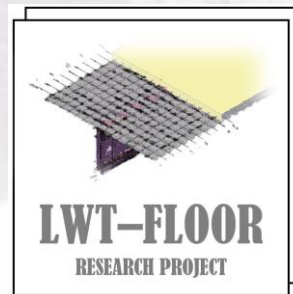
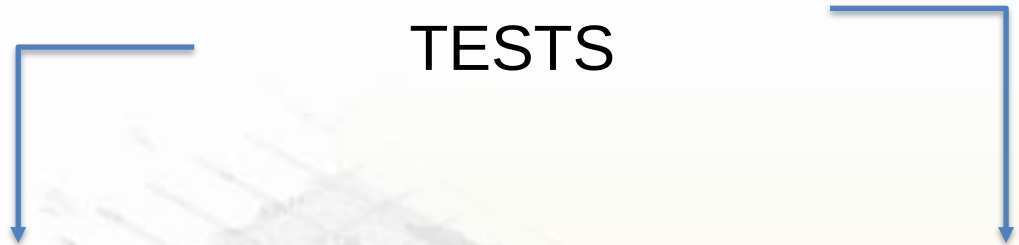


Implementation and analyses of laboratory tests - base material & spot welds

I. Lukačević, I. Ćurković, M. Bartolac, **A. Rajić**, V. Žuvelek



LABORATORY TESTS



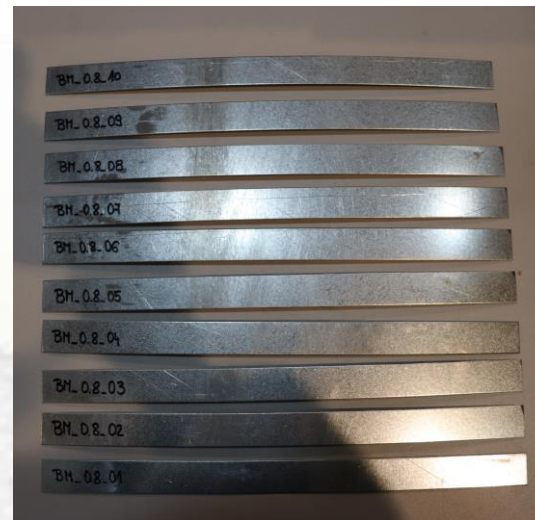
BASE MATERIAL

- steel sheets
- concrete
- reinforcement bars
- reinforcement mesh
- bolts

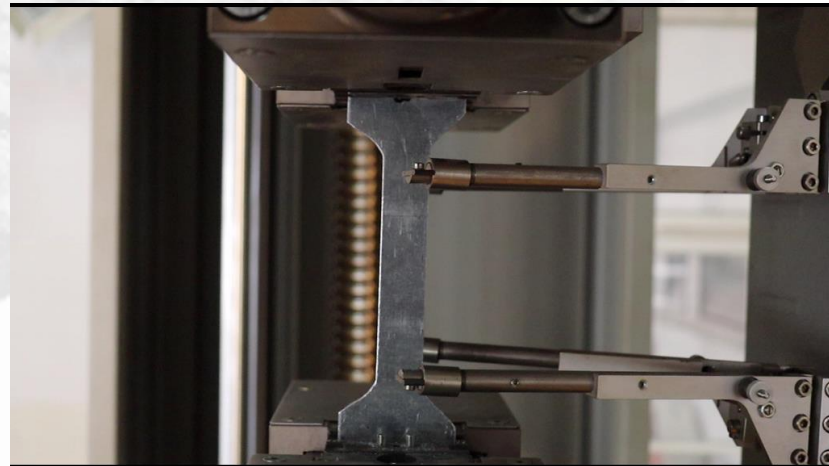
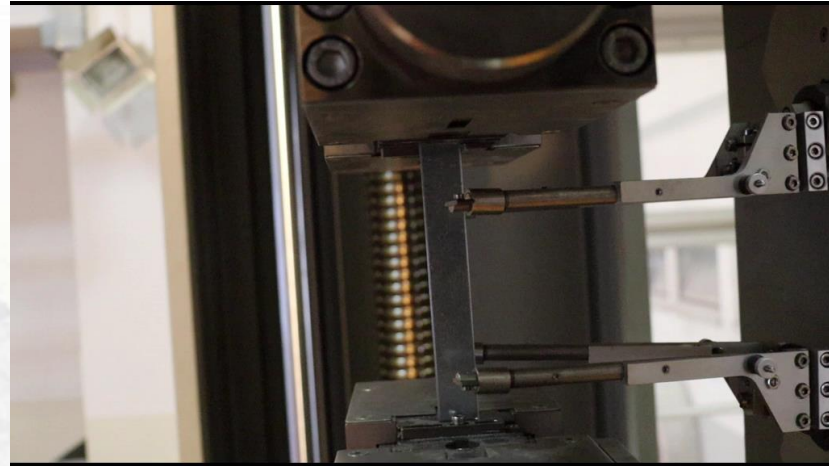
SPOT WELDS

