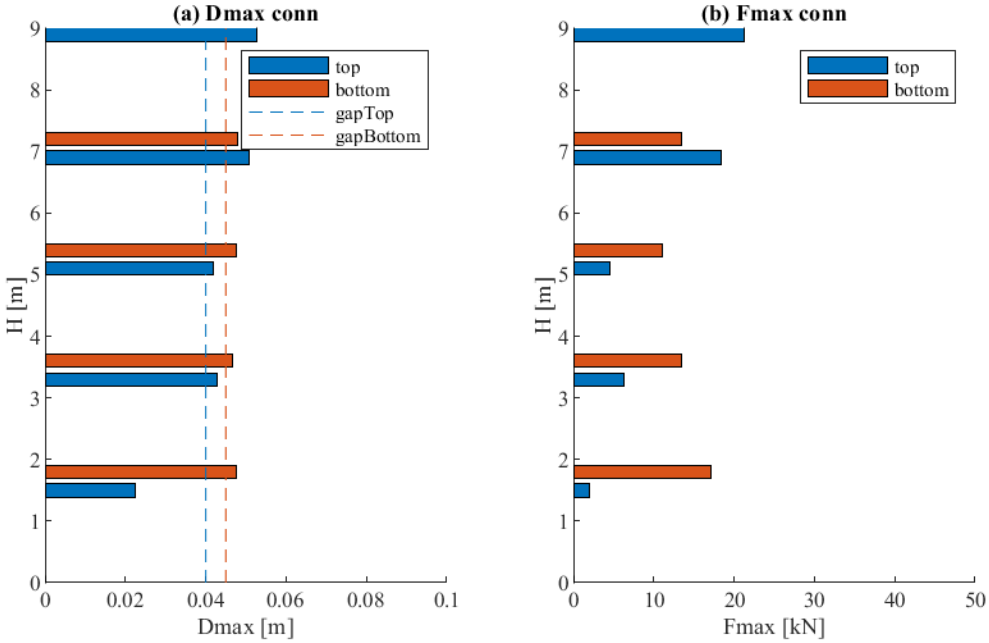

Figure B.34: Structure *m60H9* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika B.34: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

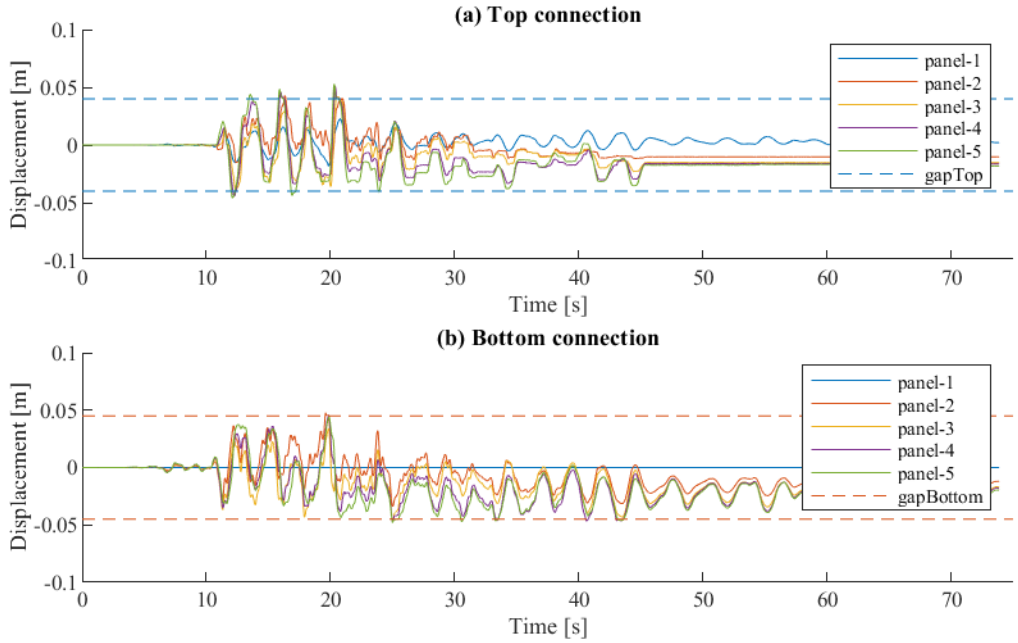

Figure B.35: Structure *m60H9* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika B.35: Montažna hala *m60H9* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

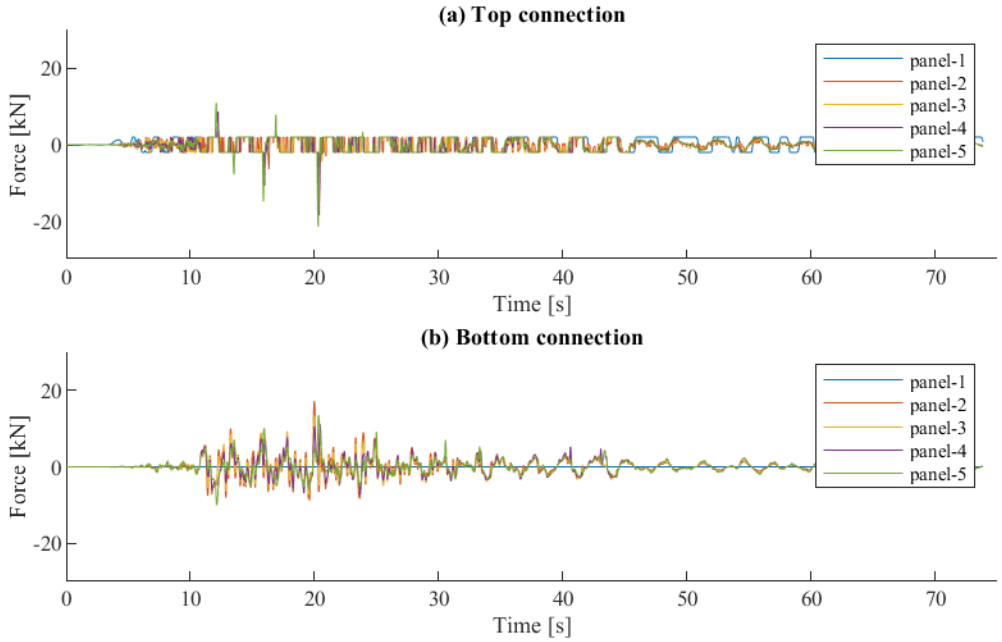

Figure B.36: Structure *m60H9* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika B.36: Montažna hala *m60H9* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

APPENDIX C: Results of parametric analysis considering *MM/P/F/2* parameters

In this appendix, the results of numerical analyses performed on precast structures with centrally positioned connections (*MM*), with silicone sealant between the panels (*P*), the bottom panel fixed to the foundation (*F*) and with the ratio factor $k = 2$ are gathered.

In Figures C.1-C.3, responses of structures with and without silicone sealant are shown for three different heights. Then, time history responses and distribution of forces and displacements along the height of the structure are shown for three characteristic structures *m60H5*, *m60H7* and *m60H*. To present the characteristic results, the response of structures subjected to ground motion no. 4 was chosen. It is the accelerogram that from all selected accelerograms has the response spectra the closest to EC8 response spectra in the period range of analysed structures.

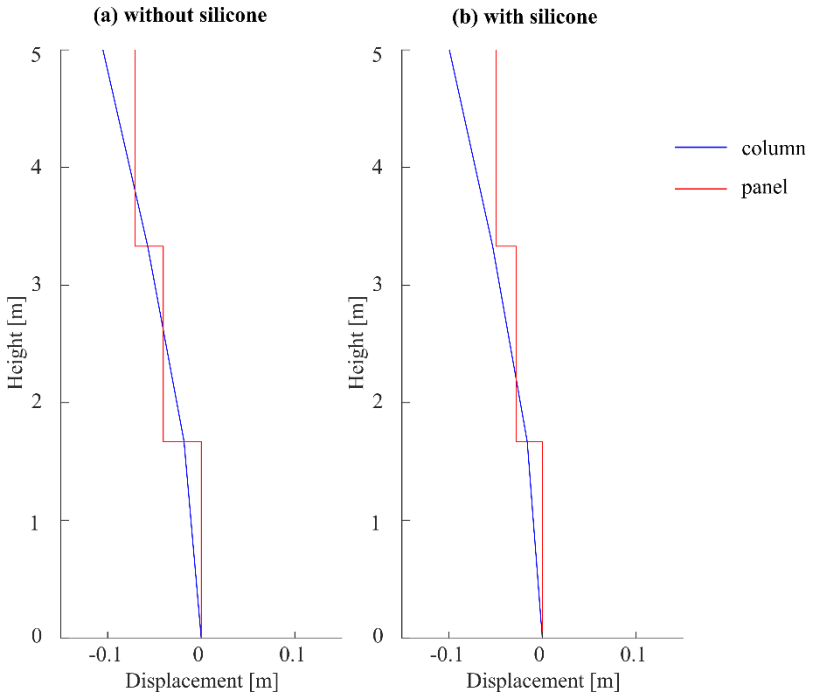

Figure C.1: Response of precast structure *m60H5*: (a) without silicone sealed joints and (b) with silicone sealant

Slika C.1: Odziv konstrukcije *m60H5*: (a) brez silikona in (b) s silikonom

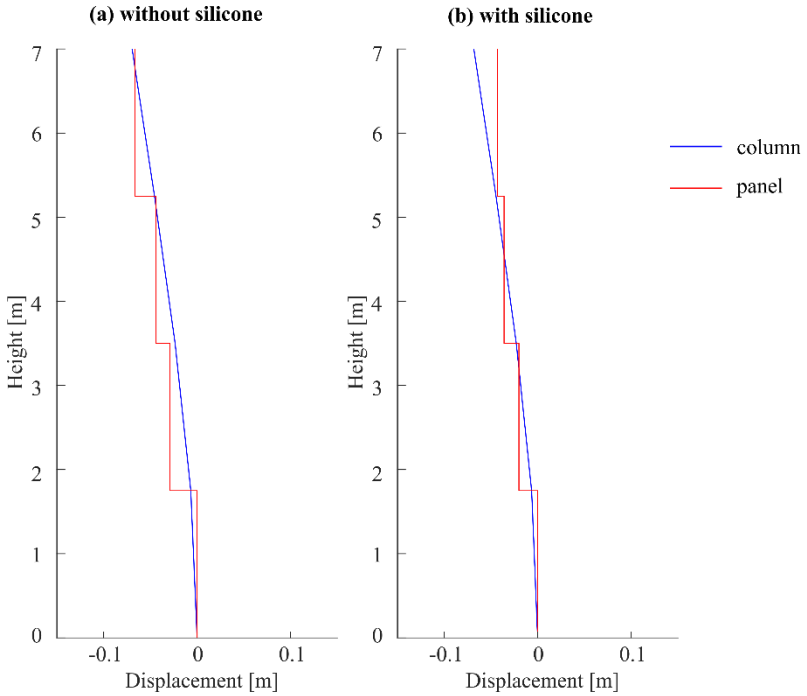

Figure C.2: Response of precast structure *m60H7*: (a) without silicone sealed joints and (b) with silicone sealant

Slika C.2: Odziv konstrukcije *m60H7*: (a) brez silikona in (b) s silikonom

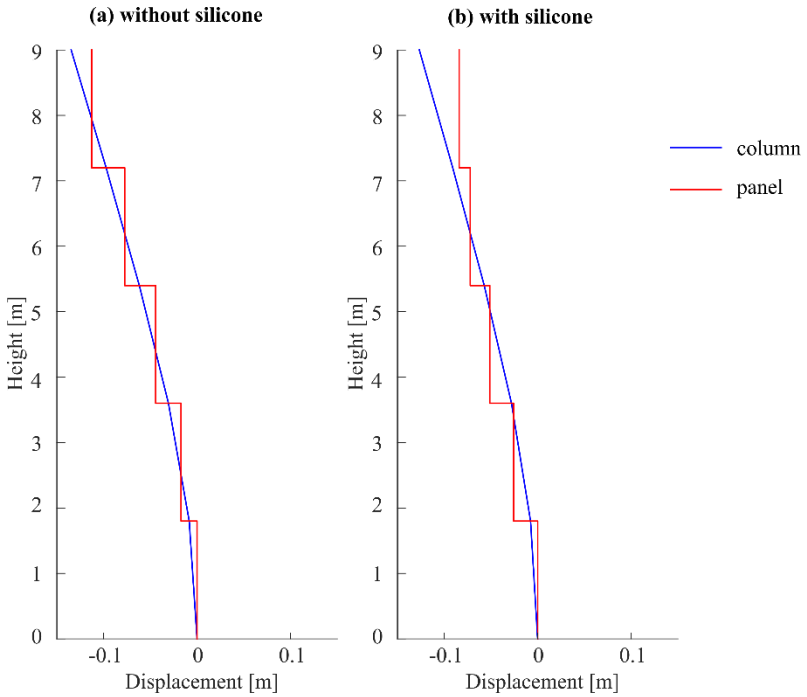

Figure C.3: Response of precast structure *m60H9*: (a) without silicone sealed joints and (b) with silicone sealant

Slika C.3: Odziv konstrukcije *m60H9*: (a) brez silikona in (b) s silikonom

C.1 Structure *m60H5* a_g = 0.25 g

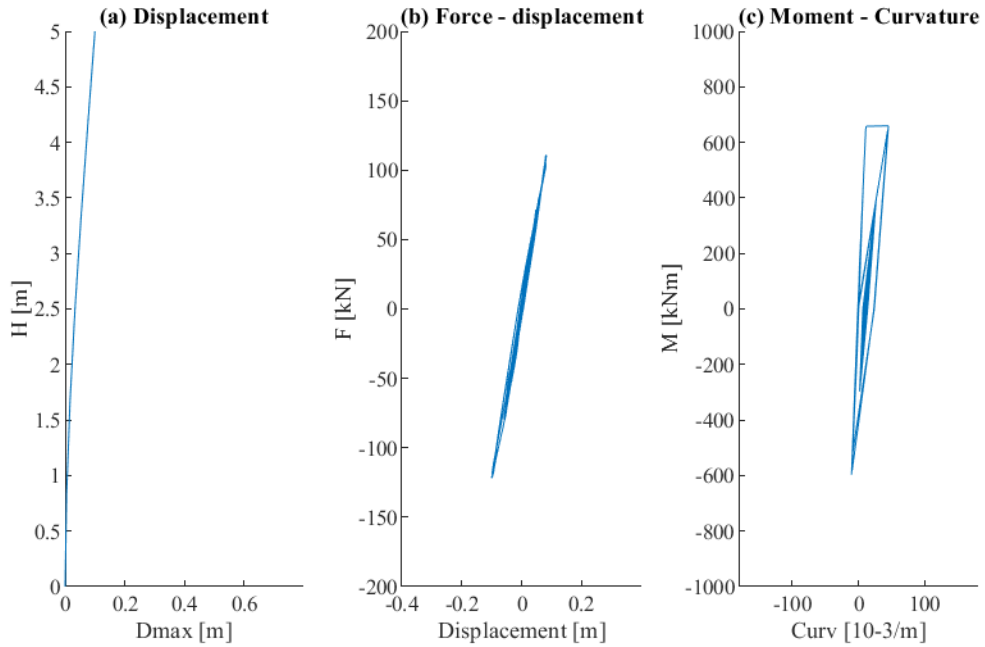

Figure C.4: Structure *m60H5* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika C.4: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

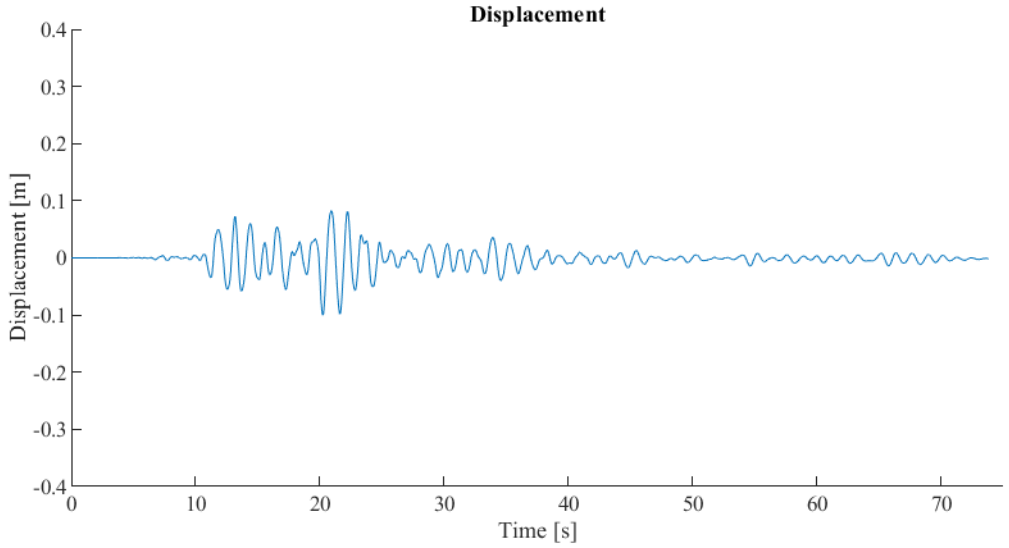

Figure C.5: Structure *m60H5* at a_g = 0.25 g: displacement response history at top of the column

Slika C.5: Montažna hala *m60H5* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

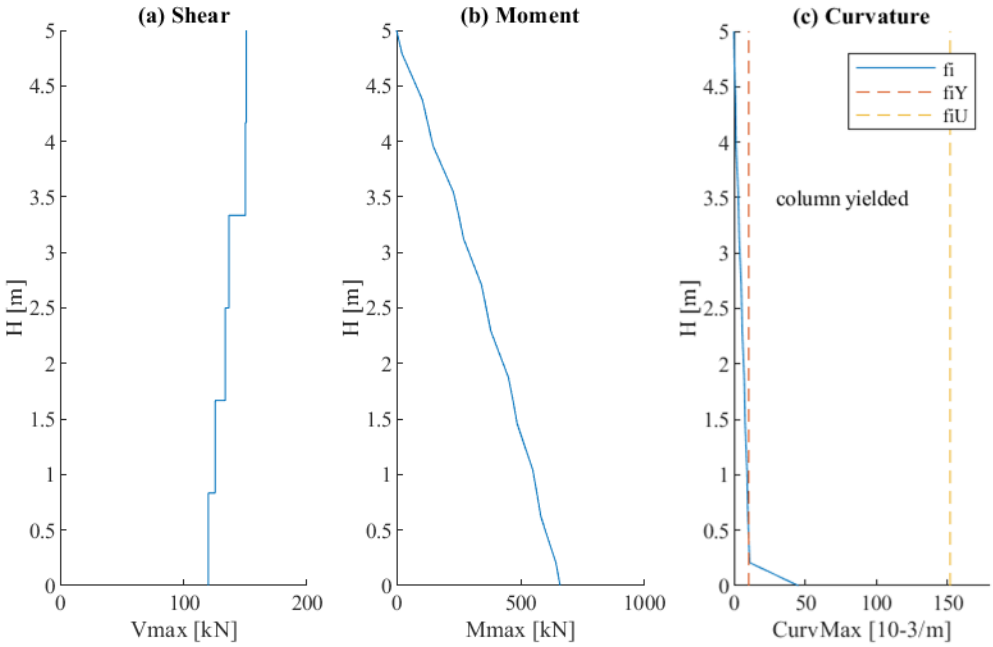

Figure C.6: Structure *m60H5* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika C.6: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

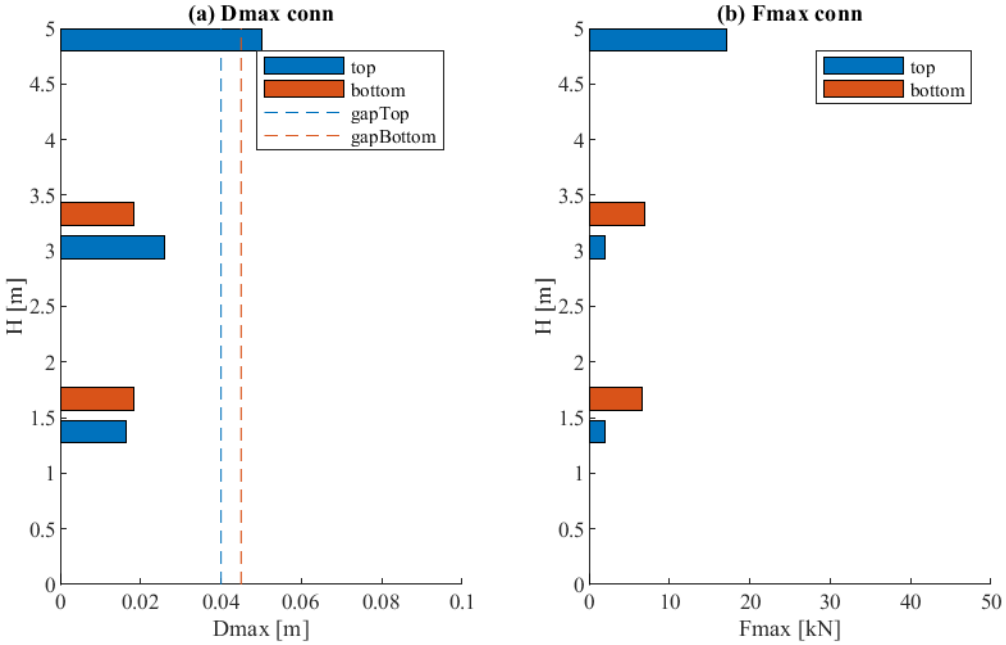

Figure C.7: Structure *m60H5* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika C.7: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

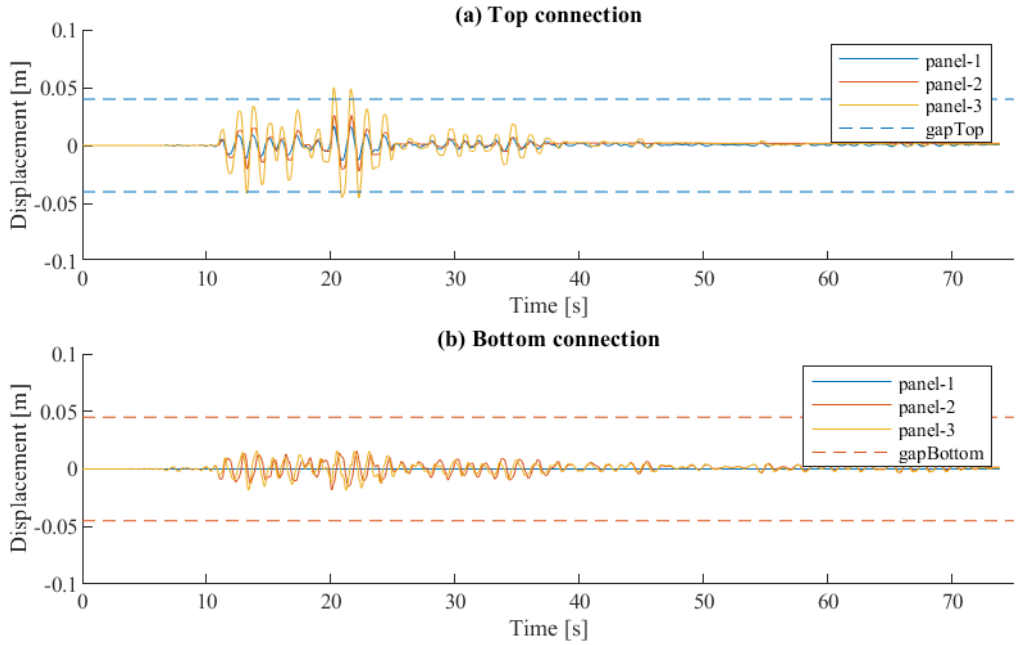

Figure C.8: Structure *m60H5* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika C.8: Montažna hala *m60H5* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

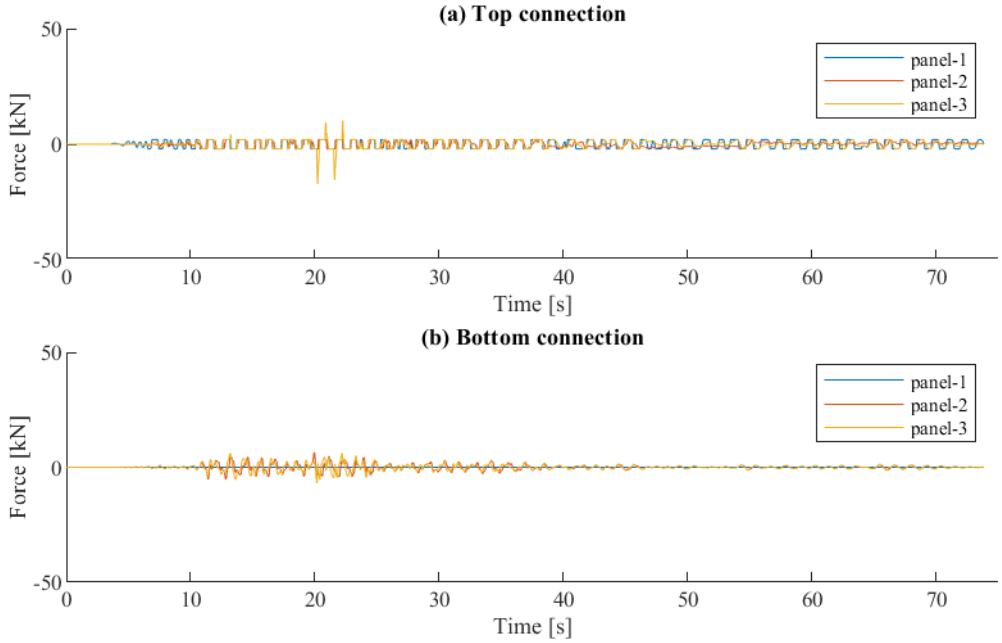

Figure C.9: Structure *m60H5* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika C.9: Montažna hala *m60H5* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

C.2 Structure *m60H7* a_g = 0.25 g

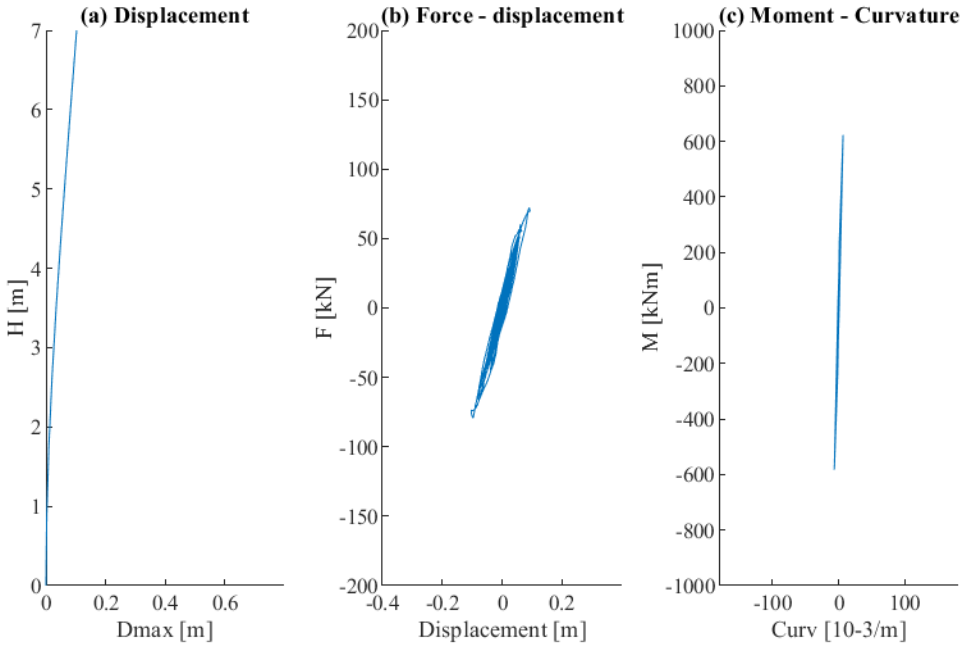

Figure C.10: Structure *m60H7* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika C.10: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

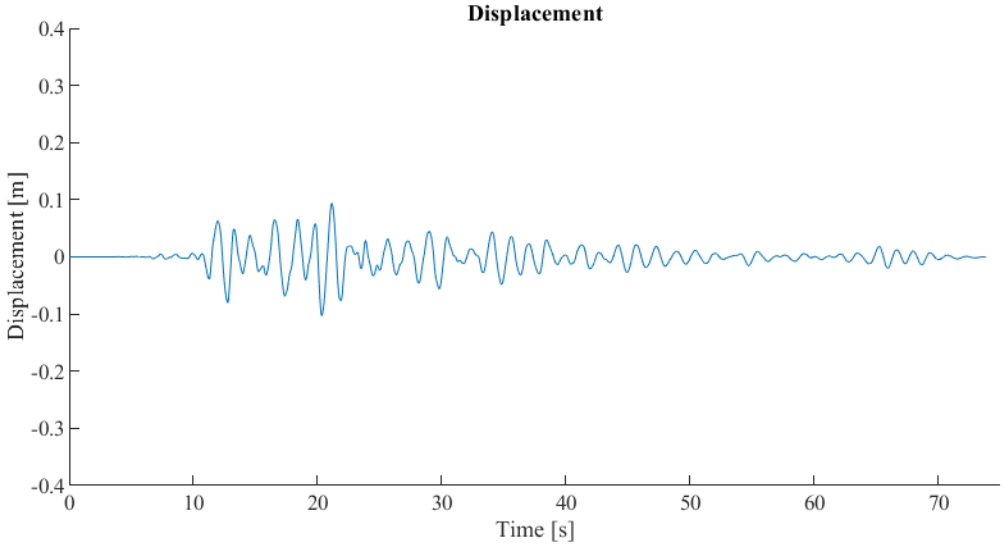

Figure C.11: Structure *m60H7* at a_g = 0.25 g: displacement response history at top of the column

Slika C.11: Montažna hala *m60H7* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

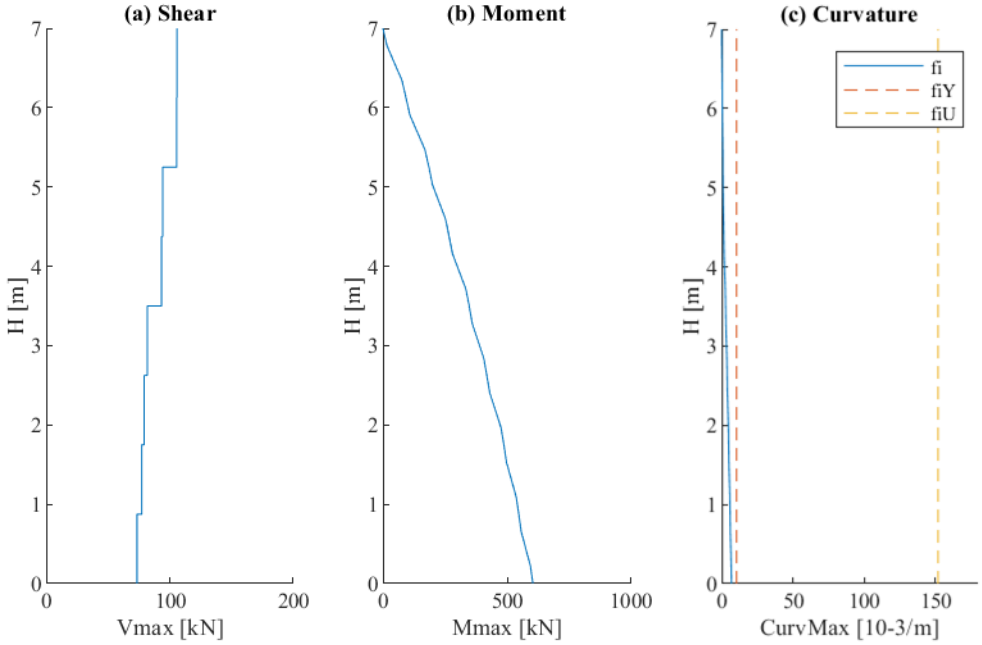

Figure C.12: Structure *m60H7* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika C.12: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

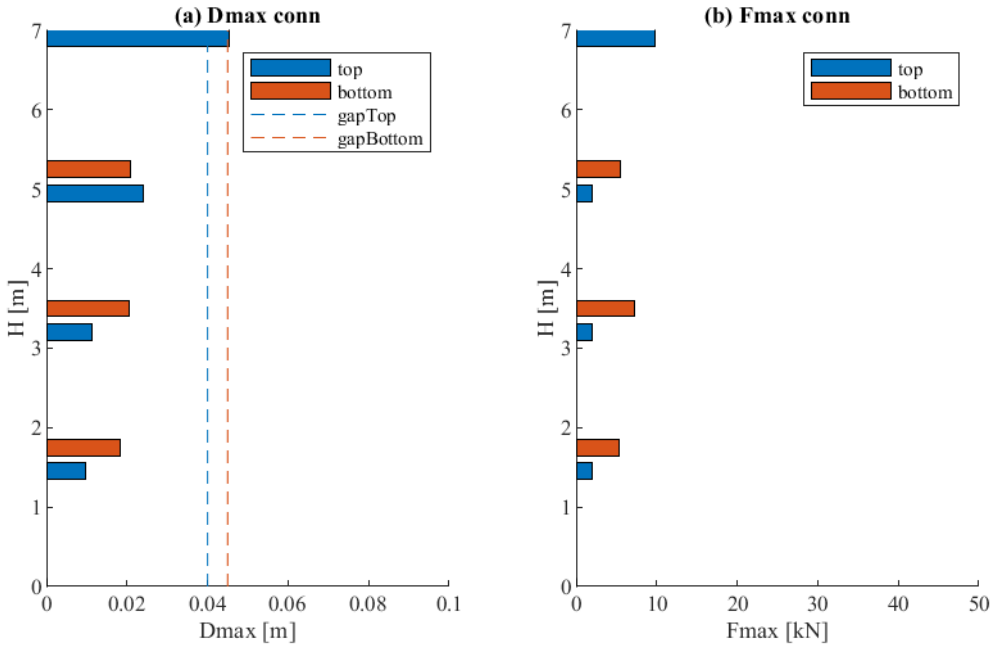

Figure C.13: Structure *m60H7* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika C.13: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

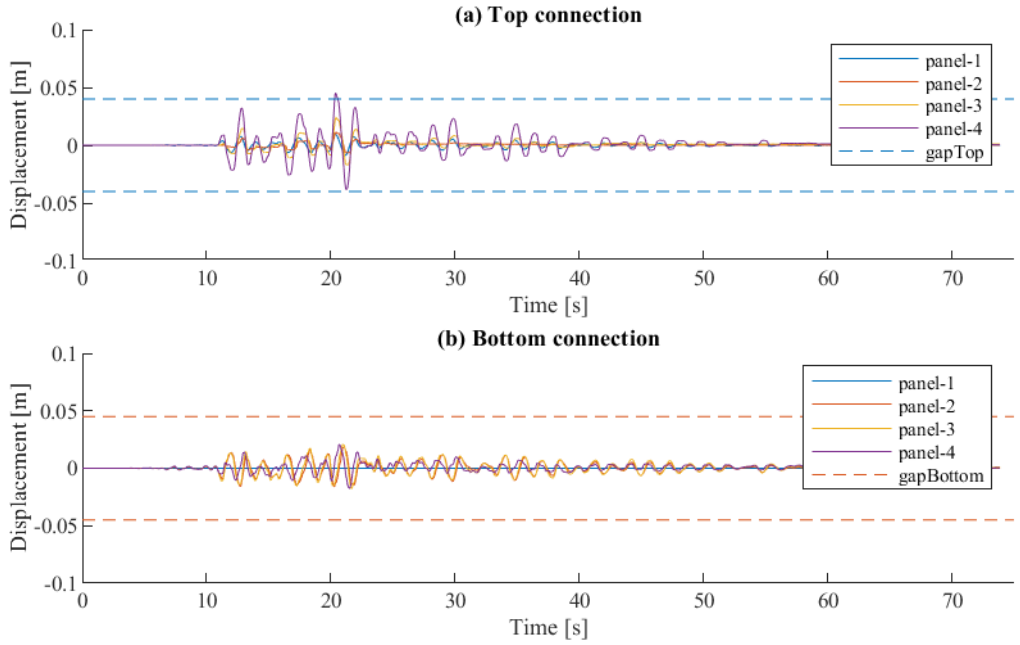

Figure C.14: Structure *m60H7* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika C.14: Montažna hala *m60H7* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

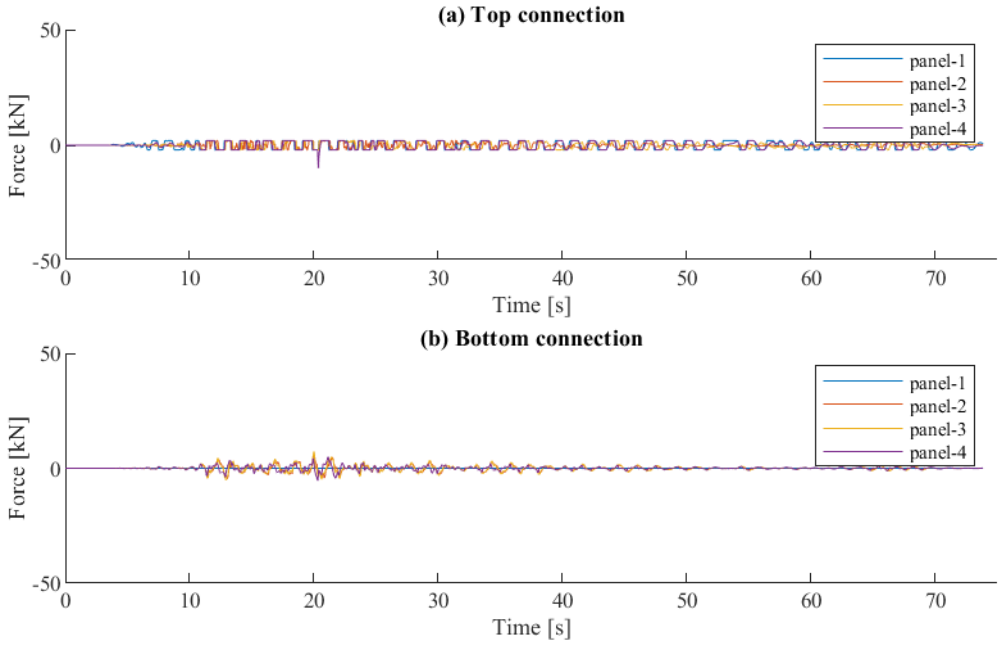

Figure C.15: Structure *m60H7* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika C.15: Montažna hala *m60H7* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

C.3 Structure *m60H9* a_g = 0.25 g

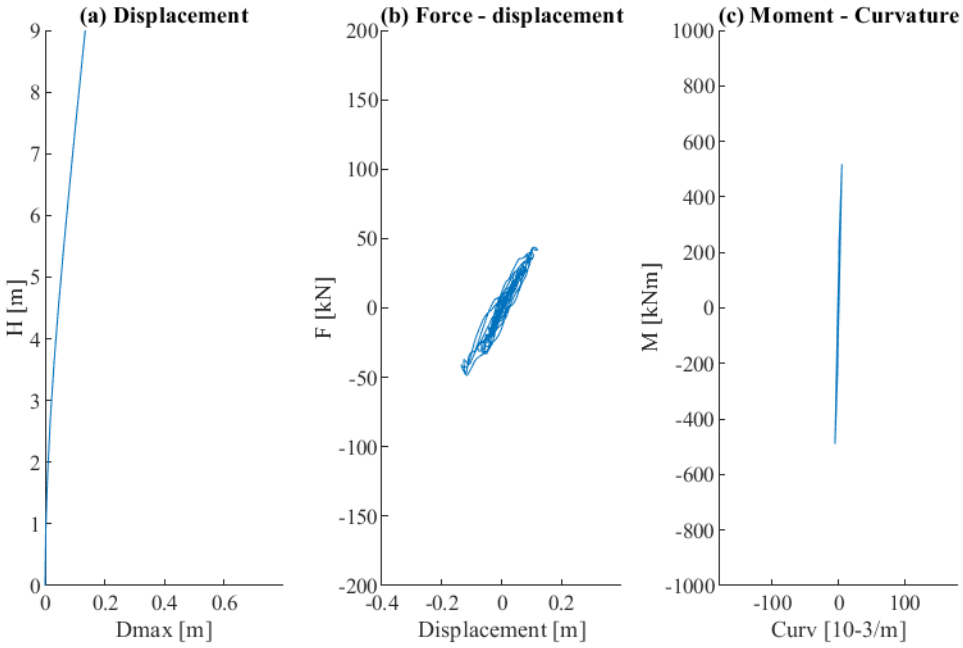

Figure C.16: Structure *m60H9* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika C.16: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

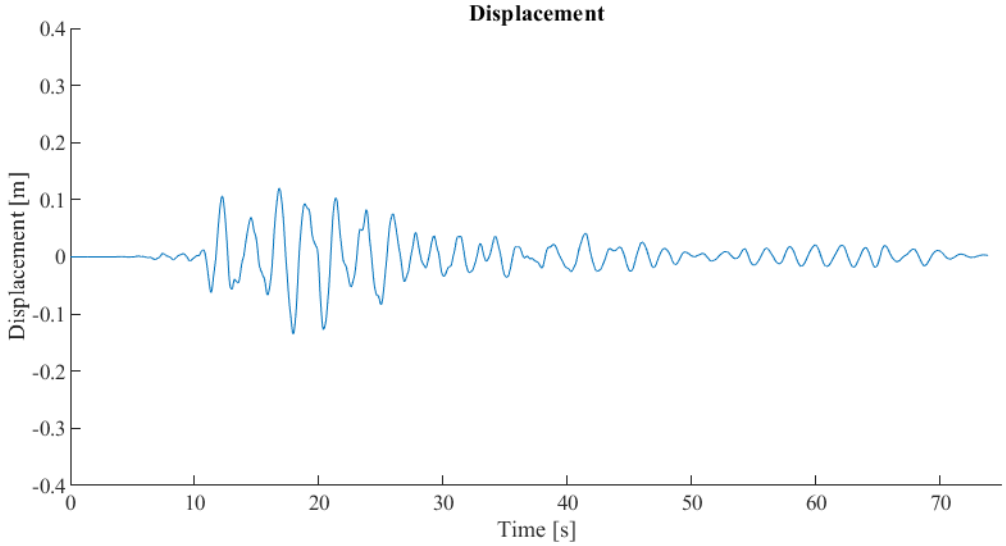

Figure C.17: Structure *m60H9* at a_g = 0.25 g: displacement response history at top of the column

Slika C.17: Montažna hala *m60H9* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

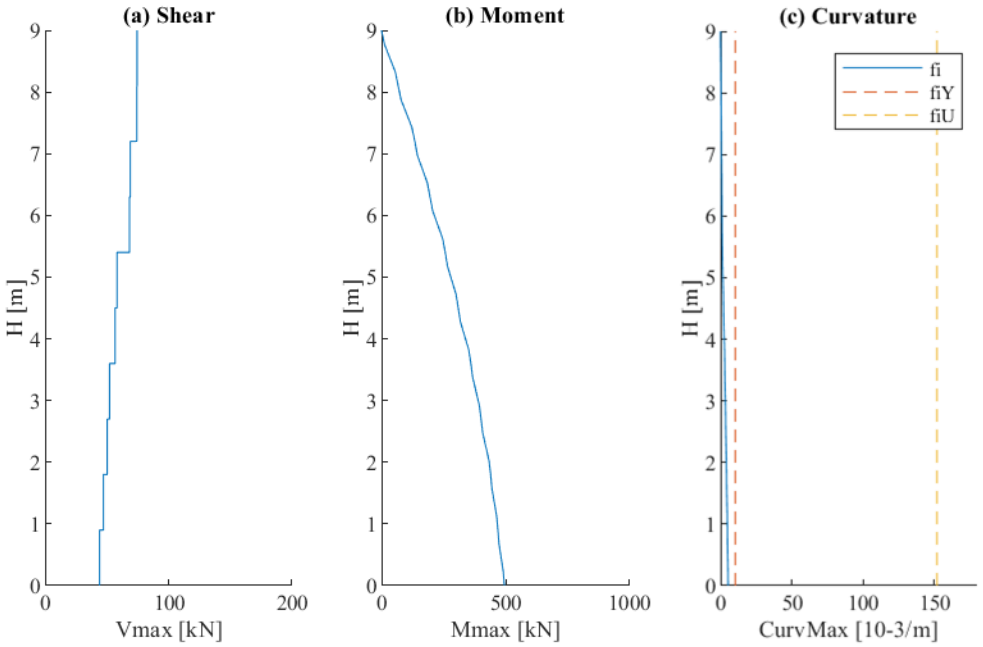

Figure C.18: Structure *m60H9* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika C.18: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

