

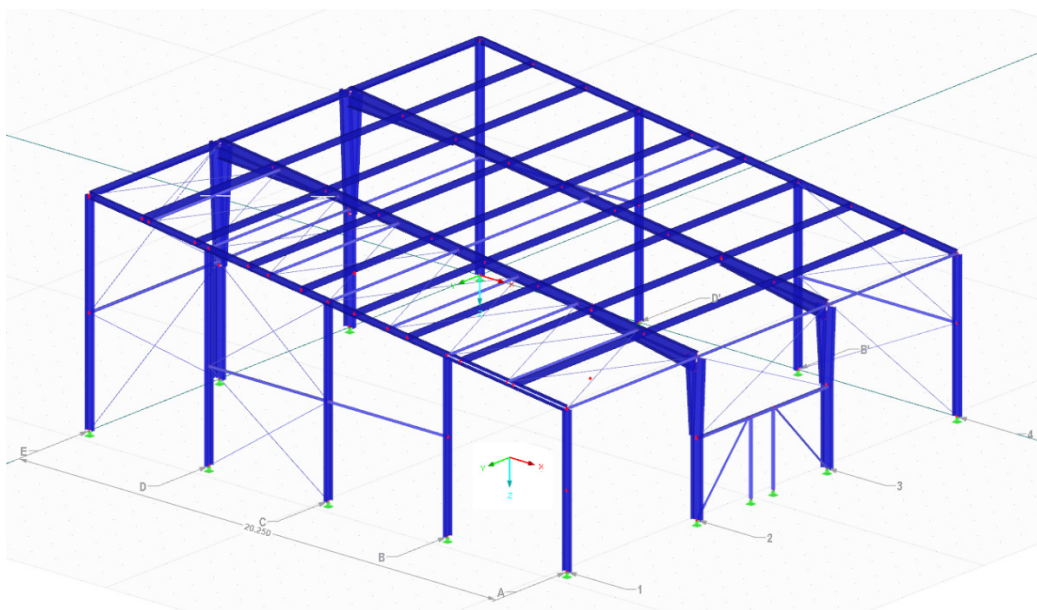
Statický výpočet: Reakce na spodní stavbu

Stavba: AMZ Group 17-05-51

Stavební objekt:

Investor: AMZ Group s.r.o.

Zhotovitel: Unihal s.r.o.



1. Zatěžovací stavy:

ZS. 1	vlastní tíha
ZS. 2	Ostatní stálé
ZS. 3	Sníh I
ZS. 4	Sníh I+návěj
ZS. 5	Vítr příčný 0
ZS. 6	Vítr příčný 0-
ZS. 7	Vítr příčný 180
ZS. 8	Vítr příčný 180-
ZS. 9	Vítr podélný 90
ZS. 10	Vítr podélný 90-
ZS. 11	Vítr podélný 90
ZS. 12	Vítr podélný 90-
ZS. 13	Udržba střechy_kategorie H

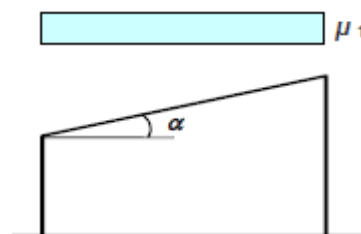
γ_G	γ_G	γ_G
1	1.35	
1	1.35	
		1.5
		1.5
		1.5
		1.5
		1.5
		1.5
		1.5
		1.5
		1.5
		1.5