tested sheets' thicknesses :

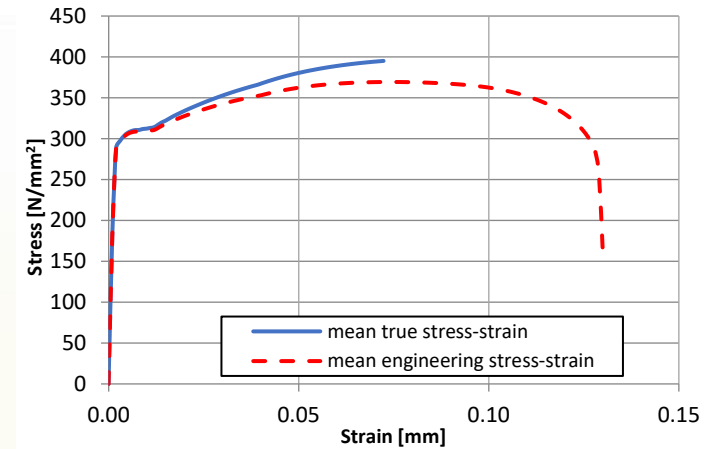
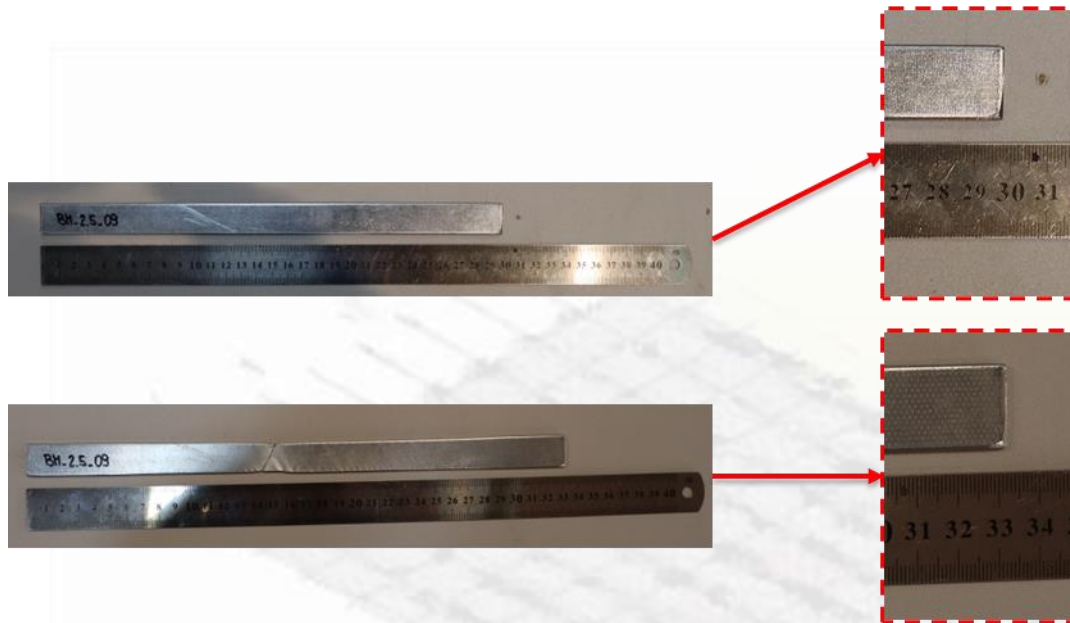
- 0.8 mm
- 1.0 mm
- 1.25 mm
- 1.5 mm
- 2.0 mm
- 2.5 mm
- 3.0 mm