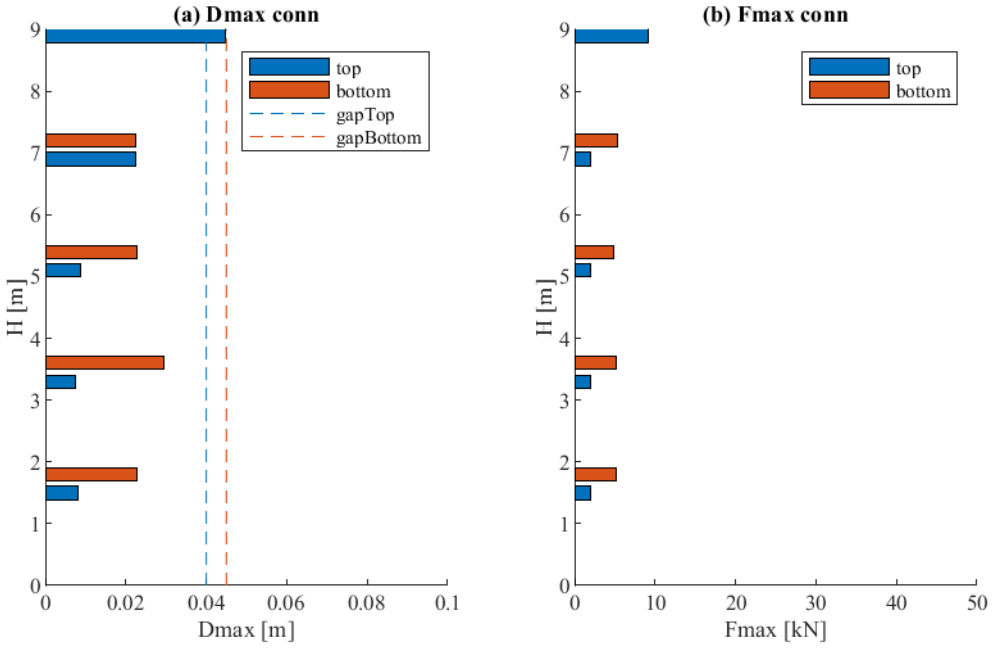

Figure C.19: Structure *m60H9* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika C.19: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

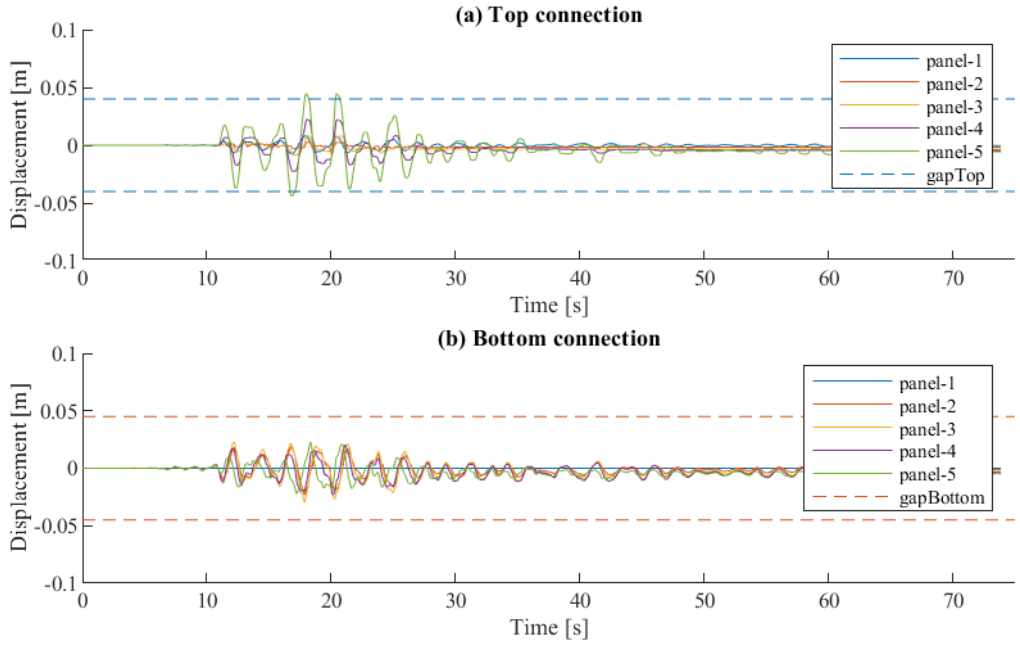

Figure C.20: Structure *m60H9* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika C.20: Montažna hala *m60H9* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

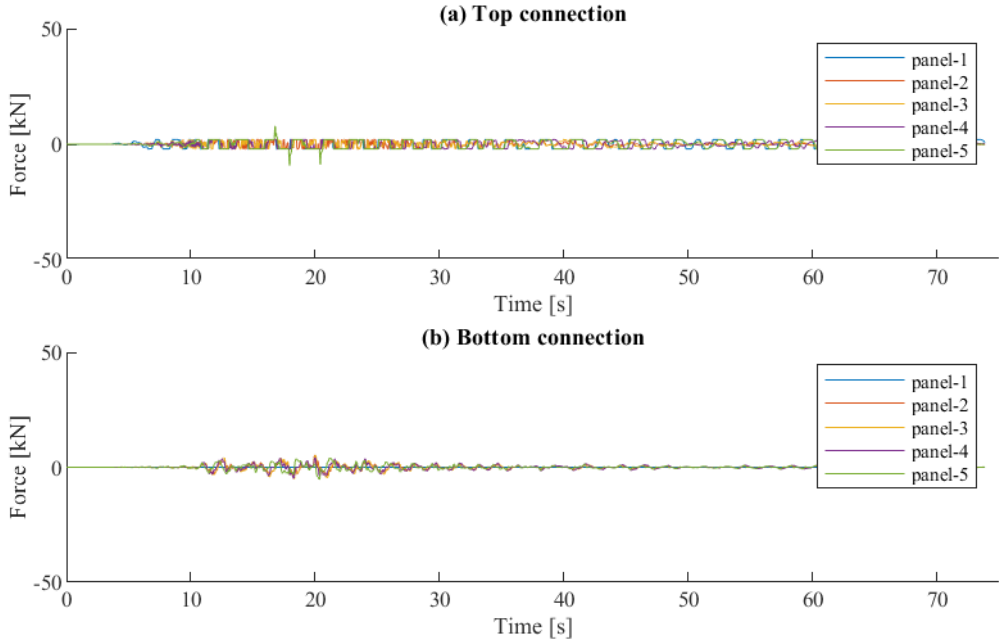

Figure C.21: Structure *m60H9* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika C.21: Montažna hala *m60H9* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

C.4 Structure *m60H5* a_g = 0.675 g

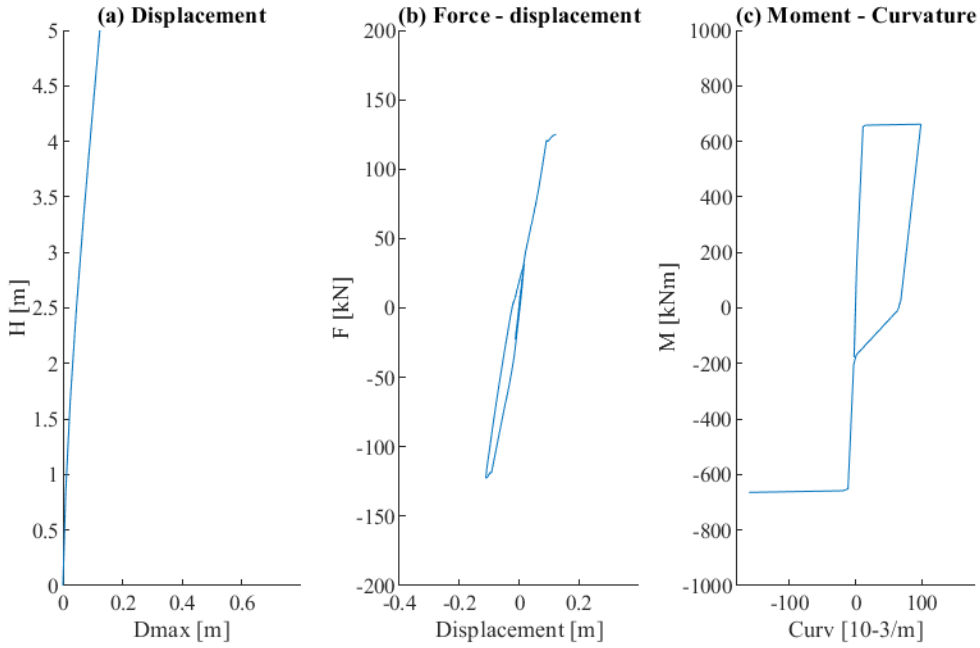

Figure C.22: Structure *m60H5* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika C.22: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

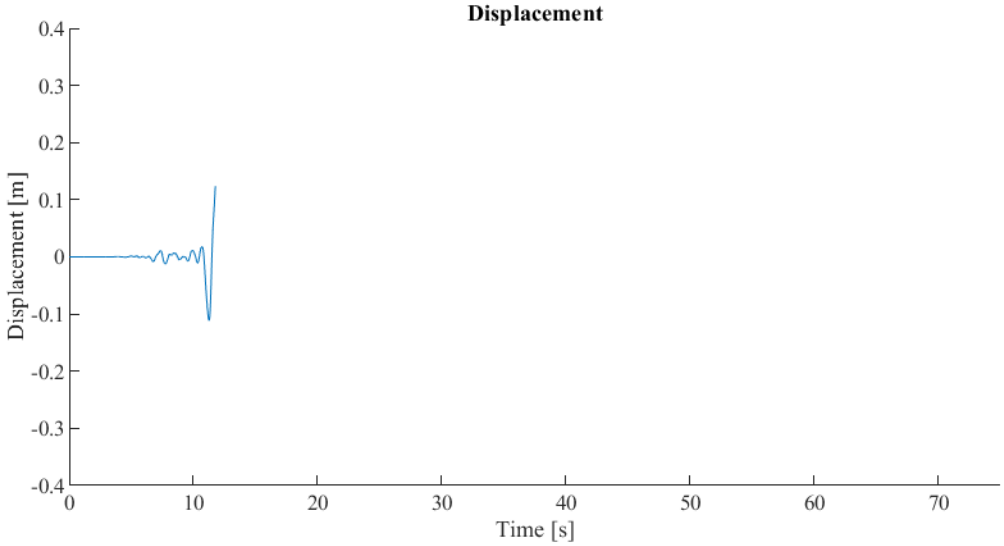

Figure C.23: Structure *m60H5* at a_g = 0.675 g: displacement response history at top of the column

Slika C.23: Montažna hala *m60H5* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

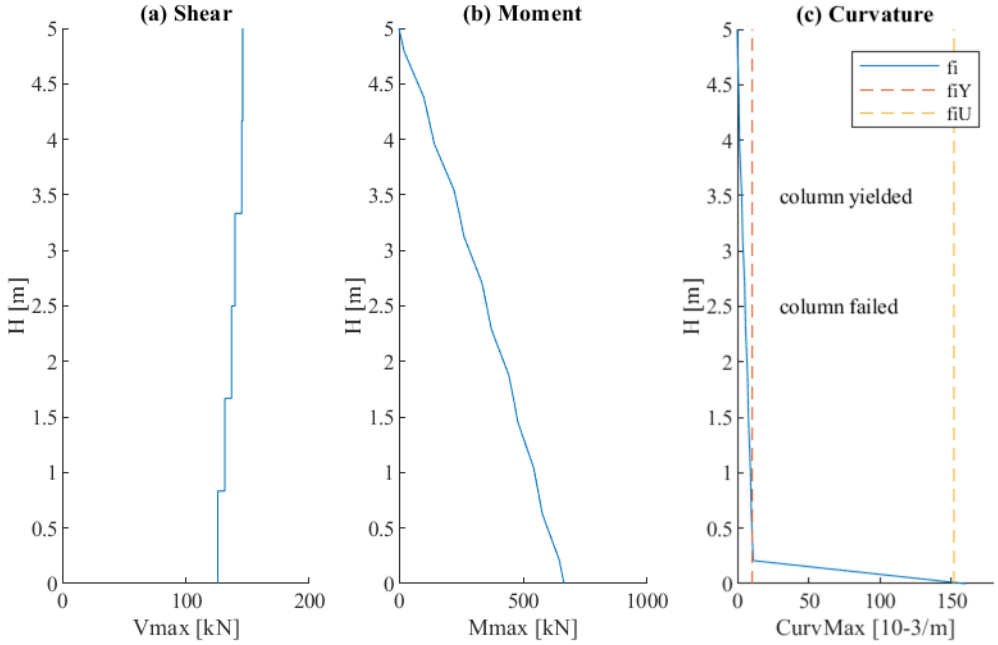

Figure C.24: Structure *m60H5* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika C.24: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

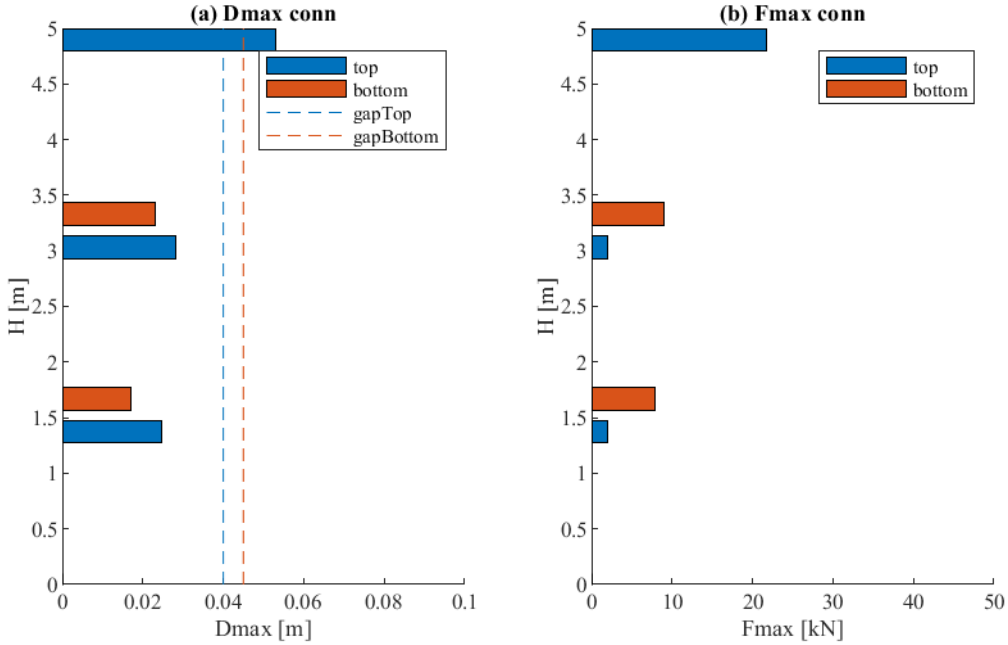

Figure C.25: Structure *m60H5* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika C.25: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

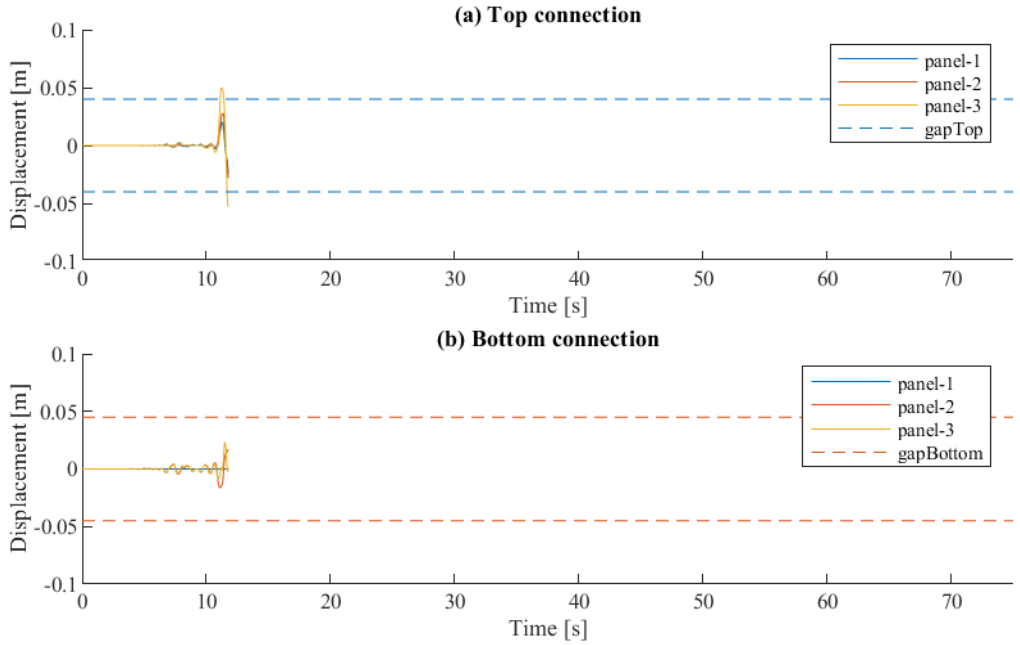

Figure C.26: Structure *m60H5* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika C.26: Montažna hala *m60H5* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

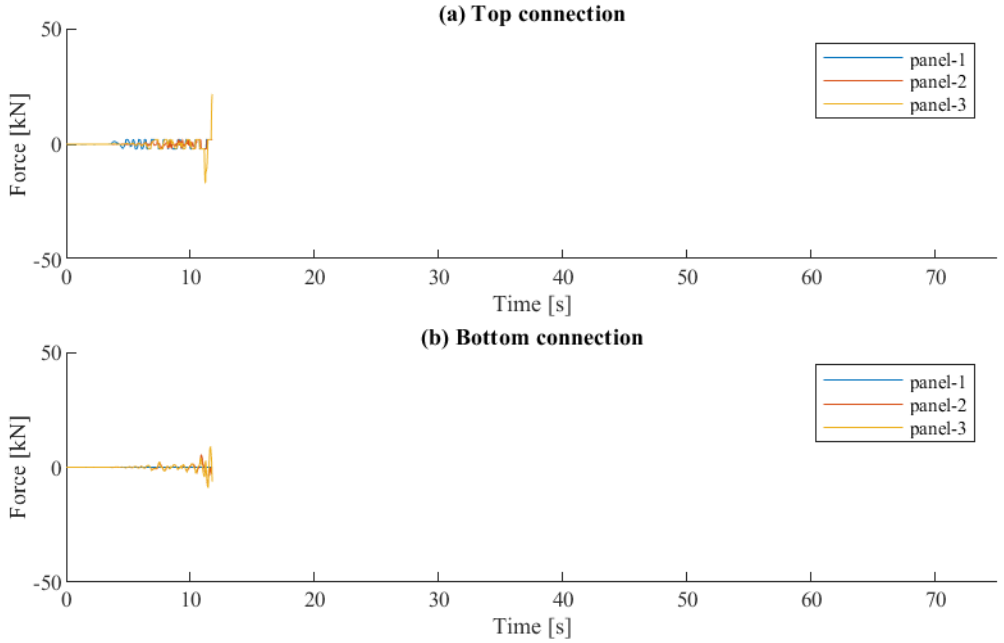

Figure C.27: Structure *m60H5* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika C.27: Montažna hala *m60H5* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

C.5 Structure *m60H7* a_g = 0.675 g

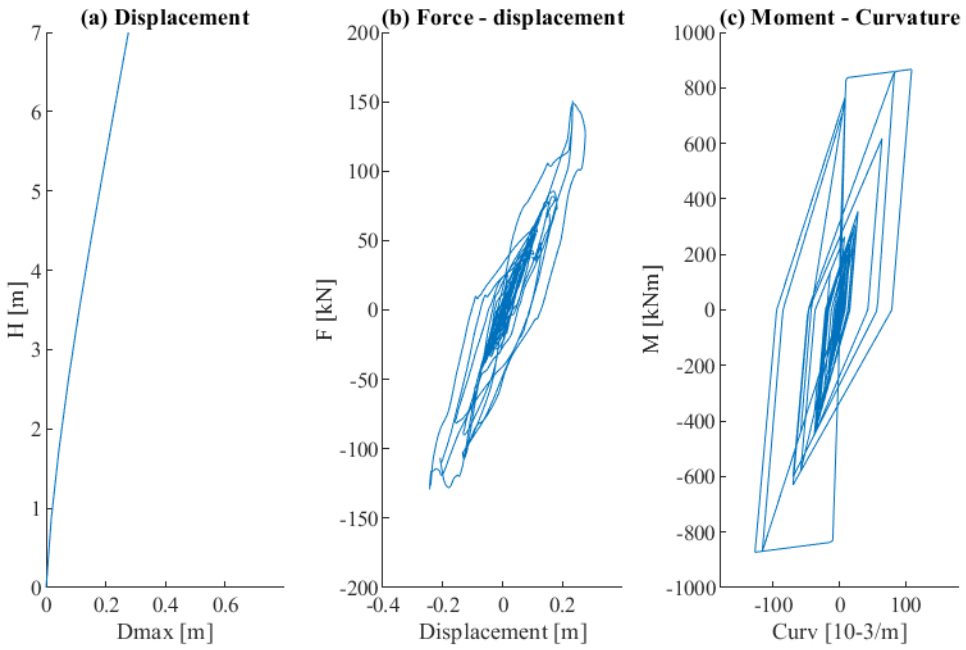

Figure C.28: Structure *m60H7* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika C.28: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

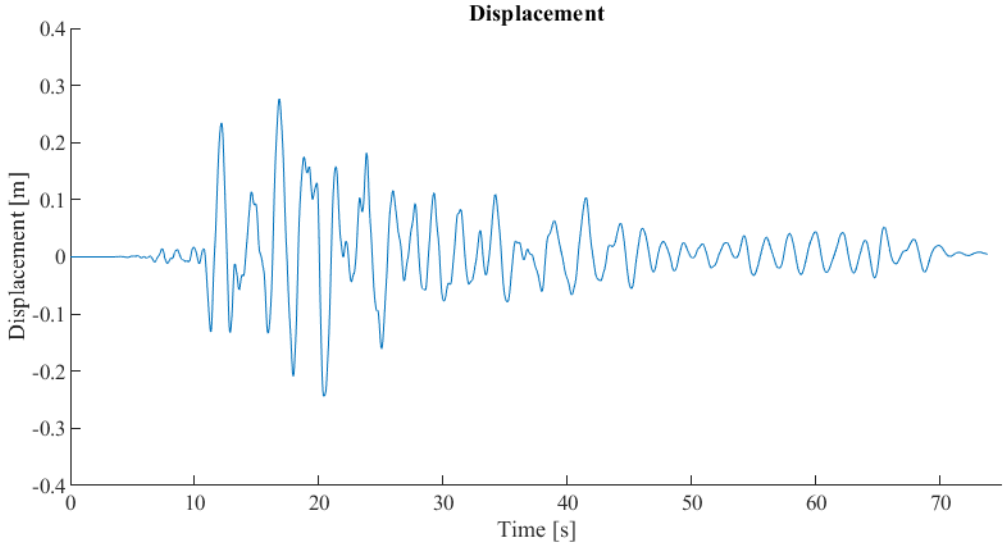

Figure C.29: Structure *m60H7* at a_g = 0.675 g: displacement response history at top of the column

Slika C.29: Montažna hala *m60H7* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

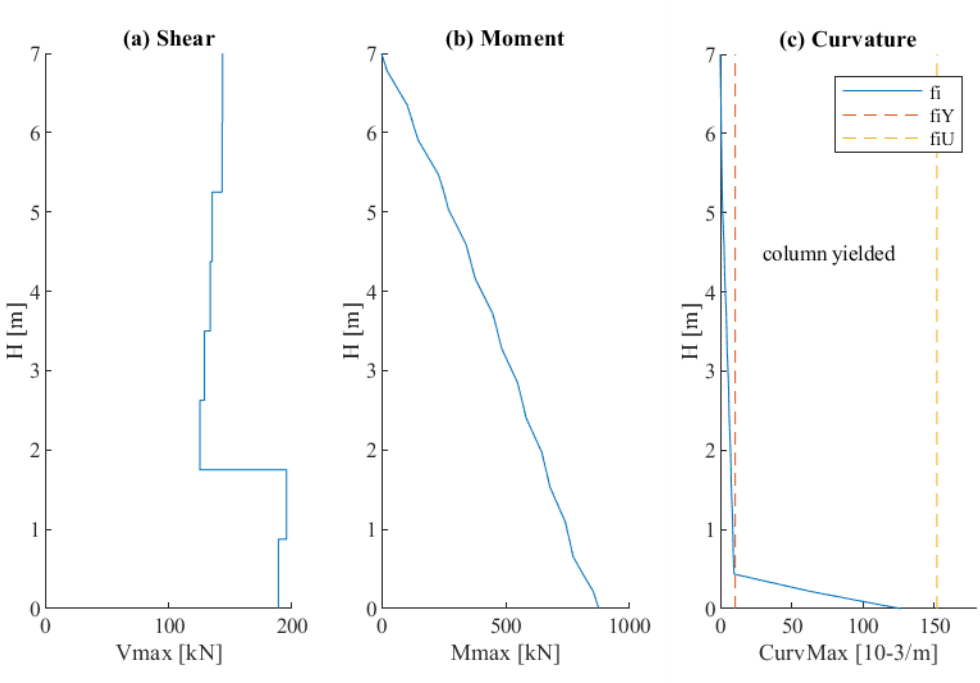

Figure C.30: Structure *m60H7* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika C.30: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

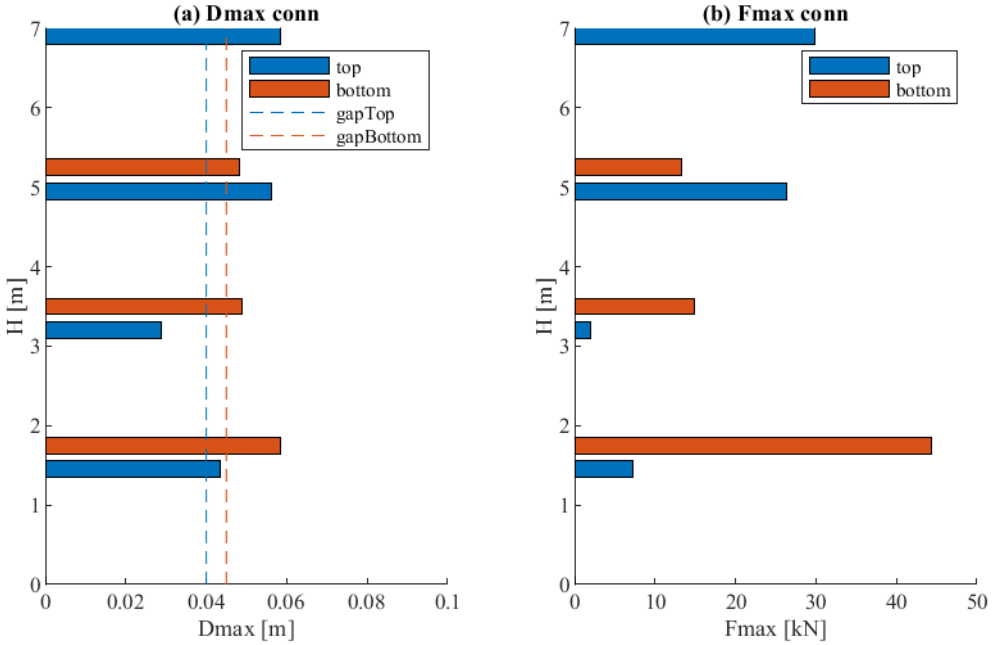

Figure C.31: Structure *m60H7* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika C.31: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

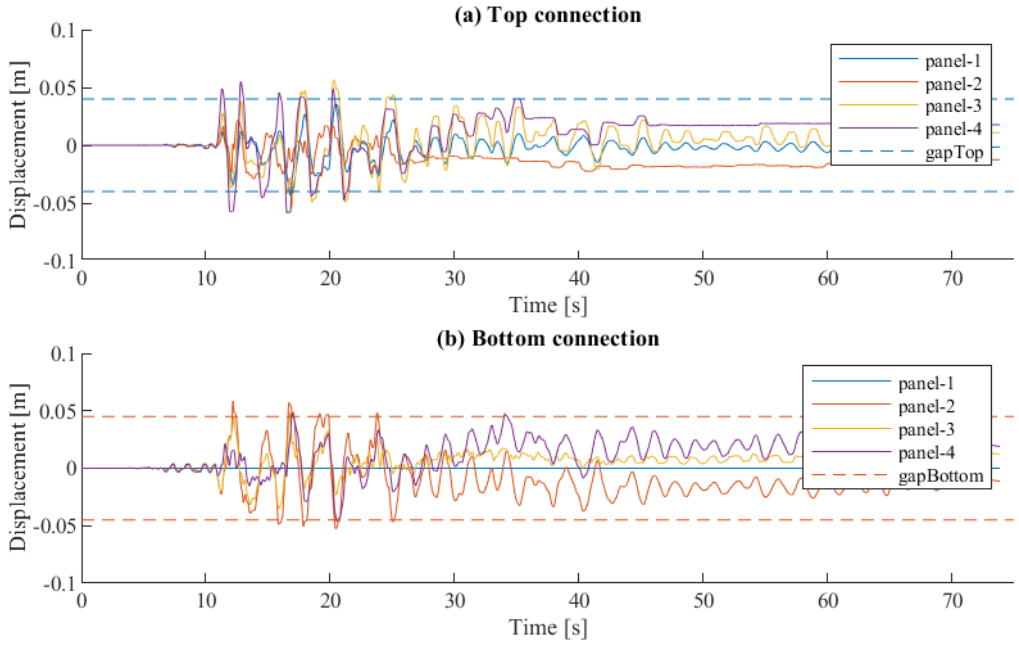

Figure C.32: Structure *m60H7* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika C.32: Montažna hala *m60H7* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

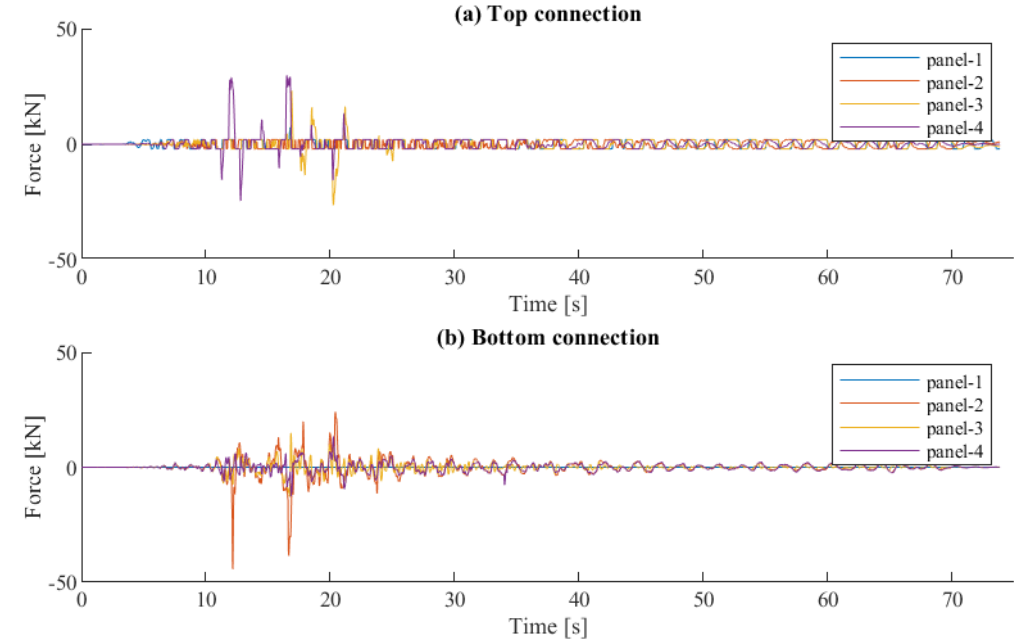

Figure C.33: Structure *m60H7* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika C.33: Montažna hala *m60H7* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

C.6 Structure *m60H9* a_g = 0.675 g

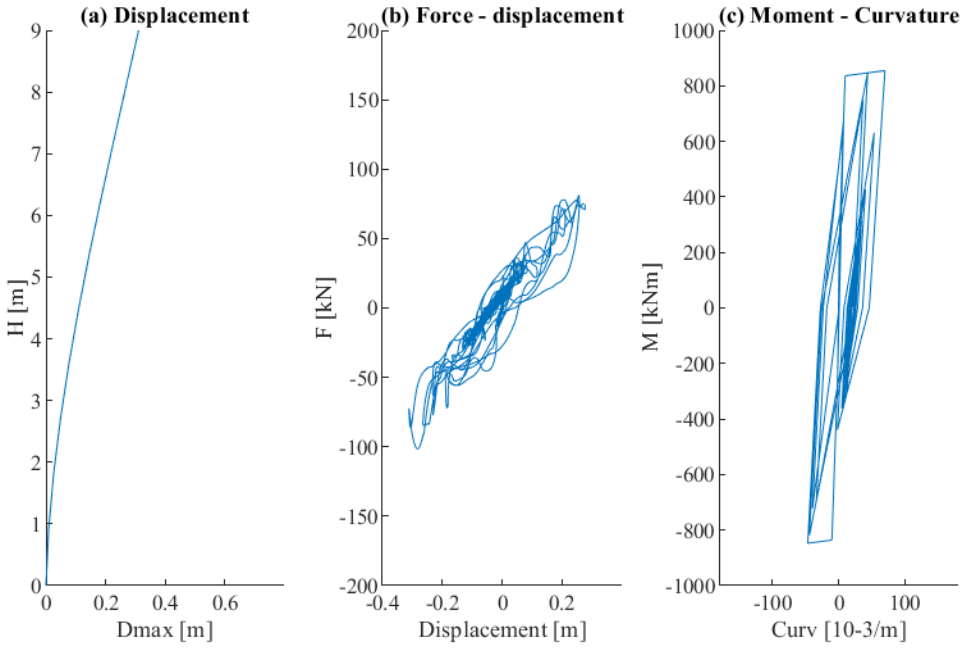

Figure C.34: Structure *m60H9* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika C.34: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

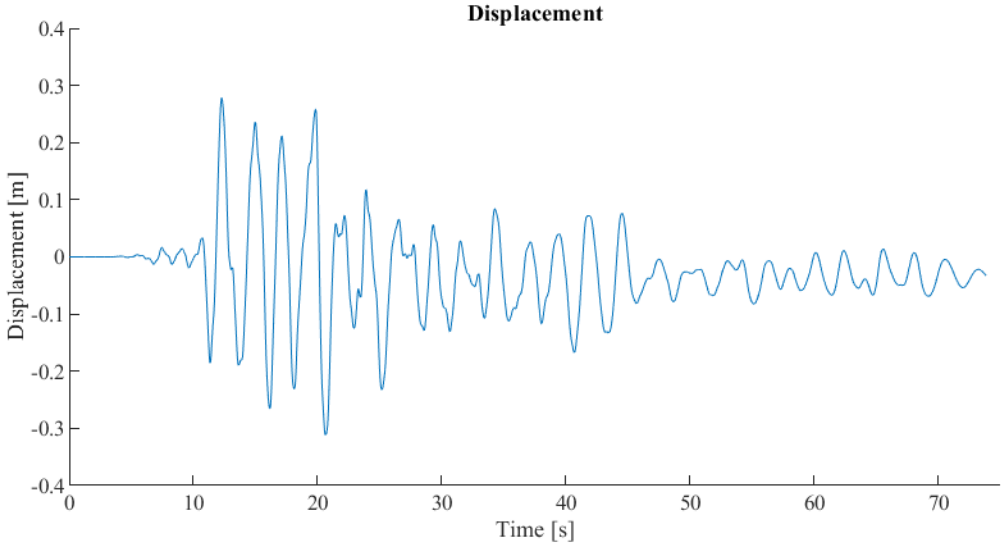

Figure C.35: Structure *m60H9* at a_g = 0.675 g: displacement response history at top of the column

Slika C.35: Montažna hala *m60H9* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

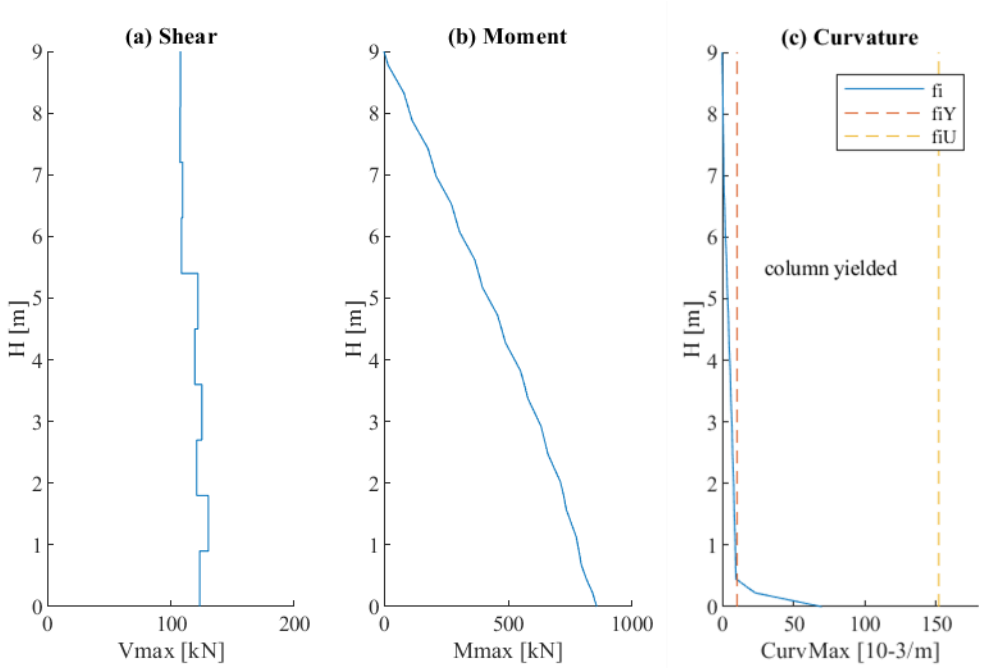

Figure C.36: Structure *m60H9* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika C.36: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

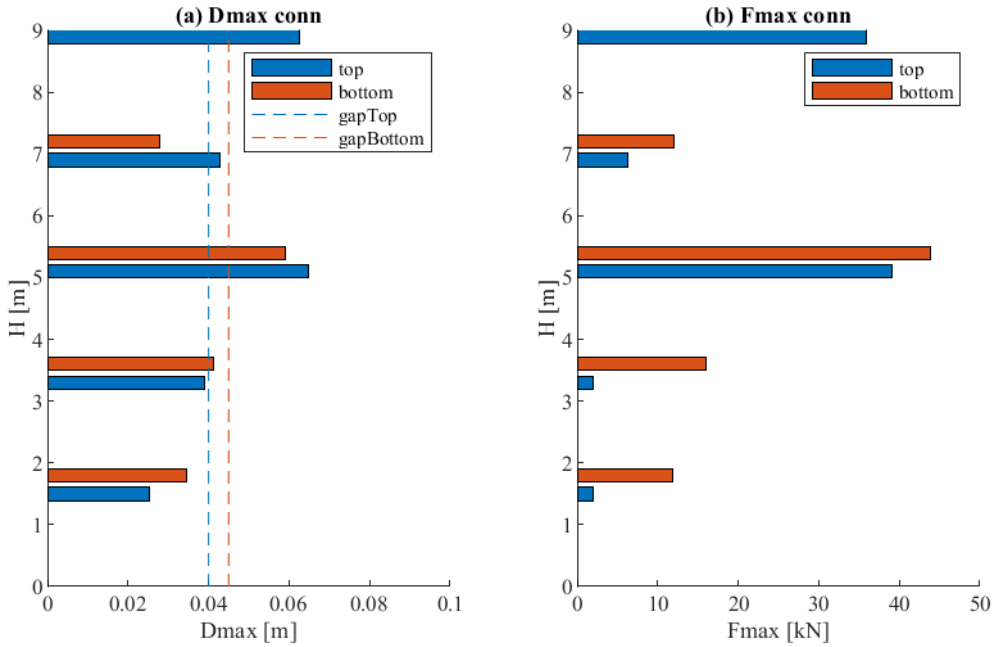

Figure C.37: Structure *m60H9* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika C.37: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

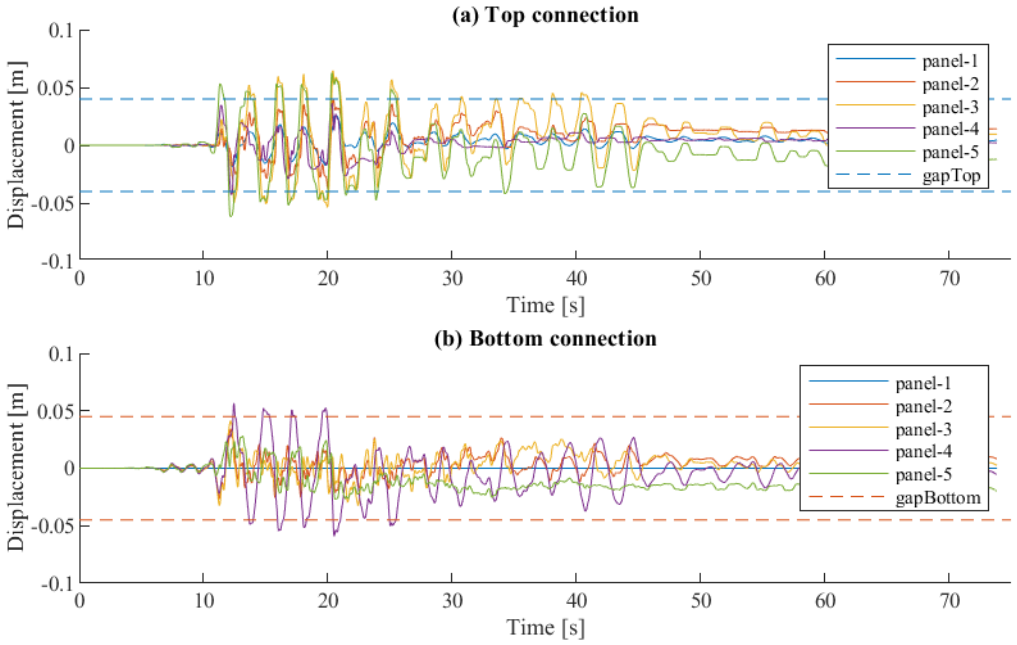

Figure C.38: Structure *m60H9* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika C.38: Montažna hala *m60H9* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

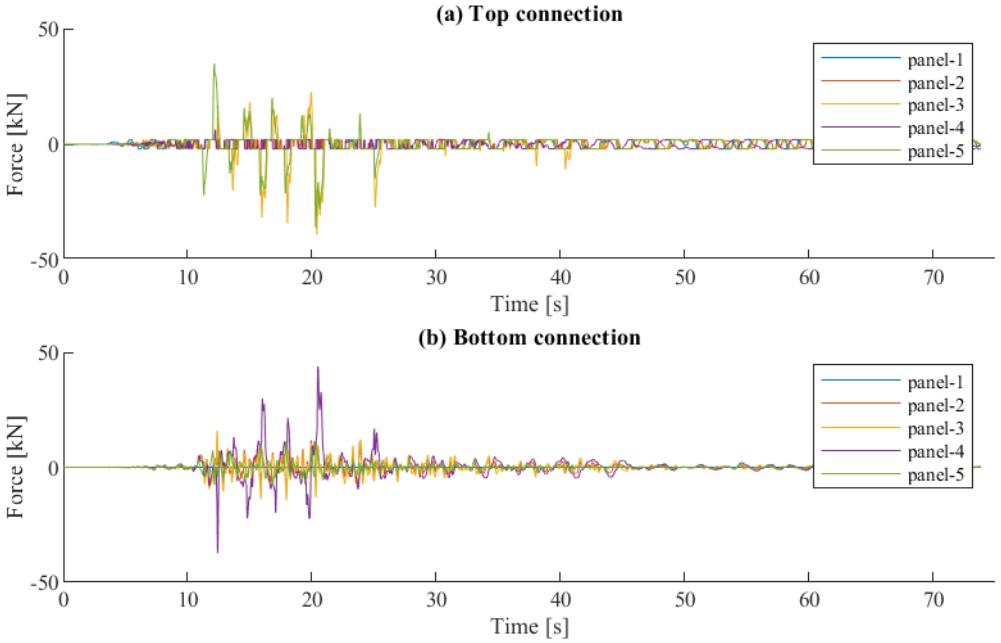

Figure C.39: Structure *m60H9* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika C.39: Montažna hala *m60H9* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

APPENDIX D: Results of parametric analysis considering *LL/P/F/2* parameters

In this appendix, the results of numerical analyses performed on precast structures with eccentric connections (*LL*), with silicone sealant between the panels (*P*), the bottom panel fixed to the foundation (*F*) and with the ratio factor $k = 2$ are gathered.