Zatížení sněhem

Sněhová oblast : I

$S_k = 0.7 \text{ kN/m}^2$

$S = \mu \times C_e \times C_t \times S_k$



Zatížení větrem

větrová oblast : III $v_{,b} = 25 \text{ m/s}$

kategorie terénu: III

$Z_{0,III} [m] = 0.3 \text{ m}$

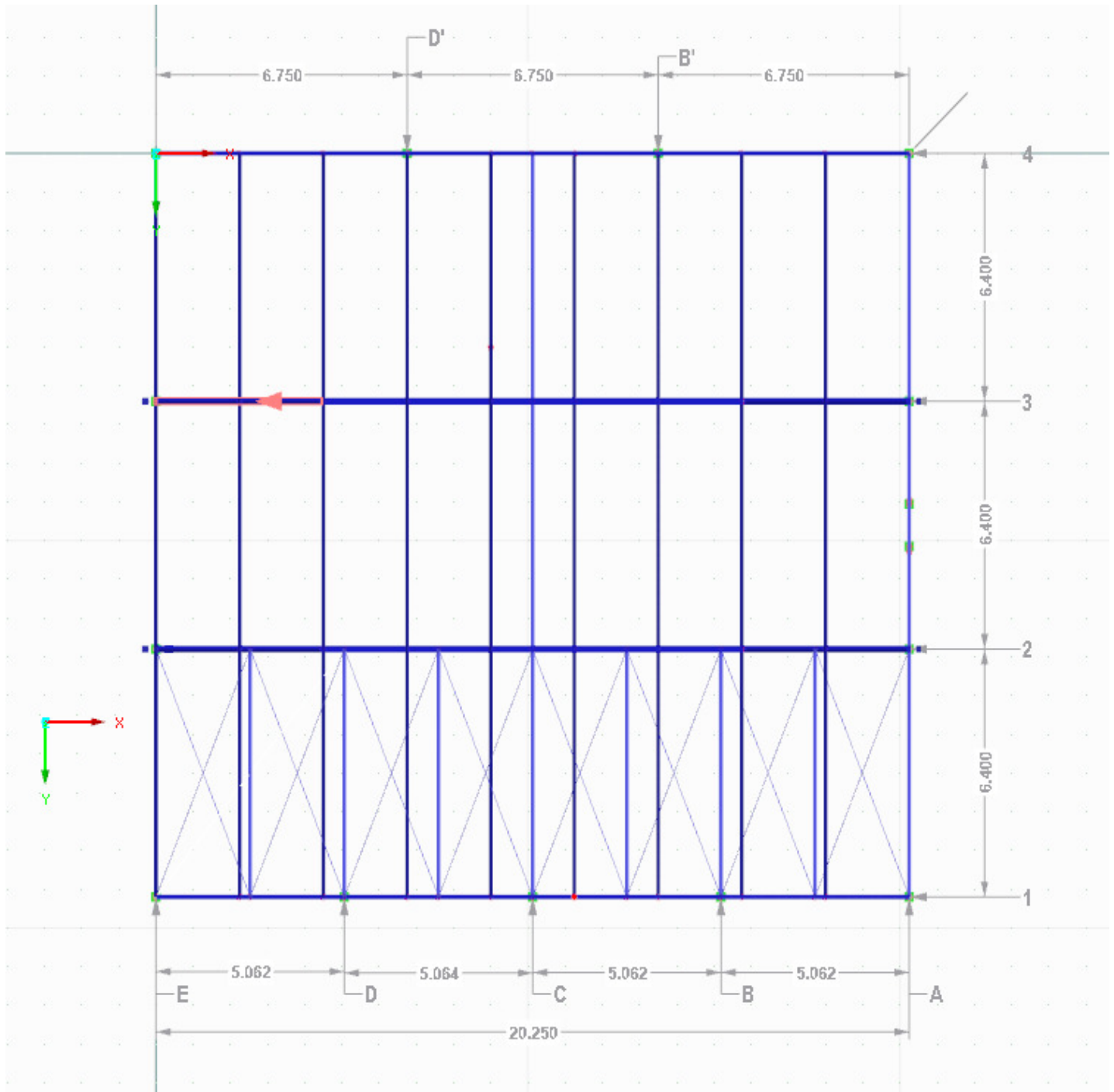
$Z_{min} [m] = 5 \text{ m}$

2. Kombinace zatížení dle 6.10.

$$\sum \gamma_G \times G_{kj} + \gamma_{q1} \times Q_{kj} + \sum \gamma_{qi} \psi_{0,i} Q_{k,i}$$