STEEL SHEETS



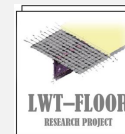
STEEL SHEETS



BM_3.0



STEEL SHEETS



BM_08_01		BM_08_02		BM_08_03		BM_08_04		BM_08_05		BM_08_06		BM_08_07		BM_08_08		BM_08_09		BM_08_10		
Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	
0.78	20.07	0.77	20.07	0.78	19.94	0.79	20.02	0.78	20.09	0.79	20.12	0.78	20.13	0.78	20.11	0.8	20.07	0.79	19.99	
0.77	20.02	0.77	20.09	0.79	19.93	0.77	20.04	0.79	20.05	0.77	20.16	0.79	20.07	0.76	20.04	0.78	20.07	0.79	19.98	
0.78	20.04	0.77	20.06	0.79	20.05	0.78	19.983	0.77	20.09	0.78	20.22	0.79	20.13	0.79	20.03	0.77	20.05	0.77	20.04	
0.78	20.04	0.77	20.07	0.79	19.97	0.78	20.01	0.78	20.08	0.78	20.17	0.79	20.11	0.78	20.06	0.78	20.06	0.78	20.00	
BM_2.5_01		BM_2.5_02		BM_2.5_03		BM_2.5_04		BM_2.5_05		BM_2.5_06		BM_2.5_07		BM_2.5_08		BM_2.5_09		BM_2.5_10		BM_2.5_11
Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)
2.5	19.89	2.52	19.78	2.52	19.94	2.52	19.96	2.52	19.89	2.52	19.92	2.52	19.77	2.52	19.96	2.54	19.9	2.52	19.74	2.53
2.51	19.89	2.52	19.74	2.52	20.04	2.52	20	2.52	19.86	2.52	19.89	2.51	19.74	2.53	19.96	2.51	19.92	2.52	19.7	2.54
2.51	19.96	2.51	19.81	2.53	19.94	2.51	20.03	2.51	19.83	2.5	19.91	2.51	19.72	2.52	19.95	2.52	19.94	2.5	19.68	2.51
2.51	19.91	2.52	19.78	2.52	19.97	2.52	20.00	2.52	19.86	2.51	19.91	2.51	19.74	2.52	19.96	2.52	19.92	2.51	19.71	2.53
BM_1.0_01		BM_1.0_02		BM_1.0_03		BM_1.0_04		BM_1.0_05		BM_1.0_06		BM_1.0_07		BM_1.0_08		BM_1.0_09		BM_1.0_10		
Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	
1.03	20.06	0.96	20.05	1.05	20.11	0.98	20.15	0.98	20.15	1.01	20.18	0.98	20.13	0.96	20.18	0.97	20.16	0.99	20.19	
0.99	20.08	0.96	20.01	0.97	20.13	0.99	20.17	0.97	20.17	0.97	20.17	0.97	20.16	0.97	20.19	1	20.19	0.98	20.12	
0.99	20.06	0.95	20.01	0.97	20.15	1.02	20.16	0.96	20.18	0.97	20.18	0.99	20.17	0.95	20.15	1.01	20.16	1	20.15	
1.00	20.07	0.96	20.02	1.00	20.13	1.00	20.16	0.97	20.17	0.98	20.18	0.98	20.15	0.96	20.17	0.99	20.17	0.99	20.15	
BM_1.25_01		BM_1.25_02		BM_1.25_03		BM_1.25_04		BM_1.25_05		BM_1.25_06		BM_1.25_07		BM_1.25_08		BM_1.25_09		BM_1.25_10		
Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	