In Figures D.1-D.3, responses of structures with centrally (*MM*) and eccentrically (*LL*) positioned connections are compared for three different heights. In following, time history responses and distribution of forces and displacements along the height of the structure are shown for three characteristic structures *m60H5*, *m60H7* and *m60H*. To present the characteristic results, the response of structures subjected to ground motion no. 4 was chosen. It is the accelerogram that from all selected accelerograms has the response spectra the closest to EC8 response spectra in the period range of analysed structures.

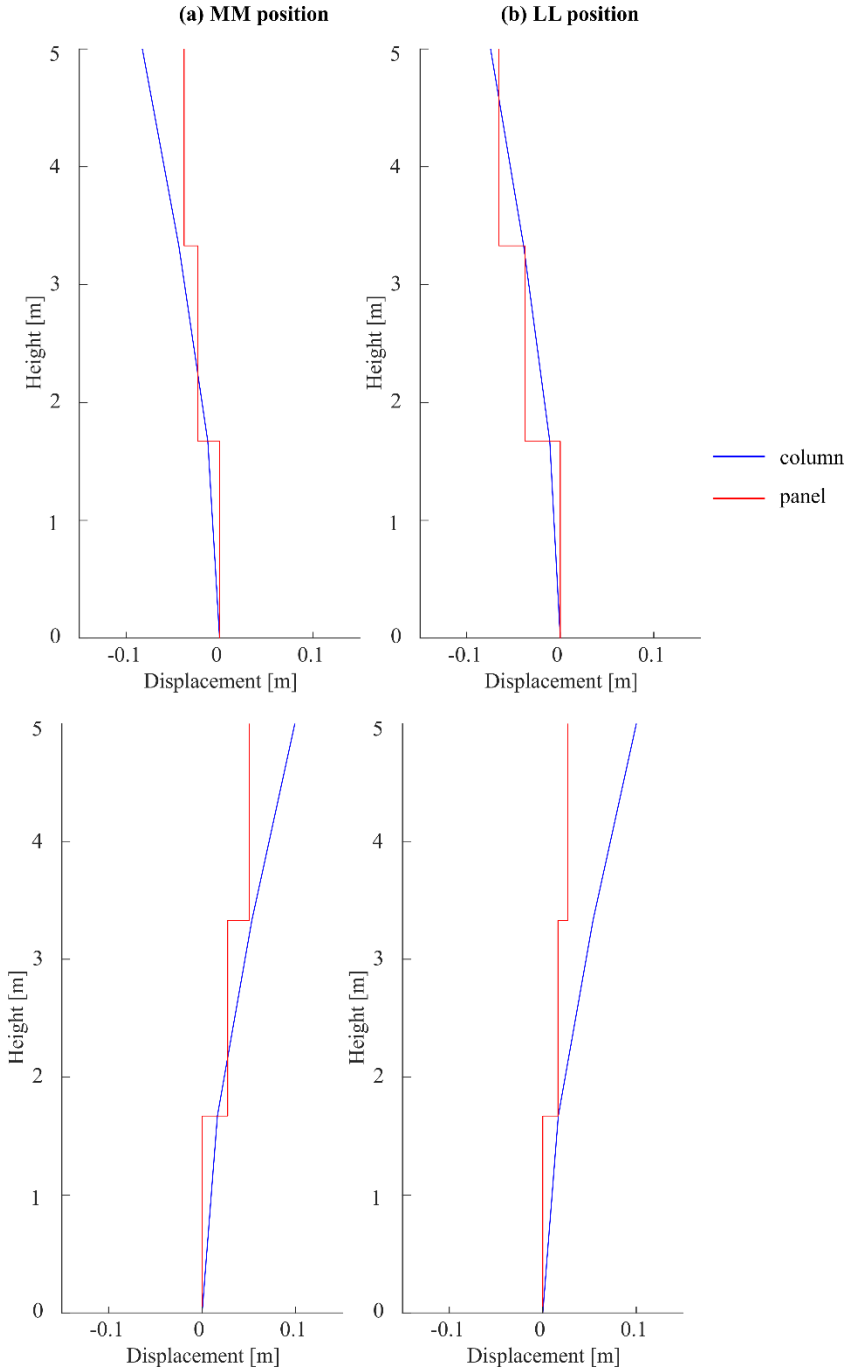

Figure D.1: Response of precast structure *m60H5*: (a) centrally positioned connections *MM* and (b) eccentric position of connections *LL*

Slika D.1: Odziv konstrukcije *m60H5*: (a) sredinska pozicija stikov *MM* in (b) ekscentrična pozicija stikov *LL*

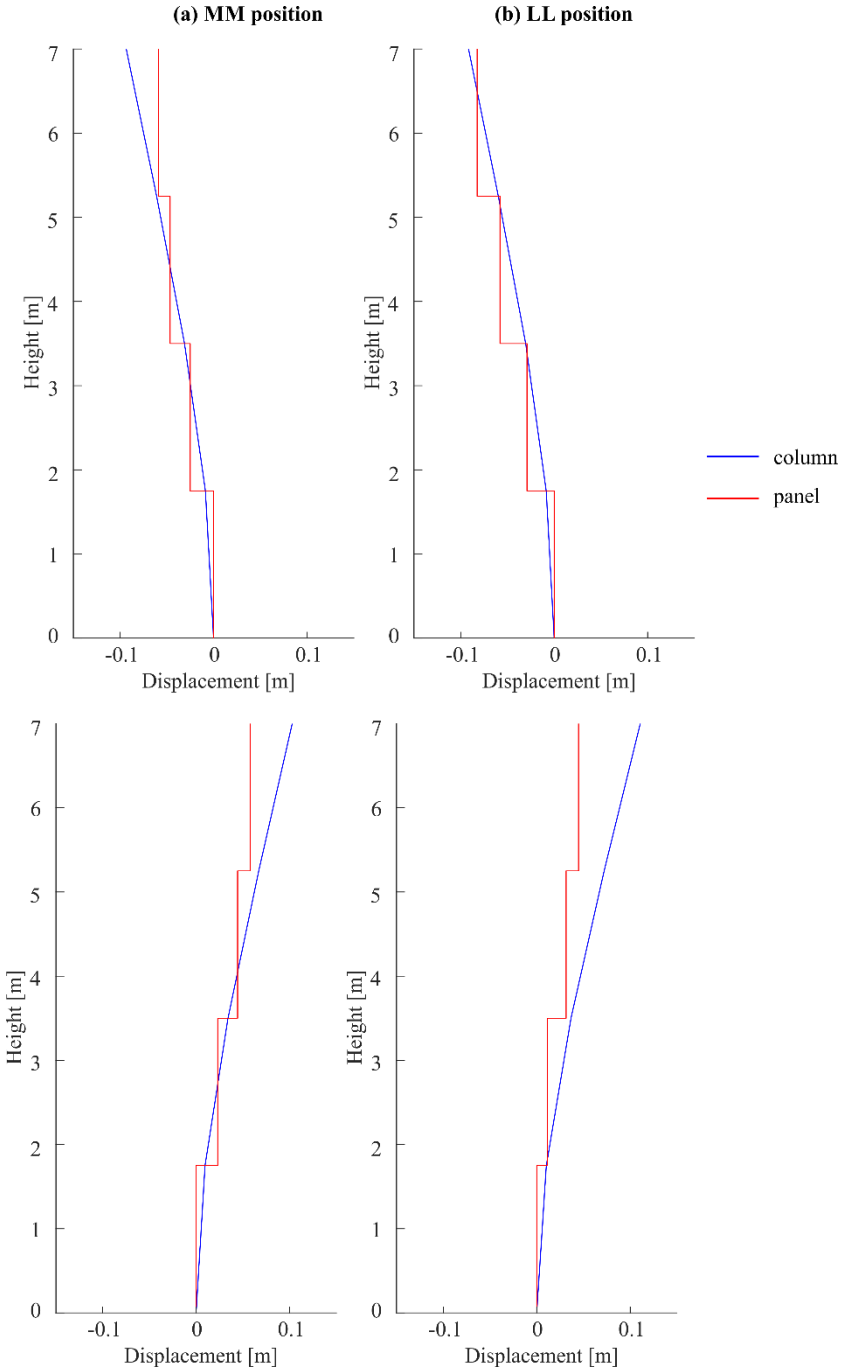

Figure D.2: Response of precast structure *m60H7*: (a) centrally positioned connections *MM* and (b) eccentric position of connections *LL*

Slika D.2: Odziv konstrukcije *m60H7*: (a) sredinska pozicija stikov *MM* in (b) ekscentrična pozicija stikov *LL*

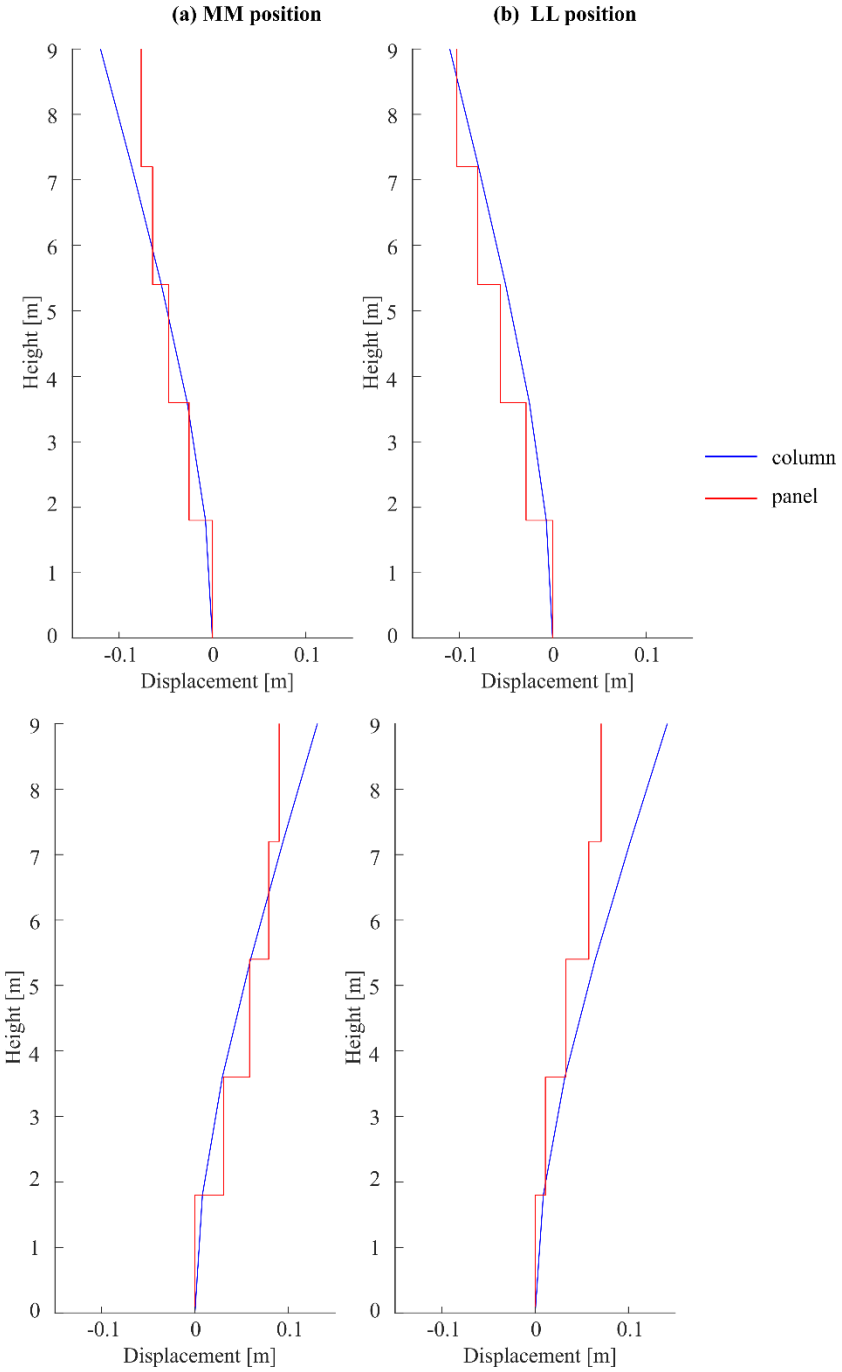

Figure D.3: Response of precast structure *m60H9*: (a) centrally positioned connections *MM* and (b) eccentric position of connections *LL*

Slika D.3: Odziv konstrukcije *m60H9*: (a) sredinska pozicija stikov *MM* in (b) ekscentrična pozicija stikov *LL*

D.1 Structure *m60H5* a_g = 0.25 g

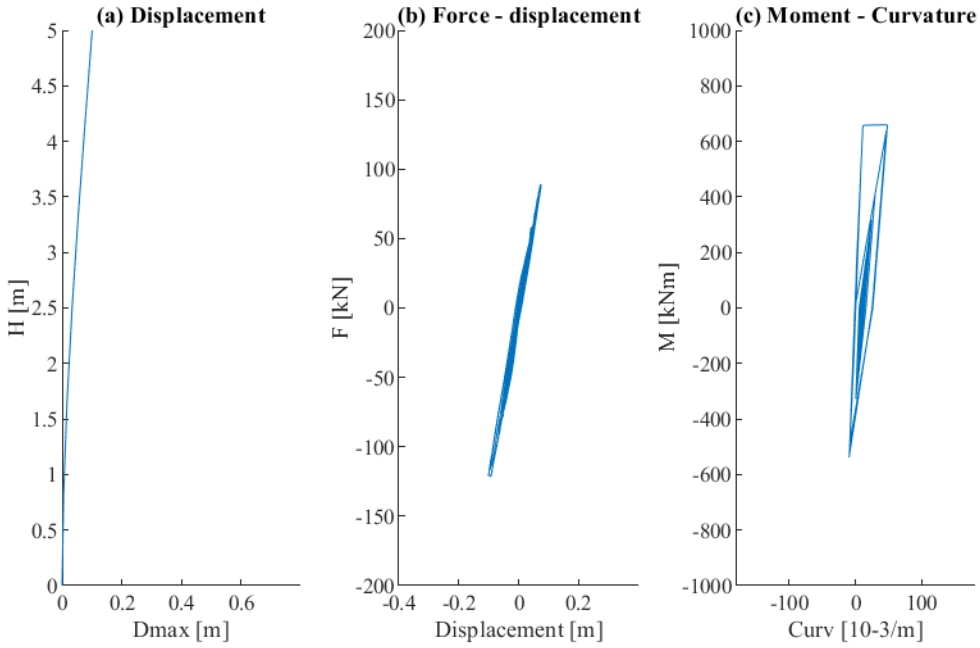

Figure D.4: Structure *m60H5* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika D.4: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

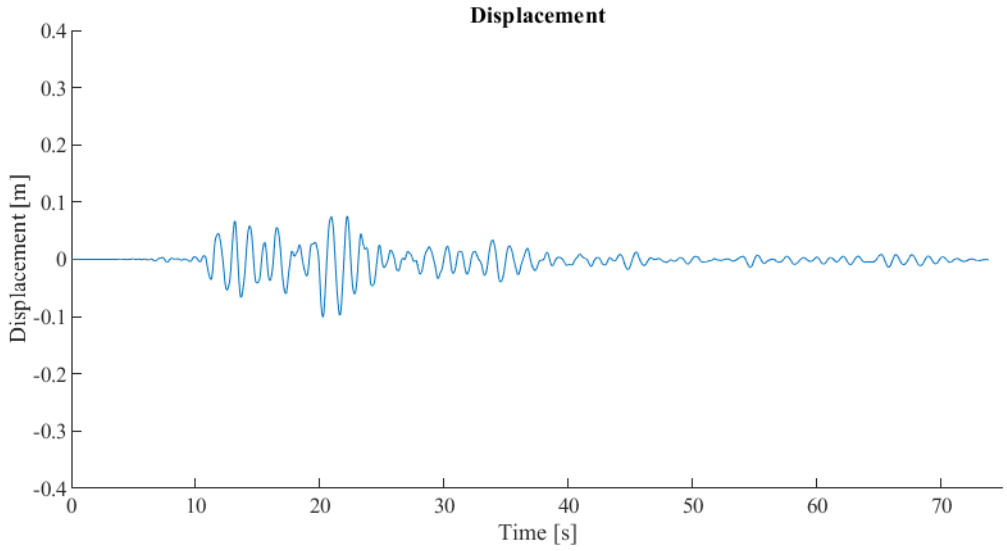

Figure D.5: Structure *m60H5* at a_g = 0.25 g: displacement response history at top of the column

Slika D.5: Montažna hala *m60H5* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

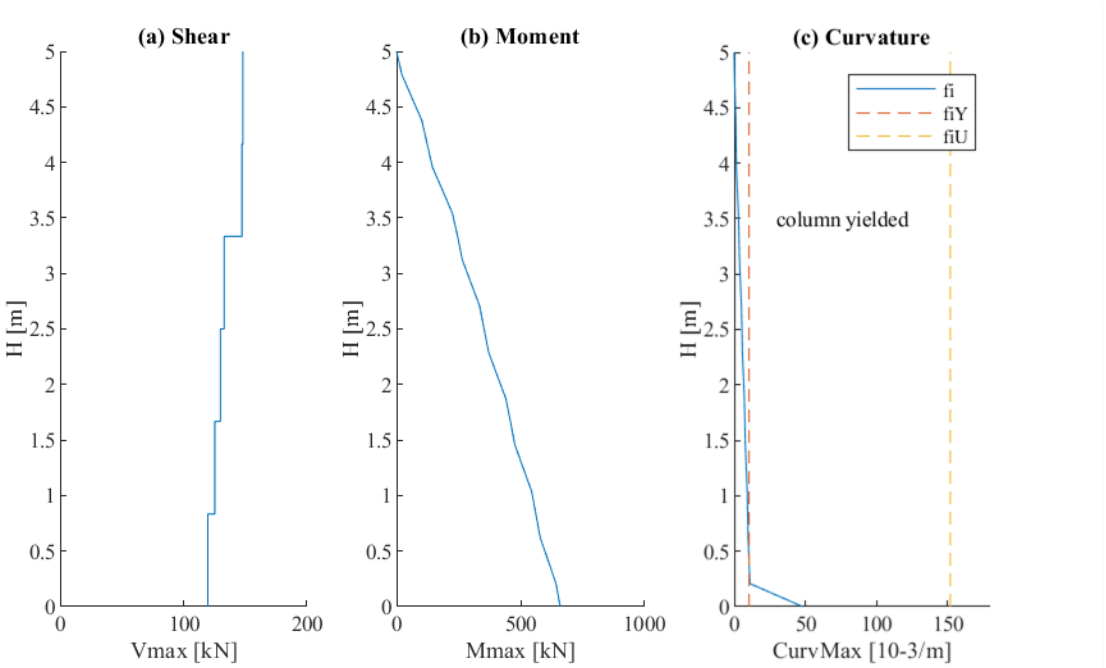

Figure D.6: Structure *m60H5* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika D.6: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

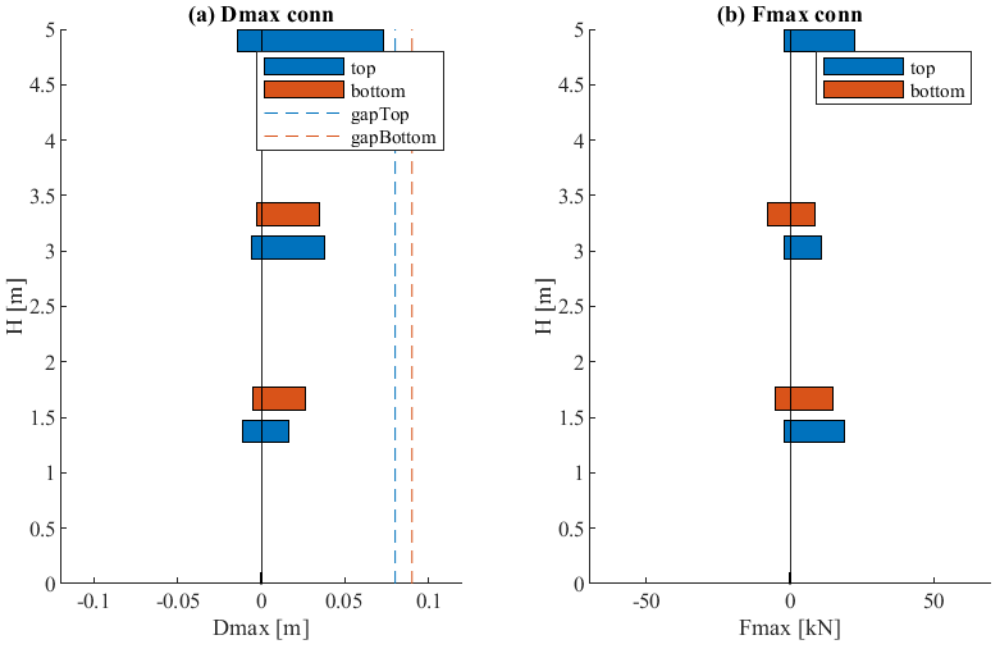

Figure D.7: Structure *m60H5* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika D.7: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

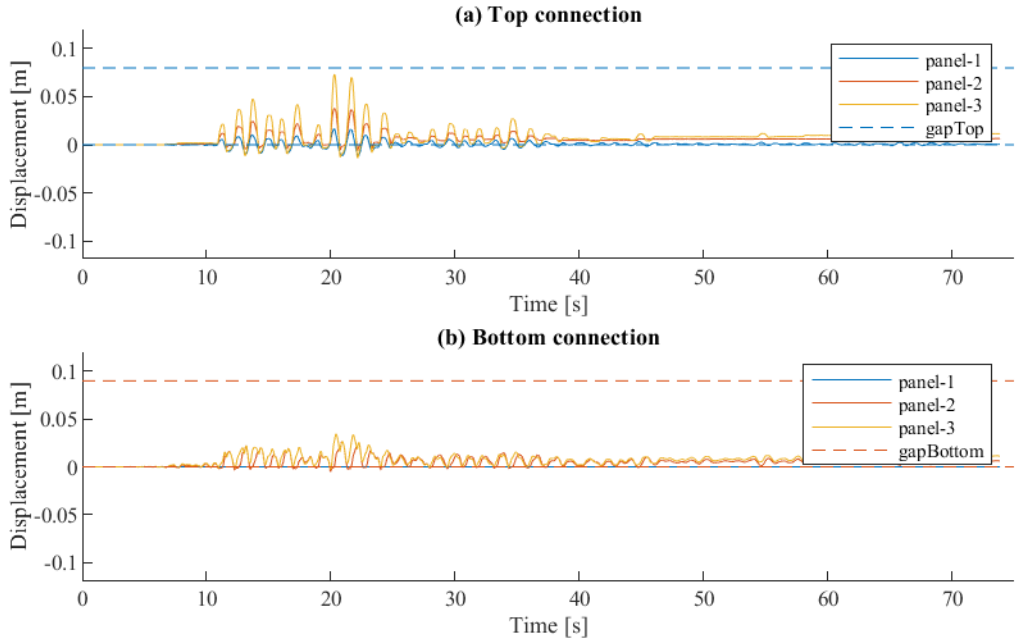

Figure D.8: Structure *m60H5* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika D.8: Montažna hala *m60H5* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

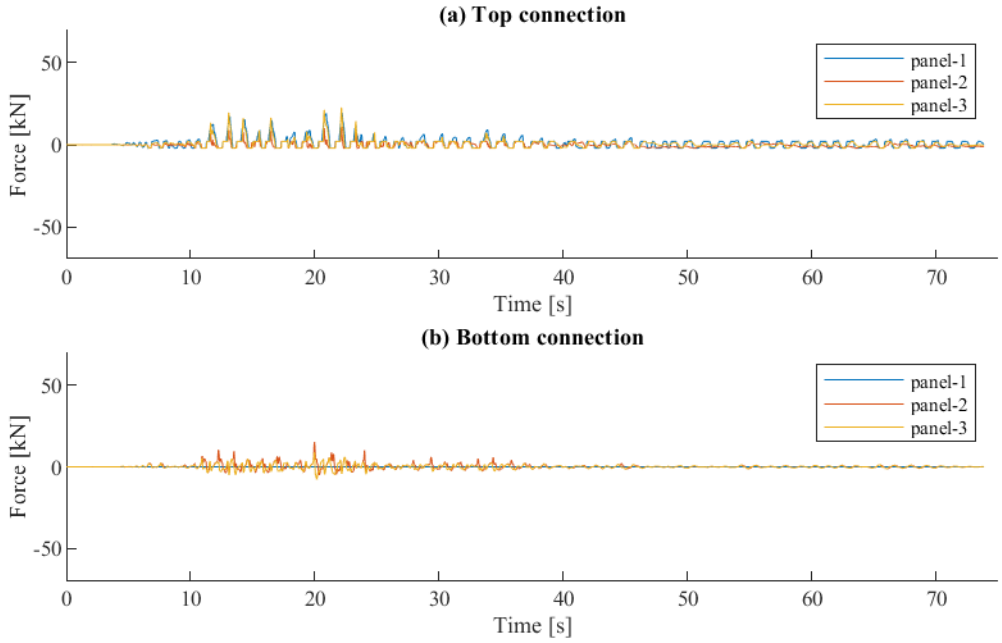

Figure D.9: Structure *m60H5* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika D.9: Montažna hala *m60H5* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

D.2 Structure *m60H7* a_g = 0.25 g

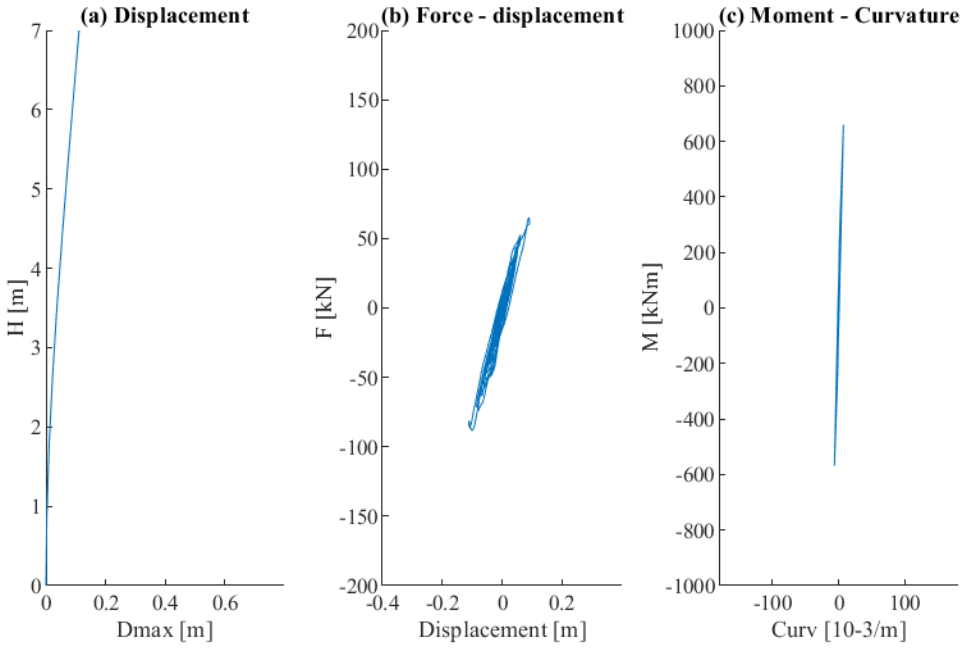

Figure D.10: Structure *m60H7* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika D.10: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

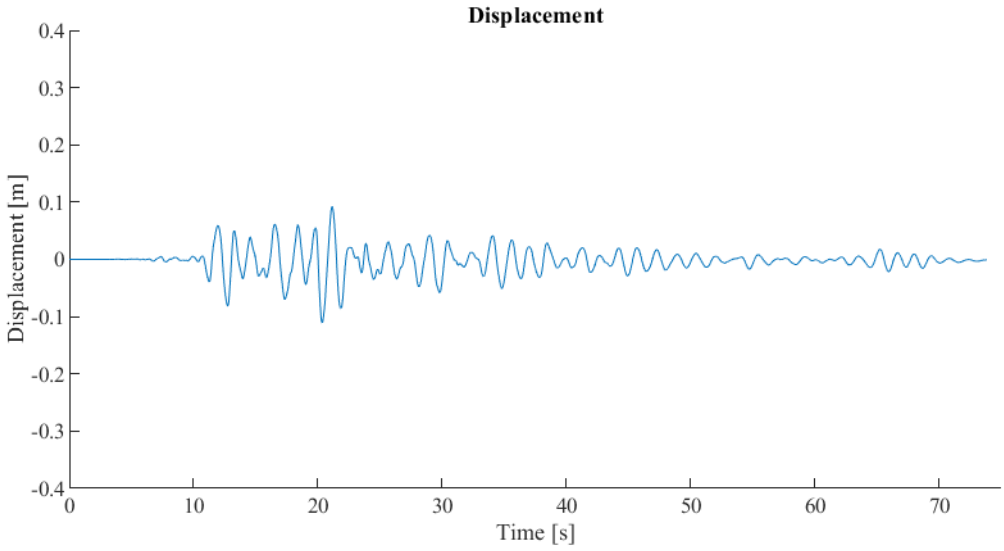

Figure D.11: Structure *m60H7* at a_g = 0.25 g: displacement response history at top of the column

Slika D.11: Montažna hala *m60H7* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

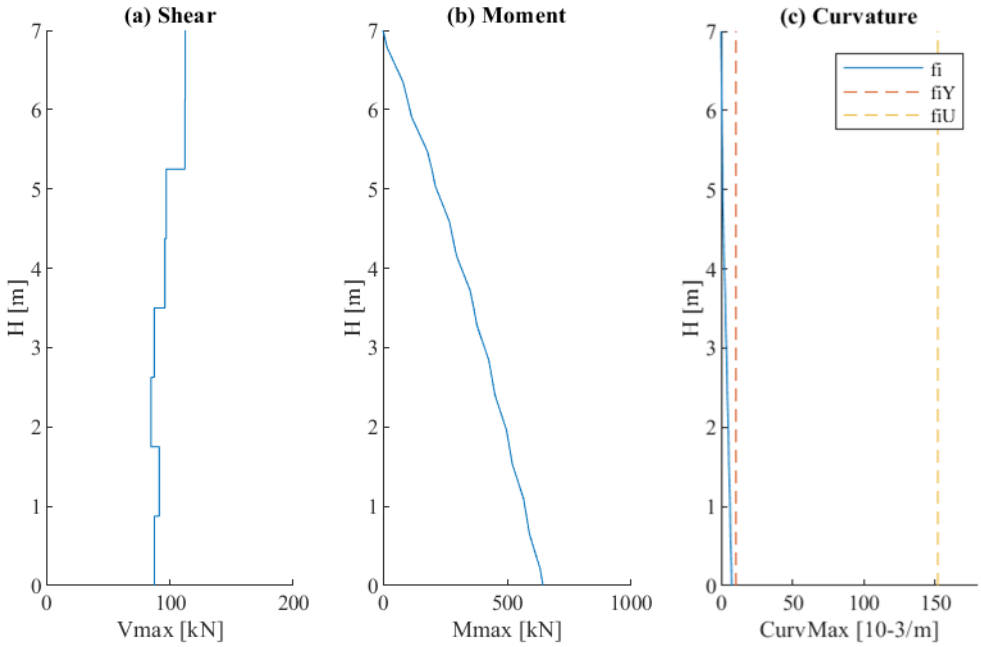

Figure D.12: Structure *m60H7* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika D.12: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

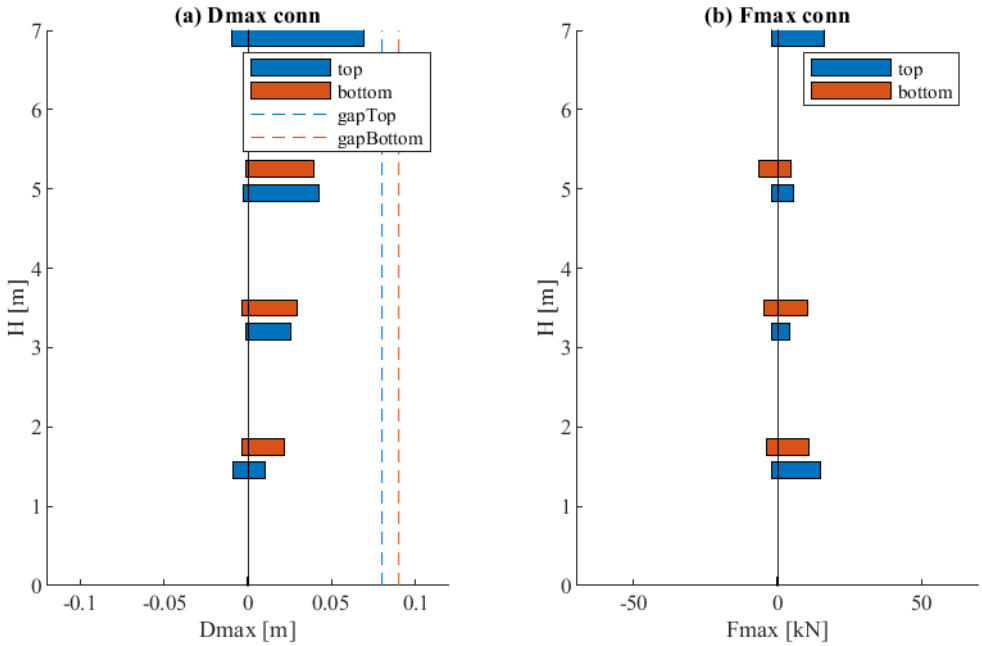

Figure D.13: Structure *m60H7* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika D.13: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

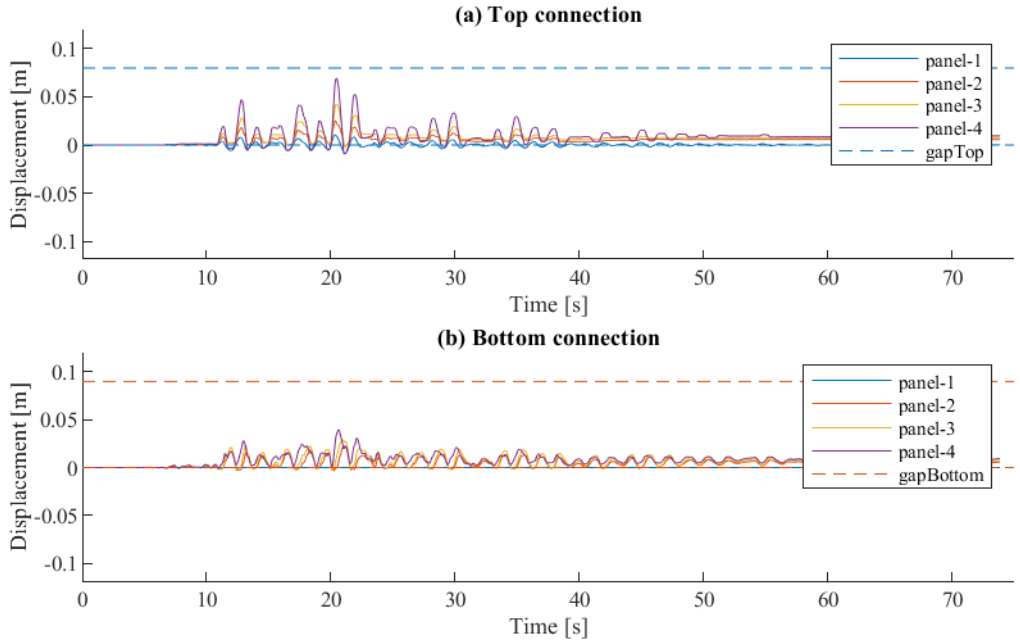

Figure D.14: Structure *m60H7* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika D.14: Montažna hala *m60H7* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

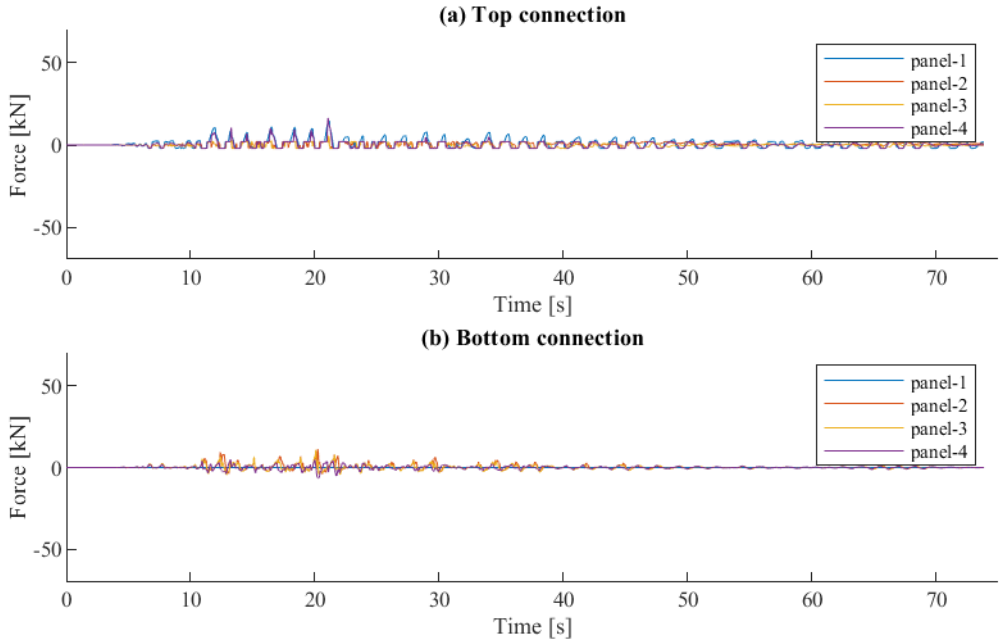

Figure D.15: Structure *m60H7* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika D.15: Montažna hala *m60H7* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

D.3 Structure *m60H9* a_g = 0.25 g

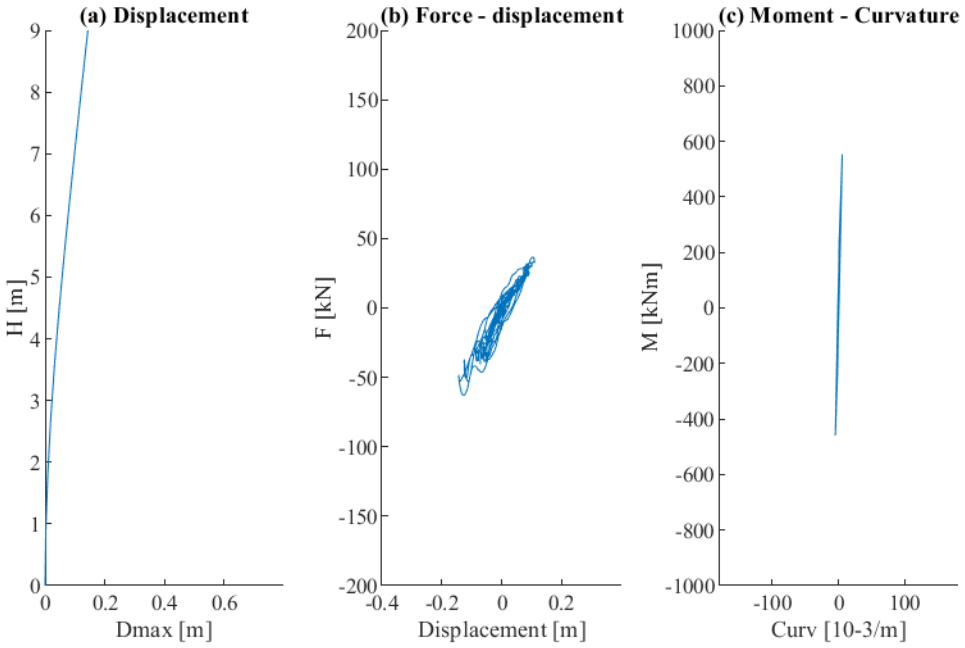

Figure D.16: Structure *m60H9* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika D.16: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

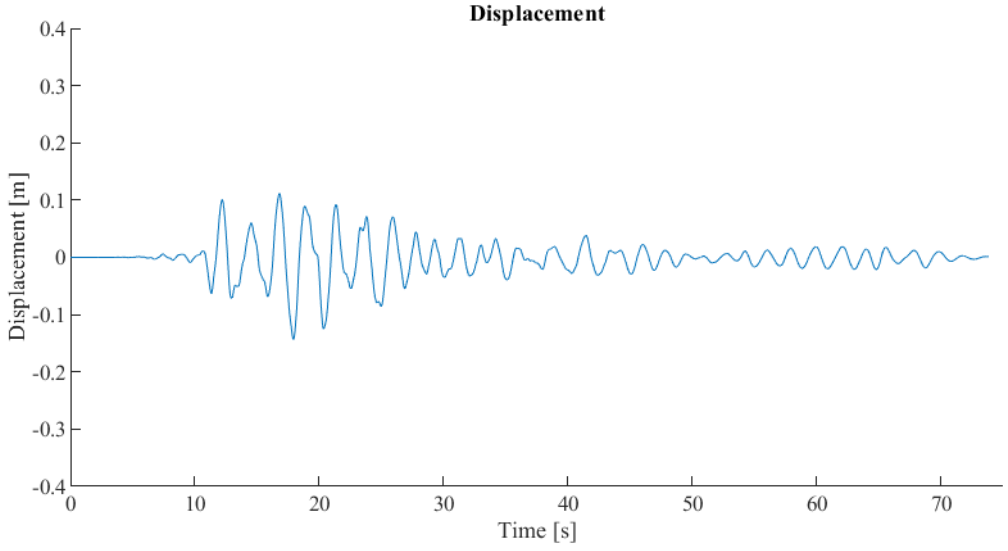

Figure D.17: Structure *m60H9* at a_g = 0.25 g: displacement response history at top of the column

Slika D.17: Montažna hala *m60H9* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