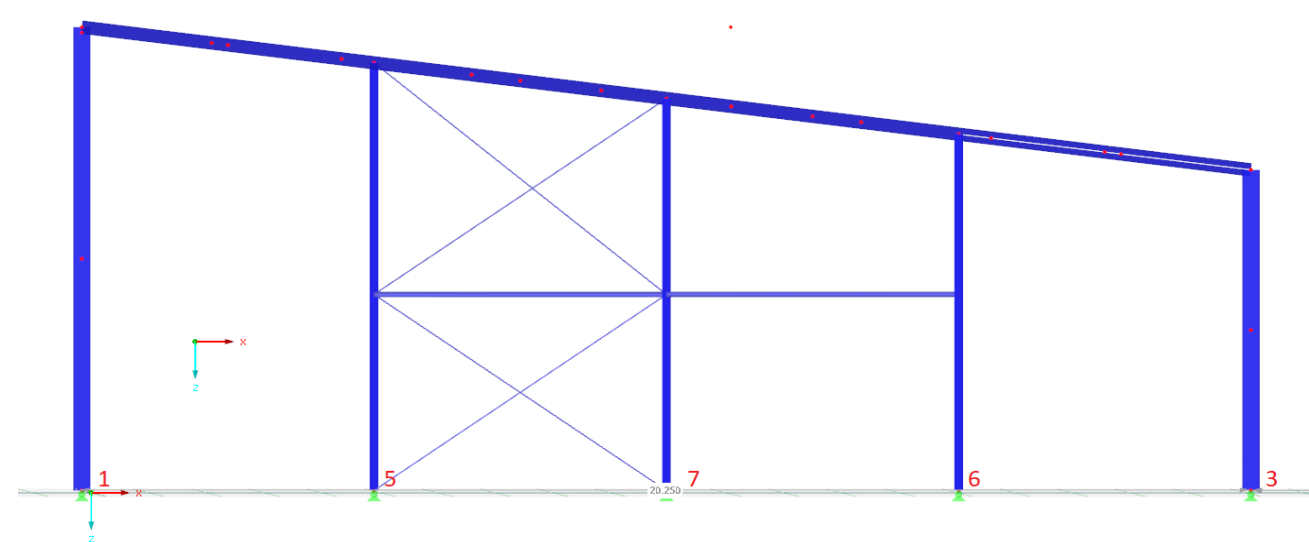
$$\sum 1.35 \times G_k + 1.5 Q_k + \sum 1.5 \times \psi Q_{k,i}$$

3. Půdorysné schéma



4. Reakce podpor

4.1. Reakce rámu 01 od ZS1 - ZS12+ kombinace



ZS 1.	vlastní tíha		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
uzel	1		-0.086	-0.001	6.514	0	0	0
	3		0.078	0	3.725	0	0	0
	5		0.001	0	8.784	0	0	0
	6		0.002	0	5.911	0	0	0
	7		-1.424	0	4.413	0	0	0

ZS 2.	ostatní stálé		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
uzel	1		-0.049	-0.001	6.028	0	0	0
	3		0.222	0	11.004	0	0	0
	5		0.001	0	15.317	0	0	0
	6		0.003	0	13.615	0	0	0
	7		-1.623	0	10.787	0	0	0

ZS 3.	Sníh případ I		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
uzel	1		-0.105	-0.002	2.015	0	0	0
	3		0.504	0	5.926	0	0	0
	5		0.004	0	12.592	0	0	0
	6		0.006	0	12.396	0	0	0
	7		-3.621	0	4.271	0	0	0

ZS 4.	Sníh I+ návěj		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
uzel	1		-0.38	-0.006	7.676	0	0	0
	3		0.363	0	5.048	0	0	0
	5		0.006	0	20.131	0	0	0
	6		0.011	0	12.183	0	0	0
	7		-5.983	0	2.02	0	0	0

