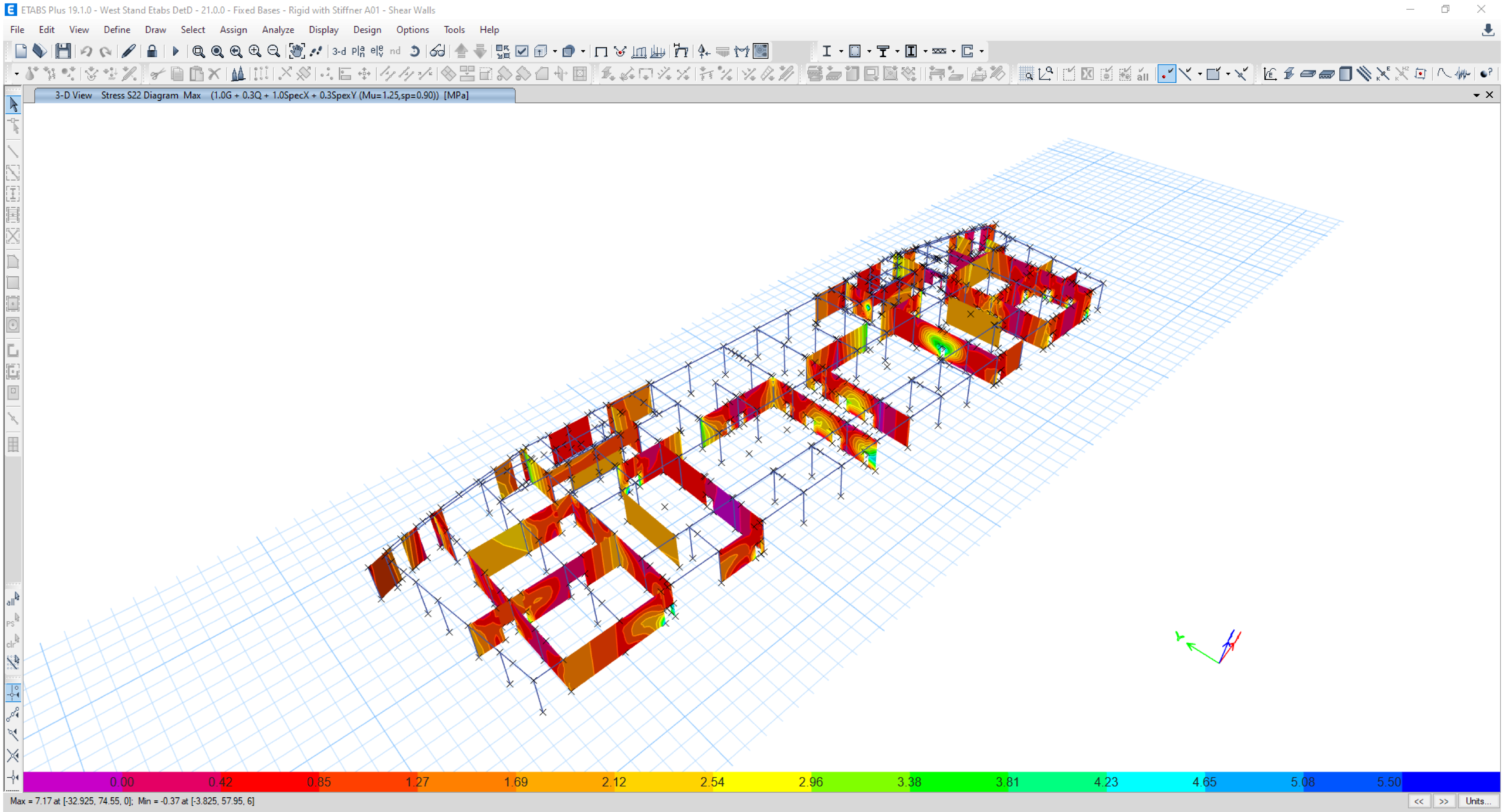
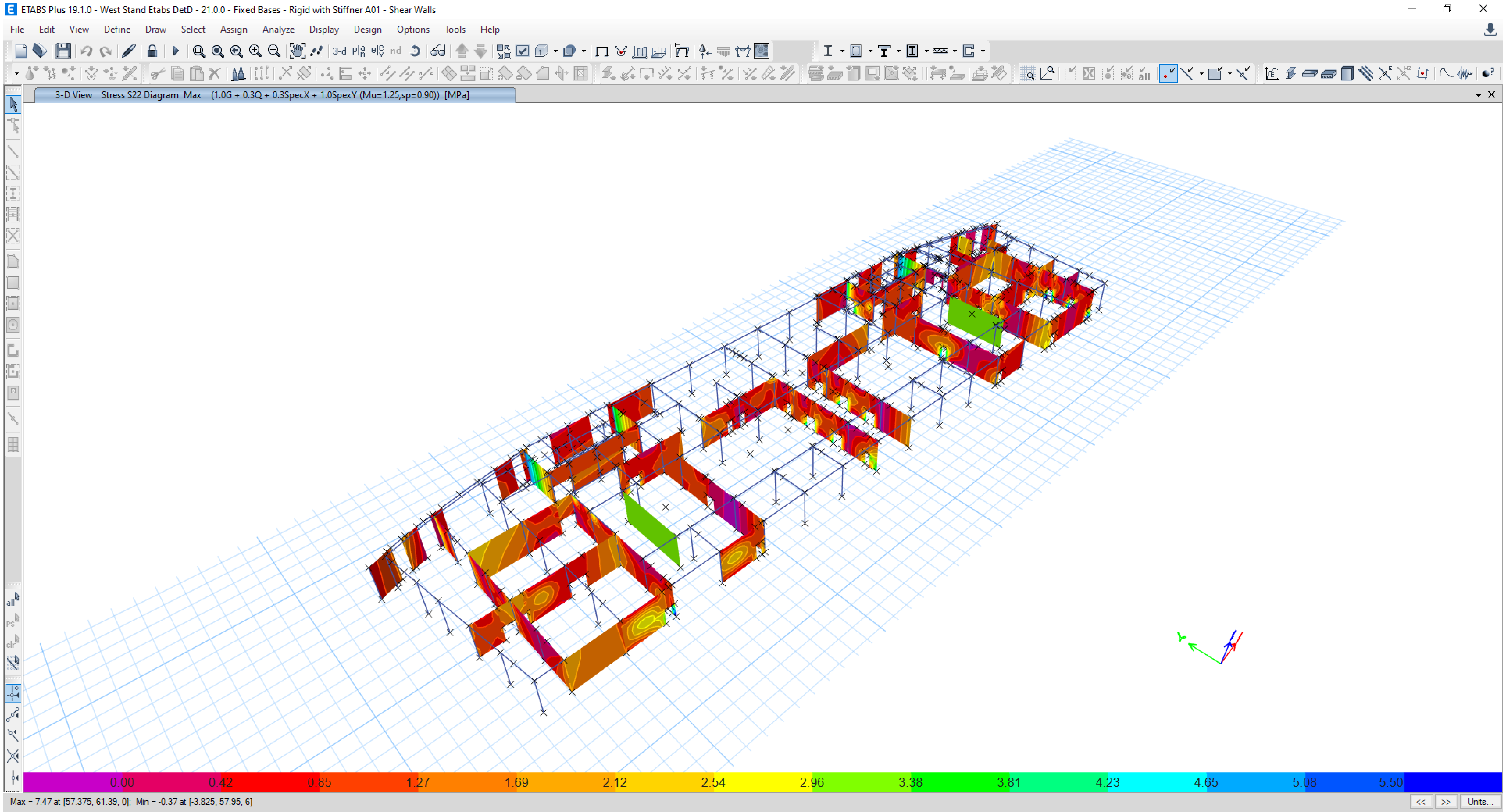
West Stand Shear Wall Design