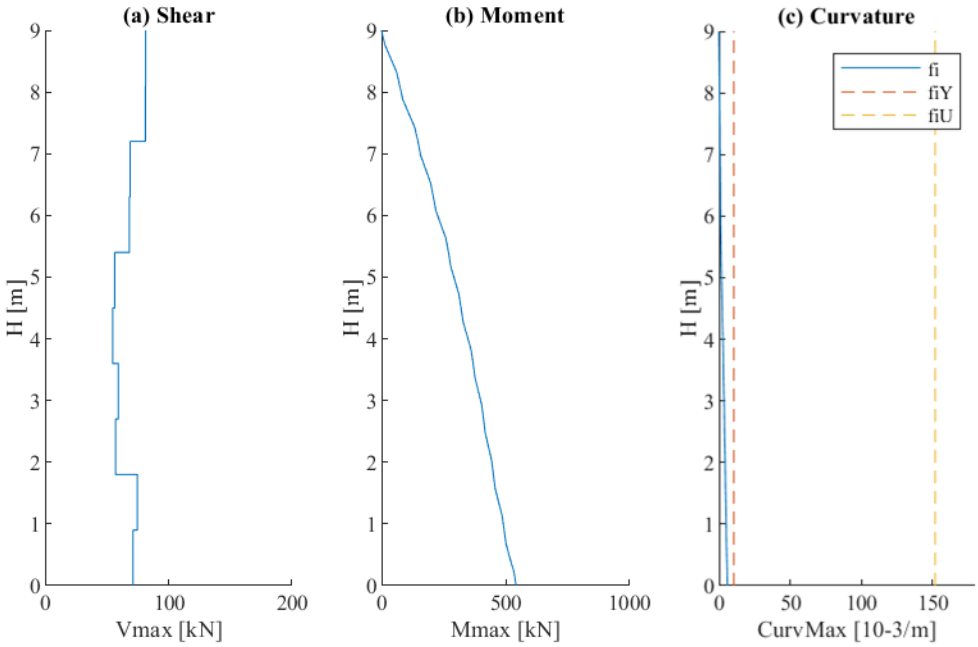

Figure D.18: Structure *m60H9* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika D.18: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

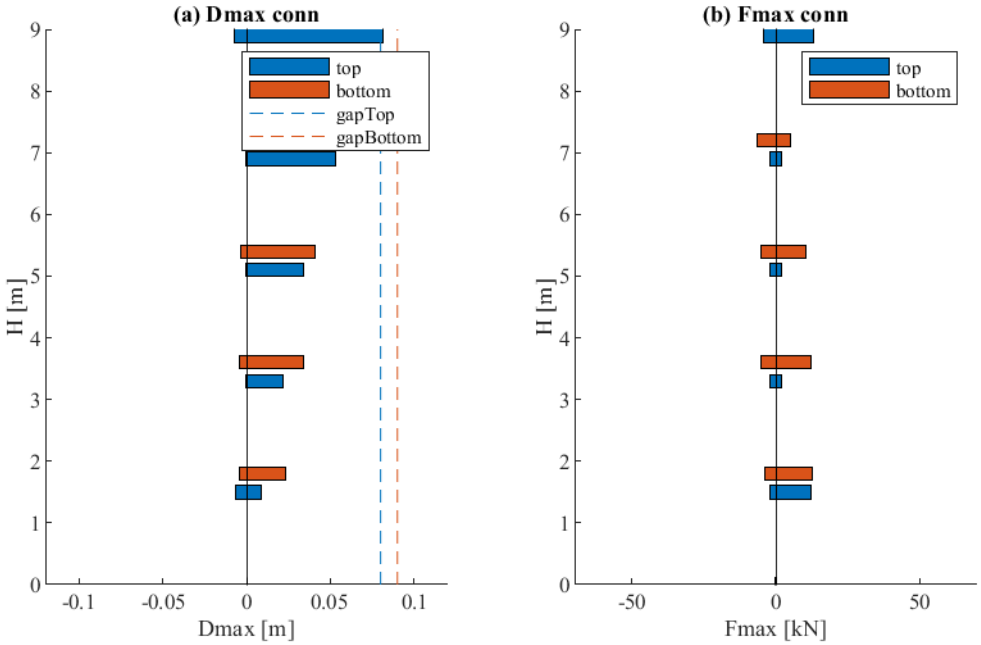

Figure D.19: Structure *m60H9* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika D.19: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

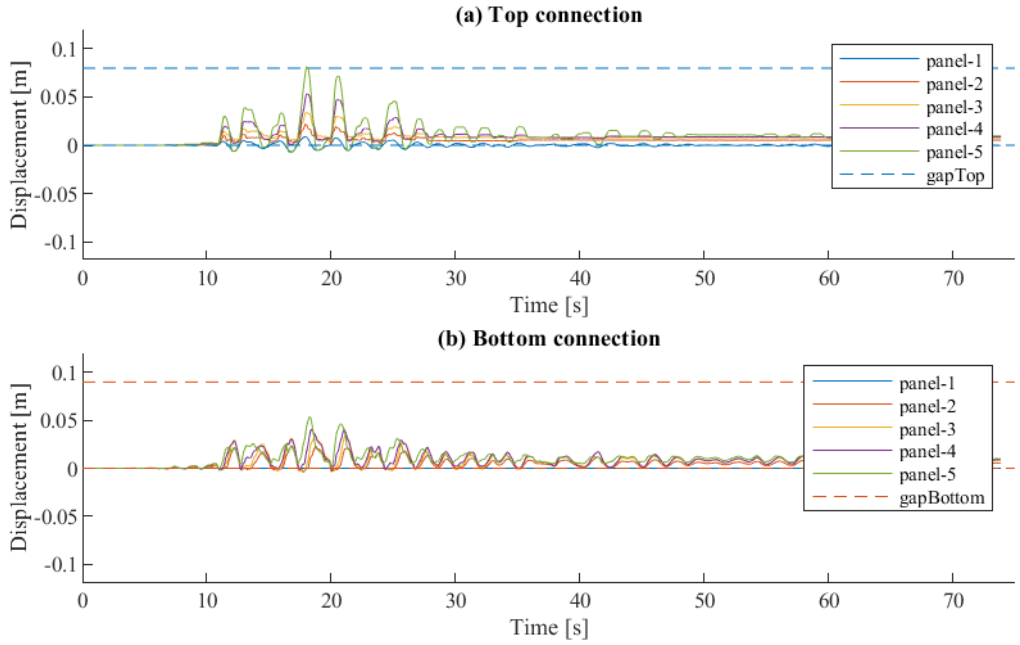

Figure D.20: Structure *m60H9* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika D.20: Montažna hala *m60H9* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

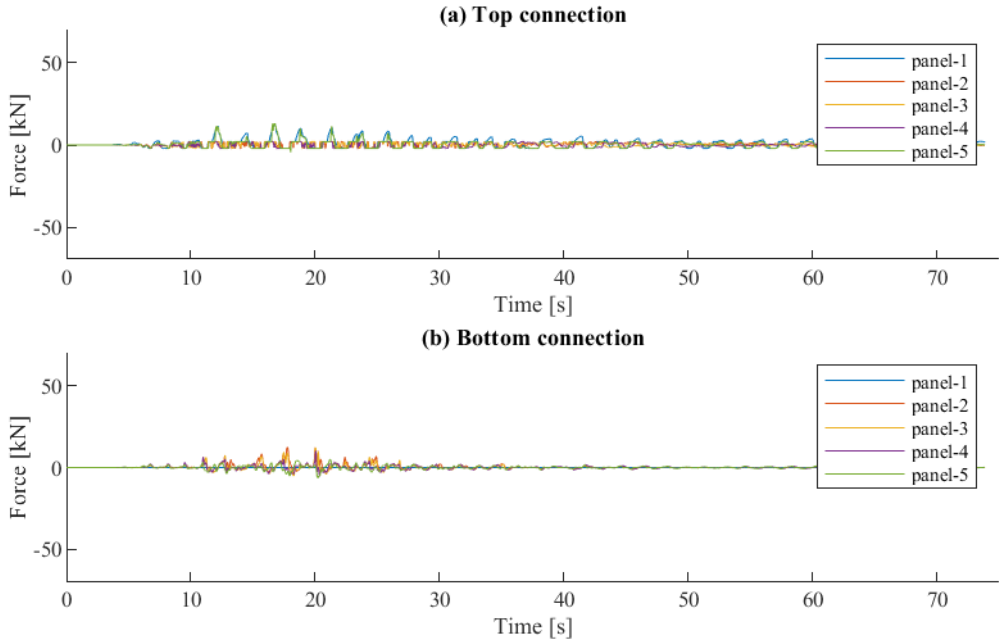

Figure D.21: Structure *m60H9* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika D.21: Montažna hala *m60H9* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

D.4 Structure *m60H5* a_g = 0.675 g

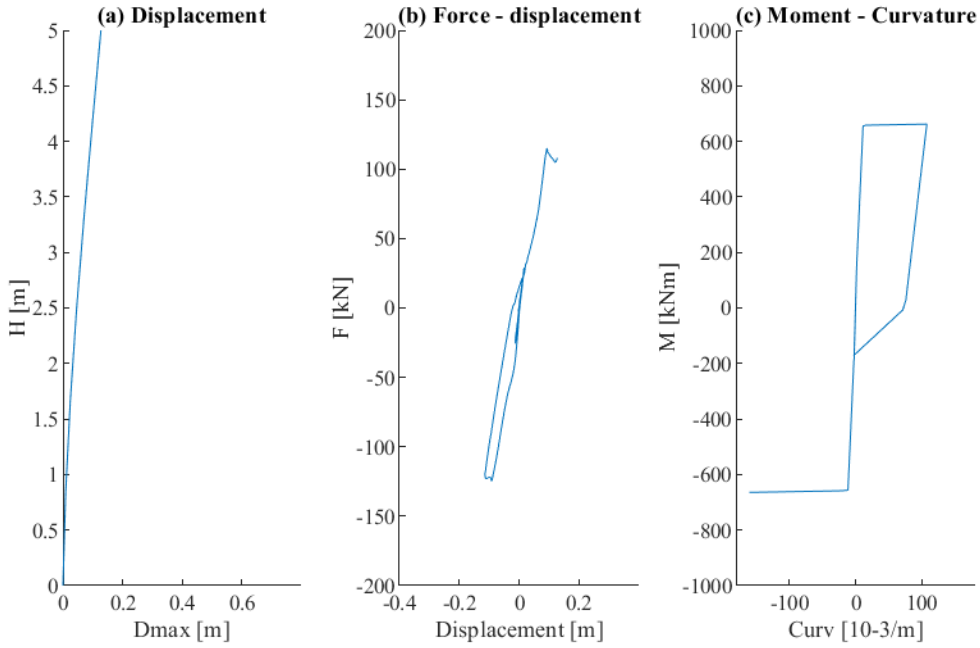

Figure D.22: Structure *m60H5* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika D.22: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

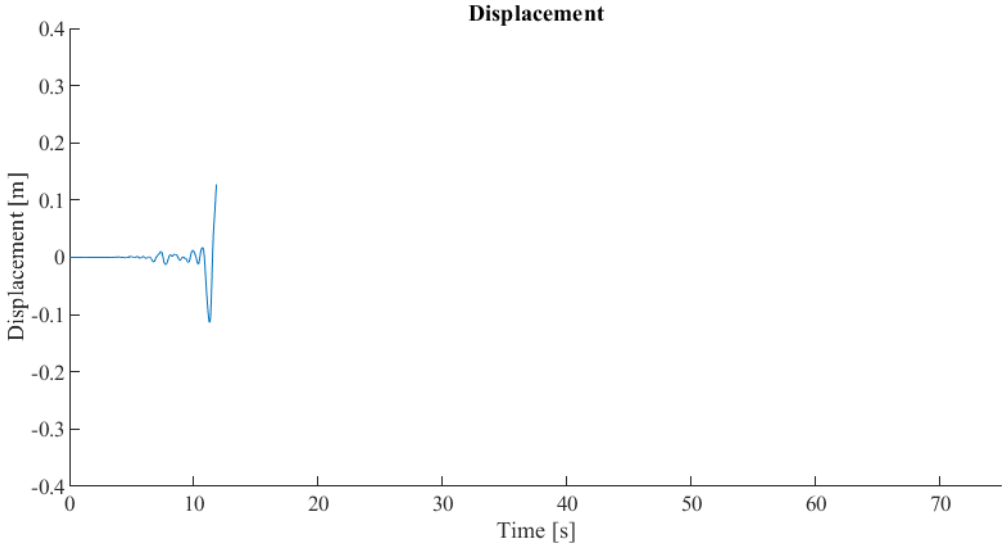

Figure D.23: Structure *m60H5* at a_g = 0.675 g: displacement response history at top of the column

Slika D.23: Montažna hala *m60H5* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

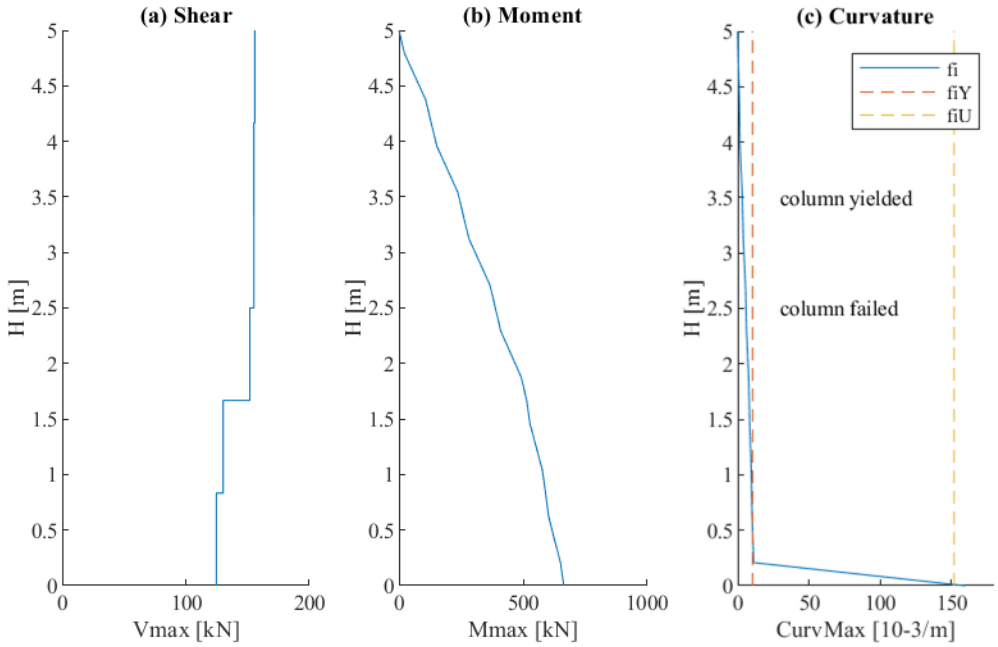

Figure D.24: Structure *m60H5* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika D.24: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

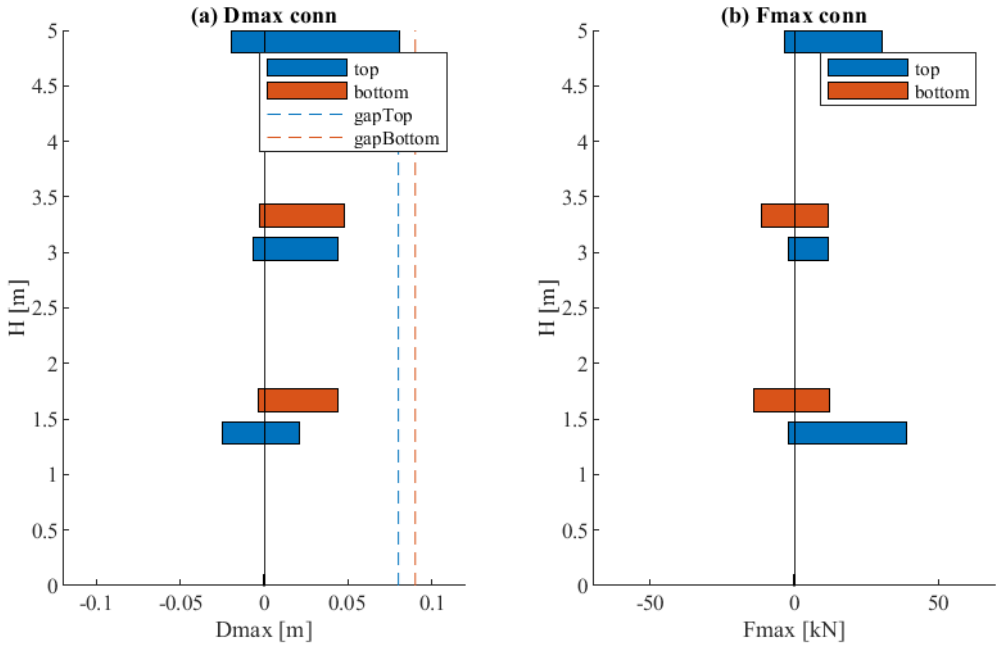

Figure D.25: Structure *m60H5* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika D.25: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

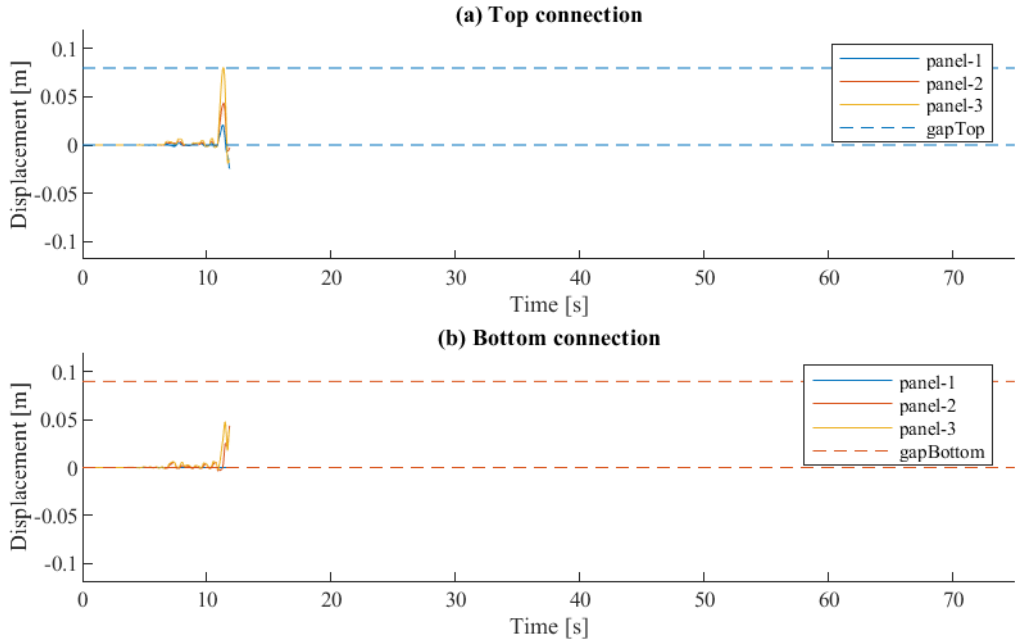

Figure D.26: Structure *m60H5* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika D.26: Montažna hala *m60H5* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

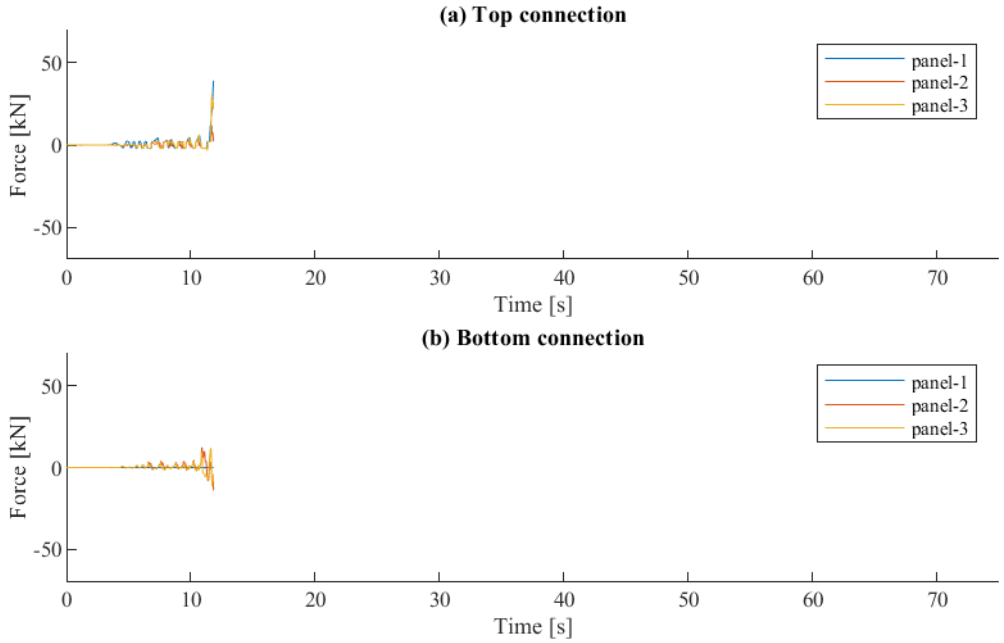

Figure D.27: Structure *m60H5* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika D.27: Montažna hala *m60H5* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

D.5 Structure *m60H7* a_g = 0.675 g

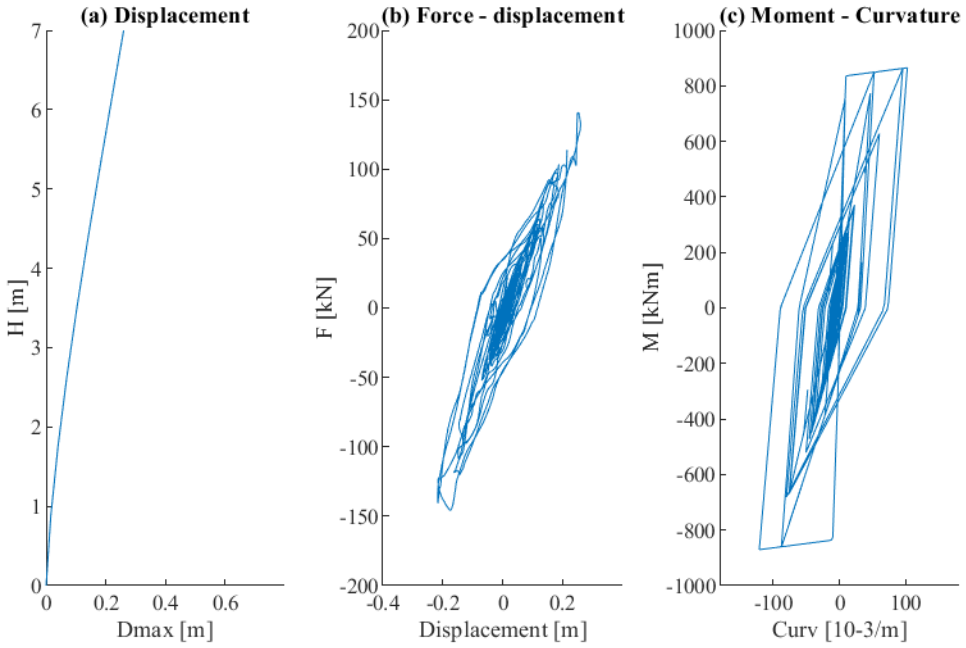

Figure D.28: Structure *m60H7* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika D.28: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

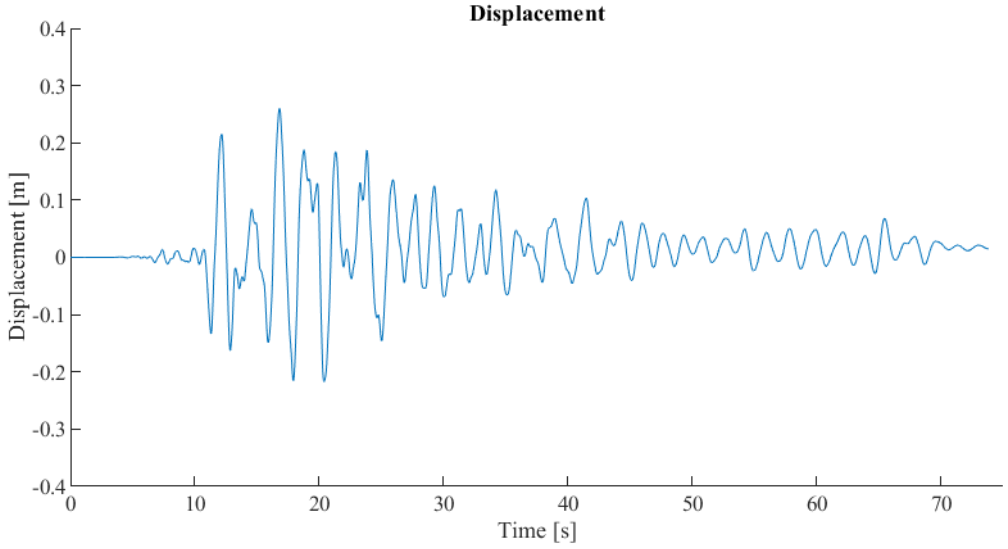

Figure D.29: Structure *m60H7* at a_g = 0.675 g: displacement response history at top of the column

Slika D.29: Montažna hala *m60H7* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

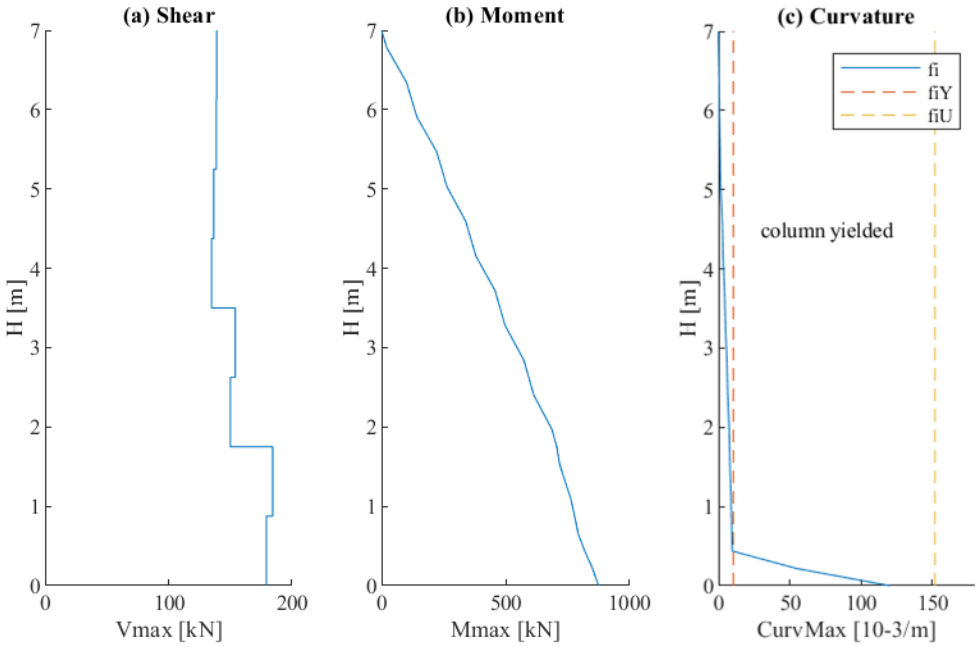

Figure D.30: Structure *m60H7* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika D.30: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

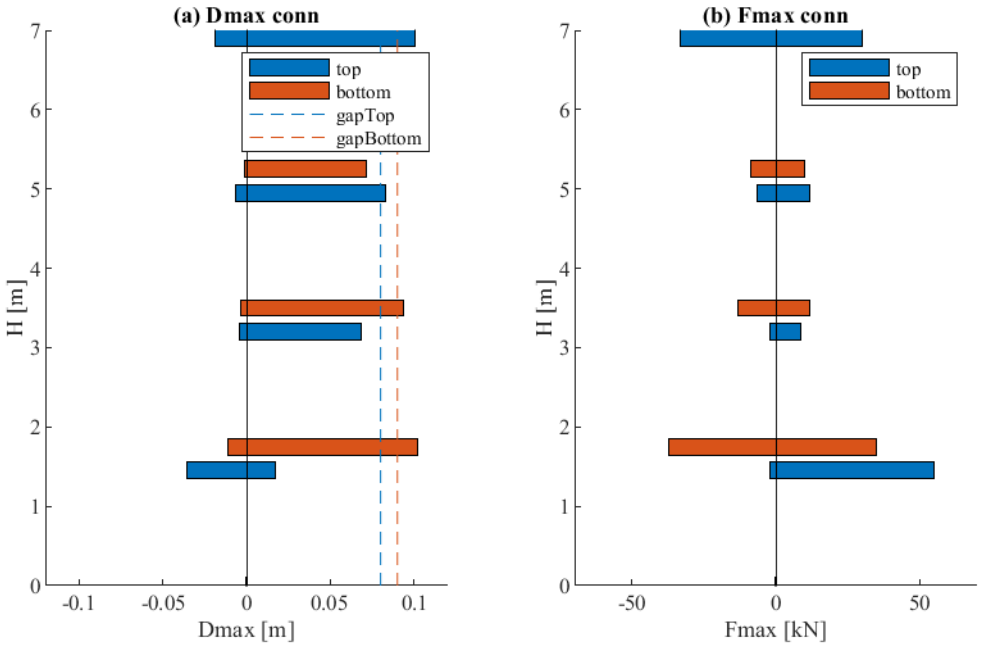

Figure D.31: Structure *m60H7* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika D.31: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

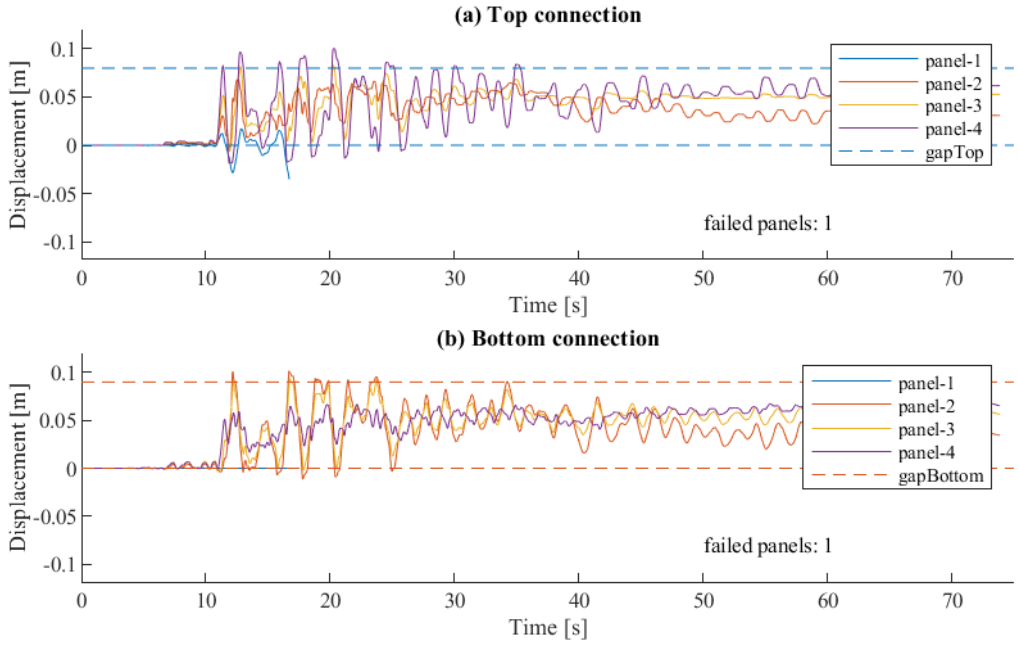

Figure D.32: Structure *m60H7* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika D.32: Montažna hala *m60H7* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

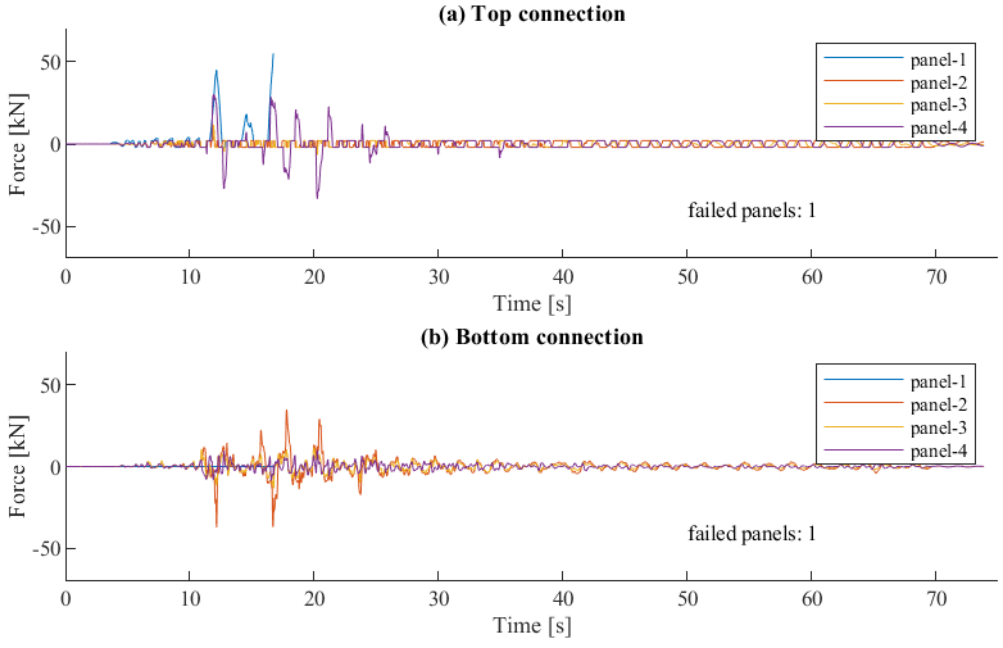

Figure D.33: Structure *m60H7* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika D.33: Montažna hala *m60H7* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

D.6 Structure *m60H9* a_g = 0.675 g

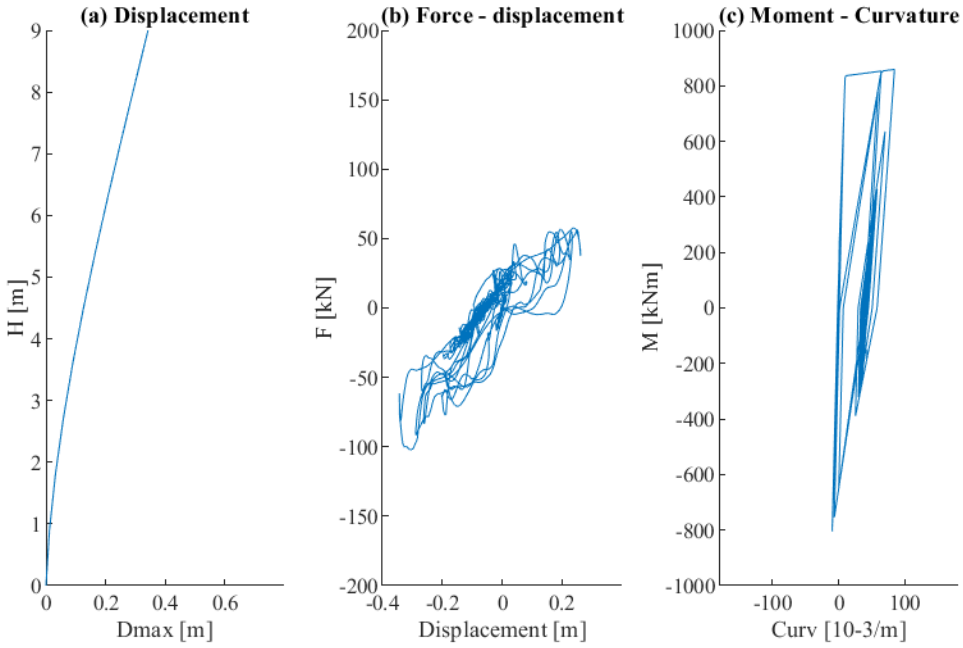

Figure D.34: Structure *m60H9* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika D.34: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

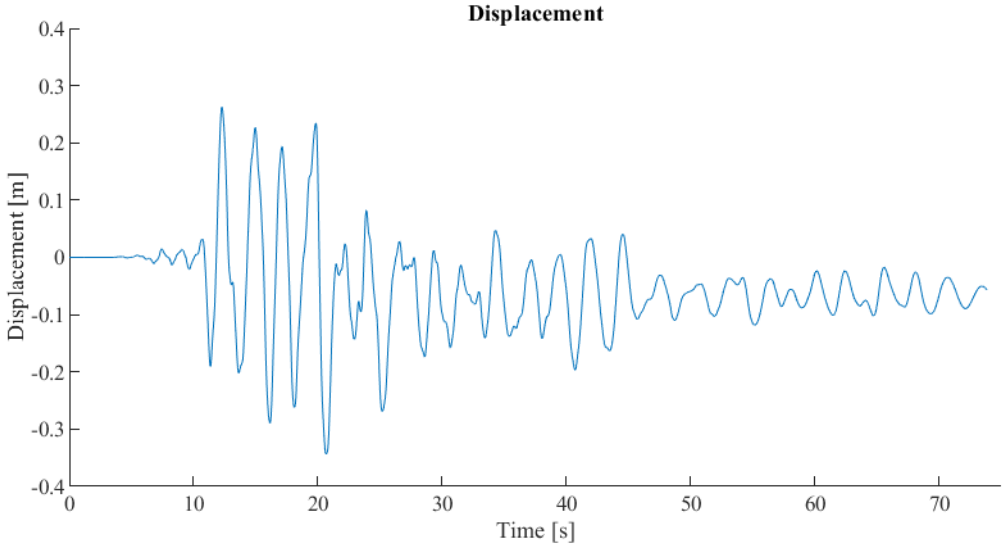

Figure D.35: Structure *m60H9* at a_g = 0.675 g: displacement response history at top of the column

Slika D.35: Montažna hala *m60H9* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

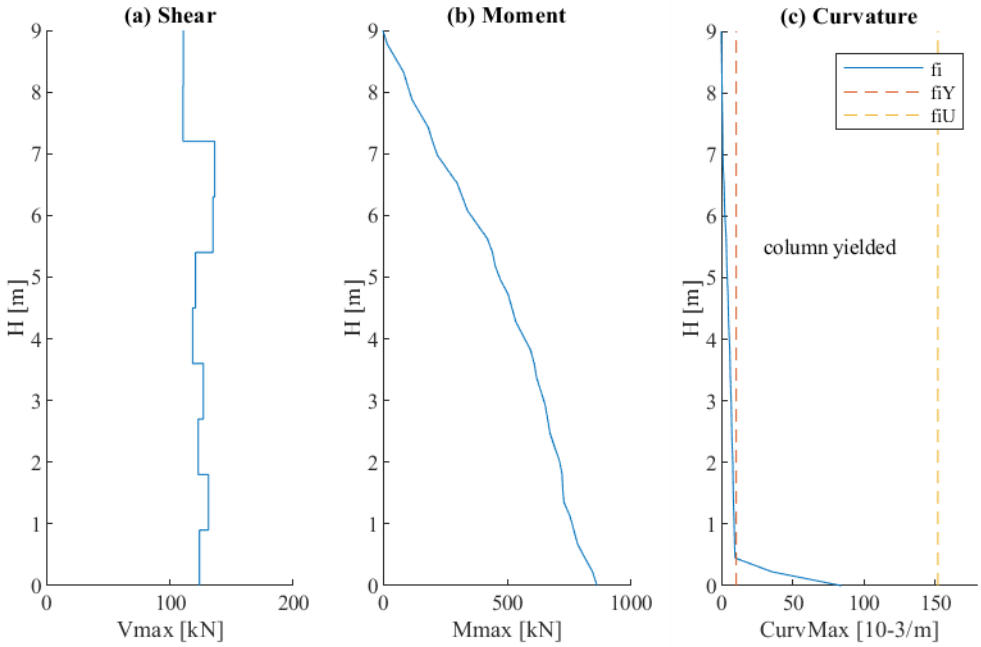

Figure D.36: Structure *m60H9* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika D.36: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

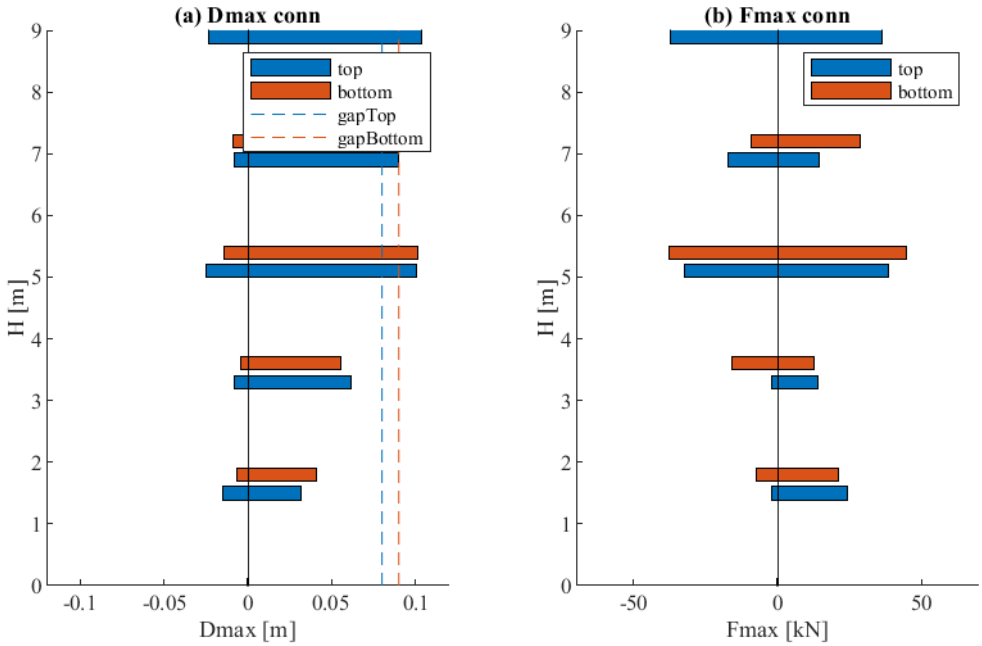

Figure D.37: Structure *m60H9* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika D.37: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

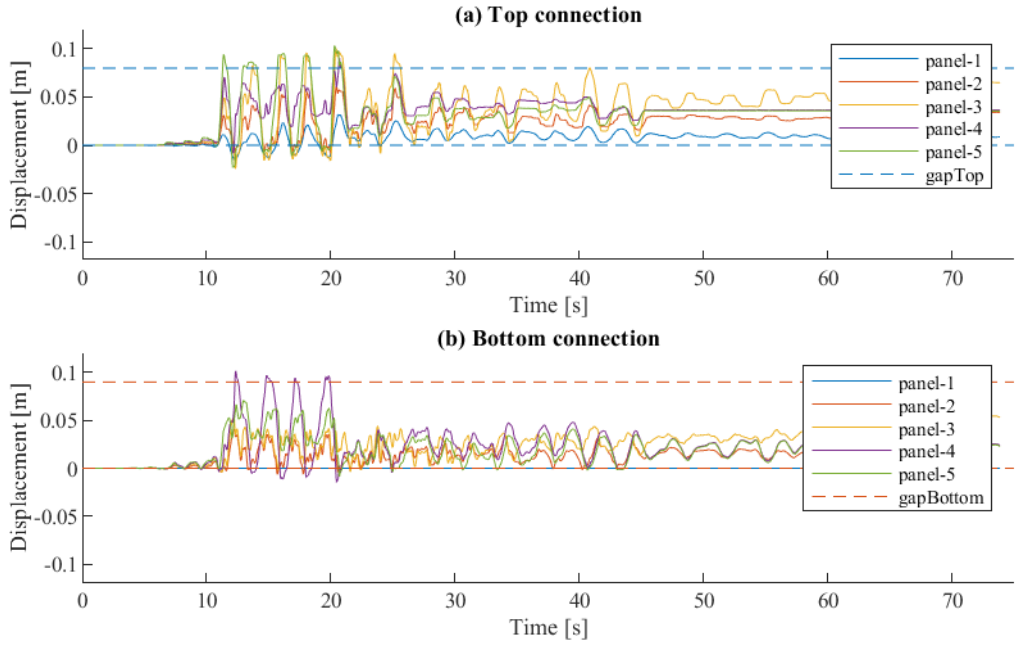

Figure D.38: Structure *m60H9* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika D.38: Montažna hala *m60H9* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

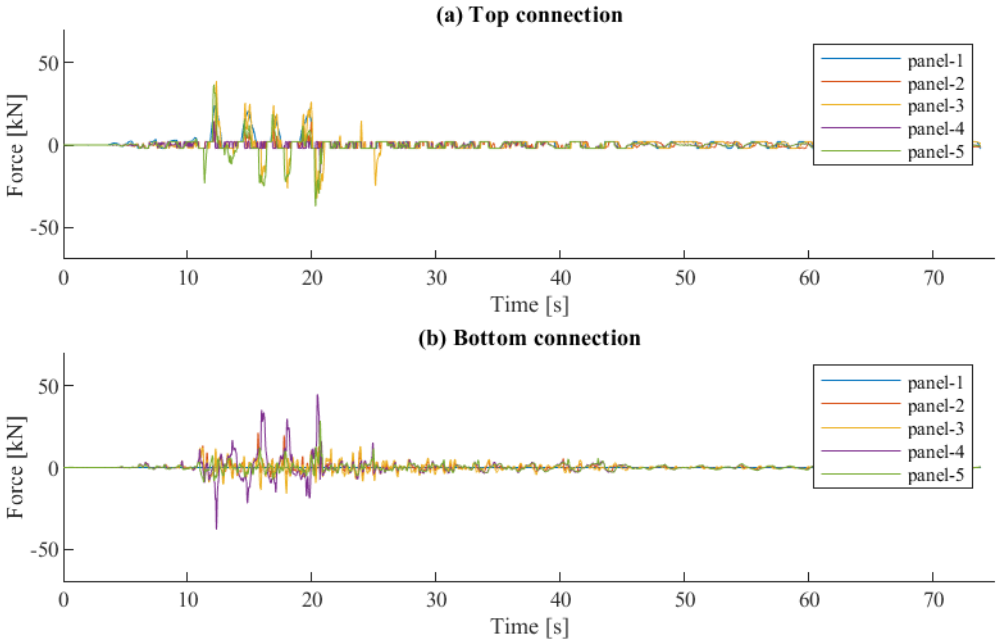

Figure D.39: Structure *m60H9* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika D.39: Montažna hala *m60H9* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

APPENDIX E: Results of parametric analysis considering *LR/P/F/2* parameters

In this appendix, the results of numerical analyses performed on precast structures with eccentric connections (*LR*), with silicone sealant between the panels (*P*), the bottom panel fixed to the foundation (*F*) and with the ratio factor $k = 2$ are gathered. Time history responses and distribution of forces and displacements along the height of the structure are shown for three characteristic structures *m60H5*, *m60H7* and *m60H*. To present the characteristic results, the response of structures subjected to ground motion no. 4 was chosen. It is the accelerogram that from all selected accelerograms has the response spectra the closest to EC8 response spectra in the period range of analysed structures.