ZS 5.	Vítr příčný 0	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	1	-2.419	1.436	9.337	0	0
		3	-3.65	5.565	0.704	0	0
		5	0.015	9.56	21.197	0	0
		6	0.022	9.287	0.682	0	0
		7	-14.846	9.112	-21.927	0	0

ZS 6.	Vítr příčný 0-	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	1	-2.261	1.443	5.903	0	0
		3	-3.999	5.565	-6.084	0	0
		5	0.004	9.56	1.79	0	0
		6	0.004	9.287	-8.582	0	0
		7	-4.346	9.112	-12.496	0	0

ZS 7.	Vítr příčný 180	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	1	4.811	2.885	4.994	0	0
		3	1.971	2.838	0.094	0	0
		5	15.75	11.237	-22.818	0	0
		6	-0.045	7.987	-0.362	0	0
		7	-0.019	9.111	23.983	0	0

ZS 8.	Vítr příčný 180-	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	1	5.112	2.889	-1.153	0	0
		3	1.909	2.838	-3.368	0	0
		5	30.306	11.238	-52.781	0	0
		6	-0.086	7.987	-10.219	0	0
		7	-0.036	9.111	36.306	0	0

ZS 9.	Vítr podélný 90	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	1	-8.508	-25.134	-27.04	0	0
		3	5.895	-2.958	-1.982	0	0
		5	0.004	-7.702	7.857	0	0
		6	0.01	-6.414	1.446	0	0
		7	-3.672	-7.059	-6.53	0	0

ZS 10.	Vítr podélný 90-	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	1	-8.242	-26.052	-30.289	0	0
		3	5.289	-2.958	-10.097	0	0
		5	6.214	-7.703	-18.032	0	0
		6	-0.015	-6.415	-15.942	0	0
		7	-0.007	-7.059	-5.389	0	0

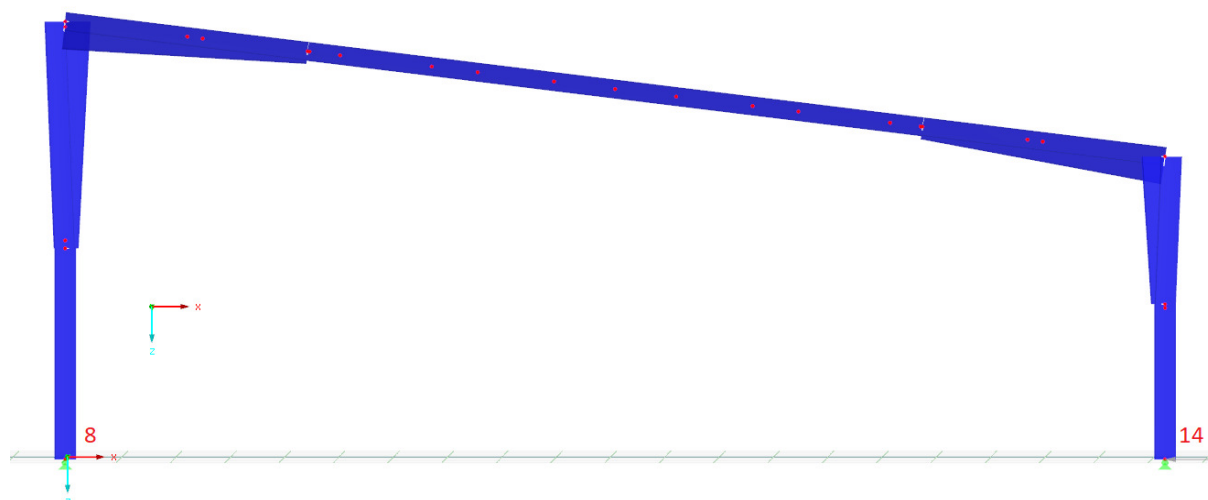
ZS 11.	Vítr podélný 270	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	1	-5.273	0.711	23.095	0	0
		3	3.701	1.454	-1.175	0	0
		5	0.002	3.785	4.519	0	0
		6	-0.008	3.152	0.843	0	0
		7	-1.957	3.469	-3.609	0	0