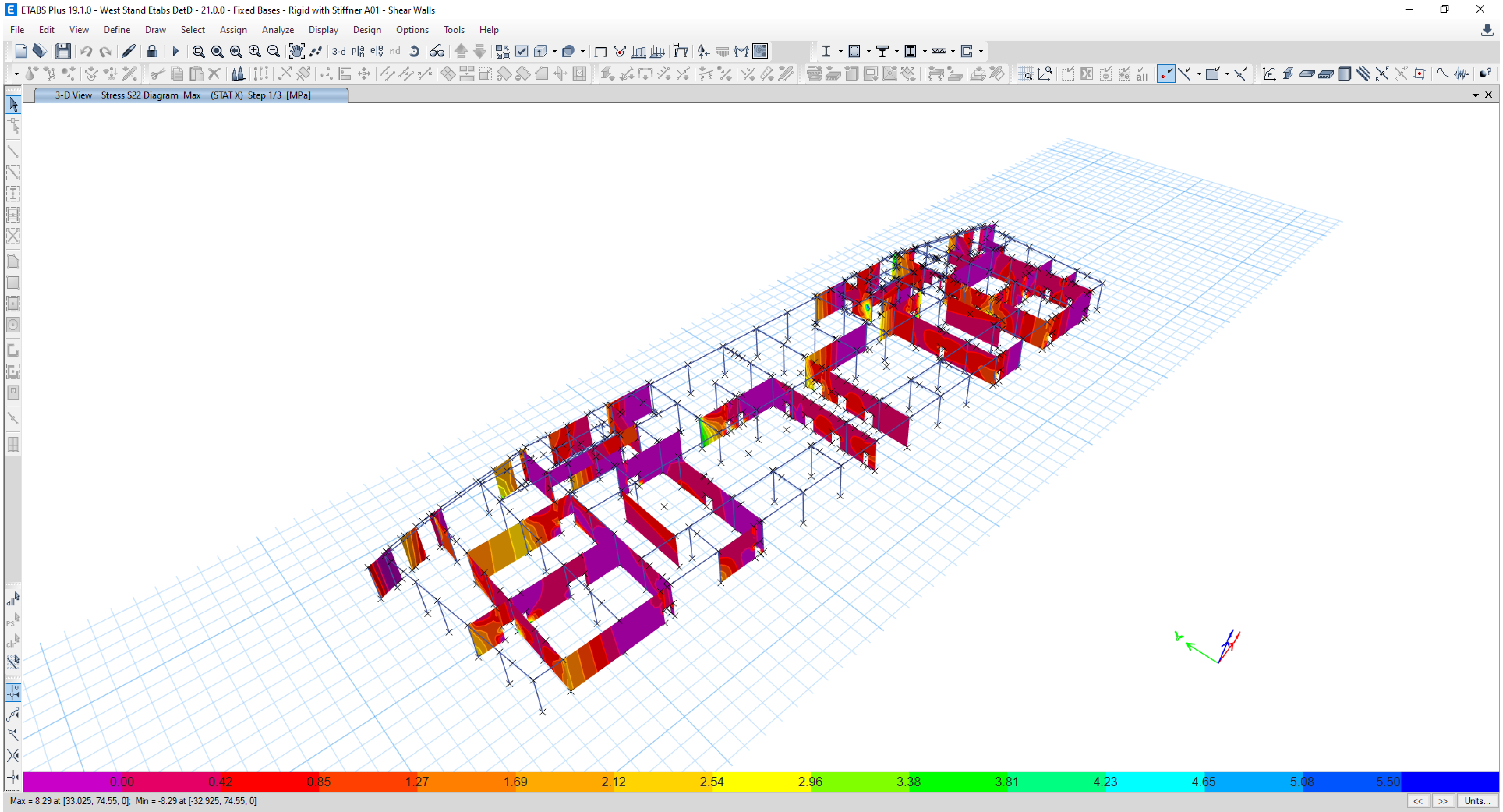
General Stress Distribution (Vertical)
1.0G + 0.30Q + 1.0SpecX + 0.30SpecY [mu = 1.25, sp = 0.90]



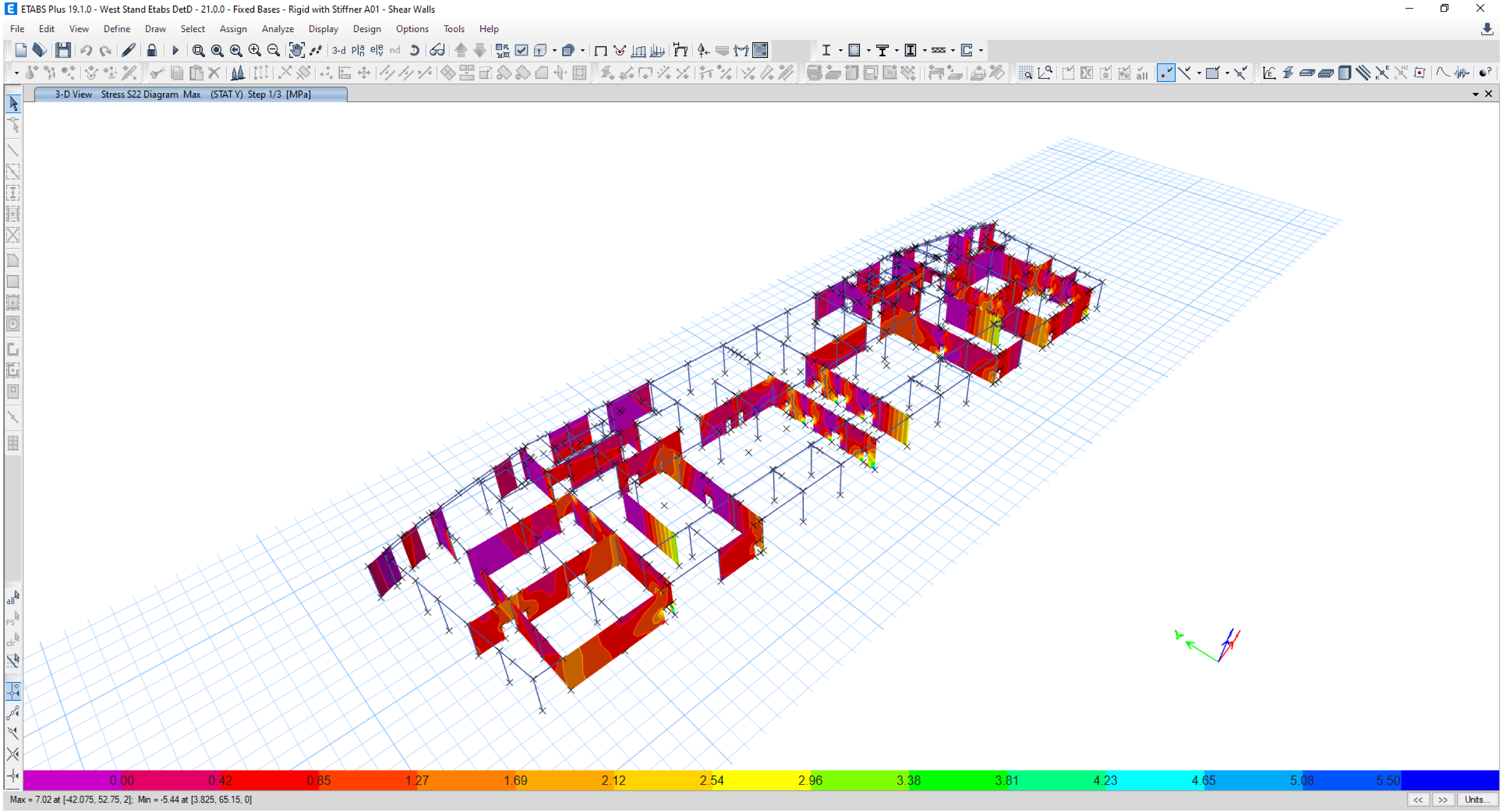
General Stress Distribution (Vertical)
1.0G + 0.30Q + 0.30SpecX + 1.0SpecY [mu = 1.25, sp = 0.90]