In Figures E.1-E.3, responses of structures with centrally (*MM*) and eccentrically (*LR*) positioned connections are compared for three different heights. In following, time history responses and distribution of forces and displacements along the height of the structure are shown for three characteristic structures *m60H5*, *m60H7* and *m60H*. To present the characteristic results, the response of structures subjected to ground motion no. 4 was chosen. It is the accelerogram that from all selected accelerograms has the response spectra the closest to EC8 response spectra in the period range of analysed structures.

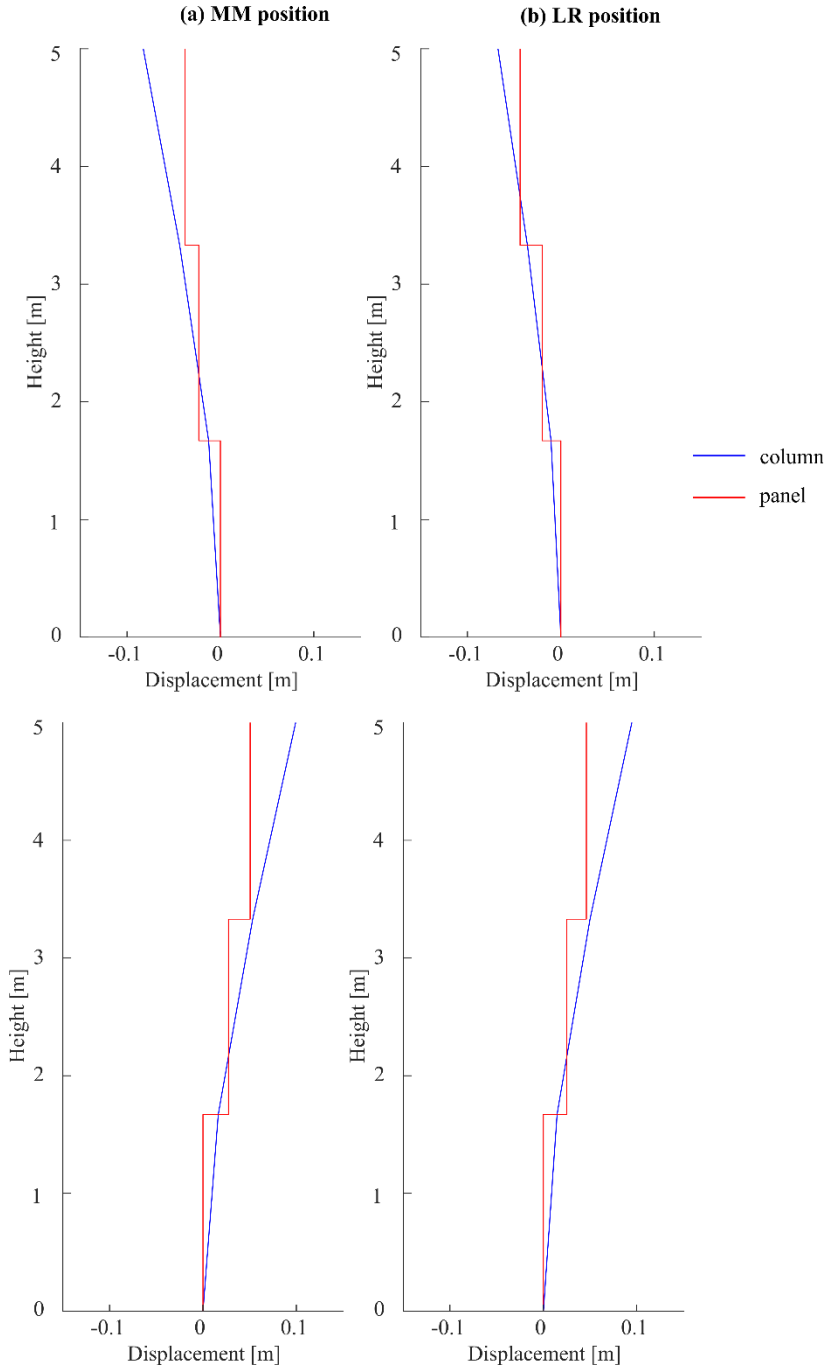

Figure E.1: Response of precast structure *m60H5*: (a) centrally positioned connections *MM* and (b) eccentric position of connections *LR*

Slika E.1: Odziv konstrukcije *m60H5*: (a) sredinska pozicija stikov *MM* in (b) ekscentrična pozicija stikov *LR*

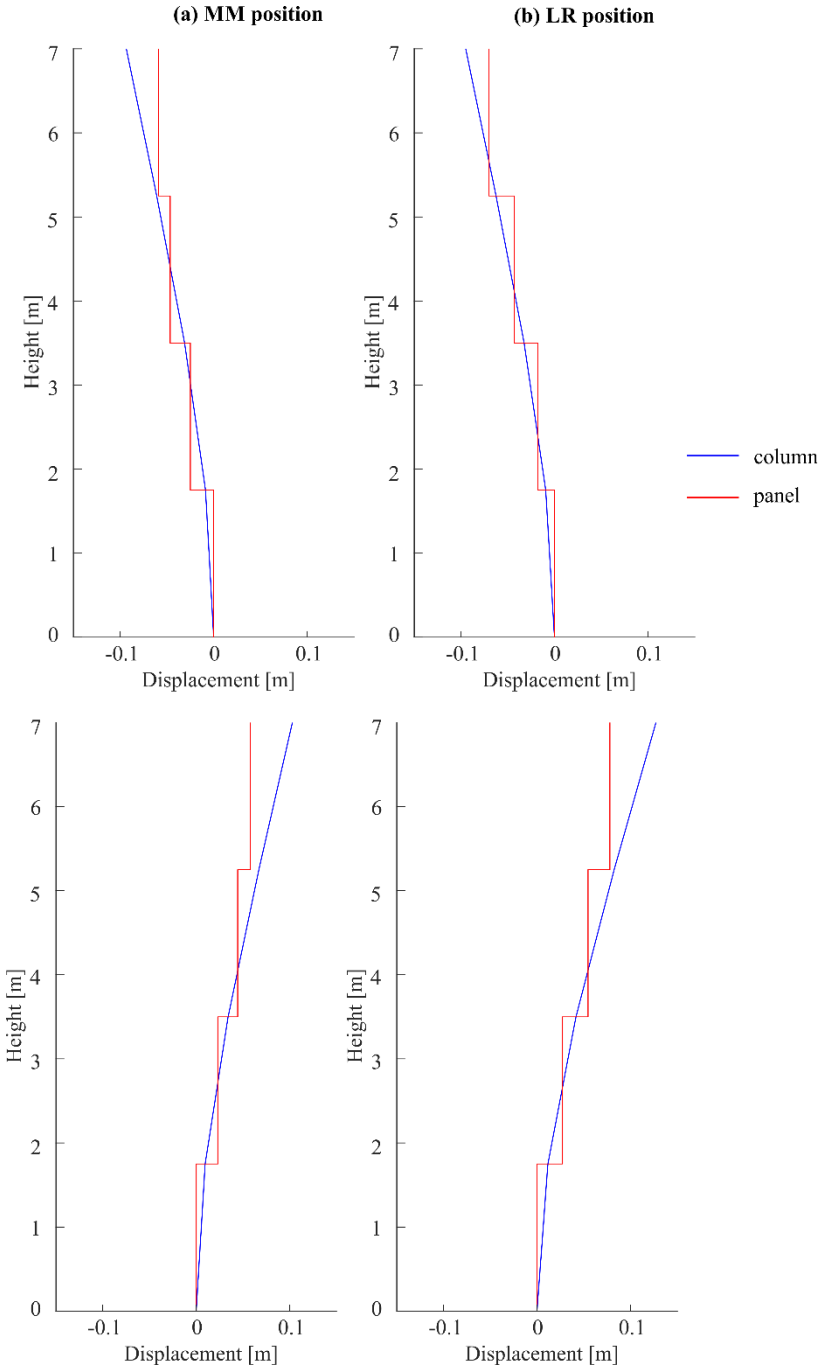

Figure E.2: Response of precast structure *m60H7*: (a) centrally positioned connections *MM* and (b) eccentric position of connections *LR*

Slika E.2: Odziv konstrukcije *m60H7*: (a) sredinska pozicija stikov *MM* in (b) ekscentrična pozicija stikov *LR*

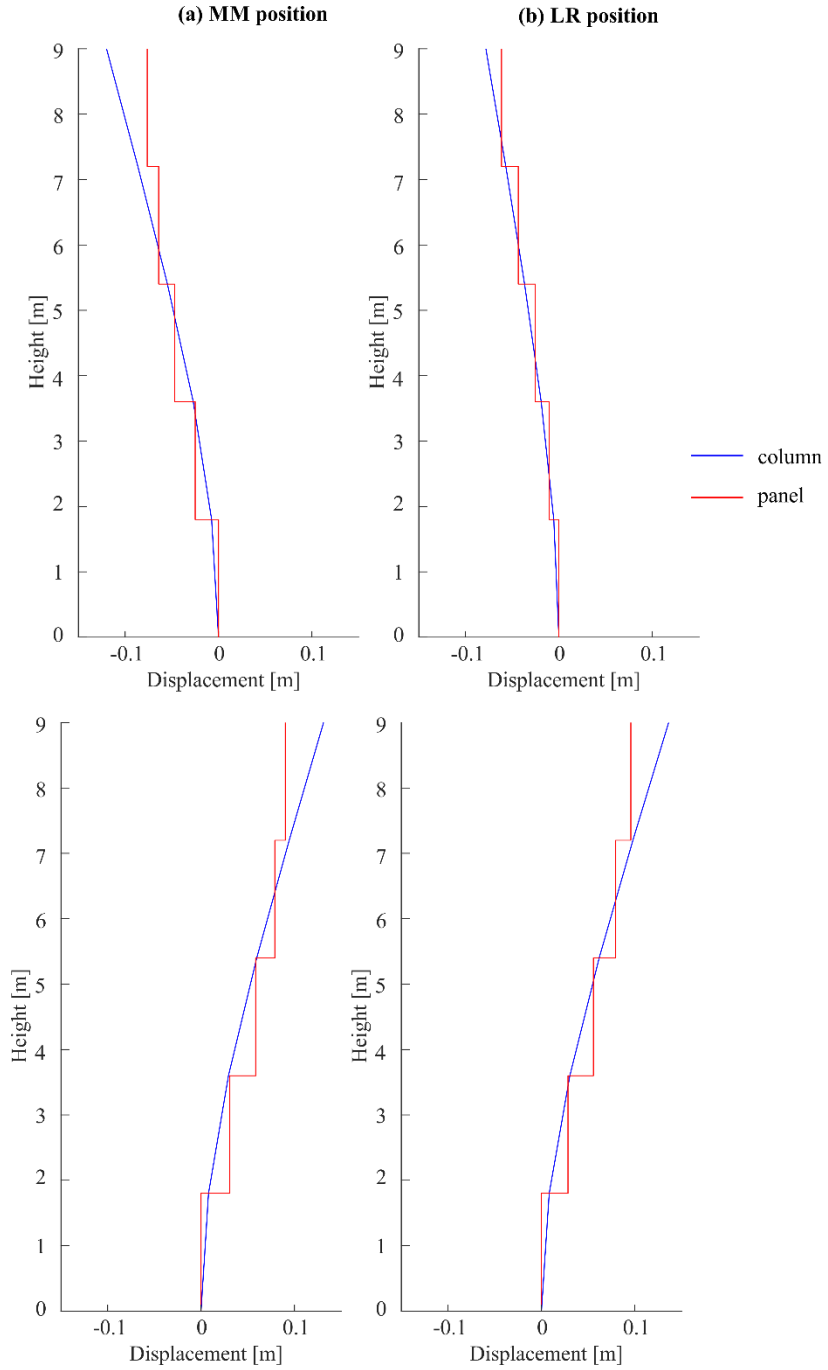

Figure E.3: Response of precast structure *m60H9*: (a) centrally positioned connections *MM* and (b) eccentric position of connections *LR*

Slika E.3: Odziv konstrukcije *m60H9*: (a) sredinska pozicija stikov *MM* in (b) ekscentrična pozicija stikov *LR*

E.1 Structure *m60H5* a_g = 0.25 g

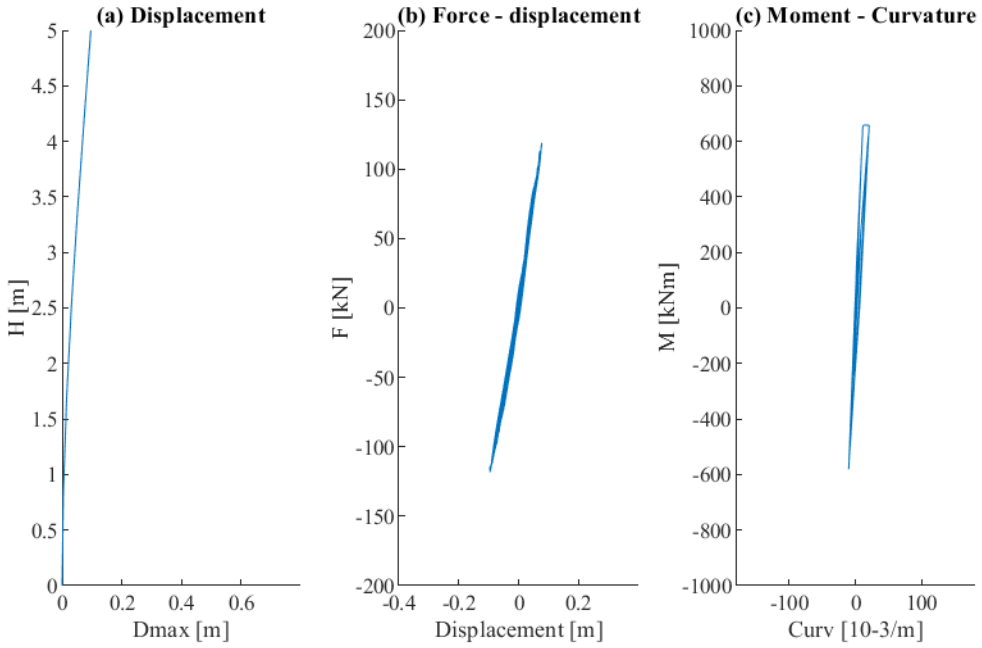

Figure E.4: Structure *m60H5* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika E.4: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

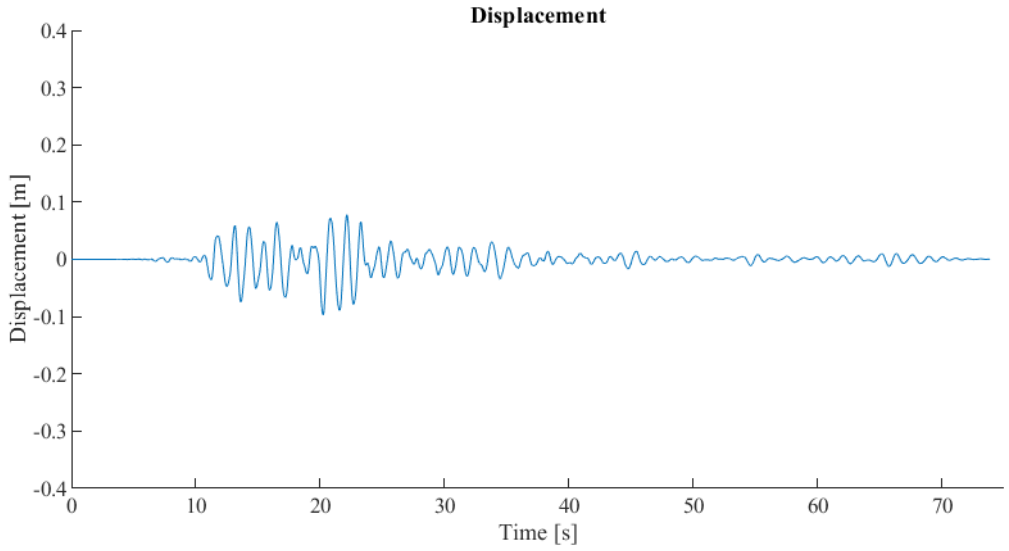

Figure E.5: Structure *m60H5* at a_g = 0.25 g: displacement response history at top of the column

Slika E.5: Montažna hala *m60H5* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

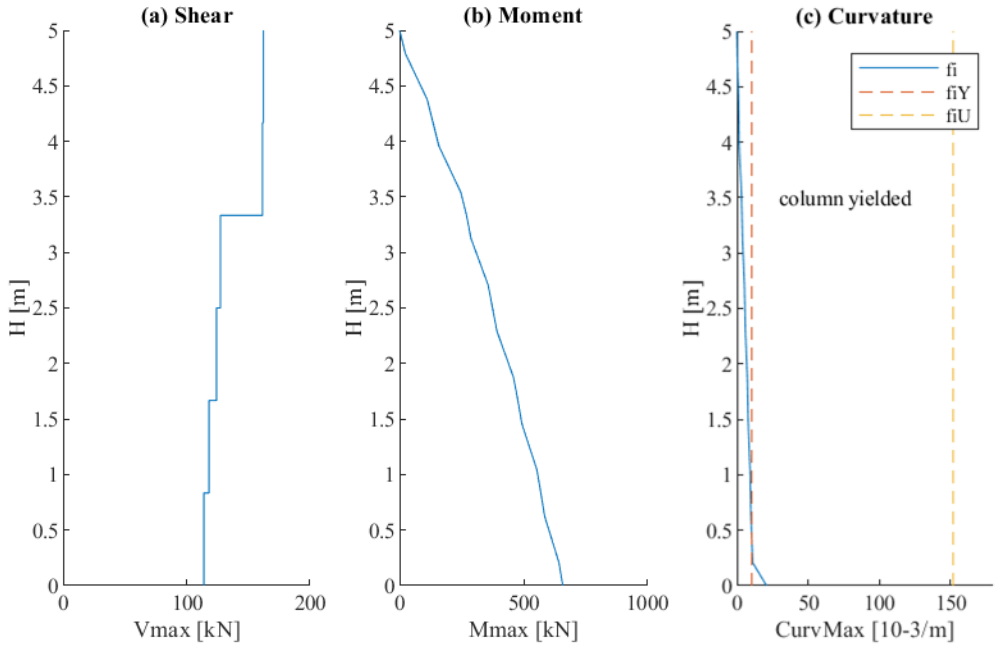

Figure E.6: Structure *m60H5* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika E.6: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

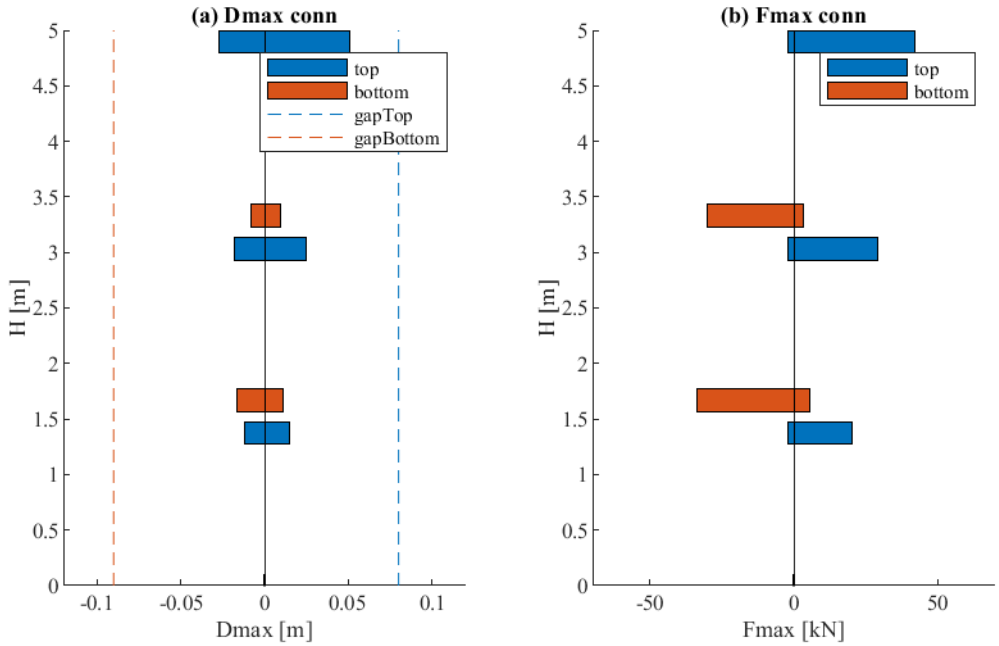

Figure E.7: Structure *m60H5* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika E.7: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

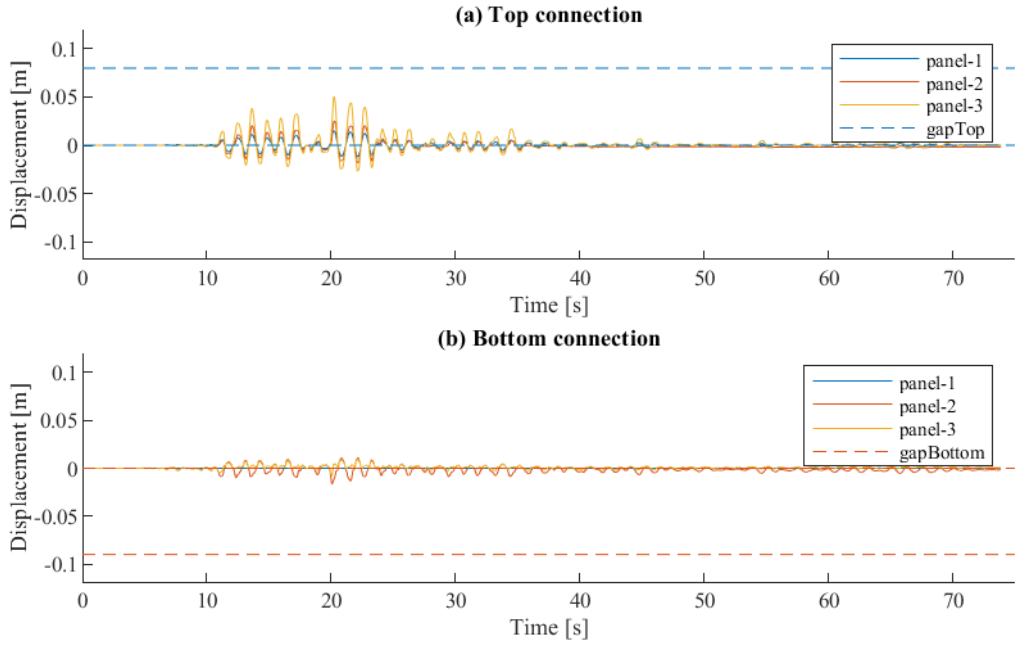

Figure E.8: Structure *m60H5* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika E.8: Montažna hala *m60H5* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

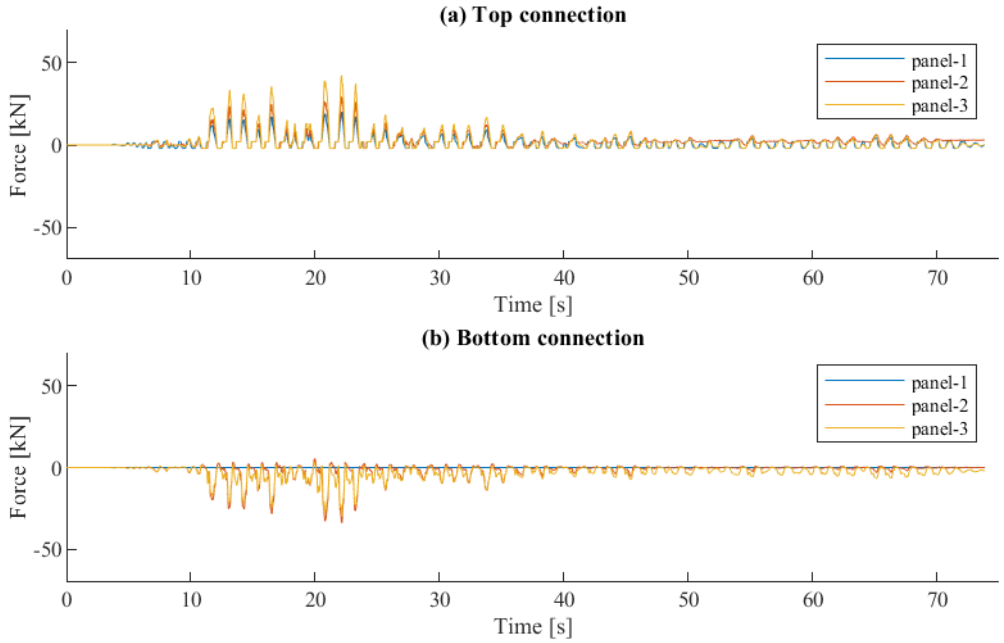

Figure E.9: Structure *m60H5* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika E.9: Montažna hala *m60H5* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

E.2 Structure *m60H7* a_g = 0.25 g

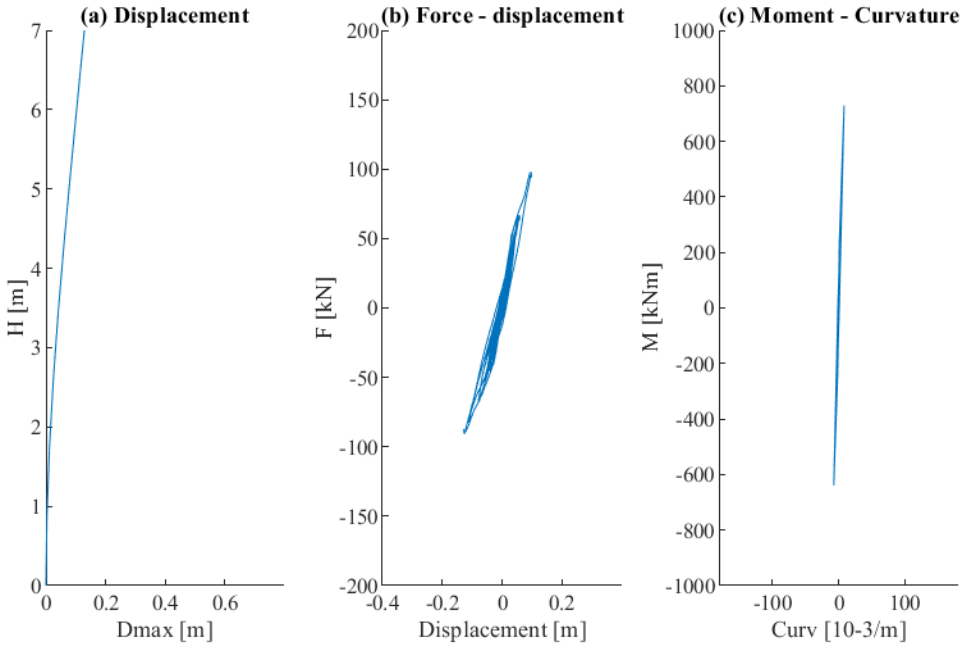

Figure E.10: Structure *m60H7* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika E.10: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

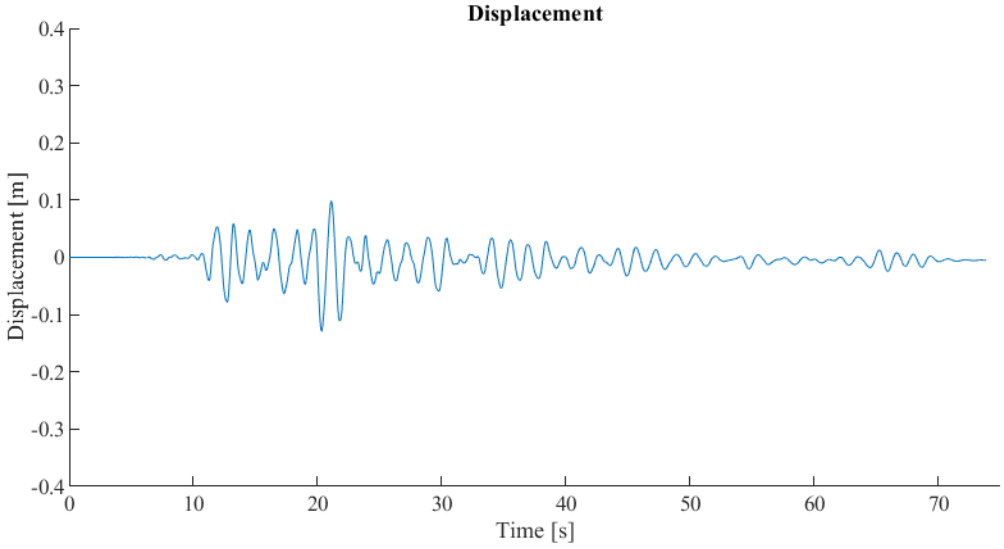

Figure E.11: Structure *m60H7* at a_g = 0.25 g: displacement response history at top of the column

Slika E.11: Montažna hala *m60H7* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

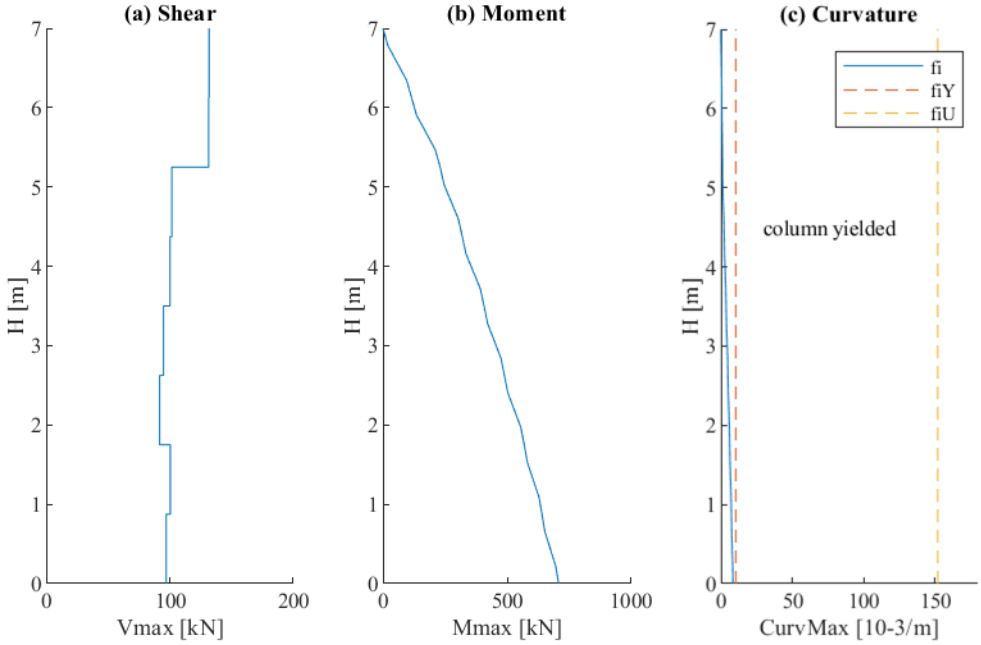

Figure E.12: Structure *m60H7* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika E.12: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

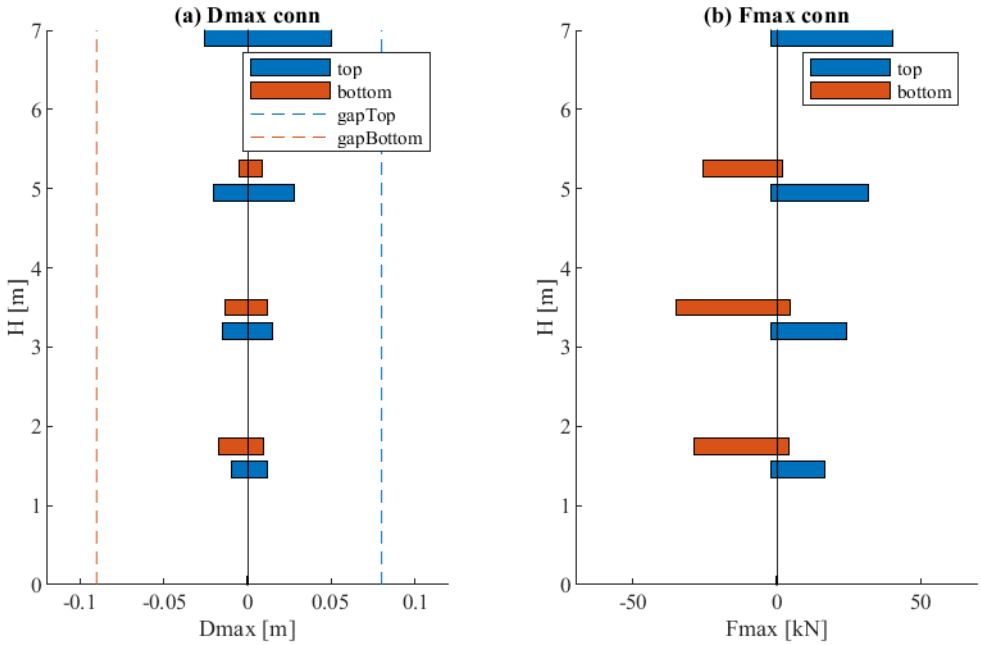

Figure E.13: Structure *m60H7* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika E.13: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

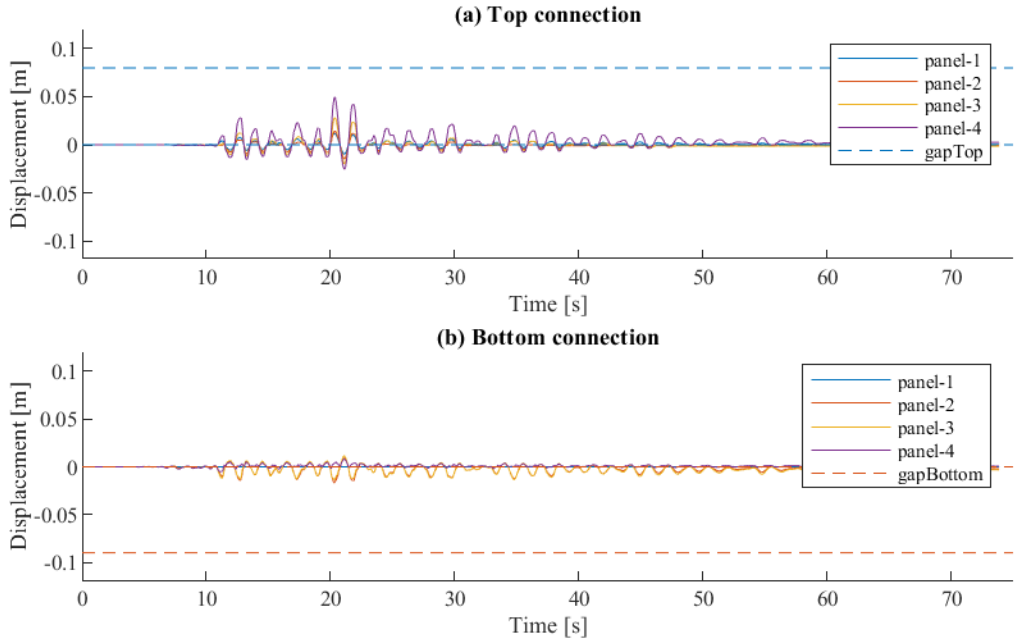

Figure E.14: Structure *m60H7* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika E.14: Montažna hala *m60H7* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

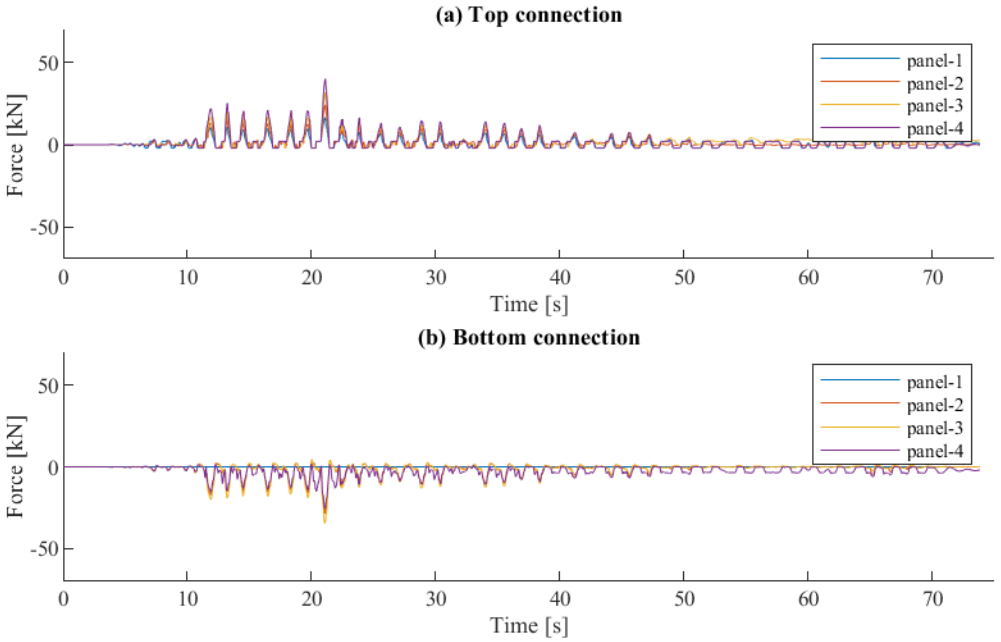

Figure E.15: Structure *m60H7* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika E.15: Montažna hala *m60H7* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

E.3 Structure *m60H9* a_g = 0.25 g

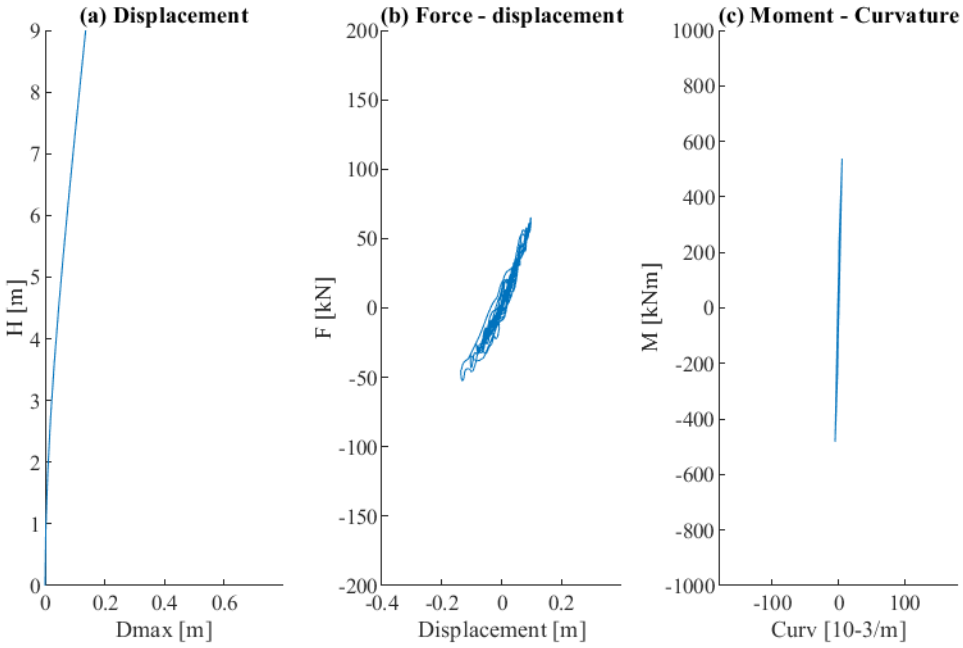

Figure E.16: Structure *m60H9* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika E.16: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

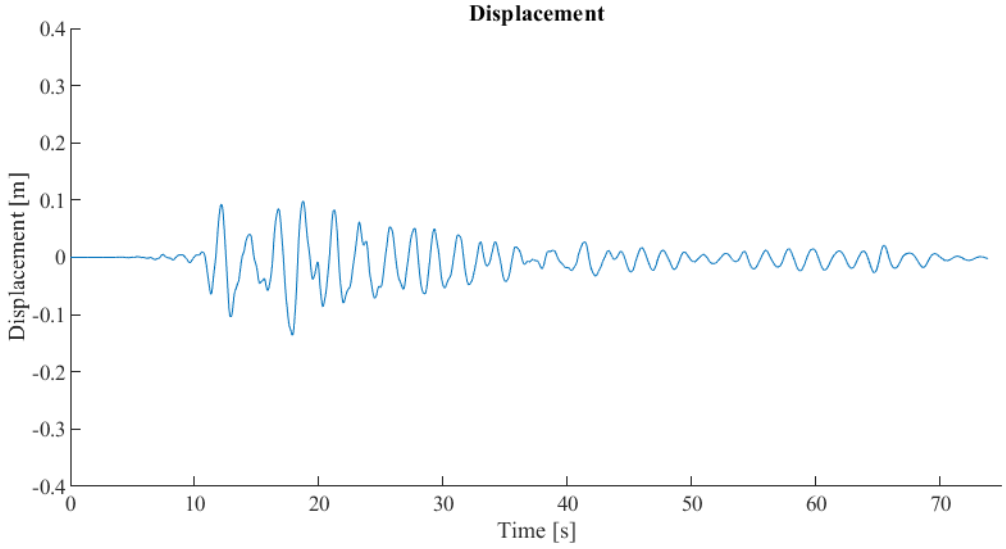

Figure E.17: Structure *m60H9* at a_g = 0.25 g: displacement response history at top of the column