1.23	19.96	1.24	19.8	1.24	19.86	1.25	19.87	1.22	19.8	1.26	19.74	1.25	19.98	1.25	19.8	1.24	19.82	1.26	19.95	
1.22	19.96	1.25	19.78	1.23	19.84	1.25	19.91	1.21	19.82	1.23	19.76	1.25	19.96	1.24	19.76	1.23	19.84	1.24	19.86	
1.22	20.01	1.25	19.79	1.23	19.82	1.23	19.97	1.2	19.79	1.23	19.78	1.24	19.97	1.25	19.75	1.25	19.82	1.25	19.86	
1.22	19.98	1.25	19.79	1.23	19.84	1.24	19.92	1.21	19.80	1.24	19.76	1.25	19.97	1.25	19.77	1.24	19.83	1.25	19.89	
BM_1.5_01		BM_1.5_02		BM_1.5_03		BM_1.5_04		BM_1.5_05		BM_1.5_06		BM_1.5_07		BM_1.5_08		BM_1.5_09		BM_1.5_10		
Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	
1.51	20.09	1.5	20.08	1.54	20.11	1.51	20.14	1.49	20.08	1.51	20.1	1.51	20.15	1.52	20.1	1.52	20.13	1.51	20.13	
1.5	20.04	1.49	20.13	1.51	20.13	1.5	20.13	1.5	20.12	1.51	20.11	1.5	20.13	1.51	20.15	1.52	20.15	1.51	20.15	
1.5	20.09	1.49	20.11	1.51	20.06	1.5	20.13	1.5	20.17	1.51	20.12	1.5	20.12	1.52	20.1	1.51	20.14	1.51	20.17	
1.50	20.07	1.49	20.11	1.52	20.10	1.50	20.13	1.50	20.12	1.51	20.11	1.50	20.13	1.52	20.12	1.52	20.14	1.51	20.15	
BM_2.0_01		BM_2.0_02		BM_2.0_03		BM_2.0_04		BM_2.0_05		BM_2.0_06		BM_2.0_07		BM_2.0_08		BM_2.0_09		BM_2.0_10		BM_2.0_11
Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)
1.93	20.27	1.93	20.14	1.92	20.14	1.93	20.2	1.92	20.15	1.93	20.16	1.94	20.25	1.92	20.25	1.93	20.17	1.92	20.07	1.92
1.92	20.3	1.91	20.17	1.9	20.2	1.92	20.17	1.91	20.21	1.93	20.19	1.94	20.25	1.92	20.23	1.92	20.21	1.93	20.11	1.92
1.91	20.31	1.91	20.22	1.91	20.21	1.92	20.21	1.92	20.2	1.92	20.21	1.92	20.21	1.91	20.15	1.92	20.09	1.92	20.2	1.93
1.92	20.29	1.92	20.18	1.91	20.18	1.92	20.19	1.92	20.19	1.93	20.19	1.93	20.24	1.92	20.21	1.92	20.16	1.92	20.13	1.92
BM_3.0_01		BM_3.0_02		BM_3.0_03		BM_3.0_04		BM_3.0_05		BM_3.0_06		BM_3.0_07		BM_3.0_08		BM_3.0_09		BM_3.0_10		BM_3.0_11
Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)	Sirina (mm)	Debljina (mm)
2.94	19.75	3.02	19.85	3.02	19.59	2.99	19.68	2.92	19.77	2.92	20.08	3	19.93	2.98	19.93	2.95	19.94	2.9	19.96	2.96
2.91	20.03	2.99	19.85	3	19.6	3.01	19.54	2.92	19.85	2.95	19.91	2.94	19.9	3.01	20.01	2.88	20.08	2.97	19.96	3