ZS 12.	Vítr podélný 270-	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	1	-5.174	0.722	23.044	0	0
		3	3.455	1.454	-4.816	0	0
		5	4.189	3.785	-8.682	0	0
		6	-0.017	3.152	-7.105	0	0
		7	-0.005	3.469	-0.513	0	0

ZS 13.	Údržba střechy : H	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	1	-0.075	-0.002	1.439	0	0
		3	0.36	0	4.233	0	0
		5	0.003	0	8.995	0	0
		6	0.005	0	8.854	0	0
		7	-2.587	0	3.051	0	0

MSU kombinace 6.10		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
uzel	1	MAX	7.539	4.335	57.328	0	0
		MIN	-13.231	-38.11	-32.85	0	0
		Max PX'	7.539	4.335	10.83	0	0
		Min PX'	-13.231	-35.006	-17.862	0	0
		Max PY'	7.419	4.335	16.781	0	0
		Min PY'	-12.492	-38.11	-32.85	0	0
		Max PZ'	-8.376	1.058	57.328	0	0
		Min PZ'	-12.492	-38.11	-32.85	0	0
uzel	3	MAX	7.539	4.335	57.328	0	0
		MIN	-13.231	-38.11	-32.85	0	0
		Max PX'	7.539	4.335	10.83	0	0
		Min PX'	-13.231	-35.006	-17.862	0	0
		Max PY'	7.419	4.335	16.781	0	0
		Min PY'	-12.492	-38.11	-32.85	0	0
		Max PZ'	-8.376	1.058	57.328	0	0
		Min PZ'	-12.492	-38.11	-32.85	0	0
uzel	5	MAX	42.304	16.856	81.949	0	0
		MIN	0.001	-11.554	-54.914	0	0
		Max PX'	42.304	16.856	-54.914	0	0
		Min PX'	0.001	5.678	29.353	0	0
		Max PY'	42.304	16.856	-54.914	0	0
		Min PY'	6.114	-11.554	-2.722	0	0
		Max PZ'	0.027	8.604	81.949	0	0
		Min PZ'	42.304	16.856	-54.914	0	0
uzel	6	MAX	0.047	13.93	50.236	0	0
		MIN	-0.12	-9.622	-4.423	0	0
		Max PX'	0.047	13.93	36.523	0	0
		Min PX'	-0.12	11.981	4.159	0	0
		Max PY'	0.011	13.93	6.654	0	0
		Min PY'	-0.013	-9.622	-4.423	0	0
		Max PZ'	0.027	-5.773	50.236	0	0
		Min PZ'	-0.013	-9.622	-4.423	0	0
uzel	7	MAX	0.001	13.667	77.783	0	0
		MIN	-30.948	-10.589	-17.723	0	0
		Max PX'	0.001	-10.589	13.458	0	0
		Min PX'	-30.948	13.667	-10.974	0	0
		Max PY'	-25.337	13.667	-17.723	0	0
		Min PY'	-0.006	-10.589	6.895	0	0
		Max PZ'	-0.045	13.667	77.783	0	0
		Min PZ'	-25.337	13.667	-17.723	0	0

4.2. Reakce rámu 02-04 od ZS1 - ZS10 + kombinace



ZS 1.	vlastní tíha		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	8	-5.052	0.002	20.378	0	0	0
		14	5.049	-0.379	16.736	0	0	-0.001

ZS 2.	ostatní stálé		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	8	-8.424	0.002	17.311	0	0	0
		14	8.418	-0.246	24.751	0	0	-0.001

ZS 3.	Sníh případ I		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	8	-18.812	0.004	37.496	0	0	0
		14	18.8	-0.539	36.128	0	0	-0.003