Slika E.17: Montažna hala *m60H9* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

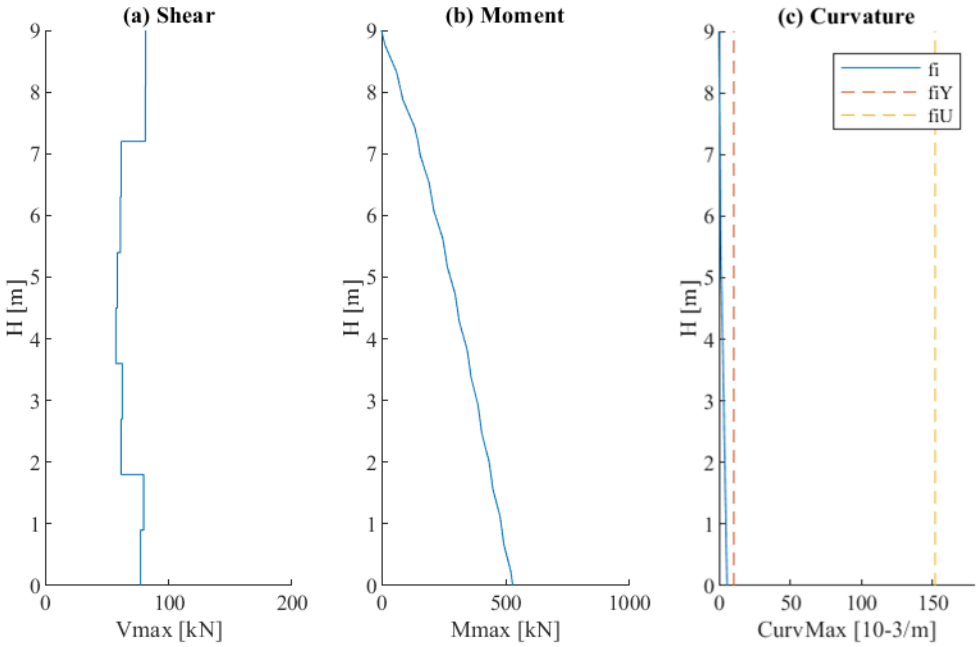

Figure E.18: Structure *m60H9* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika E.18: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

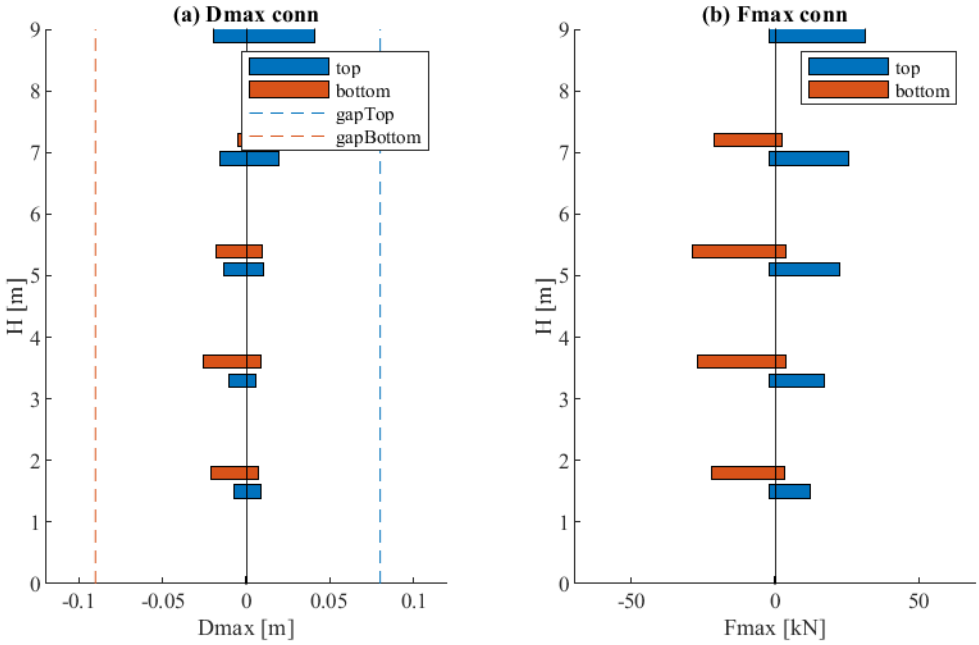

Figure E.19: Structure *m60H9* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika E.19: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

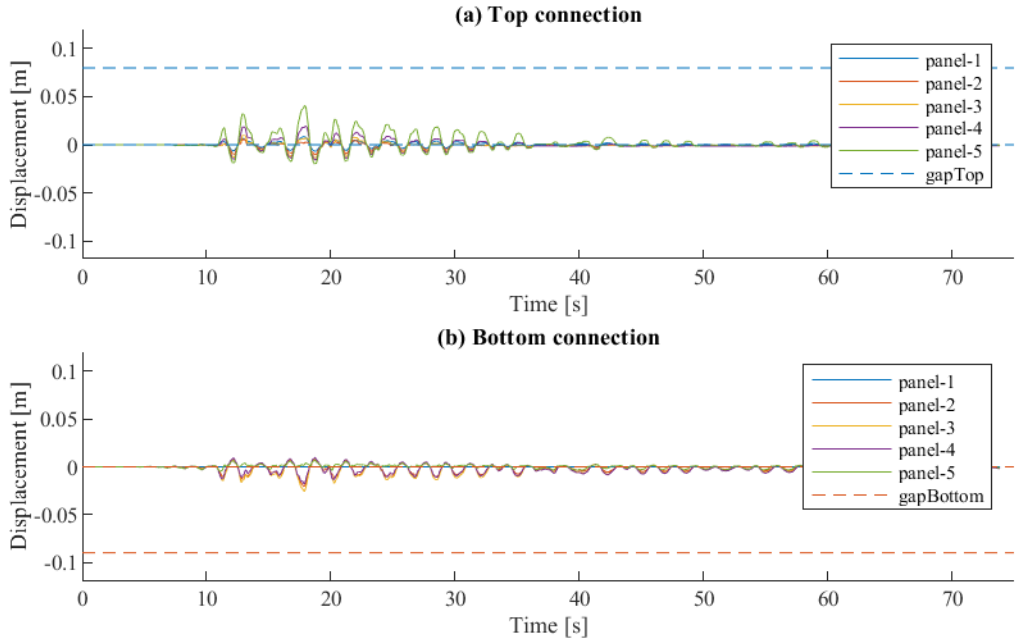

Figure E.20: Structure *m60H9* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika E.20: Montažna hala *m60H9* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

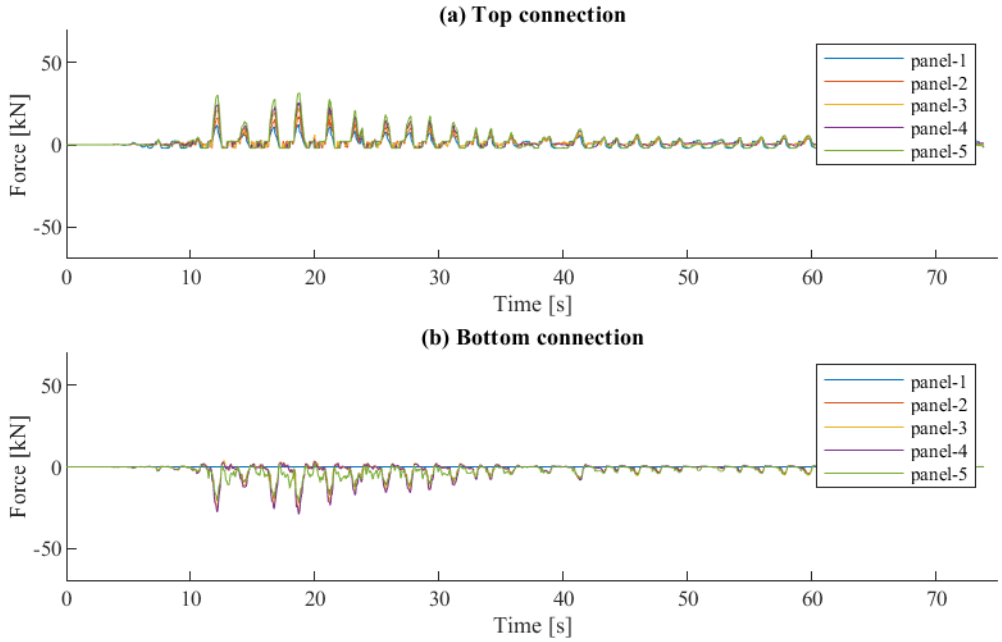

Figure E.21: Structure *m60H9* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika E.21: Montažna hala *m60H9* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

E.4 Structure *m60H5* a_g = 0.675 g

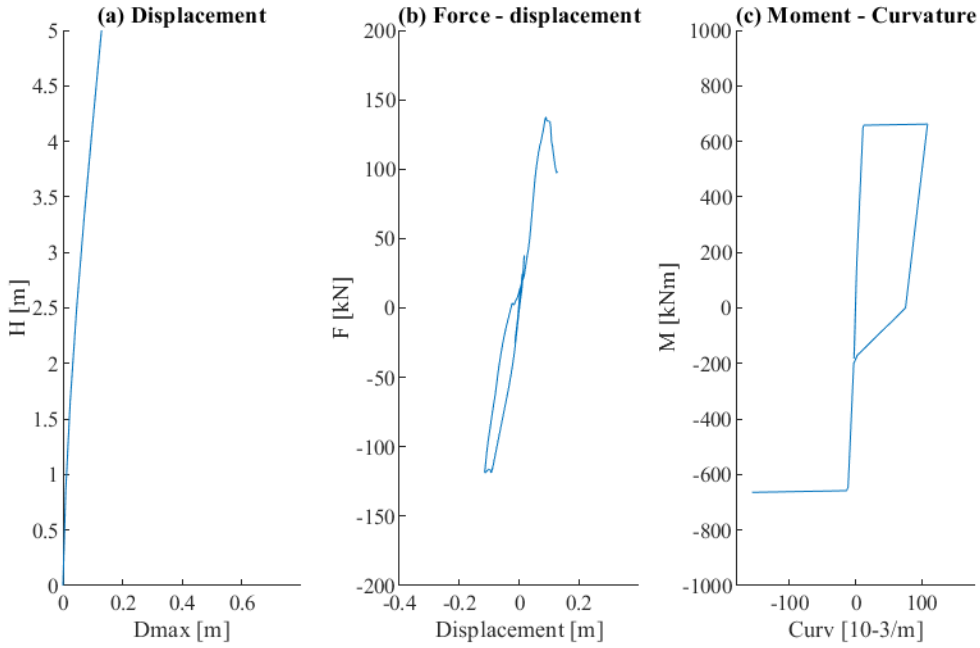

Figure E.22: Structure *m60H5* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika E.22: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

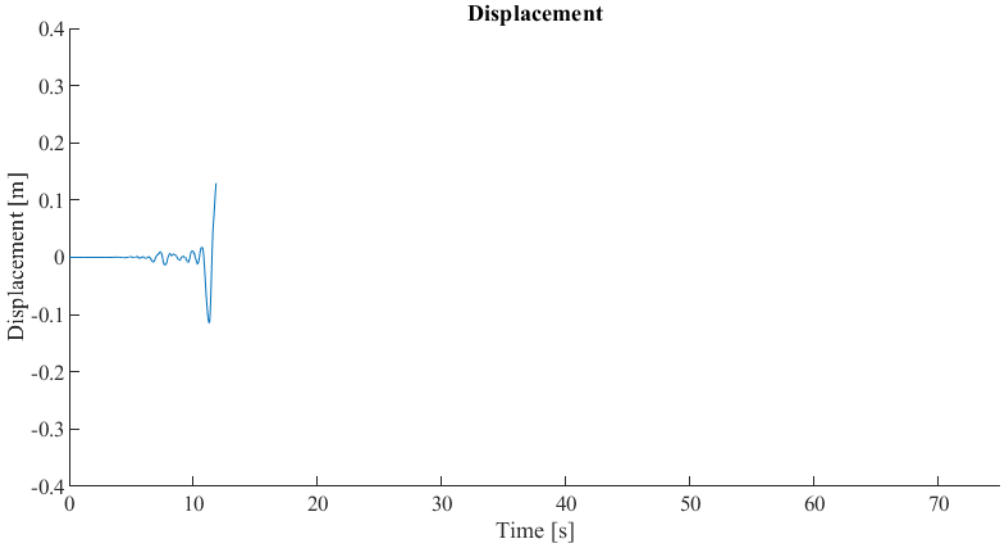

Figure E.23: Structure *m60H5* at a_g = 0.675 g: displacement response history at top of the column

Slika E.23: Montažna hala *m60H5* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

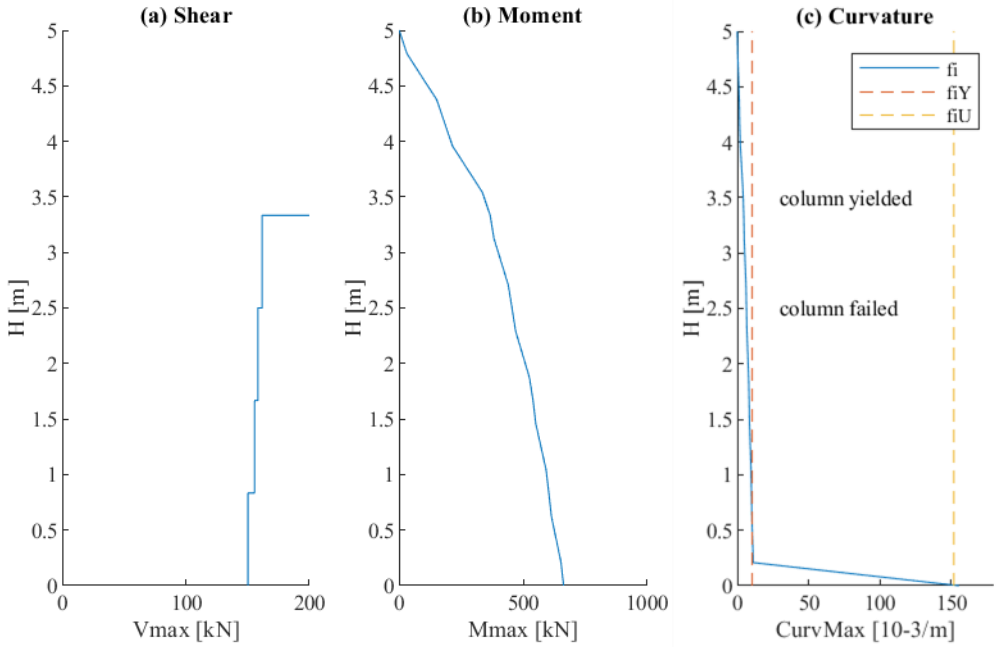

Figure E.24: Structure *m60H5* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika E.24: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

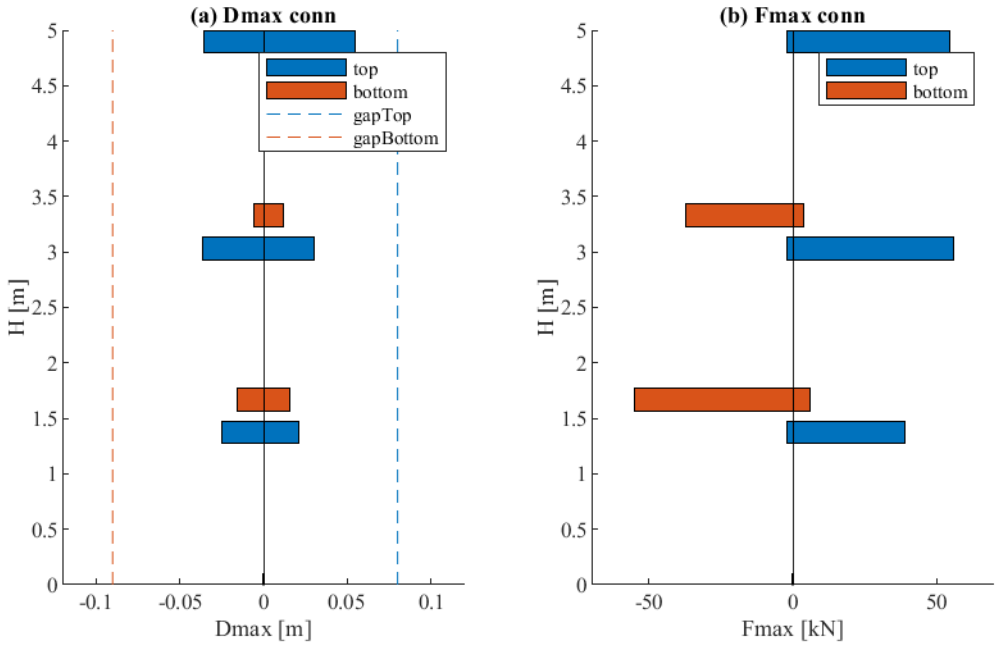

Figure E.25: Structure *m60H5* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika E.25: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

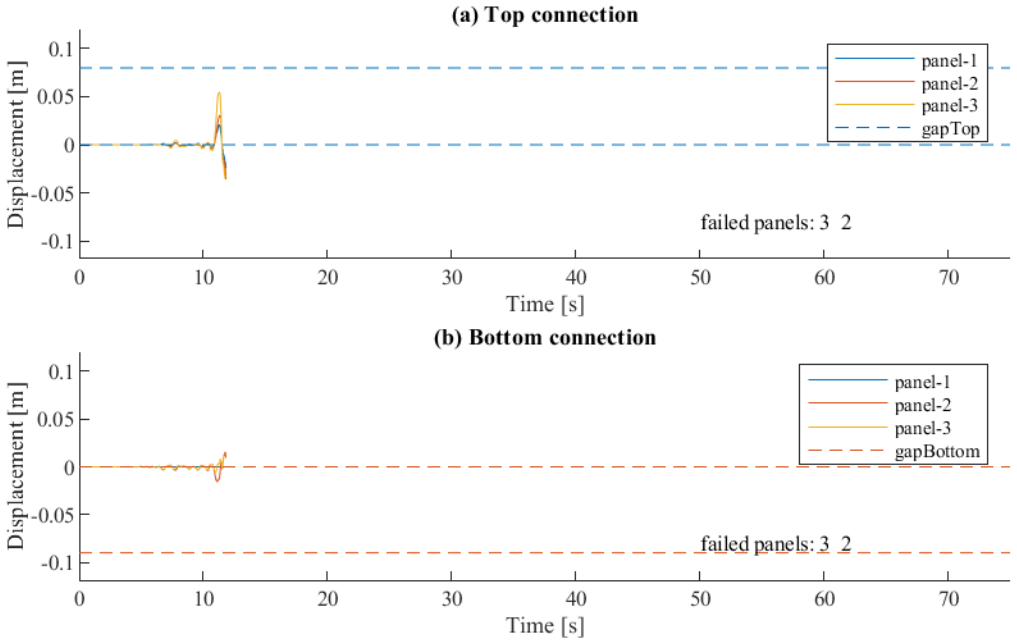

Figure E.26: Structure *m60H5* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika E.26: Montažna hala *m60H5* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

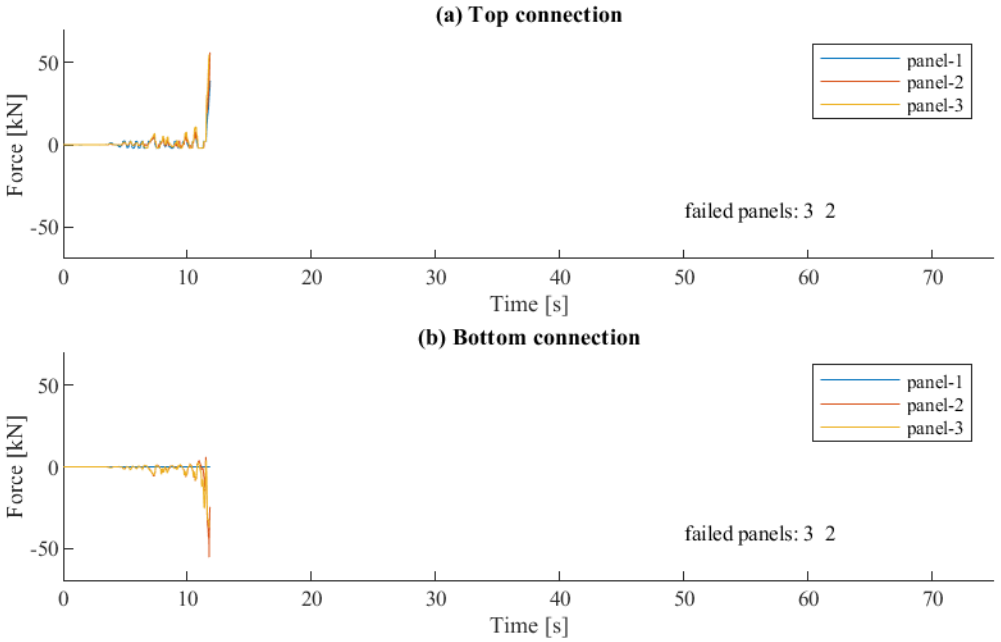

Figure E.27: Structure *m60H5* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika E.27: Montažna hala *m60H5* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

E.5 Structure *m60H7* a_g = 0.675 g

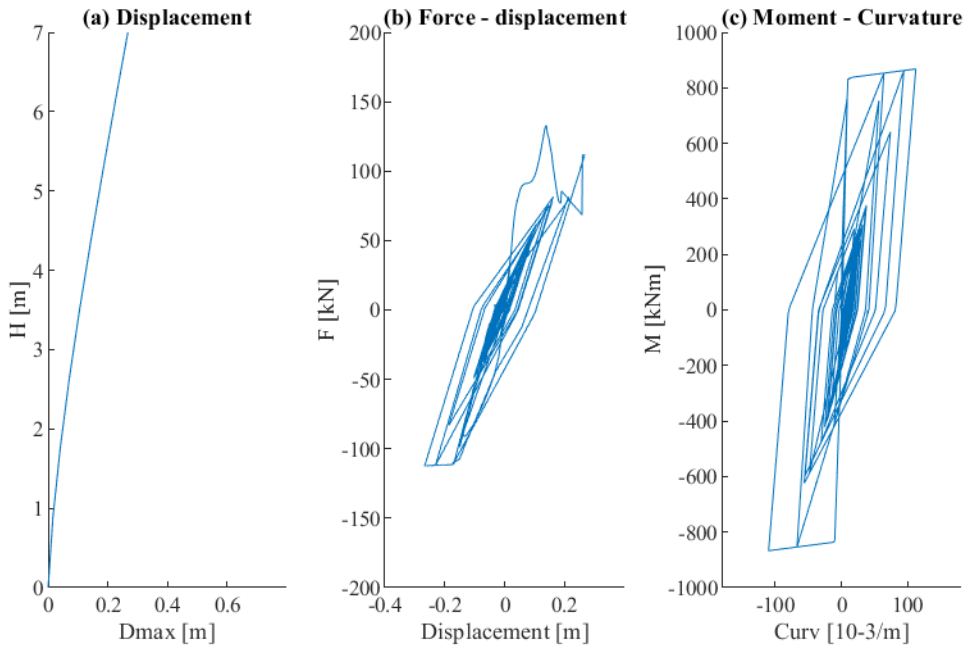

Figure E.28: Structure *m60H7* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika E.28: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

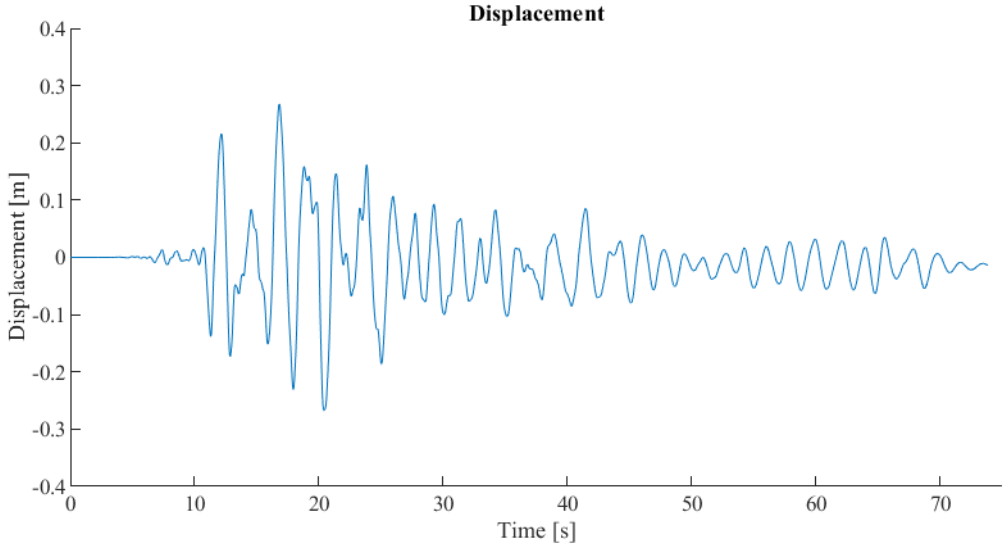

Figure E.29: Structure *m60H7* at a_g = 0.675 g: displacement response history at top of the column

Slika E.29: Montažna hala *m60H7* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

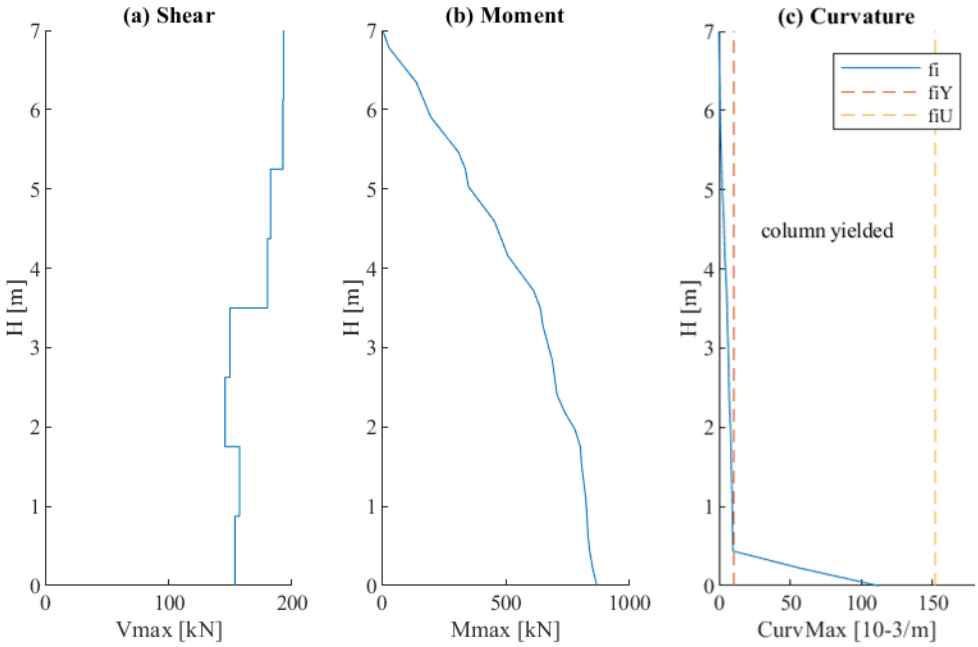

Figure E.30: Structure *m60H7* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika E.30: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

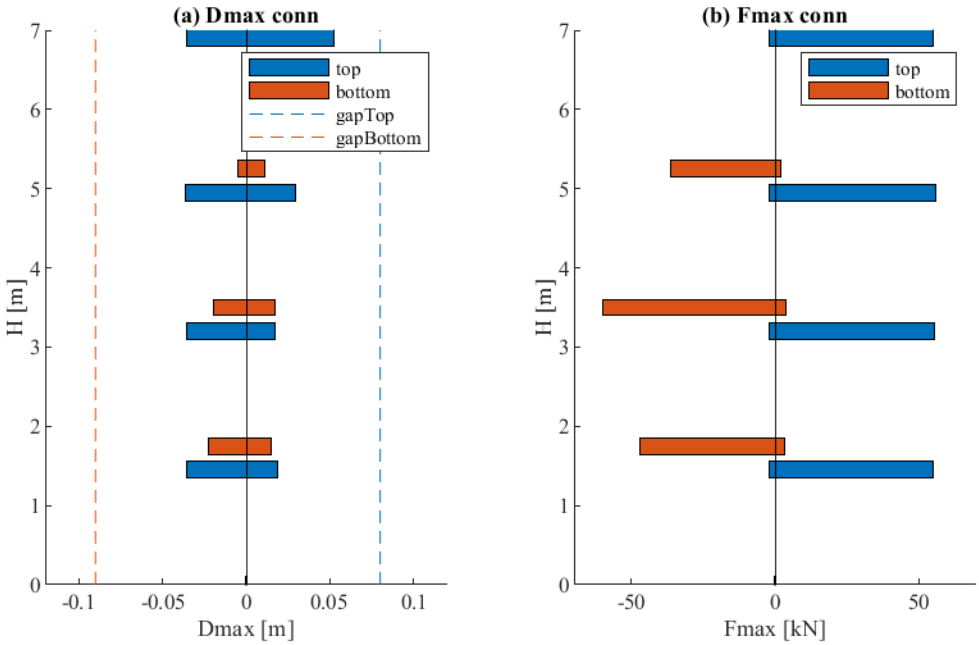

Figure E.31: Structure *m60H7* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika E.31: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

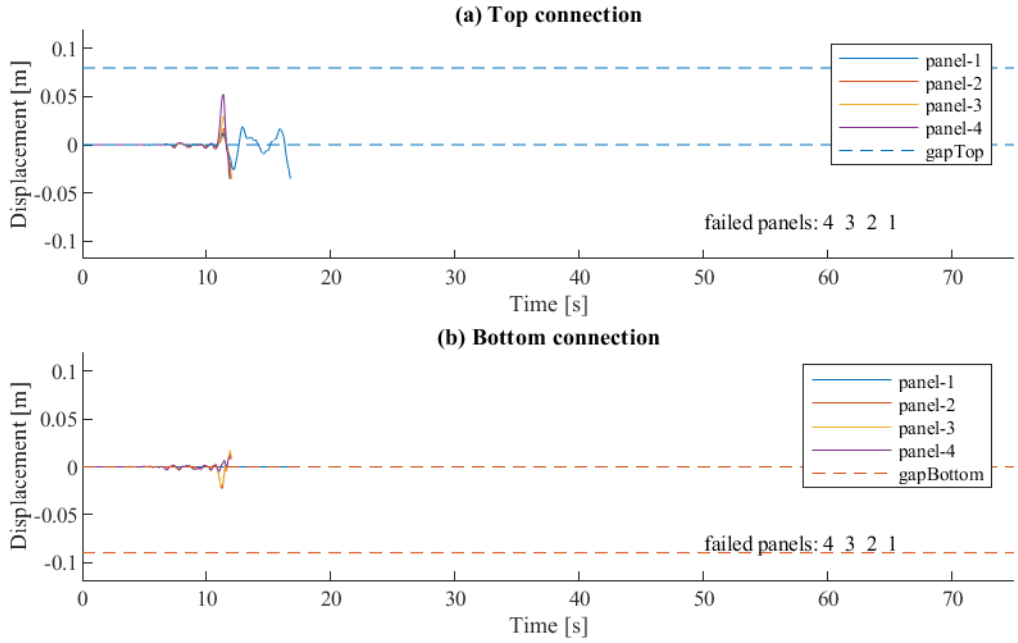

Figure E.32: Structure *m60H7* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika E.32: Montažna hala *m60H7* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

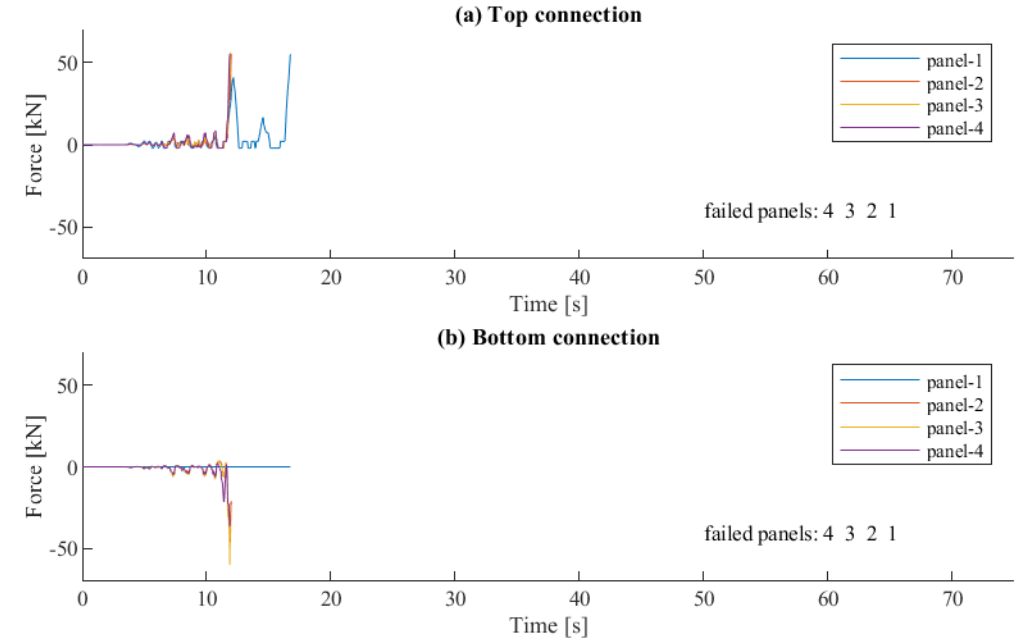

Figure E.33: Structure *m60H7* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika E.33: Montažna hala *m60H7* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

E.6 Structure *m60H9* a_g = 0.675 g

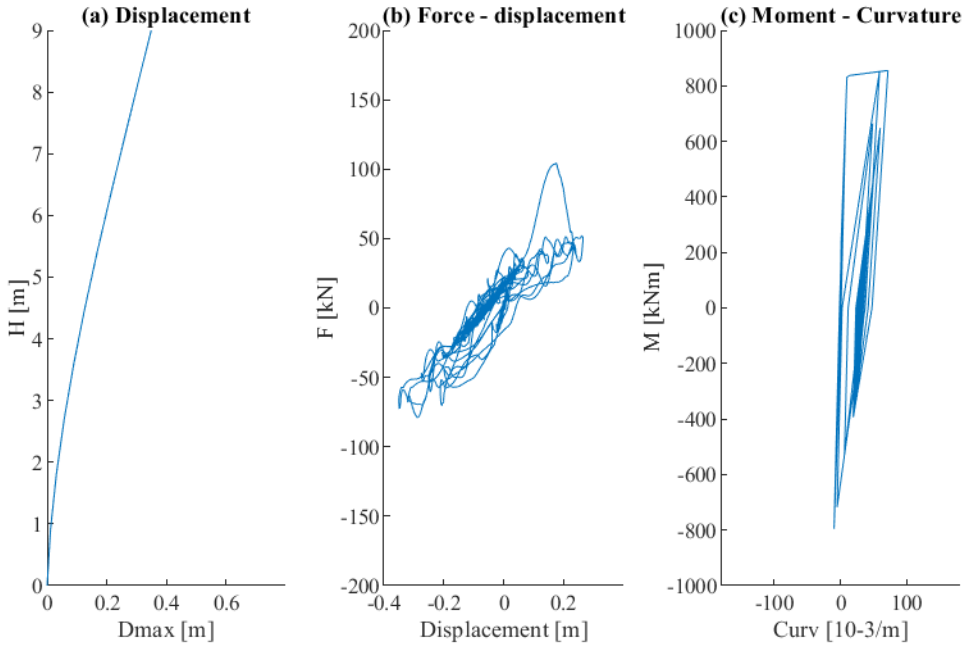

Figure E.34: Structure *m60H9* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika E.34: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

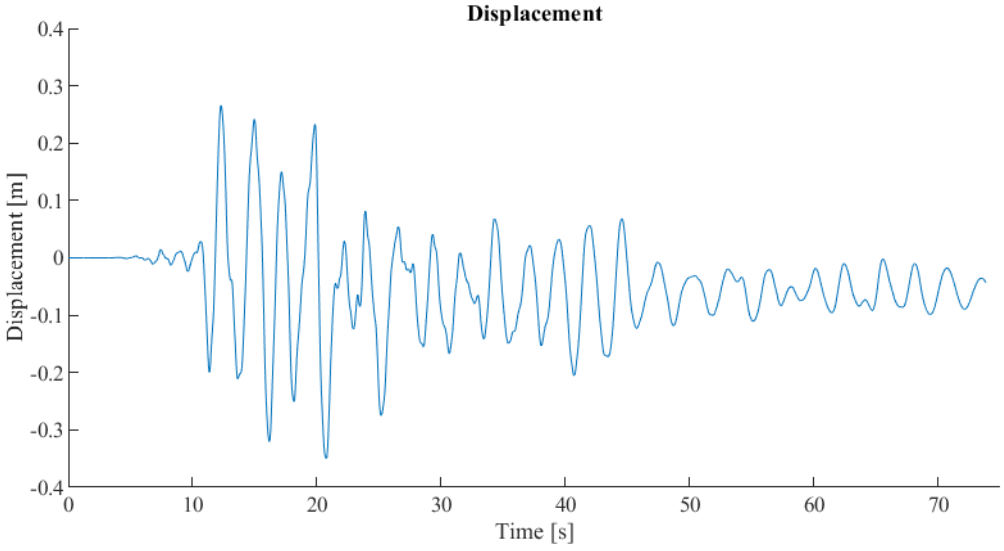

Figure E.35: Structure *m60H9* at a_g = 0.675 g: displacement response history at top of the column

Slika E.35: Montažna hala *m60H9* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

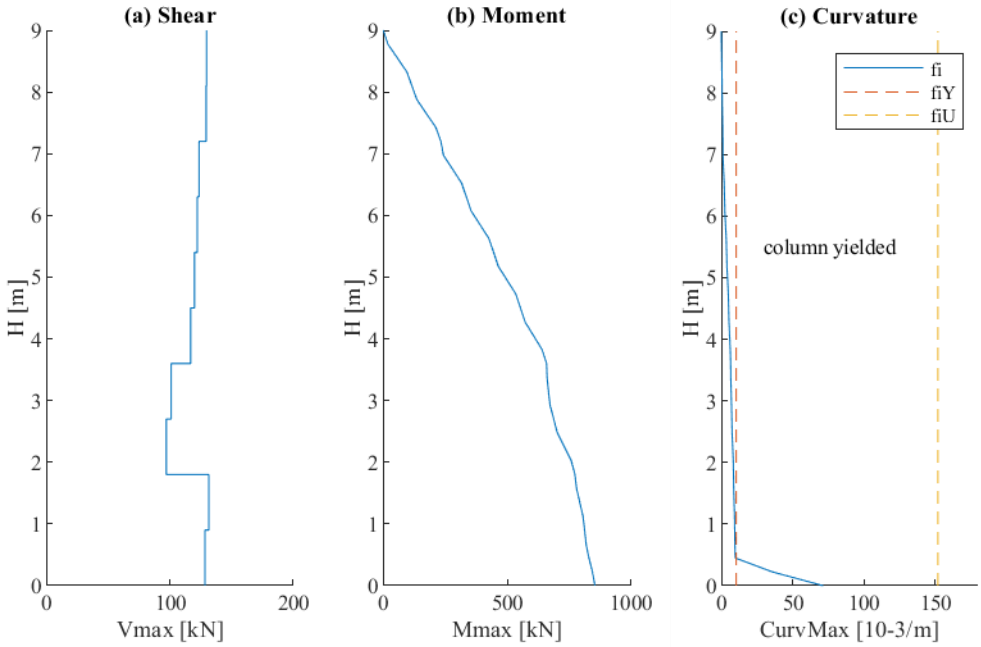

Figure E.36: Structure *m60H9* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika E.36: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

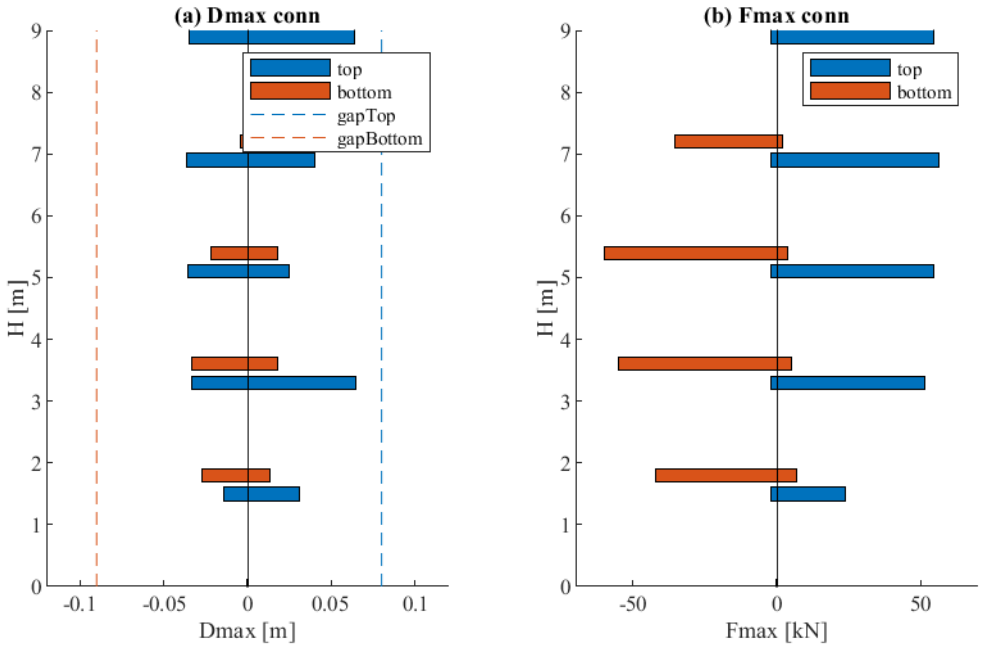

Figure E.37: Structure *m60H9* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika E.37: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

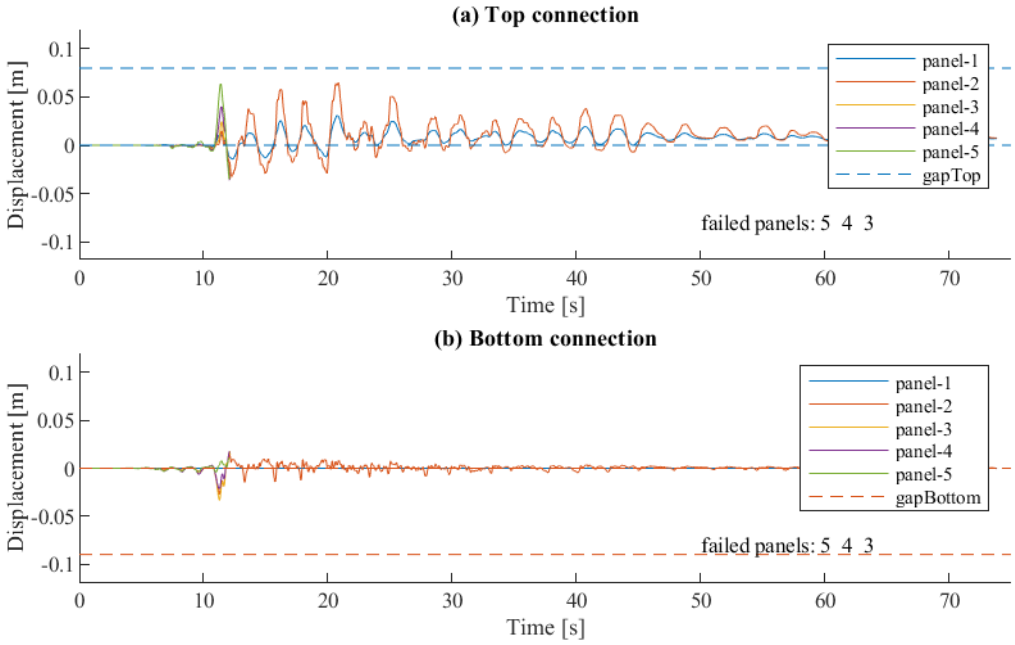

Figure E.38: Structure *m60H9* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika E.38: Montažna hala *m60H9* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

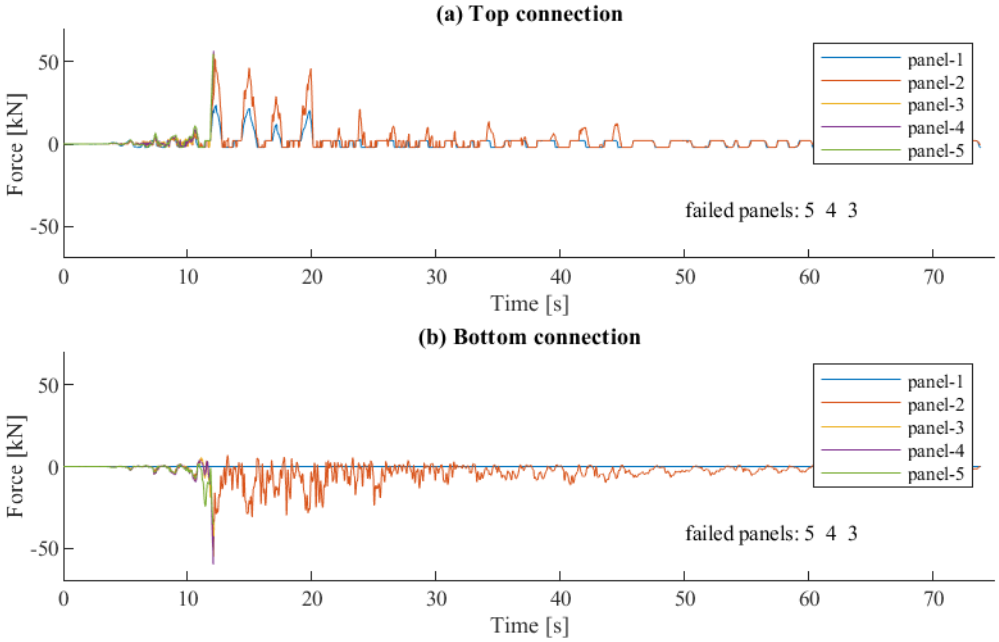

Figure E.39: Structure *m60H9* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika E.39: Montažna hala *m60H9* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

APPENDIX F: Results of parametric analysis considering *MM/P/C/2* parameters

In this appendix, the results of numerical analyses performed on precast structures with centrally positioned connections (*MM*), with silicone sealant between the panels (*P*), the bottom panel connected to the column (*C*) and with the ratio factor $k = 2$ are gathered. Time history responses and distribution of forces and displacements along the height of the structure are shown for three characteristic structures *m60H5*, *m60H7* and *m60H*. To present the characteristic results, the response of structures subjected to ground motion no. 4 was chosen. It is the accelerogram that from all selected accelerograms has the response spectra the closest to EC8 response spectra in the period range of analysed structures.