General Stress Distribution (Vertical)
STATX [mu = 1.00, sp = 0.90]



General Stress Distribution (Vertical)
STATY [mu = 1.00, sp = 0.90]



Stress, MPa	Wall Thickness, mm	Wall Depth, mm	Force, kN/m	Bar Dia, mm	Bar Area, mm^2	Bar Spacing	Number of Bars	Number of Layers	Total Area of Reo, mm^2	Yield Strength, Mpa	Cap, kN/m	Utl, %
0.5	350	1000	175	16	201.06	400	2.5	1	502.7	500	251.3274	70%
1	350	1000	350	20	314.16	400	2.5	1	785.4	500	392.6991	89%
1.5	350	1000	525	25	490.87	350	2.9	1	1402.5	500	701.2484	75%
2	350	1000	700	25	490.87	300	3.3	1	1636.2	500	818.1231	86%
2.5	350	1000	875	32	804.25	300	3.3	1	2680.8	500	1340.413	65%
3	350	1000	1050	32	804.25	300	3.3	1	2680.8	500	1340.413	78%
3.5	350	1000	1225	32	804.25	250	4.0	1	3217.0	500	1608.495	76%
4	350	1000	1400	32	804.25	250	4.0	1	3217.0	500	1608.495	87%
4.5	350	1000	1575	32	804.25	250	4.0	1	3217.0	500	1608.495	98%
5	350	1000	1750	32	804.25	225	4.4	1	3574.4	500	1787.217	98%
5.5	350	1000	1925	32	804.25	200	5.0	1	4021.2	500	2010.619	96%

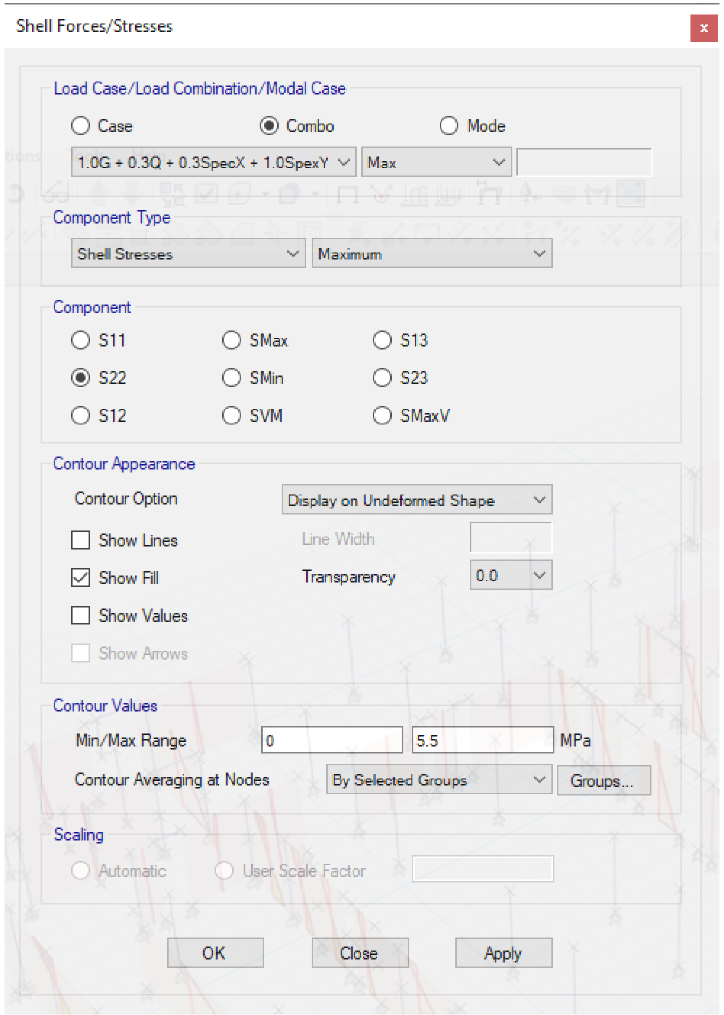
Shear Wall Design Methodology

1. Check all walls in accordance with NZS 3101:2006. Against the maximum bending (of all load combination which present a net axial tensile force in the wall) moment paired with the maximum tension.

2. In regards to V*, Shear Forces use refined loads which consider the contribution of shear from the steel structure to be loaded with (mu = 3.5 x OS) while the concrete structure is loaded at (mu = 1.25, sp = 0.9).

3. For walls which fail NZS 3101:2006 moment checks; inspect MAX - S22 (Vertical Tensile Stresses). Take 1000mm average stress and check reinforcement required. ETABS moments are conservative as they include consider locally high stresses.