CONCRETE



Crushing



Crushing

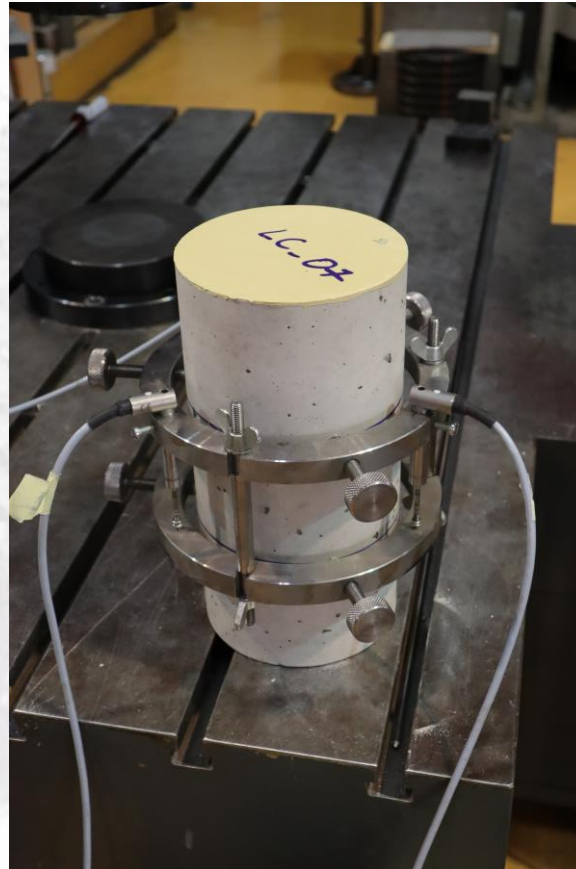


LC_02

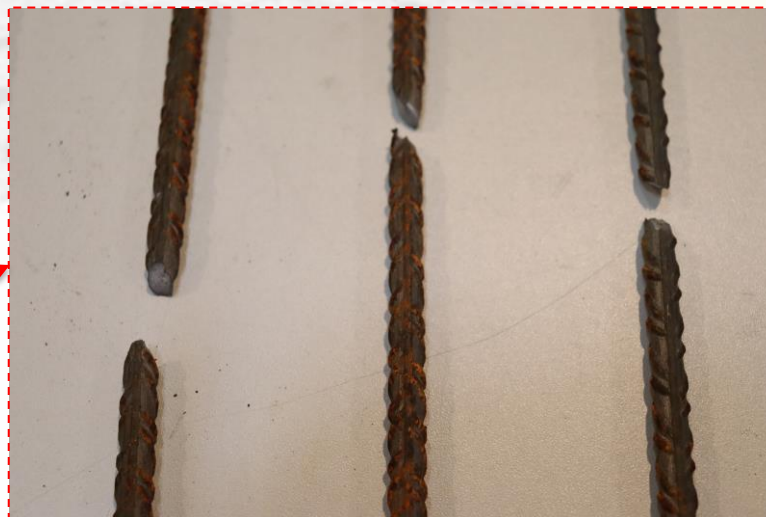
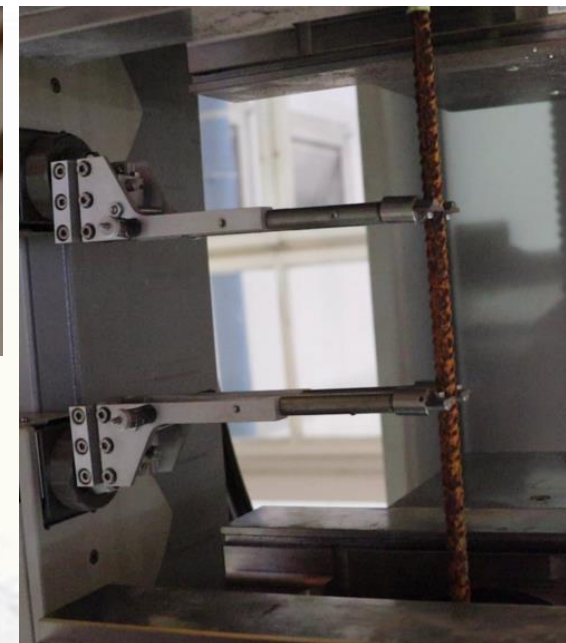
NC_08