ZS 3.	Sníh I + návěj		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	8	-38.824	0.004	79.32	0	0	-0.001
		14	38.792	-1	72.308	0	0	0

ZS 5.	Vítr příčný 0		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	8	-6.853	-0.001	5.703	0	0	0.002
		14	-13.384	0.497	-2.954	0	0	-0.013

ZS 6.	Vítr příčný 0-		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	8	8.662	-0.004	-21.609	0	0	0.002
		14	-22.214	1.661	-30.95	0	0	-0.005

ZS 7.	Vítr příčný 180		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	8	7.21	0.007	-4.298	0	0	0.003
		14	10.679	3.483	-2.478	0	0	0.013

ZS 8.	Vítr příčný 180-		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	8	29.72	0	-55.582	0	0	0.003
		14	-1.866	5.273	-33.678	0	0	0.023

ZS 9.	Vítr podélný 90		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	8	-3.743	-0.02	1.6	0	0	-0.007
		14	8.456	-9.483	17.405	0	0	0.002

ZS 10.	Vítr podélný 90-	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]	
	uzel	8	-0.36	-0.014	-22.866	0	0	-0.007
		14	-2.157	-9.009	-5.048	0	0	0.004

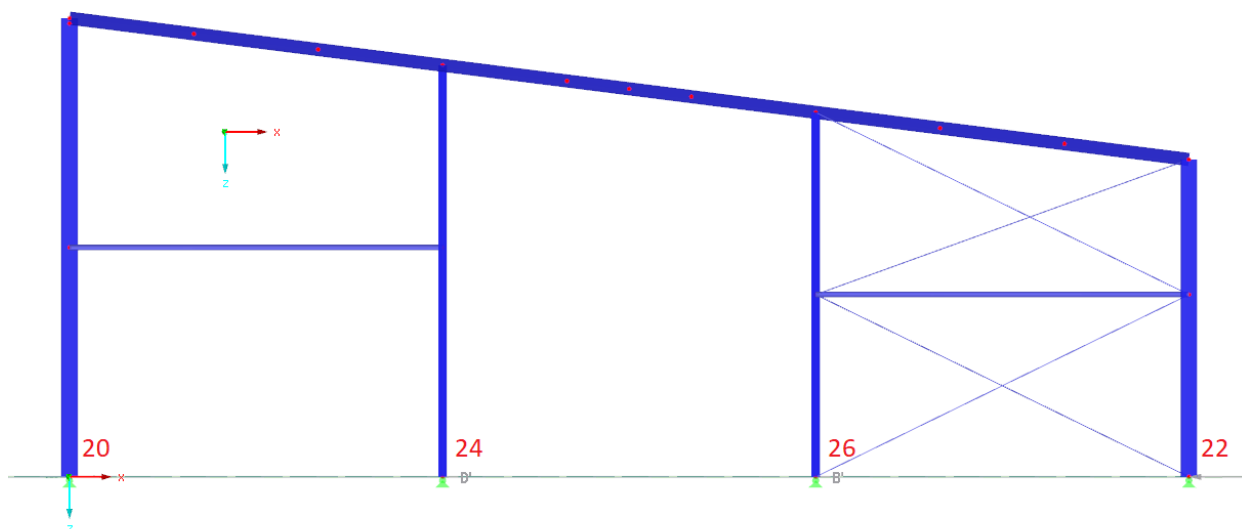
ZS 11.	Vítr podélný 270	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]	
	uzel	8	-4.069	0.072	1.743	0	0	0.004
		14	9.161	9.189	-19.722	0	0	0

ZS 12.	Vítr podélný 270-	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]	
	uzel	8	1.563	0.134	-30.597	0	0	0.002
		14	-3.528	9.731	-44.706	0	0	0.003

ZS 13.	Údřžba střechy : H	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]	
	uzel	8	-13.437	0.003	26.783	0	0	0
		14	13.428	-0.385	25.806	0	0	-0.002