F.1 Structure *m60H5* a_g = 0.25 g

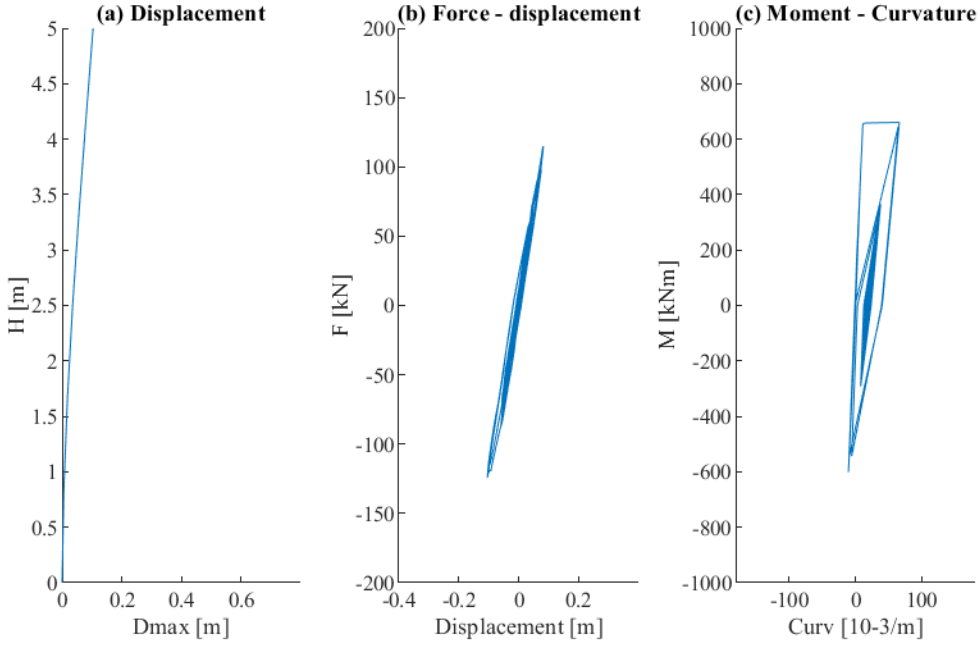

Figure F.1: Structure *m60H5* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika F.1: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

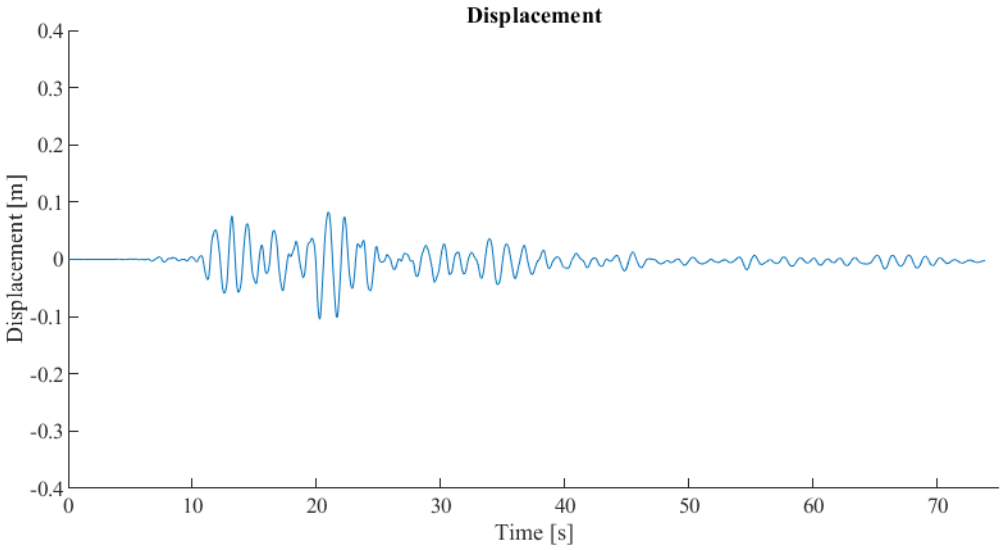

Figure F.2: Structure *m60H5* at a_g = 0.25 g: displacement response history at top of the column

Slika F.2: Montažna hala *m60H5* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

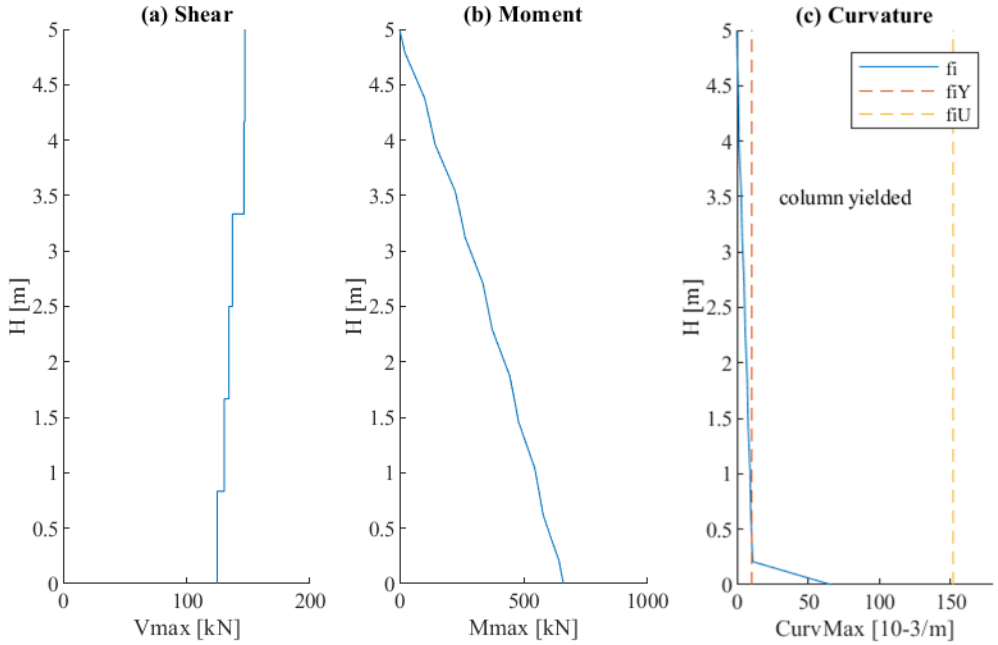

Figure F.3: Structure *m60H5* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika F.3: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

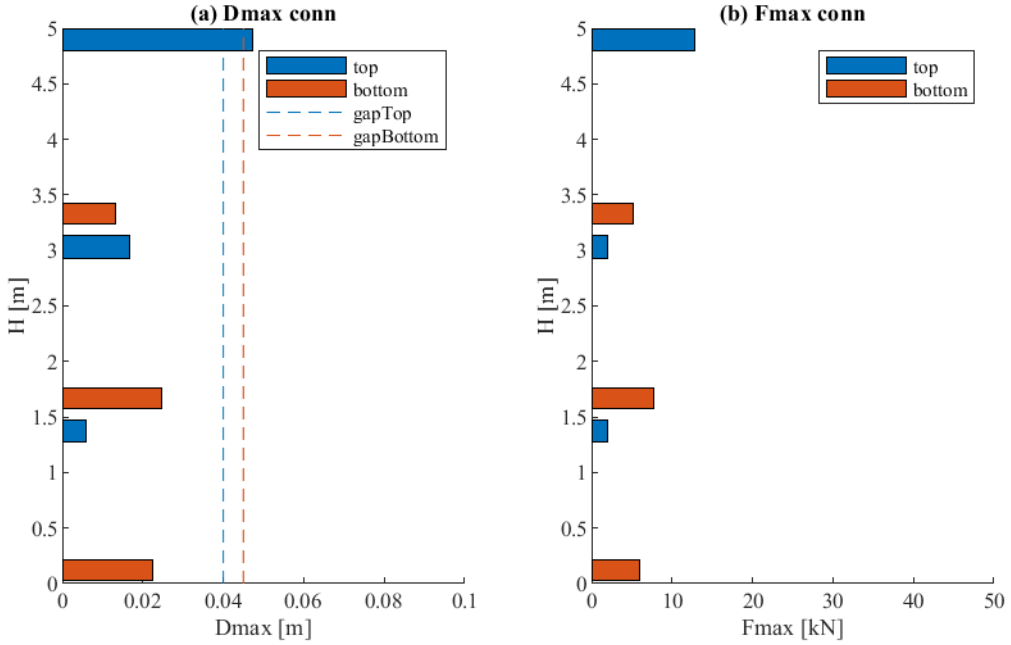

Figure F.4: Structure *m60H5* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika F.4: Montažna hala *m60H5* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

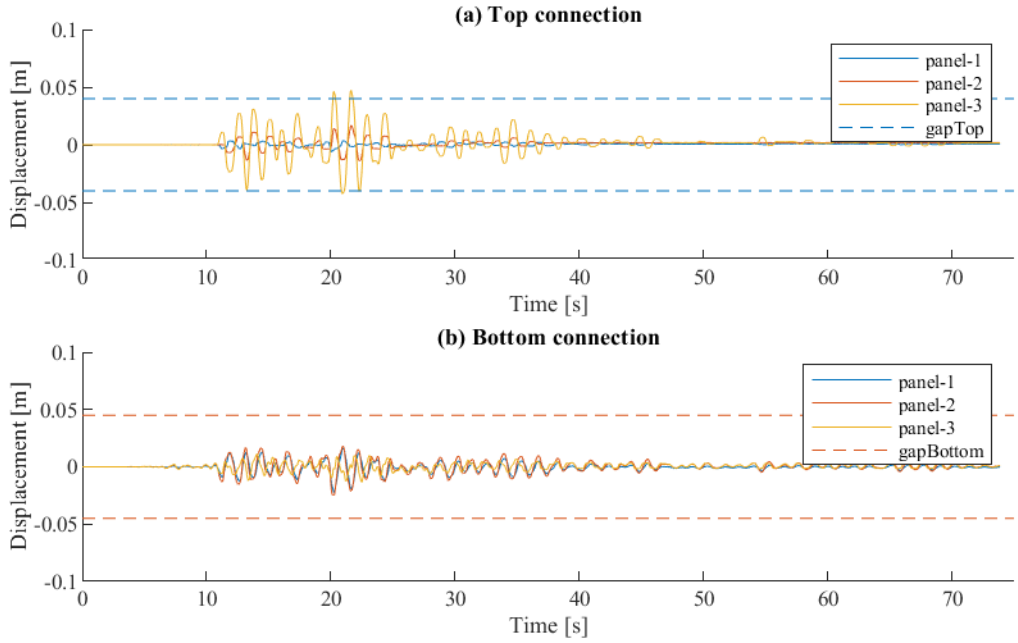

Figure F.5: Structure *m60H5* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika F.5: Montažna hala *m60H5* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

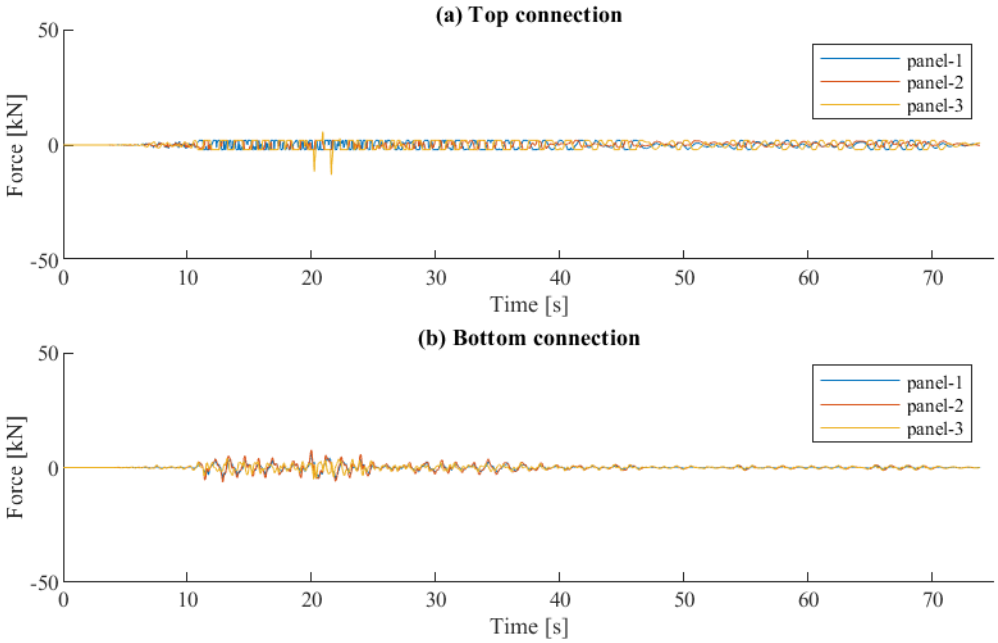

Figure F.6: Structure *m60H5* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika F.6: Montažna hala *m60H5* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

F.2 Structure *m60H7* a_g = 0.25 g

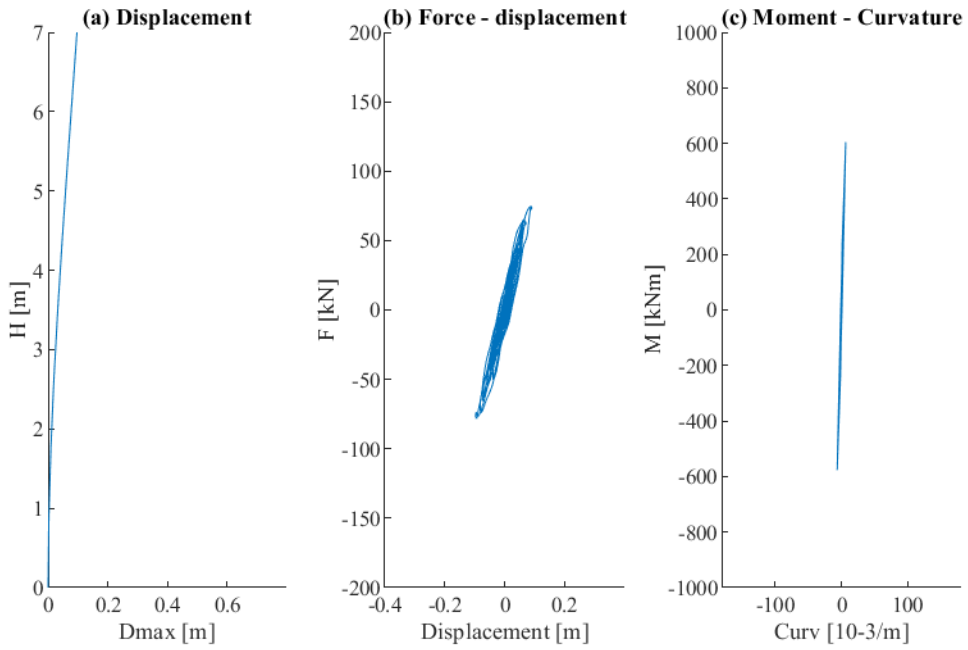

Figure F.7: Structure *m60H7* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika F.7: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

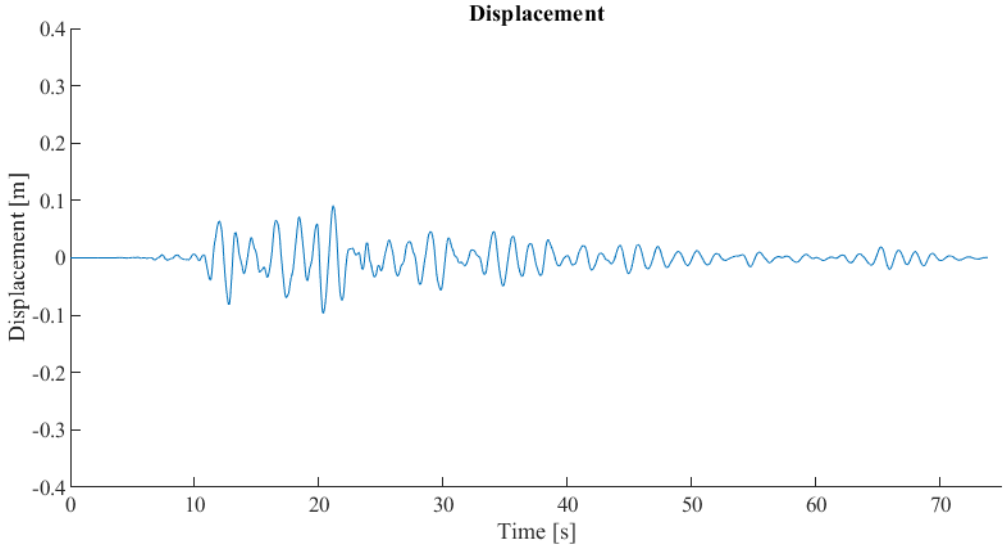

Figure F.8: Structure *m60H7* at a_g = 0.25 g: displacement response history at top of the column

Slika F.8: Montažna hala *m60H7* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

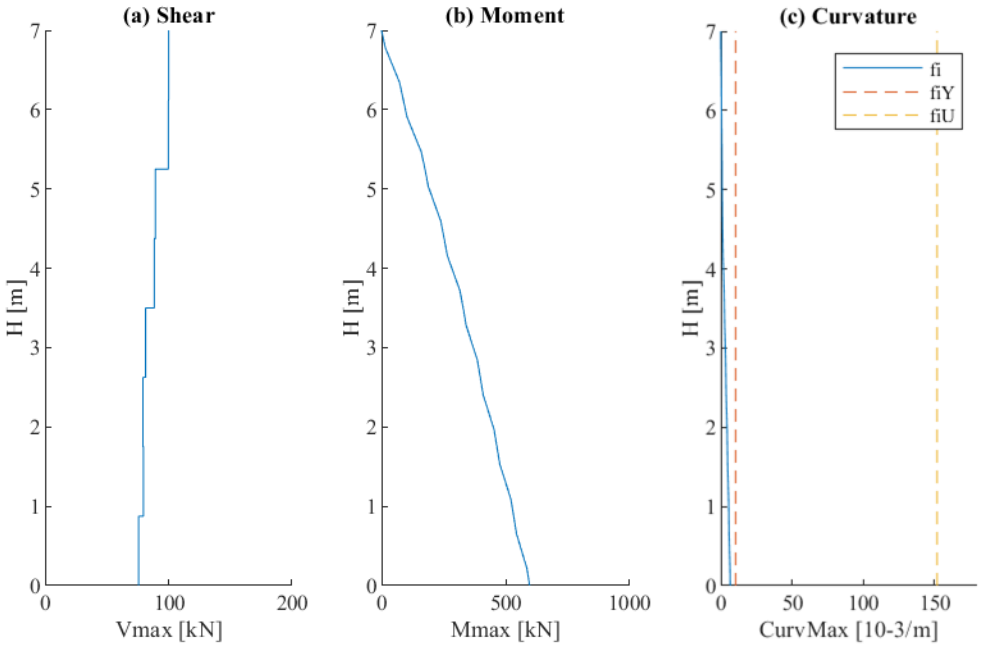

Figure F.9: Structure *m60H7* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika F.9: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

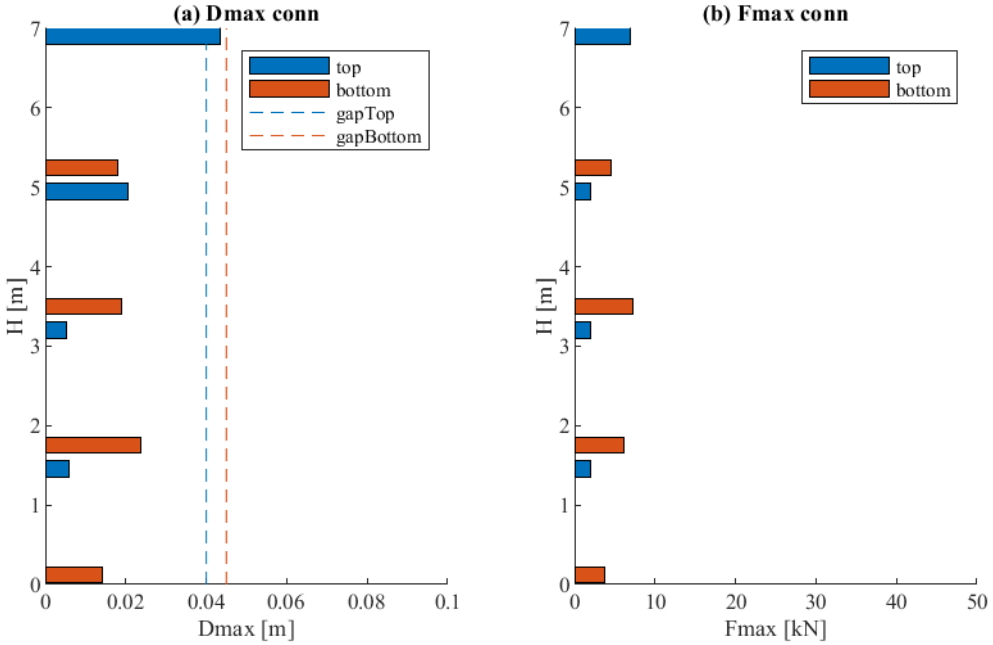

Figure F.10: Structure *m60H7* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika F.10: Montažna hala *m60H7* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

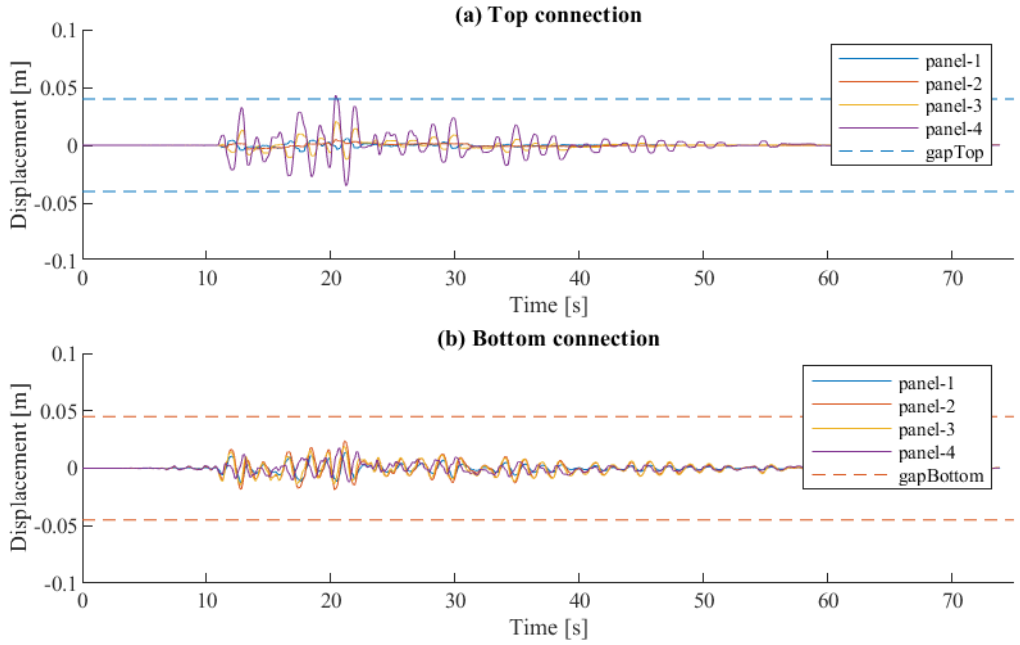

Figure F.11: Structure *m60H7* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika F.11: Montažna hala *m60H7* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

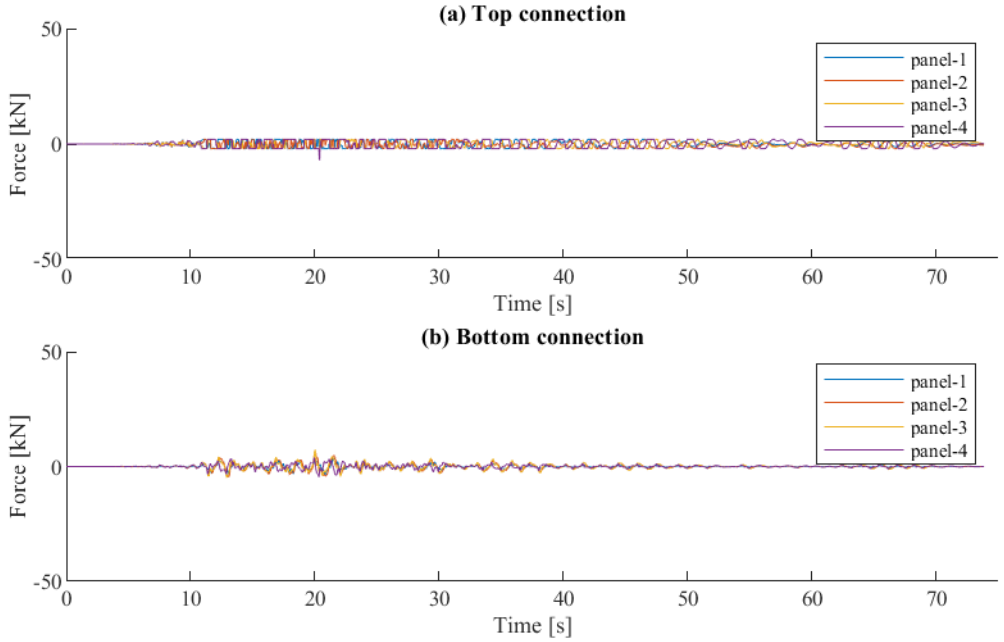

Figure F.12: Structure *m60H7* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika F.12: Montažna hala *m60H7* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

F.3 Structure *m60H9* a_g = 0.25 g

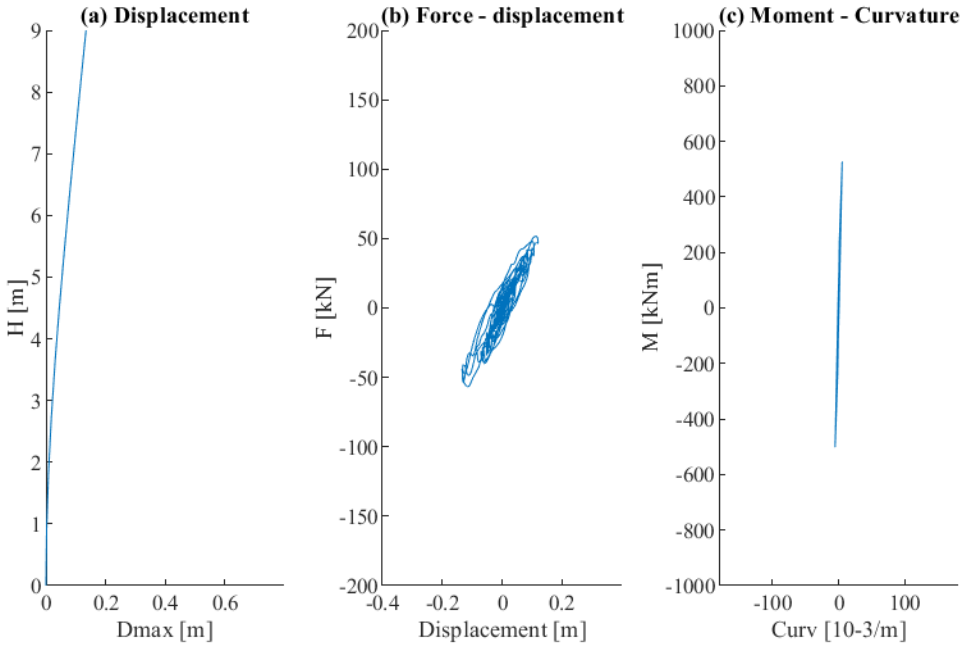

Figure F.13: Structure *m60H9* at a_g = 0.25 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika F.13: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

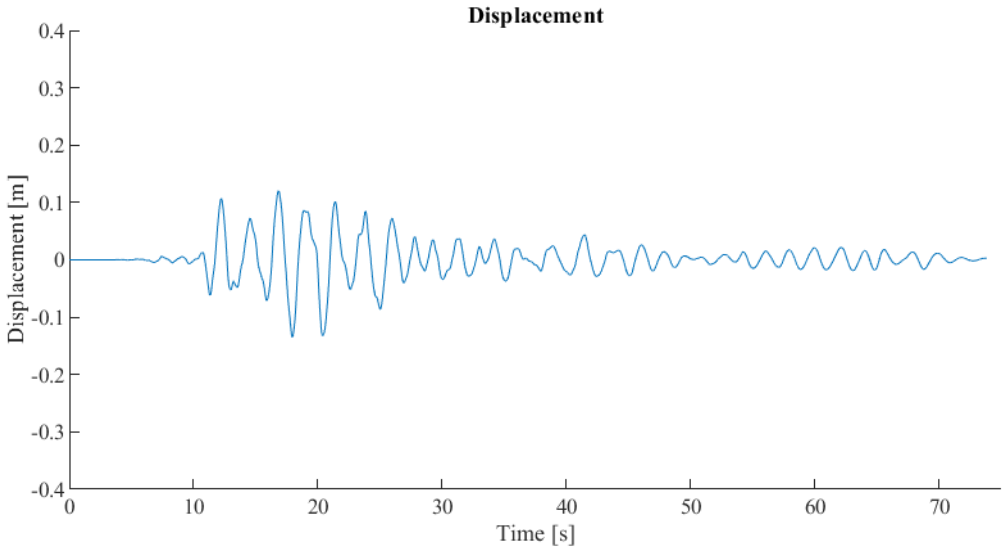

Figure F.14: Structure *m60H9* at a_g = 0.25 g: displacement response history at top of the column

Slika F.14: Montažna hala *m60H9* pri a_g = 0.25 g: časovni potek pomikov na vrhu stebra

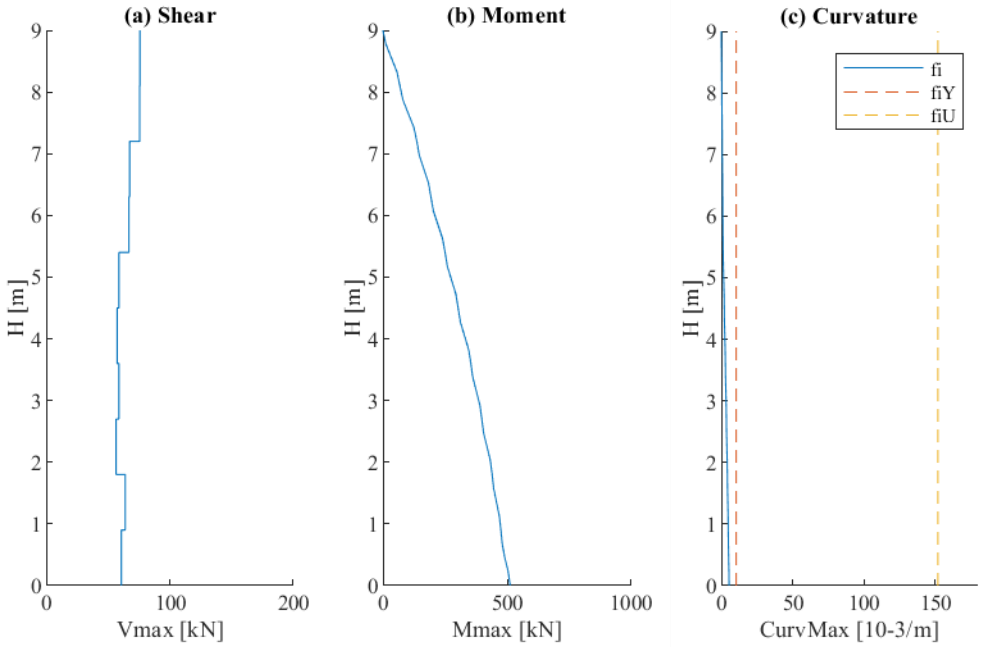

Figure F.15: Structure *m60H9* at a_g = 0.25 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika F.15: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

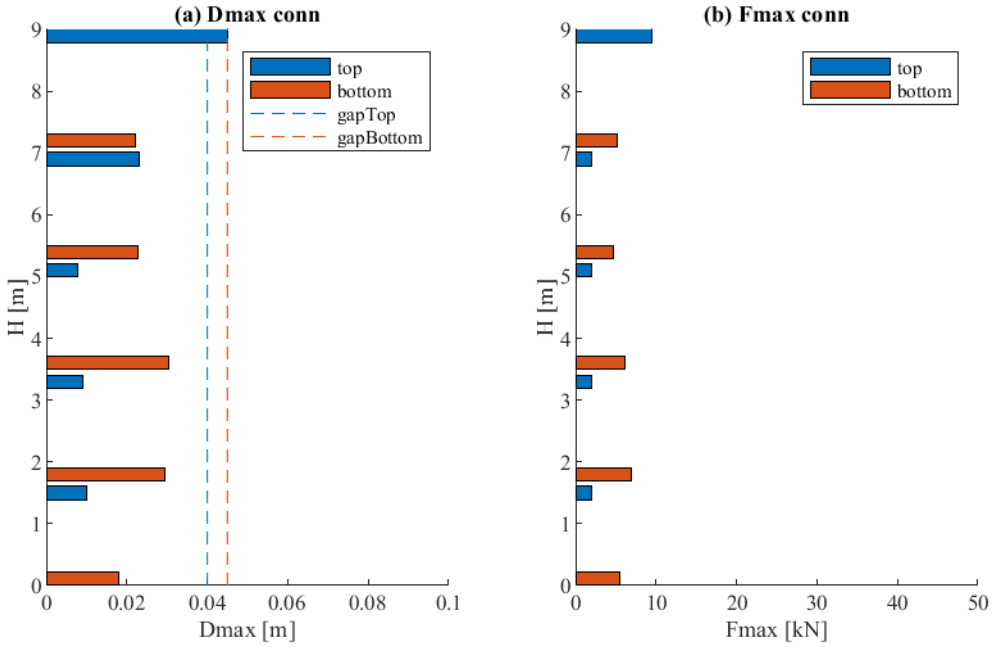

Figure F.16: Structure *m60H9* at a_g = 0.25 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika F.16: Montažna hala *m60H9* pri a_g = 0.25 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

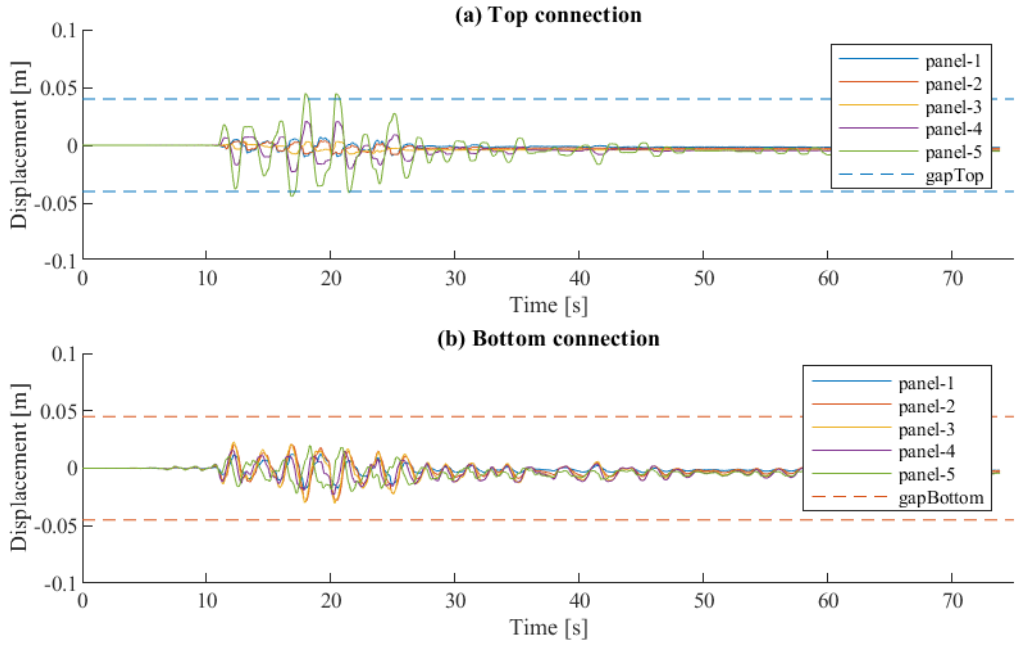

Figure F.17: Structure *m60H9* at a_g = 0.25 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika F.17: Montažna hala *m60H9* pri a_g = 0.25 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

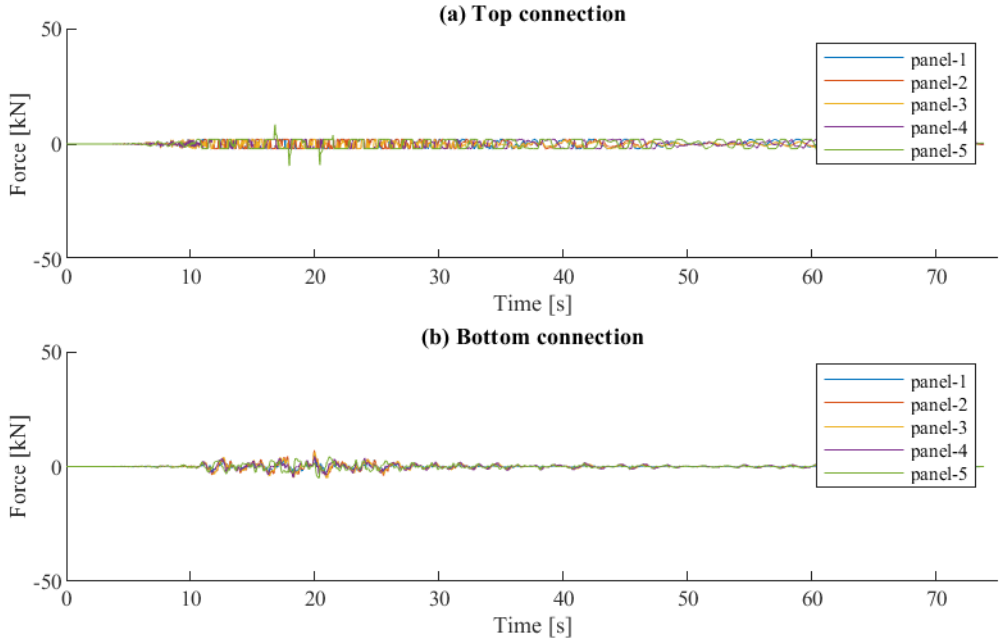

Figure F.18: Structure *m60H9* at a_g = 0.25 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika F.18: Montažna hala *m60H9* pri a_g = 0.25 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

F.4 Structure *m60H5* a_g = 0.675 g

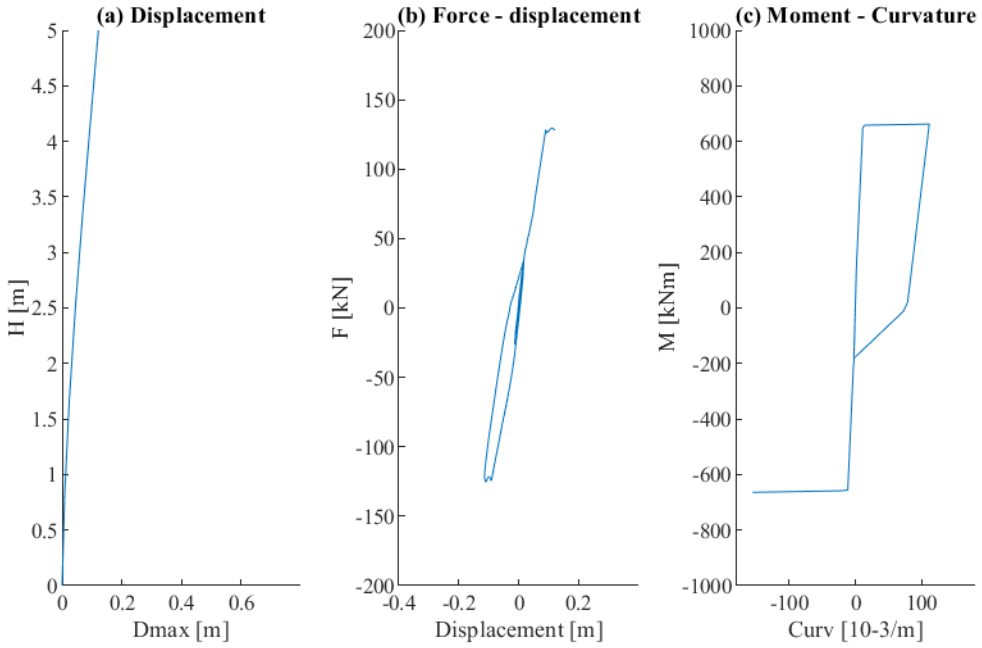

Figure F.19: Structure *m60H5* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika F.19: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