4. Consider the shear friction capacity of columns connecting to shear walls.



Refinement of Shear Forces in West Stand

Shear walls and other RC elements need to be designed to with stand the following load cases:_
- 1.0G + 0.30Q + 1.0SpecX + 0.30SpecY (μ = 1.25, Sp = 0.90)
- 1.0G + 0.30Q + 0.3SpecX + 1.0SpecY (μ = 1.25, Sp = 0.90)

Although the ground floor RC elements need to be designed for the (mu = 1.25, sp = 0.90) with a 30% orthogonal force, the steel elements above the concourse need to be designed to:
- 1.0G + 0.30Q + 0.30Spex + 1.0SpecY (μ = 3.5 x OS)
- 1.0G + 0.30Q + 1.0Spex + 0.30SpecY (μ = 3.5 x OS)

ETABS does not account for this and will overestimate the amount of force the concrete elements will be seeing.

Method:
To determine more accurate wall values of Shear Forces the following steps will be taken:

1. Take a section cut just above the concourse level to determine the total horizontal forces acting through the stand under equivalent static.
2. Take a section cut just below the concourse level to determine the total horizontal forces seen by the concrete elements at ground floor.
3. Find the difference between the two aforementioned values. This difference is the total contribution from the concourse only.
4. Apply the difference as a horizontal shell load on the concourse in a separate load case.
5. Obtain the shear values out of the wall and determine the proportional split of shear through the walls. The shear force in the walls are solely from concourse up.
6. C, % Force Contribution from Steelwork = Difference in Inertial Force V* / STAT(X or Y) V*

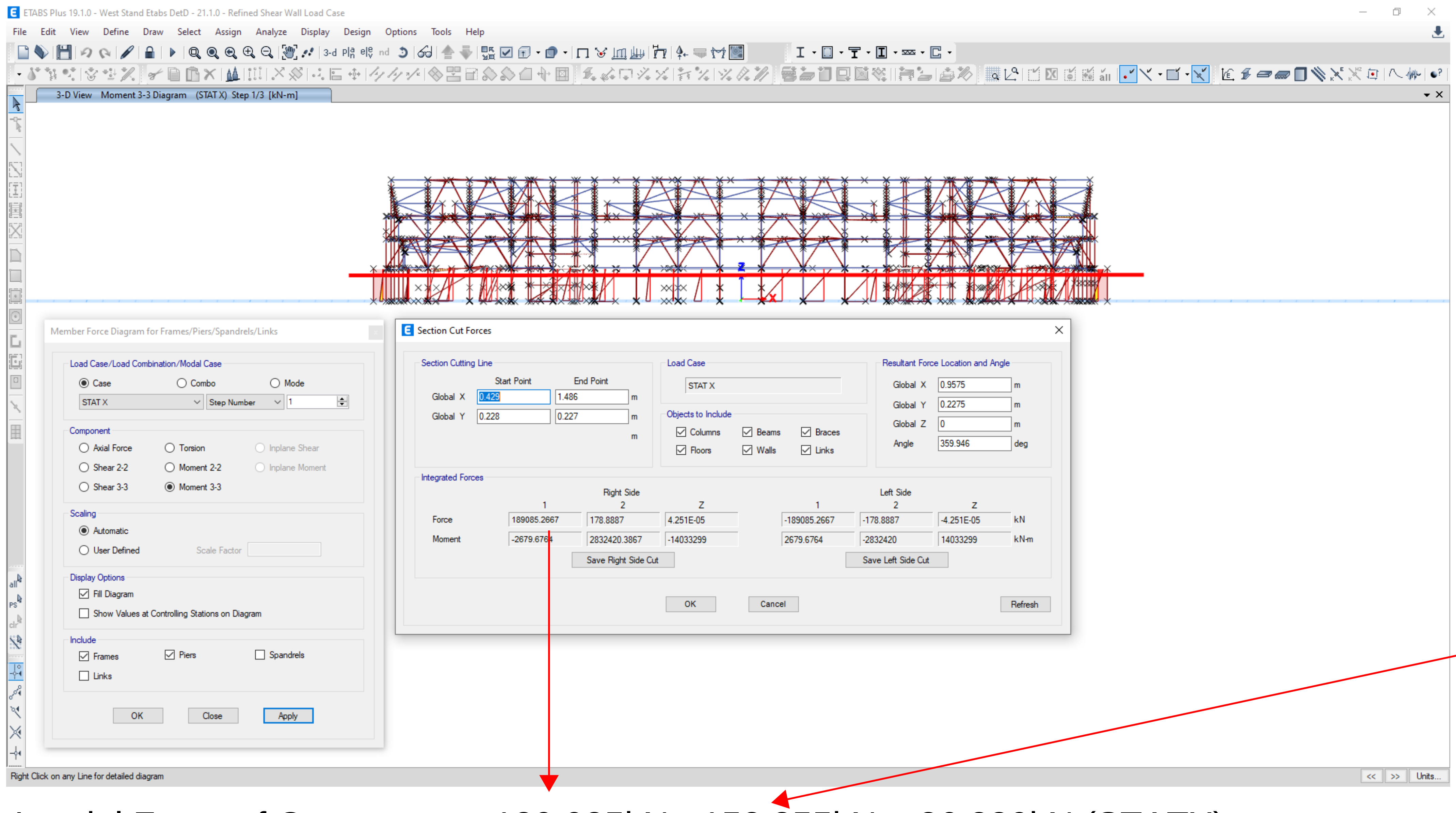
Real Shear in Shear Walls = V*.G+0.3Q + V*.concourse + V*.steelwork

Where:
V.concourse = V* (100%/30%, μ = 1.25, sp = 0.90) x (1- C)
V.steelwork = V* (100%, μ = 3.5 x OS) x C