MSU kombinace 6.10			Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
uzel	8	MAX	31.104	0.208	174.988	0	0	0.005
		MIN	-82.596	-0.048	-45.684	0	0	-0.01
		Max PX'	31.104	0.001	-45.684	0	0	0.005
		Min PX'	-82.596	0.009	174.988	0	0	0
		Max PY'	-29.956	0.208	33.107	0	0	0.003
		Min PY'	-52.925	-0.048	112.771	0	0	-0.01
		Max PZ'	-82.596	0.009	174.988	0	0	0
		Min PZ'	31.104	0.001	-45.684	0	0	0.005
uzel	14	MAX	85.979	13.928	180.118	0	0	0.032
		MIN	-19.854	-15.82	-25.507	0	0	-0.024
		Max PX'	85.979	0.606	162.511	0	0	0.008
		Min PX'	-19.854	1.836	-4.899	0	0	-0.009
		Max PY'	8.174	13.928	-25.507	0	0	0.003
		Min PY'	59.958	-15.82	136.347	0	0	0
		Max PZ'	83.978	-10.873	180.118	0	0	-0.001
		Min PZ'	8.174	13.928	-25.507	0	0	0.003

4.3. Reakce rámu 04 od ZS1 - ZS12+ kombinace



ZS 1.	vlastní tíha		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	20	-0.091	0	5.546	0	0	0
		22	0.014	0	4.393	0	0	0
		24	-0.013	0	6.32	0	0	0
		26	0.09	0	6.333	0	0	0

ZS 2.	ostatní stálé		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	20	-0.122	0	0.941	0	0	0
		22	0.031	0	7.393	0	0	0
		24	-0.017	0	5.76	0	0	0
		26	0.107	0	6.701	0	0	0

ZS 3.	Sníh případ I		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	20	-0.337	0.001	2.623	0	0	0
		22	0.056	0	5.253	0	0	0
		24	-0.047	0	14.597	0	0	0
		26	0.328	0	13.815	0	0	0

ZS 4.	Sníh I + návěj		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	20	-1.103	0.001	11.1	0	0	0
		22	0.193	0	18.631	0	0	0
		24	-0.153	0	41.028	0	0	0
		26	1.063	0	44.284	0	0	0

ZS 5.	Vítr příčný 0		Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
	uzel	20	-0.53	0.321	0.28	0	0	0.001
		22	-9.447	-7.125	-4.999	0	0	0.004
		24	-0.055	-2.939	0.853	0	0	0
		26	-0.014	-2.006	5.692	0	0	0

ZS 6.	Vítr příčný 0-	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]	
	uzel	20	-0.254	0.321	-1.577	0	0	0.001
		22	-6.258	-7.125	-8.197	0	0	0.004
		24	-0.021	-2.939	-8.738	0	0	0
		26	-0.036	-2.006	-7.198	0	0	0

ZS 7.	Vítr příčný 180	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]	
	uzel	20	0.987	0.567	-0.195	0	0	0.001
		22	0.813	-4.085	5.58	0	0	0.002
		24	0.106	-3.043	-0.373	0	0	0
		26	6.871	-1.831	-5.011	0	0	0

ZS 8.	Vítr příčný 180-	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]	
	uzel	20	1.262	0.565	-2.131	0	0	0.002
		22	0.569	-4.085	2.769	0	0	0.002
		24	0.138	-3.043	-10.769	0	0	0
		26	11.12	-1.831	-24.016	0	0	0

ZS 9.	Vítr podélný 90	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]	
	uzel	20	-1.057	0.148	0.13	0	0	-0.002
		22	2.439	-1.955	-1.16	0	0	0.005
		24	-0.118	-1.11	0.562	0	0	0
		26	1.017	-0.713	0.468	0	0	0