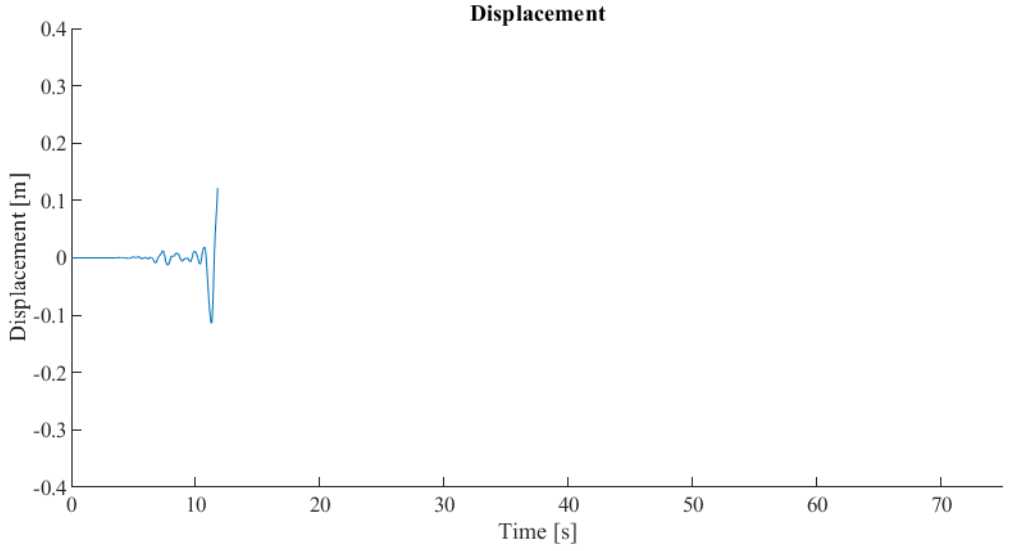

Figure F.20: Structure *m60H5* at a_g = 0.675 g: displacement response history at top of the column

Slika F.20: Montažna hala *m60H5* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

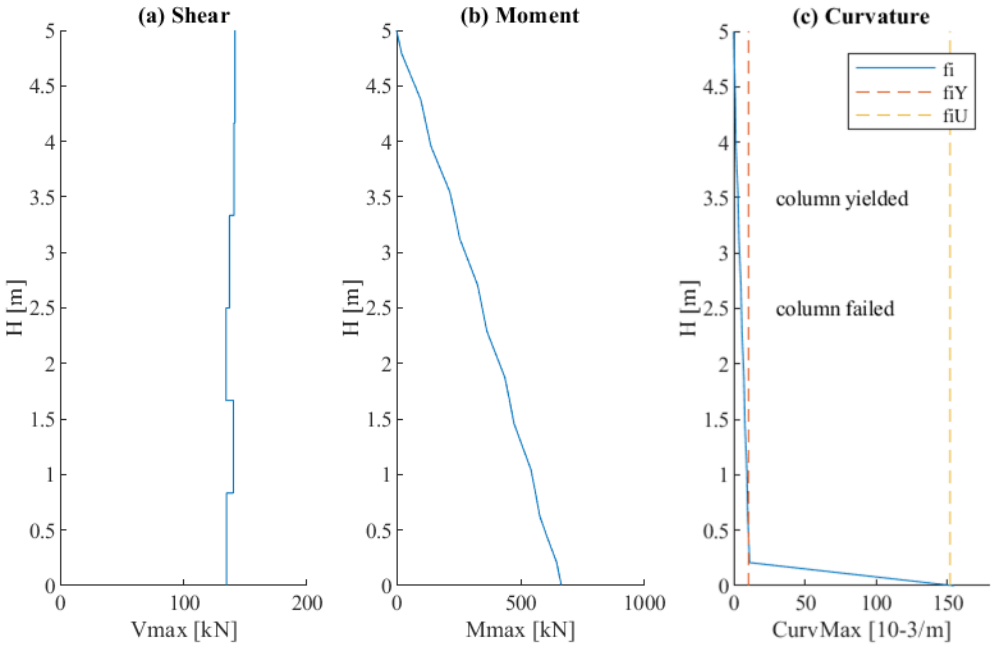

Figure F.21: Structure *m60H5* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika F.21: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

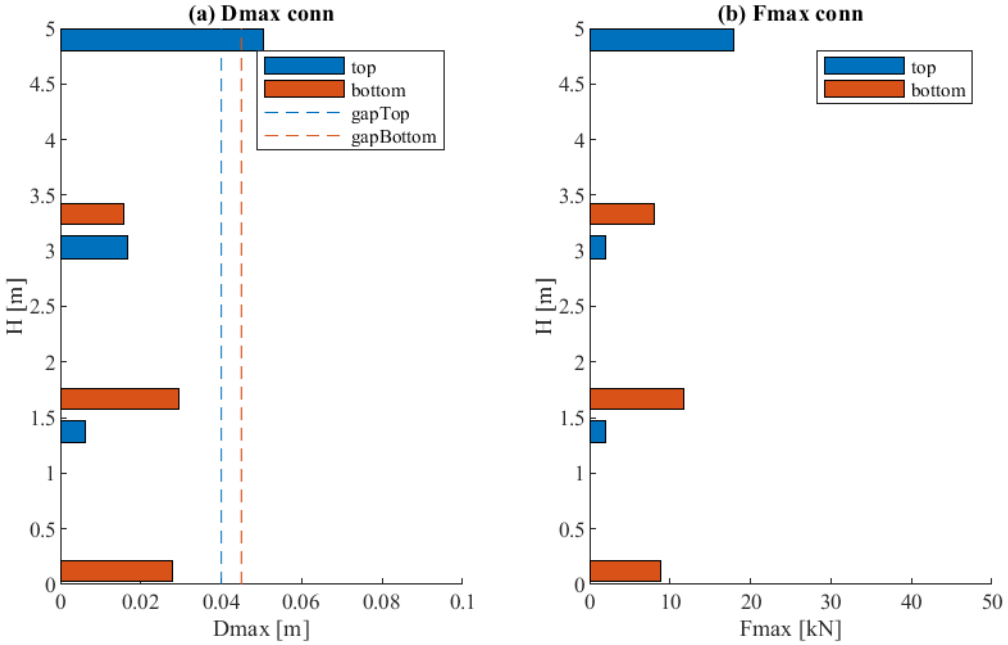

Figure F.22: Structure *m60H5* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika F.22: Montažna hala *m60H5* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

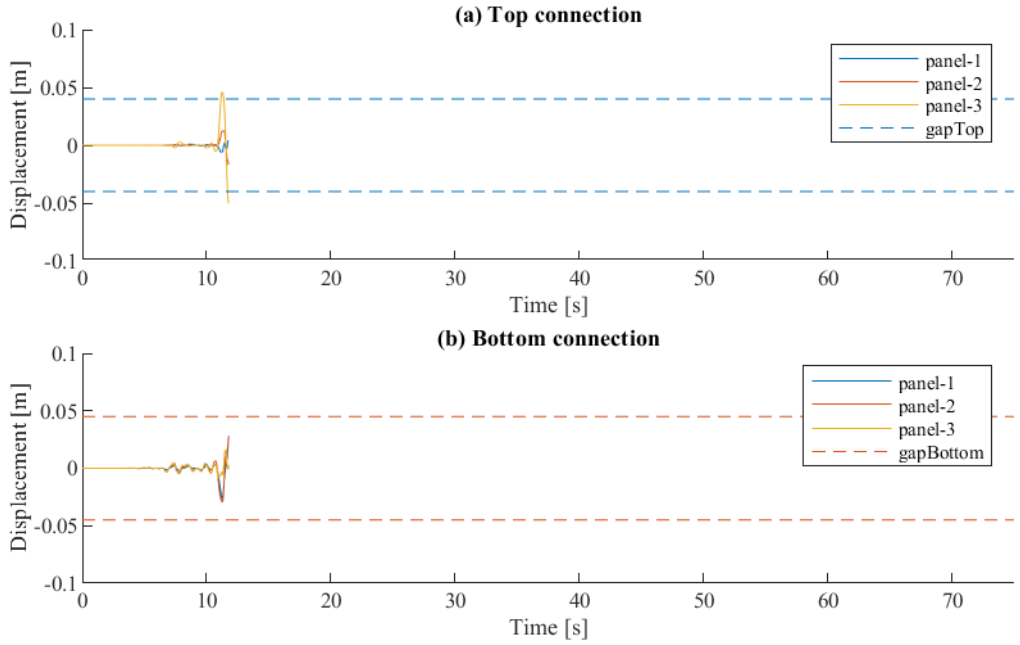

Figure F.23: Structure *m60H5* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika F.23: Montažna hala *m60H5* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

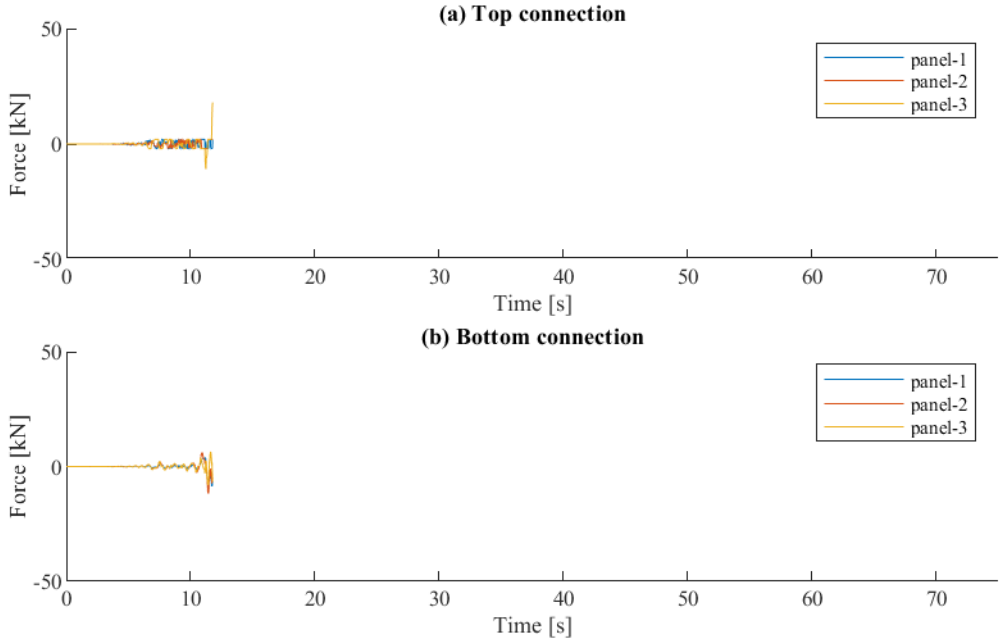

Figure F.24: Structure *m60H5* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika F.24: Montažna hala *m60H5* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

F.5 Structure *m60H7* a_g = 0.675 g

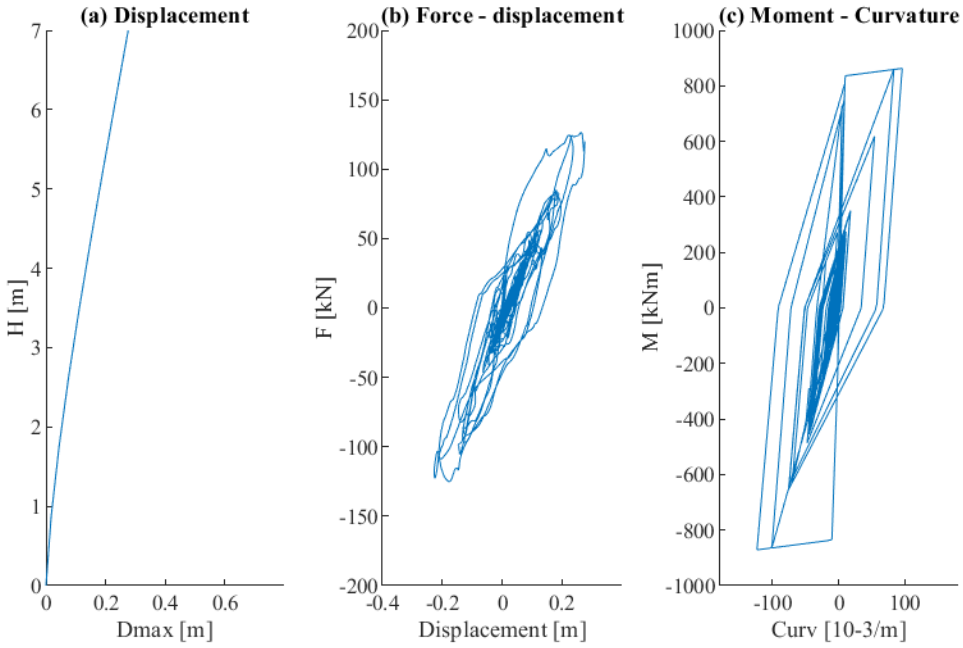

Figure F.25: Structure *m60H7* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika F.25: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

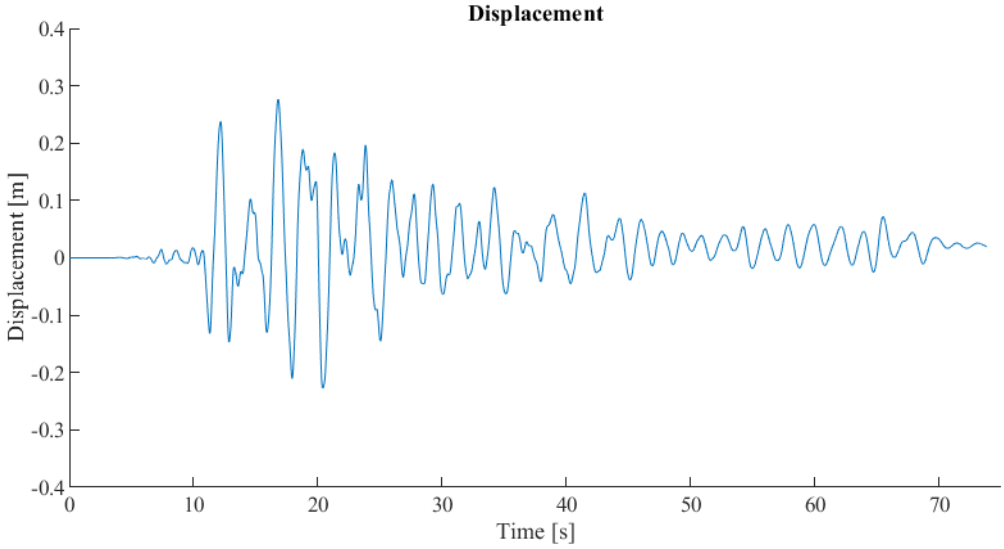

Figure F.26: Structure *m60H7* at a_g = 0.675 g: displacement response history at top of the column

Slika F.26: Montažna hala *m60H7* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

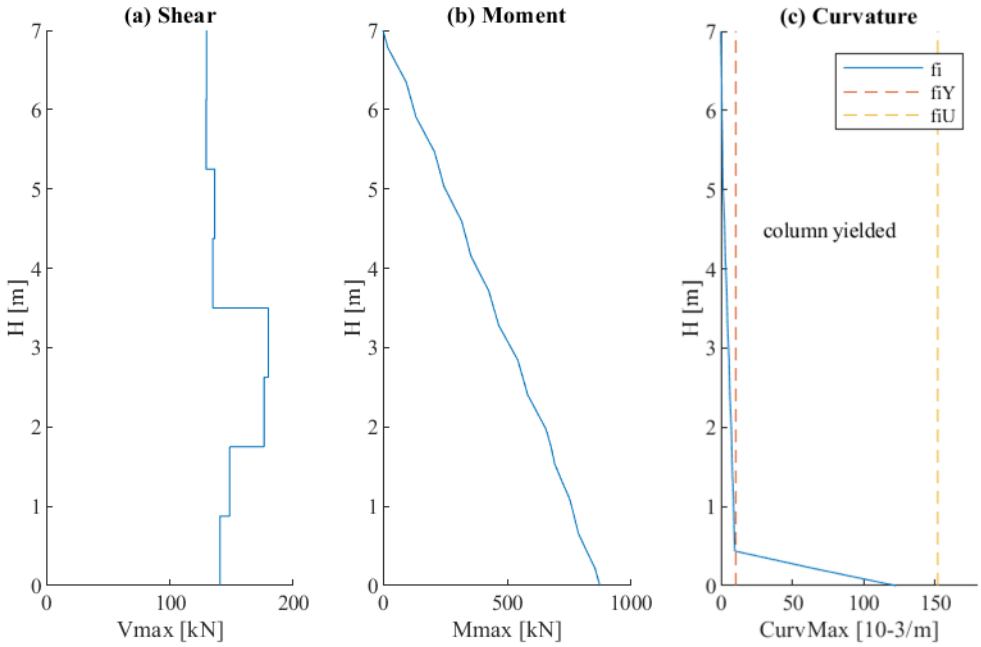

Figure F.27: Structure *m60H7* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika F.27: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

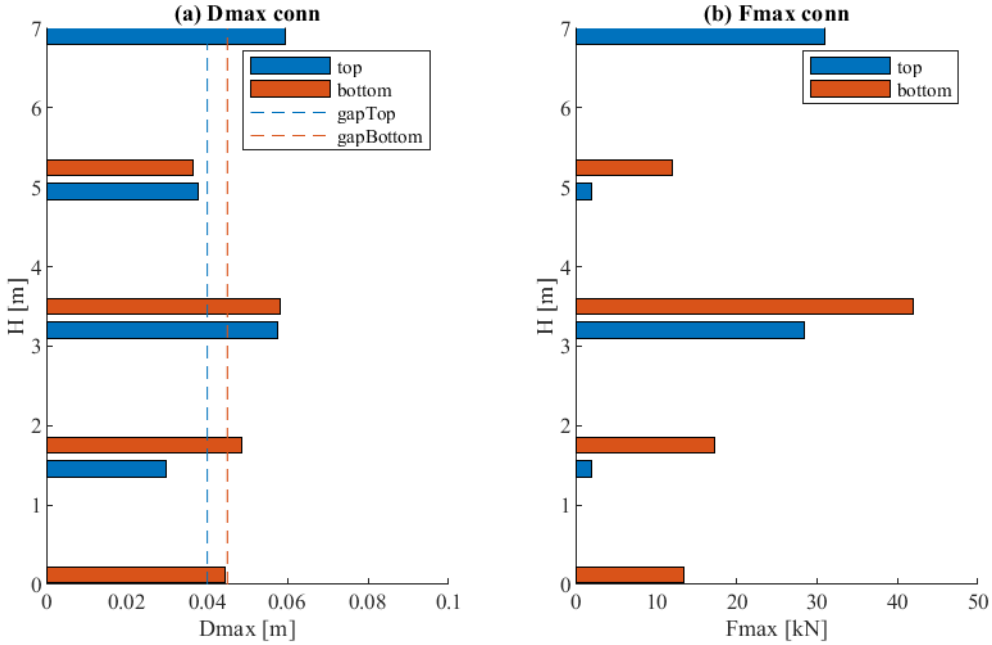

Figure F.28: Structure *m60H7* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika F.28: Montažna hala *m60H7* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

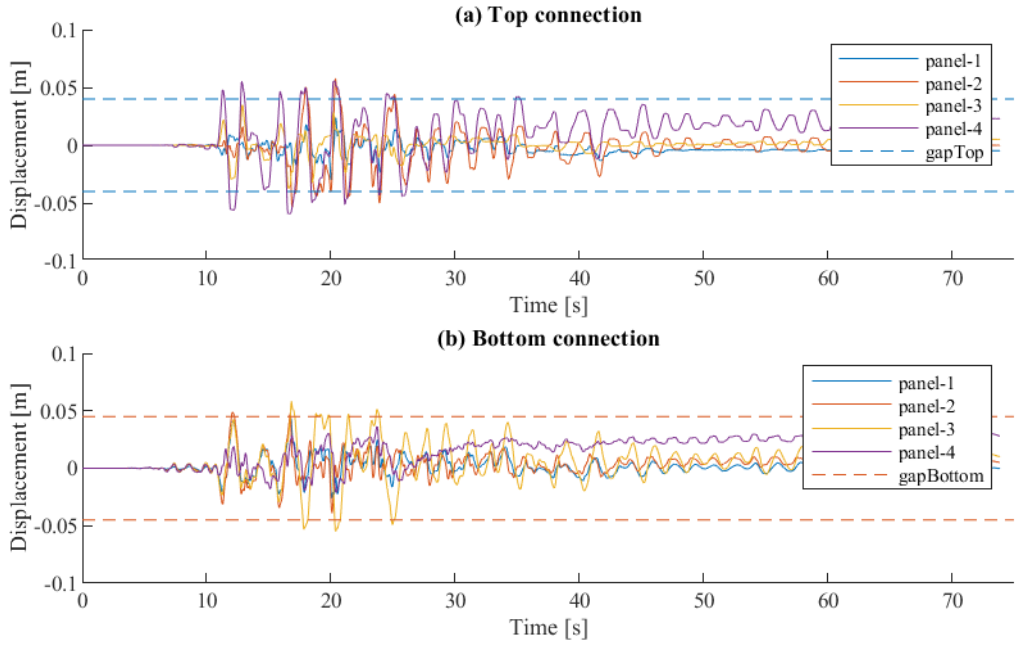

Figure F.29: Structure *m60H7* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika F.29: Montažna hala *m60H7* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

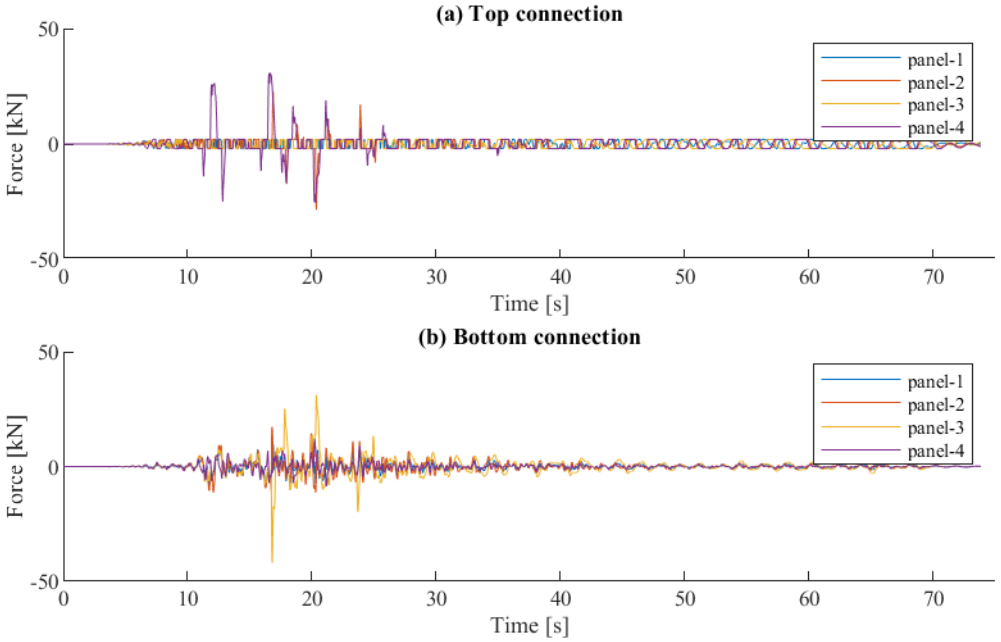

Figure F.30: Structure *m60H7* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika F.30: Montažna hala *m60H7* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

F.6 Structure *m60H9* a_g = 0.675 g

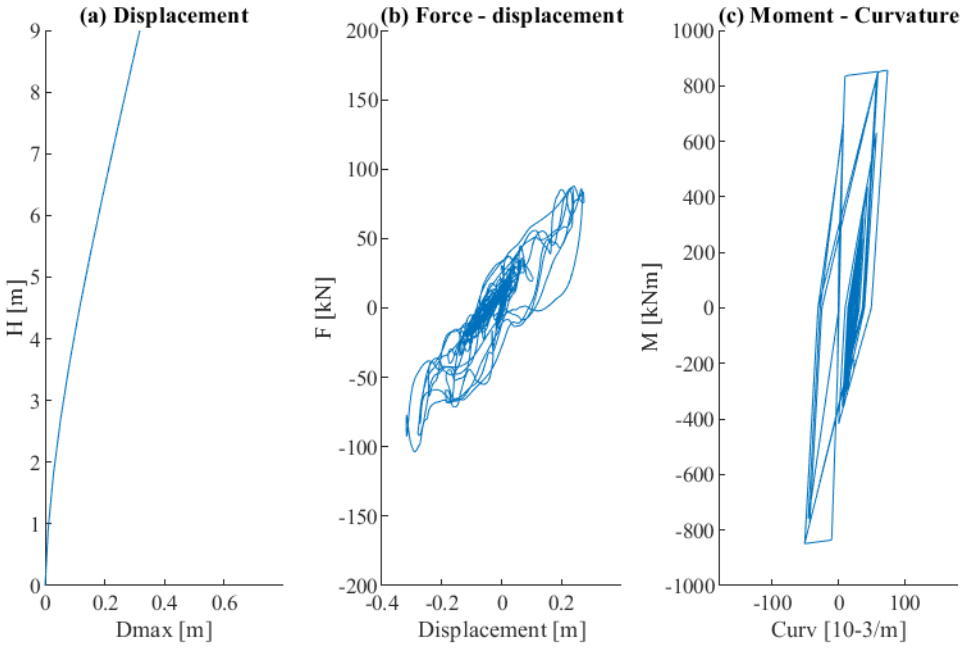

Figure F.31: Structure *m60H9* at a_g = 0.675 g: (a) maximum column's displacements, (b) force-displacement response and (c) moment-curvature response at column's base

Slika F.31: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največji pomiki stebra, (b) odziv sila-pomik in (c) odziv moment-ukrivljenost ob vpetju stebra

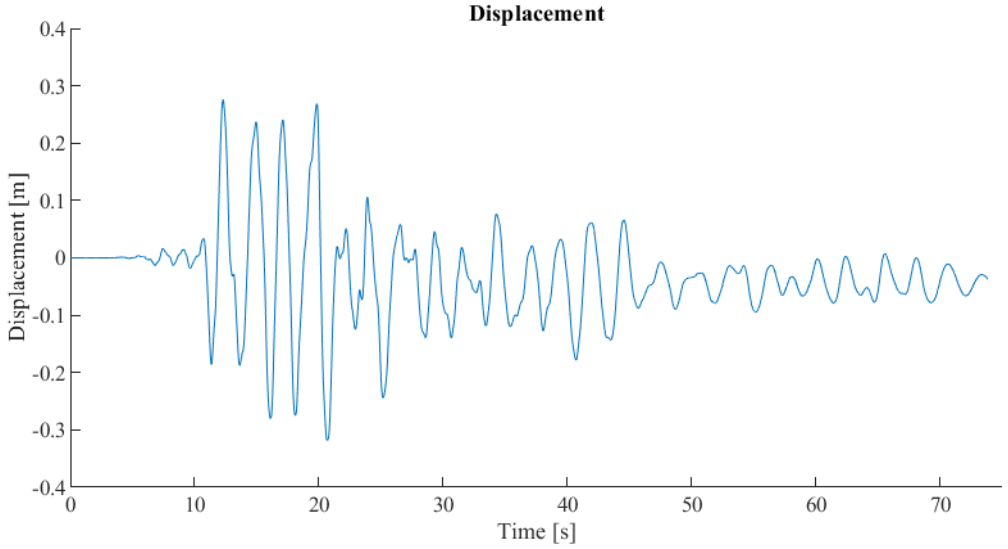

Figure F.32: Structure *m60H9* at a_g = 0.675 g: displacement response history at top of the column

Slika F.32: Montažna hala *m60H9* pri a_g = 0.675 g: časovni potek pomikov na vrhu stebra

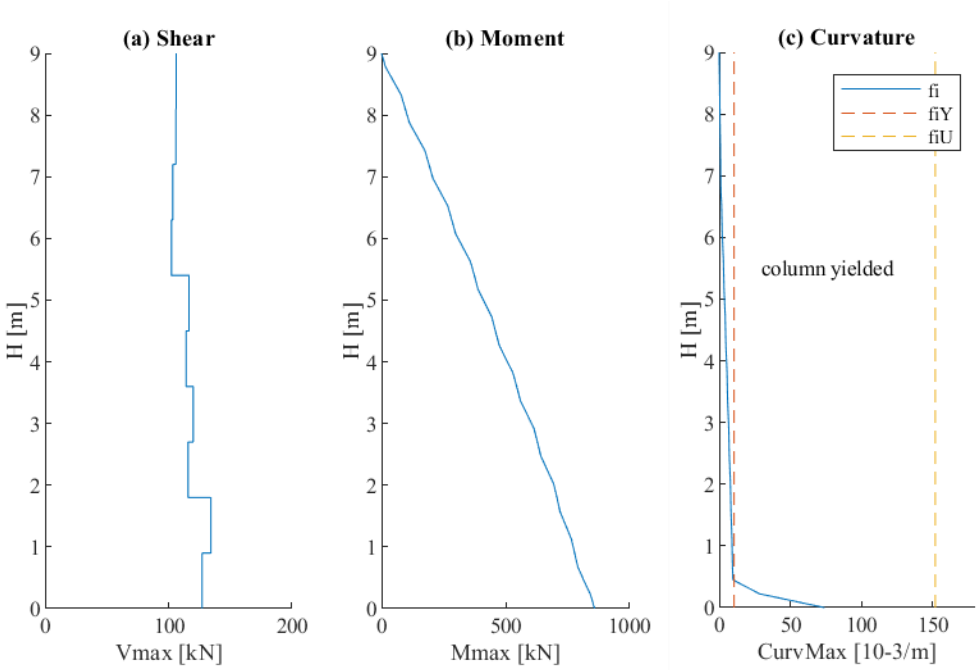

Figure F.33: Structure *m60H9* at a_g = 0.675 g: (a) maximum shear force, (b) maximum moments and (c) maximum curvature along the column's height

Slika F.33: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največja strižna sila, (b) največji momenti in (c) največja ukrivljenost po višini stebra

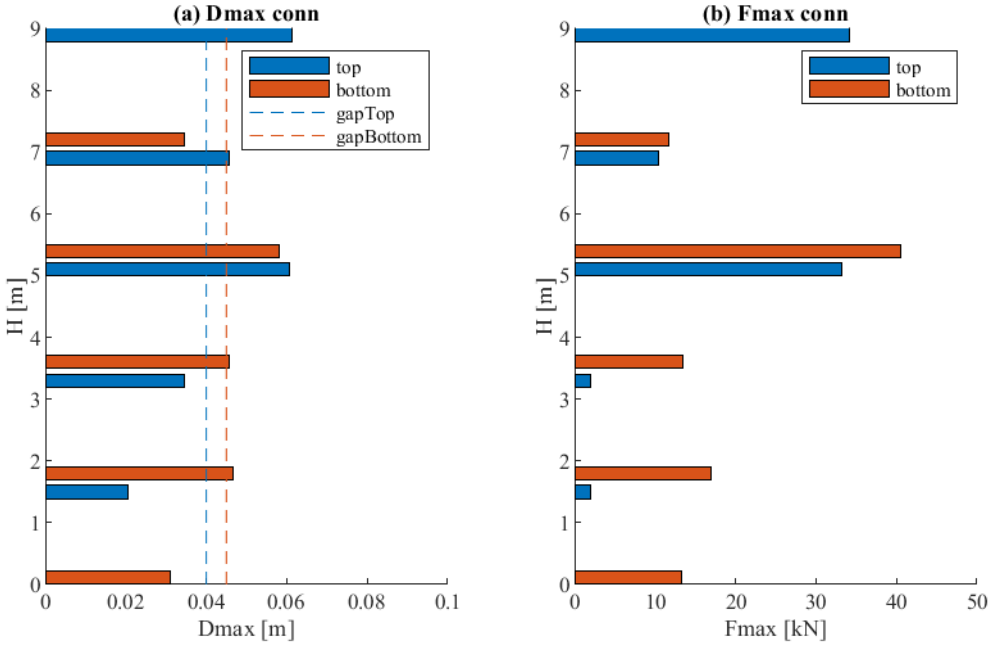

Figure F.34: Structure *m60H9* at a_g = 0.675 g: (a) maximum relative displacements in cladding connections, (b) maximum forces in cladding connections

Slika F.34: Montažna hala *m60H9* pri a_g = 0.675 g: (a) največji relativni pomiki fasadnih stikov, (b) največje sile v fasadnih stikih

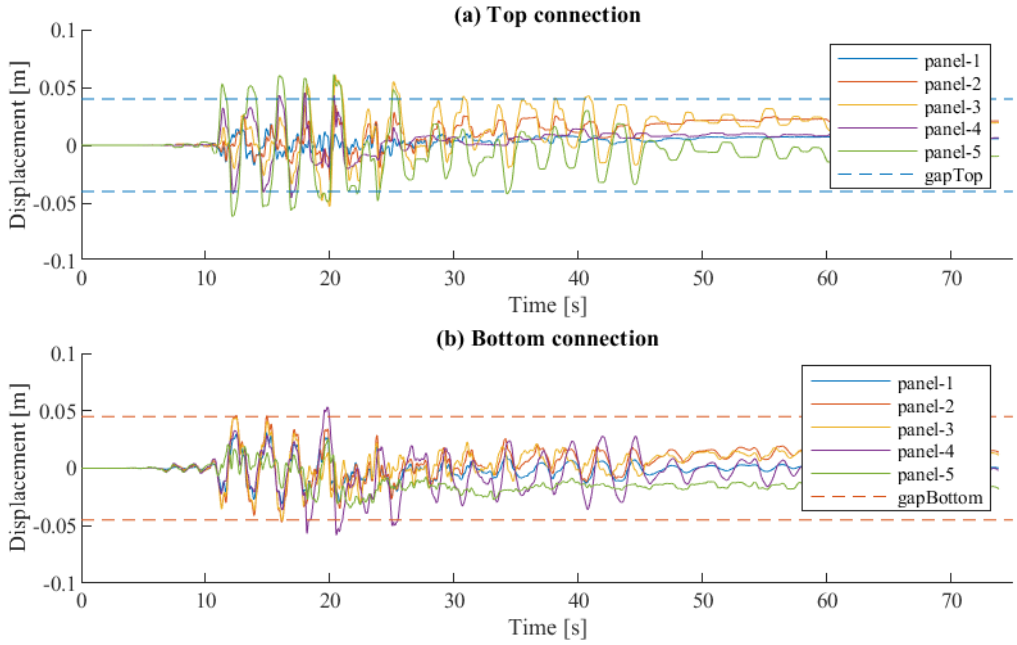

Figure F.35: Structure *m60H9* at a_g = 0.675 g: (a) displacement response history for the top connections, (b) displacement response history for the bottom connections

Slika F.35: Montažna hala *m60H9* pri a_g = 0.675 g: (a) časovni potek pomikov v zgornjih stikih, (b) časovni potek pomikov v spodnjih stikih

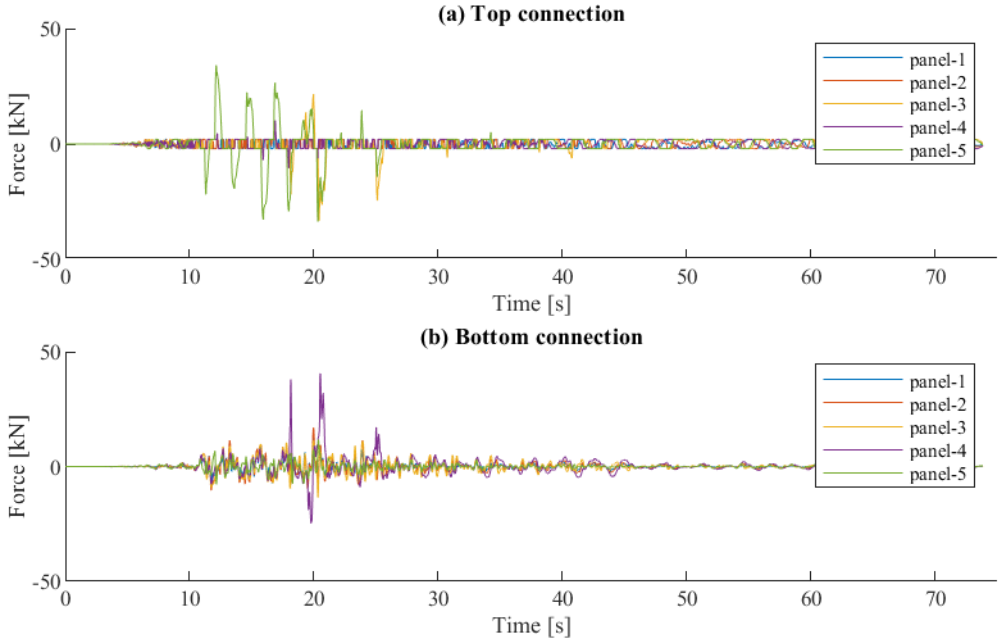

Figure F.36: Structure *m60H9* at a_g = 0.675 g: (a) force response history for the top connections, (b) force response history for the bottom connections

Slika F.36: Montažna hala *m60H9* pri a_g = 0.675 g: (a) časovni potek sil v zgornjih stikih, (b) časovni potek sil v spodnjih stikih

APPENDIX G: Derivation of expressions for estimation of the ratio between the maximum and average column drifts along the single panel

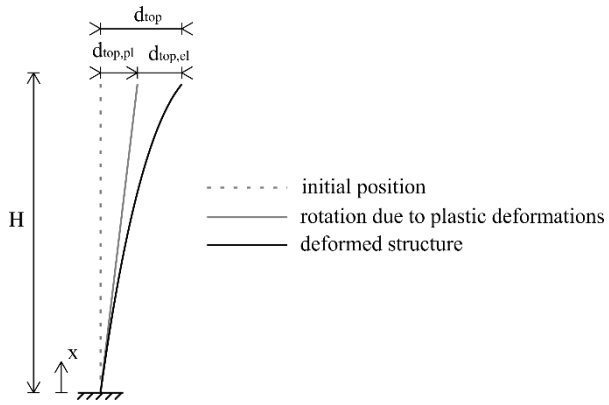

Figure G.1: Deflection of a cantilever column
Slika G.1: Deformacijska linija konzolnega stebra

As shown in Figure G.1, displacement at top of the structure d_{top} can be expressed as sum of the plastic part $d_{top,pl}$ and the elastic part $d_{top,el}$. It is approximately sum of the displacement due to rotation of plastic hinge and displacement due to the elastic deformations of the column.

$$d_{top} = d_{top,pl} + d_{top,el} \tag{G.1}$$

$$d_{top,pl} = r_d \cdot d_{top} \tag{G.2}$$

$$d_{top,el} = (1 - r_d) \cdot d_{top} \tag{G.3}$$

Average column's drift along the single panel:

$$\Delta d_{col,p,avg} = \frac{d_{top}}{H} \cdot h_p \tag{G.4}$$

Maximum column's drift along the single panel, i.e. column's drift along the panel at top of the structure:

$$\Delta d_{col,p,top} = \Delta d_{col,p,pl} + \Delta d_{col,p,el} \tag{G.5}$$

$$\Delta d_{col,p,pl} = \frac{d_{top,pl}}{H} \cdot h_p \tag{G.6}$$

$$\Delta d_{col,p,el} = A \cdot \Delta d_{col,p,el,avg} \tag{G.7}$$

A is the ratio between maximum and average column's drifts along the single panel ($\Delta d_{col,pl,el}$ / $\Delta d_{col,pl,el,avg}$) due to the elastic part of deformations. It is derived from formula of cantilever deflection under concentrated load at free end:

$$y(x) = \frac{Px^2}{6EI} \cdot (3H - x) \tag{G.8}$$

$$\Delta d_{col,p,el} = y(H) - y(H - h_p) \tag{G.9}$$

Displacement at top due to elastic part of deformations:

$$y(H) = \frac{PH^2}{6EI} \cdot (3H - H) = \frac{PH^3}{3EI} \tag{G.10}$$

$$y(H) = d_{top,el} = \frac{PH^3}{3EI} \tag{G.11}$$

$$P = d_{top,el} \cdot \frac{3EI}{H^3} \tag{G.12}$$

Displacement at the level (*H – hp)* due to elastic part of deformations:

$$y\big(H - h_p\big) = \frac{P(H-h_p)^2}{6EI} \cdot \big(3H - (H - h_p)\big) = d_{top,el} \cdot \frac{3EI}{H^3} \cdot \frac{(H-h_p)^2}{6EI} \cdot \big(3H - H + h_p\big) \tag{G.13}$$

$$y\big(H - h_p\big) = d_{top,el} \cdot \frac{3EI}{H^3} \cdot \frac{(H-h_p)^2}{6EI} \cdot \big(3H - H + h_p\big) \tag{G.14}$$

$$y\big(H - h_p\big) = d_{top,el} \cdot \frac{(H-h_p)^2}{2H^3} \cdot \big(2H + h_p\big) \tag{G.15}$$

Maximum column's drift along the single panel (i.e. column's drift along the panel at top of the structure) due to elastic deformations:

$$\Delta d_{col,p,el} = d_{top,el} - d_{top,el} \cdot \frac{(H-h_p)^2}{2H^3} \cdot \big(2H + h_p\big) \tag{G.16}$$

Average column's drift along the single panel due to elastic deformations:

$$\Delta d_{col,p,el,avg} = \frac{d_{top,el}}{H} \cdot h_p \tag{G.17}$$

The ratio between maximum and average column's drifts along the single panel due to elastic deformations:

$$A = \frac{\Delta d_{col,p,el}}{\Delta d_{col,p,el,avg}} \tag{G.18}$$

$$A = \frac{d_{top,el} \cdot H}{d_{top,el} \cdot h_p} - \frac{d_{top,el} \cdot H}{d_{top,el} \cdot h_p} \cdot \frac{(H-h_p)^2}{2H^3} \cdot \big(2H + h_p\big) \tag{G.19}$$

$$A = \frac{2H^3-(H-h_p)^2(2H+h_p)}{2H^2 \cdot h_p} \tag{G.20}$$

The ratio between maximum and average column drifts along the single panel:

$$\frac{\Delta d_{col,p,top}}{\Delta d_{col,p,avg}} = \frac{\Delta d_{col,p,pl}+\Delta d_{col,p,el}}{\frac{d_{top}}{H} \cdot h_p} \tag{G.21}$$

$$\frac{\Delta d_{col,p,top}}{\Delta d_{col,p,avg}} = \frac{\frac{d_{top,pl}}{H} \cdot h_p + A \cdot \Delta d_{col,p,el,avg}}{\frac{d_{top}}{H} \cdot h_p} \tag{G.22}$$

$$\frac{\Delta d_{col,p,top}}{\Delta d_{col,p,avg}} = \frac{\frac{d_{top,pl}}{H} \cdot h_p + A \cdot \frac{d_{top,el}}{H} \cdot h_p}{\frac{d_{top}}{H} \cdot h_p} \tag{G.23}$$

$$\frac{\Delta d_{col,p,top}}{\Delta d_{col,p,avg}} = \frac{d_{top,pl}+A \cdot d_{top,el}}{d_{top}} \tag{G.24}$$

$$\frac{\Delta d_{col,p,top}}{\Delta d_{col,p,avg}} = \frac{r_d \cdot d_{top}+A \cdot (1-r_d) \cdot d_{top}}{d_{top}} \tag{G.25}$$

$$\frac{\Delta d_{col,p,top}}{\Delta d_{col,p,avg}} = A - Ar_d + r_d \tag{G.26}$$

If there are no plastic deformations, then r_d is equal to zero, and the ratio between maximum and average column drifts along the single panel is equal to *A*.