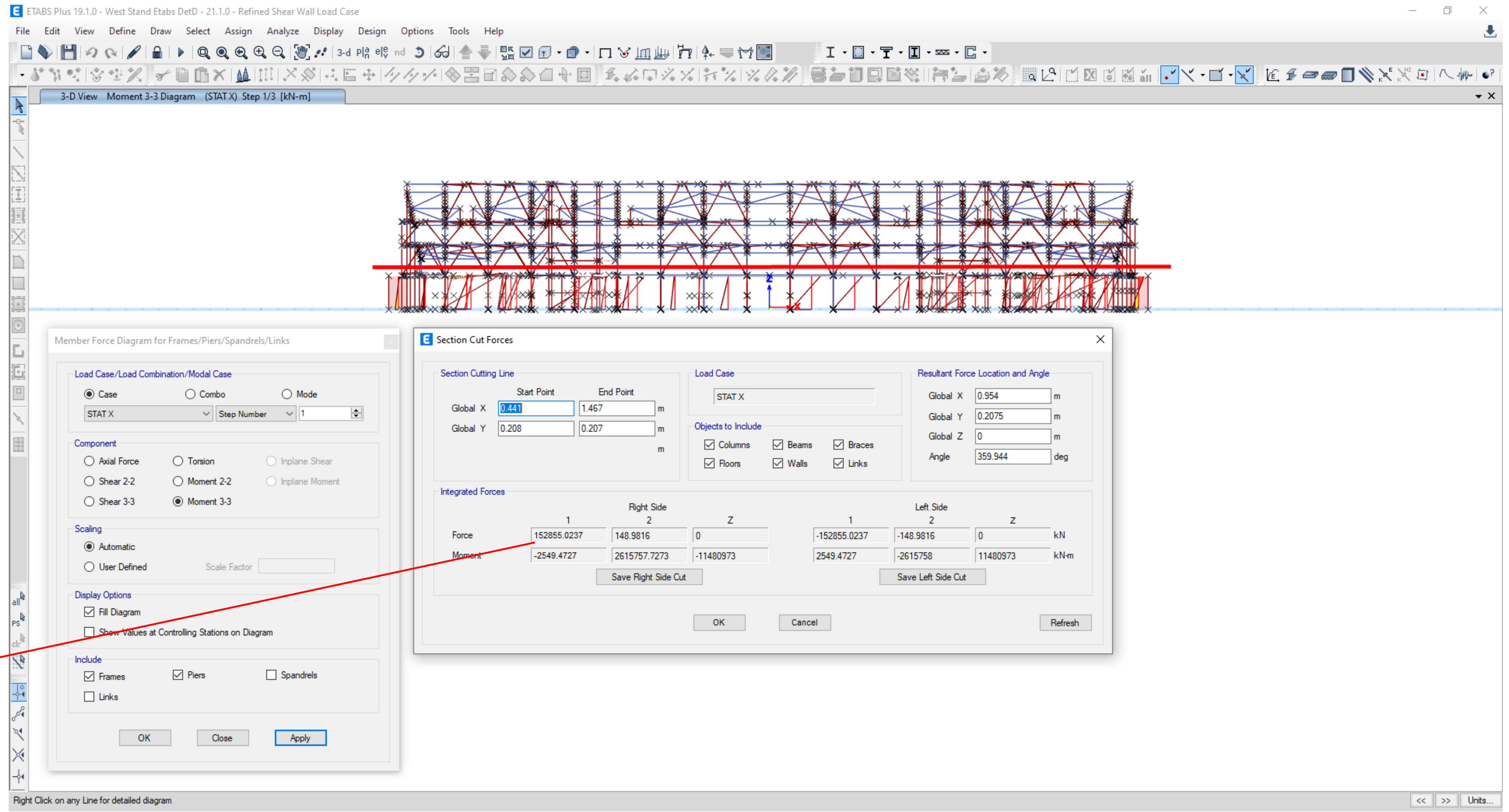
Over Strength Calculation:

Material Over-strength = 1.5 / 0.9 = 1.67
Building Over-strength = 85%
1.67 / 0.85 = 1.9647