Modulus Elasticity



REINFORCEMENT BARS



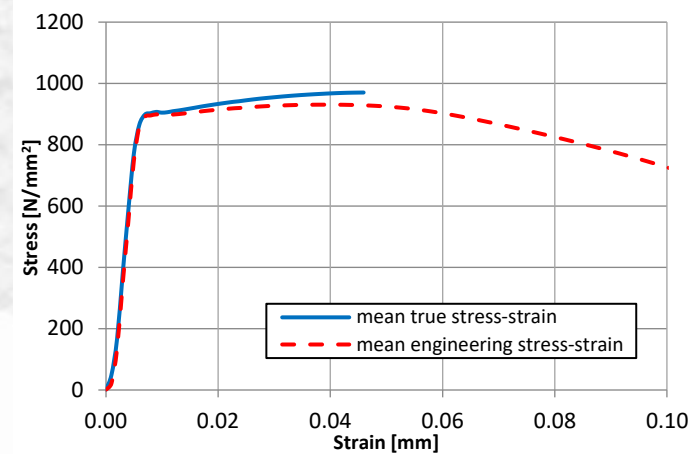
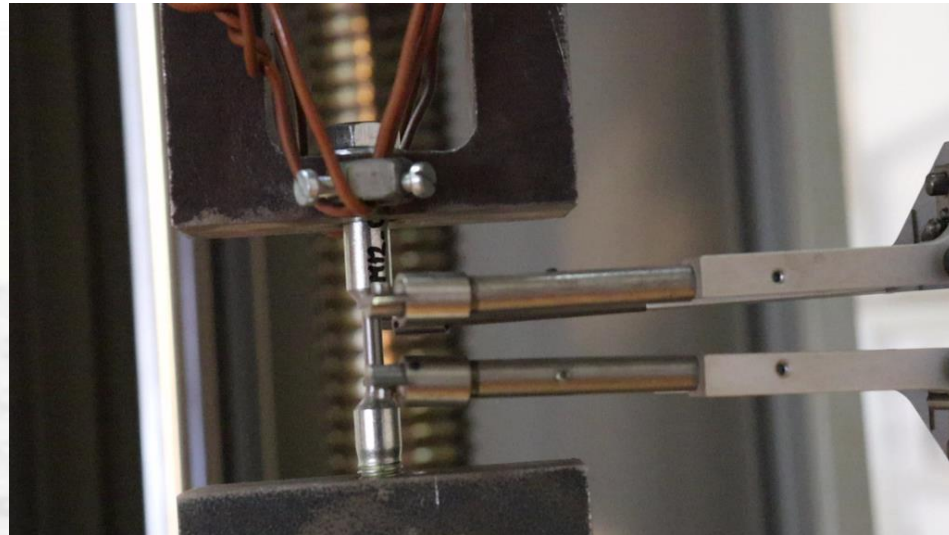
šipka	L (mm)	m (g)	
1	497	197.5	8.028336857
2	495	196.3	8.020063027
3	500	198.3	8.020410297
4	493	194.7	8.003496274
5	495	195.4	8.001656636
			8.014792618

REINFORCEMENT MESH



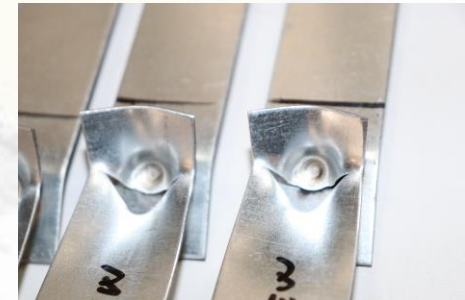
mreza	I1	I2	I3	I4	I5	ukupna duljina	m(g)	
1	728	29	30	24	32	843	509.3	9.899045
2	720	19	18	19	18	794	494.3	10.04859
3	731	30	30	30	31	852	515.5	9.906375
4	730	22	16	19	19	806	499.2	10.02282
5	723	31	31	40	29	854	516.4	9.903402

BOLTS

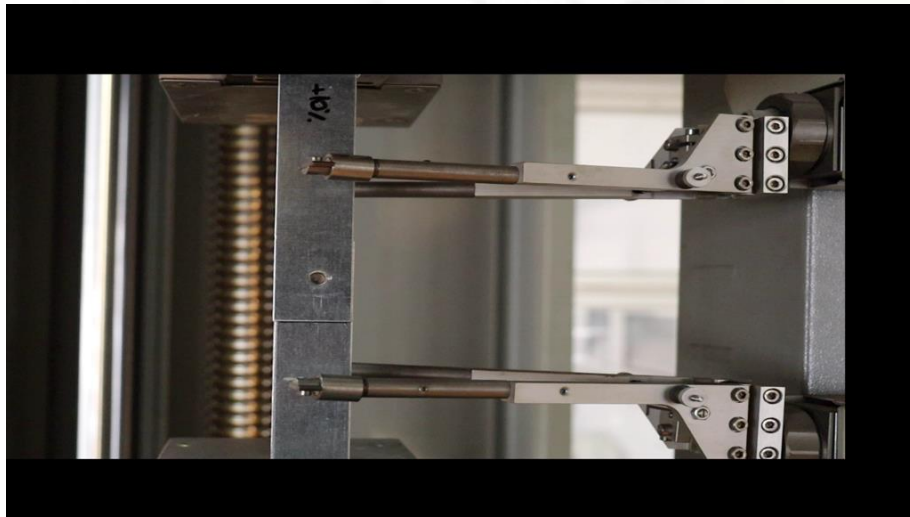


Steel sheets combinations:

- 0.8 mm – 0.8 mm
- 0.8 mm – 1.0 mm
- 0.8 mm – 1.25 mm
- 0.8 mm – 1.5 mm
- 0.8 mm – 2.0 mm
- 0.8 mm – 2.5 mm
- 0.8 mm – 3.0 mm
- 1.0 mm – 1.0 mm
- 1.0 mm – 1.25 mm
- 1.0 mm – 1.5 mm
- 1.0 mm – 2.0 mm
- 1.0 mm – 2.5 mm
- 1.0 mm – 3.0 mm
- 1.25 mm – 1.25 mm
- 1.25 mm – 1.5 mm
- 1.25 mm – 2.0 mm
- 1.25 mm – 2.5 mm
- 1.25 mm – 3.0 mm
- 1.5 mm – 1.5 mm
- 1.5 mm – 2.0 mm
- 1.5 mm – 2.5 mm
- 1.5 mm – 3.0 mm
- 2.0 mm – 2.0 mm
- 2.0 mm – 2.5 mm
- 2.0 mm – 3.0 mm
- 2.5 mm – 2.5 mm
- 2.5 mm – 3.0 mm
- 3.0 mm – 3.0 mm

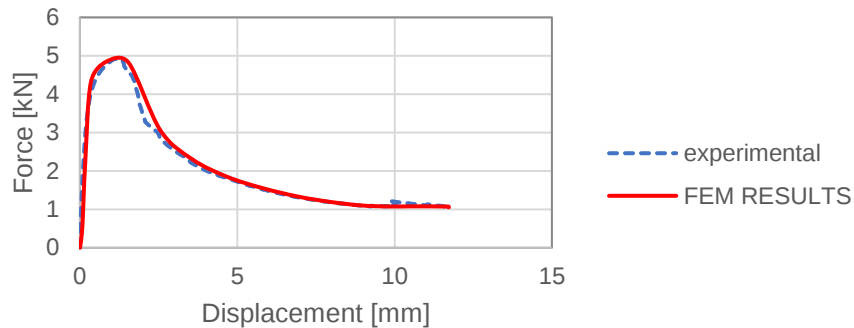


SPOT WELDS

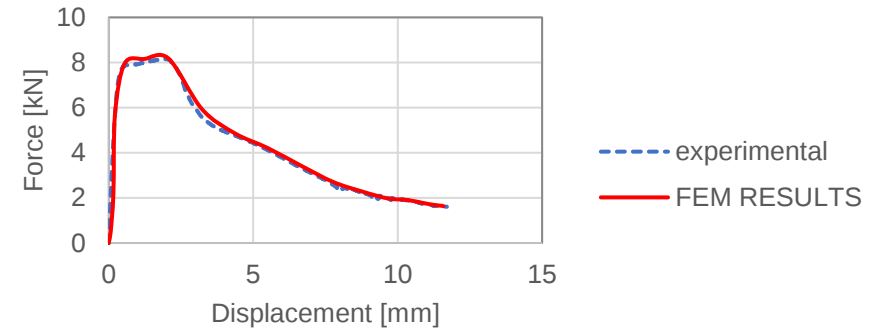


SPOT WELDS

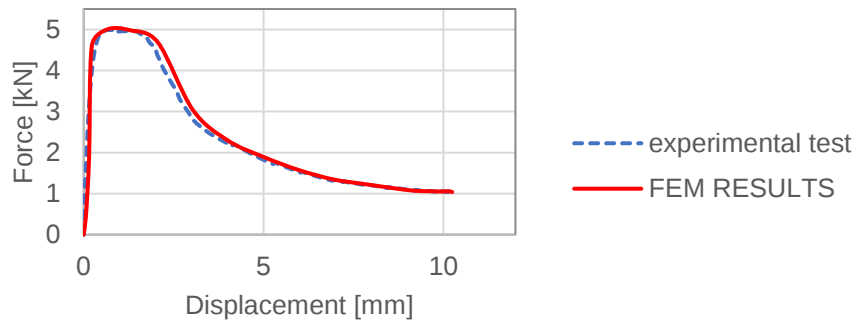