ZS 10.	Vítr podélný 90-	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]	
	uzel	20	-4.914	0.15	-1.711	0	0	-0.002
		22	2.369	-1.955	-3.373	0	0	0.005
		24	-0.214	-1.11	-8.161	0	0	0
		26	1.951	-0.713	-9.352	0	0	0

ZS 11.	Vítr podélný 270	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]	
	uzel	20	-1.701	-0.295	0.209	0	0	0.001
		22	3.925	3.978	-1.867	0	0	-0.005
		24	-0.19	2.258	0.904	0	0	0
		26	1.637	1.451	0.753	0	0	0

ZS 12.	Vítr podélný 270-	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]	
	uzel	20	-7.74	2.061	-4.318	0	0	0.001
		22	3.763	3.978	-7.237	0	0	-0.005
		24	-0.324	2.254	-17.409	0	0	0
		26	5.061	1.451	-23.729	0	0	0

ZS 13.	Údřba střeby : H	Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]	
	uzel	20	-0.241	0.001	1.874	0	0	0
		22	0.04	0	3.752	0	0	0
		24	-0.033	0	10.427	0	0	0
		26	0.235	0	9.868	0	0	0

MSU kombinace 6.10			Rx [kN]	Ry [kN]	Rz [kN]	Mx [kNm]	My [kNm]	Mz [kNm]
uzel	20	MAX	1.679	3.094	25.665	0	0	0.002
		MIN	-12.721	-0.442	0.009	0	0	-0.002
		Max PX'	1.679	0.848	3.29	0	0	0.002
		Min PX'	-12.721	3.094	10.6	0	0	0.001
		Max PY'	-12.149	3.094	4.246	0	0	0.001
		Min PY'	-2.763	-0.442	6.801	0	0	0.001
		Max PZ'	-2.423	0.292	25.665	0	0	0
		Min PZ'	-11.822	3.093	0.009	0	0	0.001
uzel	22	MAX	6.093	5.967	48.879	0	0	0.007
		MIN	-13.939	-10.688	-0.51	0	0	-0.007
		Max PX'	6.093	5.967	27.084	0	0	-0.007
		Min PX'	-13.939	-10.688	4.287	0	0	0.006
		Max PY'	5.933	5.967	8.986	0	0	-0.007
		Min PY'	-9.155	-10.688	-0.51	0	0	0.006
		Max PZ'	1.128	-3.677	48.879	0	0	0.002
		Min PZ'	-9.155	-10.688	-0.51	0	0	0.006
uzel	24	MAX	0.178	3.387	78.662	0	0	0
		MIN	-0.64	-4.564	-14.034	0	0	0
		Max PX'	0.178	-4.564	-4.073	0	0	0
		Min PX'	-0.64	3.381	20.977	0	0	0
		Max PY'	-0.315	3.387	13.435	0	0	0
		Min PY'	0.178	-4.564	-4.073	0	0	0
		Max PZ'	-0.44	2.032	78.662	0	0	0
		Min PZ'	-0.515	3.381	-14.034	0	0	0
uzel	26	MAX	17.773	2.176	89.144	0	0	0
		MIN	-0.045	-3.009	-22.991	0	0	0
		Max PX'	17.773	-2.746	14.781	0	0	0
		Min PX'	-0.045	-3.009	2.237	0	0	0
		Max PY'	7.796	2.176	-22.56	0	0	0
		Min PY'	-0.045	-3.009	2.237	0	0	0
		Max PZ'	0.081	-1.806	89.144	0	0	0
		Min PZ'	16.884	-2.747	-22.991	0	0	0

V Otrokovicích 11.05.2018

Zhotovitel: Unihal s.r.o.

Vypracoval: Ing Jakub Trávníček

UNIHAL s.r.o., Třída T.Bati 1766, 765 02 Otrokovice, Česká republika

gsm: ; +420 702 107 812 klapka 4; +420 776 603 538 | email: jakub.travnicek@unihal.cz

IČO: 03138089 | IČO: 03138089 | www.unihal.cz