STATX, Section Cut, Below Concourse

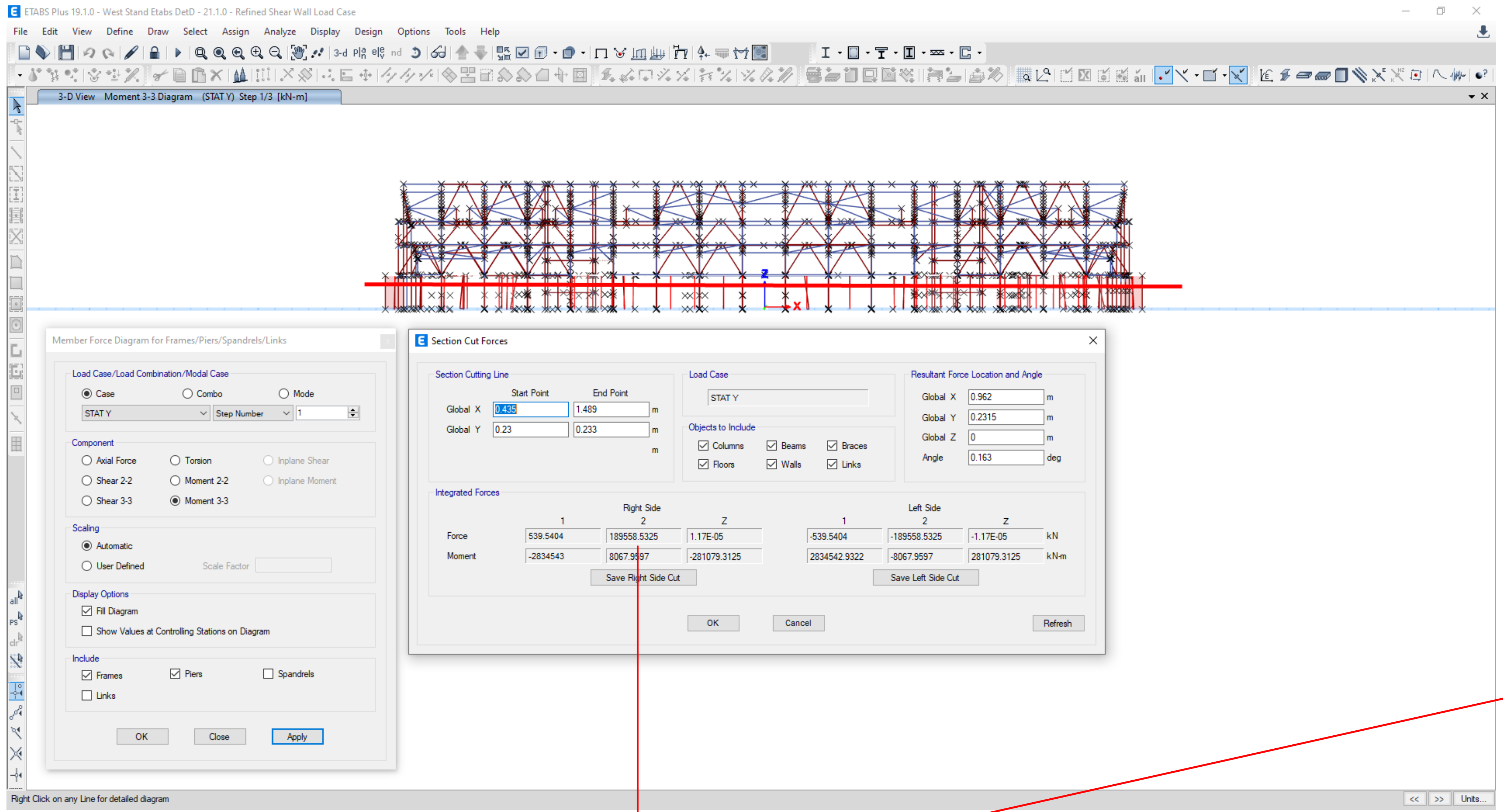


STATX, Section Cut, Above Concourse

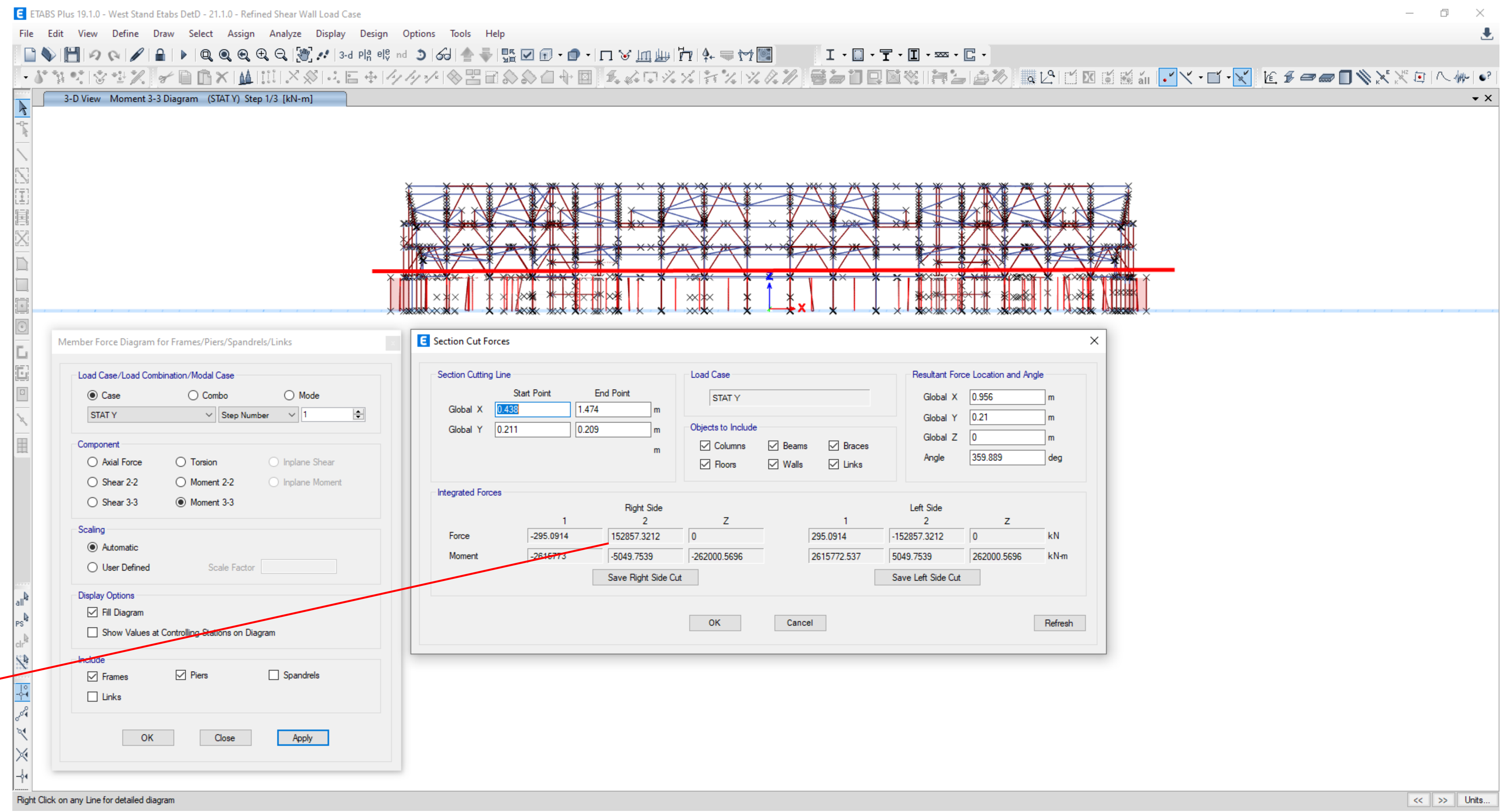


Inertial Force of Concourse = 189,085kN - 152,855kN = 36,230kN (STATX)

STATY, Section Cut, Below Concourse



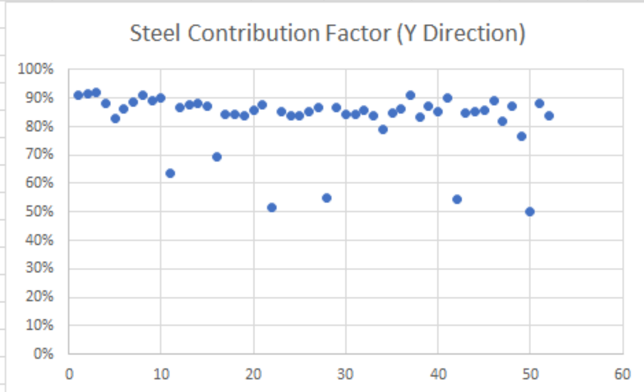
STATY, Section Cut, Above Concourse



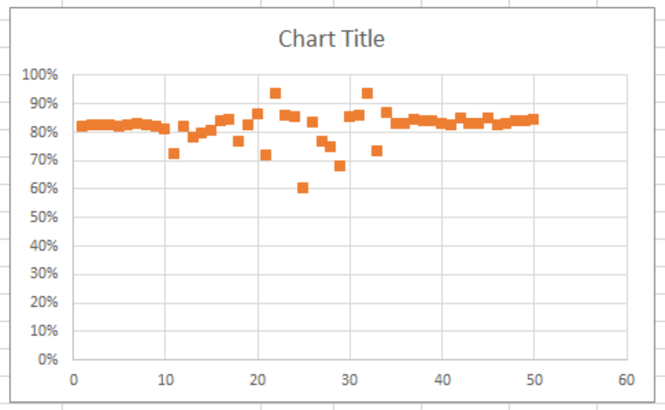
Inertial Force of Concourse = 189,558kN - 152,857kN = 36,701 (STATY)