SW 0.8-1.25



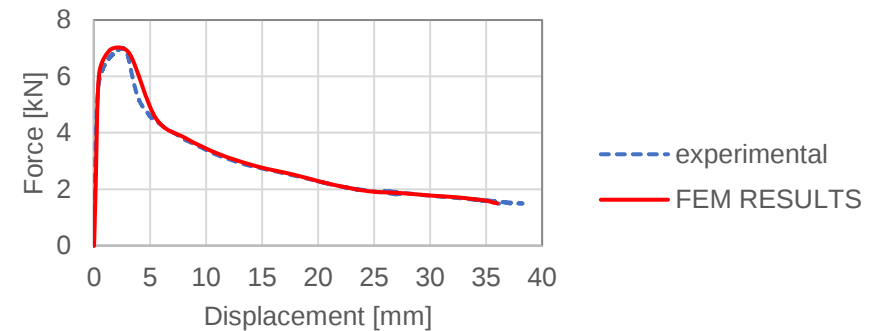
SW 1.0-2.5

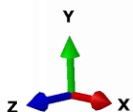
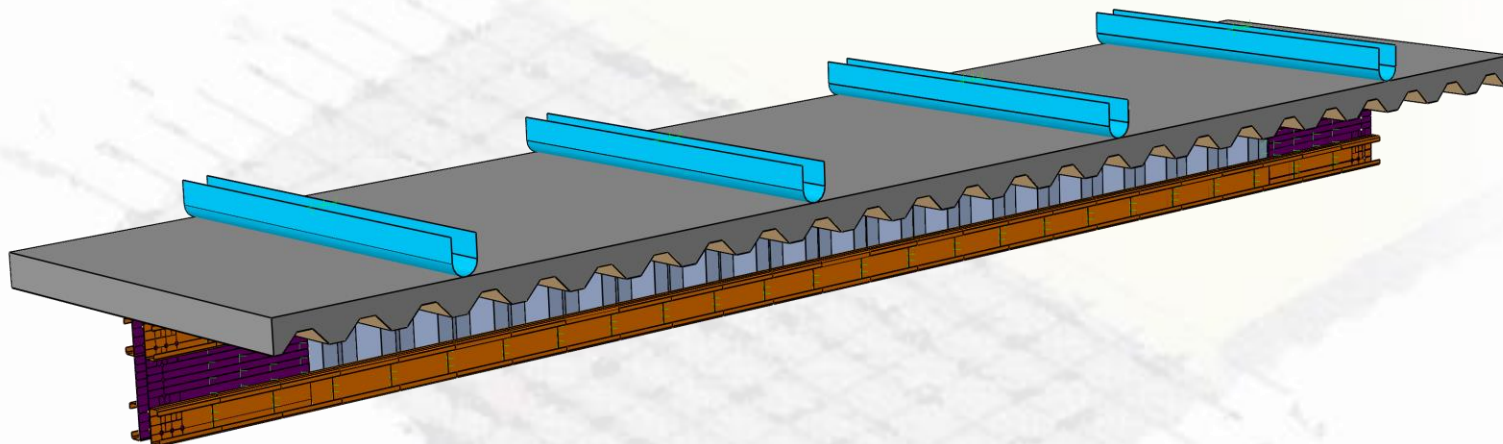


SW 0.8-1.0



SW 1.25-2.5





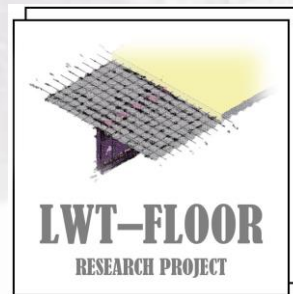
Project title: **Innovative lightweight cold-formed steel-concrete composite floor system**

Acronym: **LWT-FLOOR** Project ID: **UIP-2020-02-2964**

2nd LWT-FLOOR Project Workshop

Implementation and analyses of laboratory tests - base material & spot welds

I. Lukačević, I. Ćurković, M. Bartolac, **A. Rajić**, V. Žuvelek



University of Zagreb/Faculty of Civil Engineering

<http://www.grad.unizg.hr/lwtfloor>