Calculation of C, Steel Contribution Factor

V* (kN)	STAT X	STAT Y	User Seismic X	User Seismic Y	Steel Contribution Factor (X Direction)	Steel Contribution Factor (Y Direction)
WP001	-615.5445	7831.6912	-298.4041	689.6765		91%
WP002	975.959	10737.9126	-41.0979	889.1352		92%
WP003	441.6725	6210.9639	-17.778	480.1831		92%
WP004	1716.9513	5019.5845	97.6295	597.8356		88%
WP005	1168.3691	2163.5561	-15.4326	371.3075		83%
WP006	376.258	462.5531	62.1502	62.8992		86%
WP007	1018.7208	4683.9719	140.1109	520.4385		89%
WP008	-316.6604	10646.0882	-57.9002	937.6194		91%
WP009	2155.3759	8729.9508	63.7119	951.8954		89%
WP010	481.923	6772.5133	-66.5667	654.5277		90%
WP011	-1418.0316	2790.6637	-96.7872	1009.9435		64%
WP012	1079.095	6873.0474	118.9412	906.3042		87%
WP013	481.3209	8509.0906	-0.3005	1053.0651		88%
WP014	226.7793	6263.8372	-14.1256	736.8977		88%
WP015	306.1603	10669.4775	-45.7636	1358.0476		87%
WP016	990.9716	3373.4891	50.0356	1035.7186		69%
WP017	7.2273	468.5743	0.3974	72.541		85%
WP018	39.5124	3092.5932	2.3898	479.4009		84%
WP019	11.3045	1101.5362	0.9379	175.5275		84%
WP020	28.9512	4770.0284	2.1628	688.2302		86%
WP021	-75.181	3934.5448	-1.4942	480.7948		88%
WP022	-28.8743	208.5515	-1.1426	100.843		52%
WP023	-967.6842	2666.2076	-51.2492	393.4686		85%
WP024	42.5543	4870.849	10.534	791.7795		84%
WP025	13.6237	1171.8637	2.4804	191.5427		84%
WP026	151.0032	4922.5656	13.1215	727.775		85%
WP027	537.7595	3862.2681	26.258	517.5108		87%
WP028	185.3272	271.1988	9.3653	121.8356		55%
WP029	1453.6789	1960.3107	58.5404	256.3197		87%
WP030	-911.0229	6795.7601	-136.5612	1078.0044		84%
WP031	-31.0978	6145.848	20.4792	959.6393		84%
WP032	199.3452	9002.8057	44.4988	1297.8974		86%
WP033	269.3977	6382.332	70.2615	1027.2292		84%
WP034	-386.3306	3468.2461	-31.8715	734.0678		79%
WP035	-1129.5871	7278.1762	-200.1658	1117.9318		85%
WP036	998.4562	5990.0834	82.7182	827.9005		86%
WP037	651.5012	1876.1776	24.5066	166.757		91%
WP038	-208.7338	2530.1905	4.6844	416.1008		84%
WP039	-148.9158	4156.394	22.3257	531.1486		87%
WP040	-16.1992	2087.8249	34.5891	302.6592		86%
WP041	277.8678	2729.1884	50.948	273.5381		90%
WP042	1819.2931	3186.9518	125.3749	1451.0994		54%
WP043	1267.7708	3640.2011	258.8515	559.1686		85%
WP044	528.2363	1792.8701	108.5214	264.2557		85%
WP045	92.5677	3743.7066	45.8281	538.6138		86%
WP046	-70.7721	4338.0048	4.4112	461.6903		89%
WP047	14.0382	1459.9811	6.3979	264.7658		82%
WP048	341.4927	6082.4142	38.5891	767.8872		87%
WP049	-1141.1112	5768.6779	-46.6941	1344.4487		77%
WP050	-836.4706	1890.7087	57.2331	943.6893		50%
WP051	619.4056	8934.7166	-34.573	1057.1152		88%
WP052	17.1723	9046.7513	58.1922	1454.8836		84%
WP101	6941.2897	-193.0734	1260.4998	-72.1617	82%	
WP102	5102.2169	1525.7148	894.8619	237.0274	82%	
WP103	4298.9325	1243.2766	752.414	190.3636	82%	
WP104	385.6503	252.4418	67.9158	41.2277	82%	
WP105	421.5147	-131.1139	76.3654	-22.4888	82%	
WP106	5136.6783	-290.5758	913.9608	-63.6106	82%	
WP107	1056.5661	-390.9241	183.4225	-66.2486	83%	
WP108	5392.3095	33.838	961.0781	-9.7178	82%	
WP109	6033.5608	2149.7424	1094.5386	323.2055	82%	
WP110	349.751	338.5989	66.5816	53.2312	81%	
WP111	1730.0563	514.266	479.0298	14.7768	72%	
WP112	6542.795	48.9505	1178.3312	59.843	82%	
WP113	5274.8388	1153.9033	1146.5157	56.6054	78%	
WP114	738.2749	0	151.2848	6.6988	80%	
WP115	4266.9217	84.827	825.5768	38.1318	81%	
WP116	3602.2533	417.4512	578.0104	27.5586	84%	
WP117	3090.7466	1314.9235	478.8781	30.8794	85%	
WP118	5226.6473	-673.1583	1217.2951	43.7102	77%	
WP119	4010.5639	135.2217	701.0177	26.358	83%	
WP120	12018.6943	2593.4134	1652.9073	101.3208	86%	
WP121	2942.7601	155.7503	823.1441	-41.4044	72%	
WP122	2705.355	127.9775	181.7824	-3.6587	93%	
WP123	4384.4871	839.3885	619.3309	-36.942	86%	
WP124	3227.6803	-115.8324	469.6674	60.5168	85%	
WP125	2011.2438	265.5889	798.0373	-1.6033	60%	
WP126	1483.8182	20.482	245.0227	-2.3956	83%	
WP127	4610.3251	-124.8478	1070.6807	-80.9524	77%	
WP128	6114.8458	430.1168	1535.3566	66.2509	75%	
WP129	4494.6562	106.5385	1434.0351	1.9656	68%	
WP130	3204.9274	557.1318	465.5743	-33.464	85%	
WP131	4481.8567	-262.424	635.5365	101.6013	86%	
WP132	2600.7749	-14.8292	171.9593	6.9053	93%	
WP133	4442.2419	255.2504	1191.0045	56.4717	73%	
WP134	10863.9969	-1218.3706	1444.582	-156.9364	87%	
WP135	8233.2719	-28.2347	1413.9076	-35.2748	83%	
WP136	8625.5525	638.8542	1473.8026	-30.2425	83%	
WP137	676.9552	371.2689	106.6262	26.5592	84%	
WP138	945.2178	374.045	152.2918	24.0412	84%	
WP139	1465.3051	510.0009	238.3553	30.8126	84%	
WP140	2129.7579	532.0246	361.2041	28.2687	83%	
WP141	963.9618	149.3296	168.8823	6.2235	82%	
WP142	5676.7588	563.4948	870.4455	-40.6267	85%	
WP143	4194.4512	459.6868	713.7048	-41.926	83%	
WP144	4734.8392	257.3477	804.7634	-45.7174	83%	
WP145	5708.5934	349.4133	876.4657	-66.8816	85%	
WP146	995.6082	29.1813	173.9225	-32.6306	83%	
WP147	2161.2797	-86.1982	366.0101	-94.1691	83%	
WP148	1699.9364	-185.0507	275.4985	-96.1935	84%	
WP149	1915.056	-286.459	306.3755	-130.0011	84%	
WP150	1982.0667	-372.9981	313.6181	-155.499	84%	



Sample Mean	83%
Standard Deviation	0.09955
Alpha Value	1%
Number of Values	52
Confidence Interval, ±	3.6%
C (Y Direction)	79%

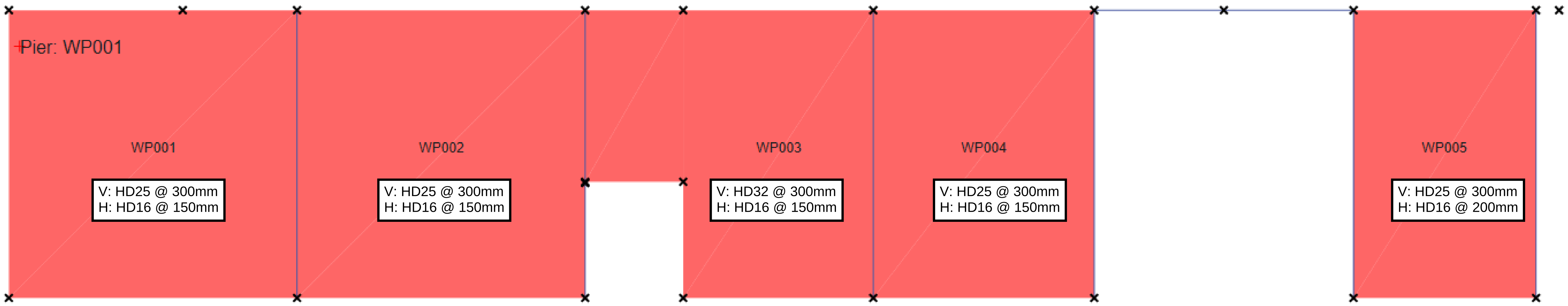


Sample Mean	82%
Standard Deviation	0.05420
Alpha Value	1%
Number of Values	50
Confidence Interval, ±	2.0%
C (Y Direction)	80%

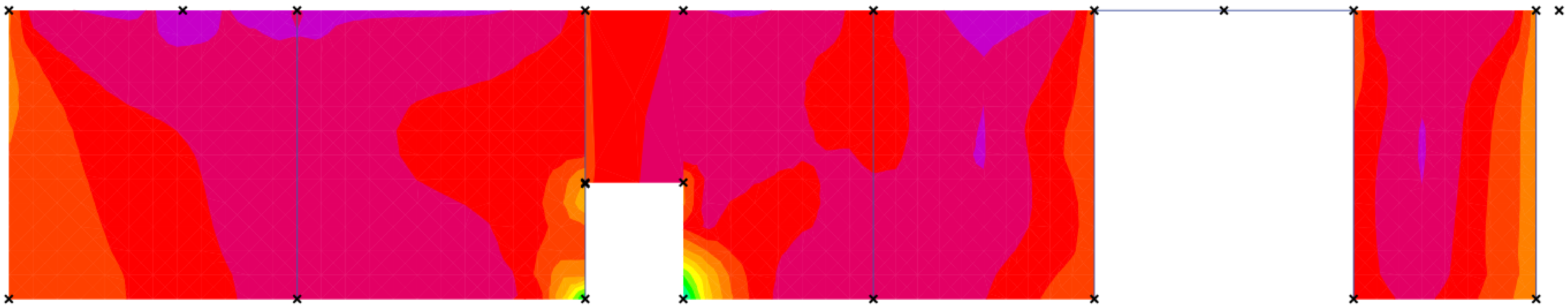
Refined Shear Forces

Pier	1.0G+0.3Q	Spec X (env)	Spec Y (env)	1.0SpexX + 0.30SpecQ (mu = 1.25, sp = 0.9)	1.0SpexX + 0.30SpecQ (mu = 1.25, sp = 0.9)	V*, (mu = 1.25, sp = 0.9)	1.0 x SpecX (mu = 3.5) x OS	1.0 x SpecY (mu = 3.5) x OS	V*, (mu = 3.5) x OS	(1-C) x $V^*_{(mu = 1.25, sp = 0.9)}$ + C x $V^*_{(mu = 3.5) x OS}$
WP001	10	3357	9510	4894	8288	8288	1900	5381	5381	5981
WP002	-45	4293	13159	6493	11384	11384	2429	7446	7446	8258
WP003	-11	2526	7674	3805	6644	6644	1429	4342	4342	4817
WP004	36	2374	5959	3279	5257	5257	1343	3372	3372	3761
WP005	52	1434	2555	1734	2353	2353	811	1446	1446	1633
WP006	-3	395	476	424	468	468	224	269	269	310
WP007	90	1781	5023	2591	4379	4379	1008	2842	2842	3159
WP008	-51	4597	12214	6510	10711	10711	2601	6911	6911	7695
WP009	-102	3626	9762	5165	8549	8549	2052	5523	5523	6148
WP010	-6	2487	7684	3776	6643	6643	1407	4348	4348	4821
WP011	184	2147	3086	2422	2940	2940	1215	1746	1746	1993
WP012	-221	2334	6833	3454	5936	5936	1320	3866	3866	4293
WP013	148	2748	8661	4213	7474	7474	1555	4901	4901	5432
WP014	9	2032	6415	3118	5536	5536	1150	3630	3630	4023
WP015	155	3439	10895	5286	9398	9398	1946	6165	6165	6832
WP016	205	1359	3257	1841	2888	2888	769	1843	1843	2058
WP017	6	119	462	203	392	392	67	262	262	289
WP018	5	798	3099	1362	2631	2631	452	1753	1753	1934
WP019	144	292	1130	497	959	959	165	639	639	705
WP020	28	1246	4853	2129	4119	4119	705	2746	2746	3029
WP021	-85	1099	4234	1867	3596	3596	622	2396	2396	2643
WP022	84	183	196	190	198	198	103	111	111	129
WP023	47	2166	2686	2342	2629	2629	1226	1520	1520	1749
WP024	-108	1312	4875	2186	4151	4151	743	2758	2758	3046
WP025	136	318	1180	529	1005	1005	180	667	667	737
WP026	18	1344	4942	2227	4212	4212	760	2797	2797	3089
WP027	-84	1123	4127	1861	3518	3518	636	2335	2335	2579
WP028	97	215	255	230	251	251	122	144	144	166
WP029	30	1741	1960	1835	1956	1956	985	1109	1109	1284
WP030	-212	2262	6948	3425	6010	6010	1280	3931	3931	4360
WP031	237	1989	6399	3080	5513	5513	1125	3621	3621	4011
WP032	-195	3003	9485	4608	8184	8184	1699	5367	5367	5948
WP033	230	2132	6704	3265	5787	5787	1206	3794	3794	4205
WP034	221	1166	3632	1778	3138	3138	660	2055	2055	2279
WP035	-4	2687	8163	4047	7068	7068	1520	4619	4619	5124
WP036	-50	2563	6872	3644	6021	6021	1450	3889	3889	4329
WP037	-12	1116	2263	1415	2047	2047	632	1281	1281	1439
WP038	63	1365	2859	1752	2575	2575	772	1618	1618	1815
WP039	-36	1577	4946	2412	4270	4270	892	2799	2799	3102
WP040	53	769	2411	1176	2081	2081	435	1364	1364	1512
WP041	-2	1124	3270	1659	2842	2842	636	1850	1850	2055
WP042	210	2358	3453	2674	3278	3278	1334	1954	1954	2227
WP043	-37	2140	4536	2759	4080	4080	1211	2567	2567	2879
WP044	73	906	2212	1237	1957	1957	512	1251	1251	1397
WP045	-4	1507	4607	2277	3987	3987	853	2607	2607	2892
WP046	-9	1793	5518	2717	4772	4772	1014	3122	3122	3462
WP047	1	576	1792	877	1548	1548	326	1014	1014	1124
WP048	-13	2589	7676	3855	6661	6661	1465	4343	4343	4821
WP049	42	2349	6866	3474	5965	5965	1329	3885	3885	4314
WP050	95	1537	2440	1788	2286	2286	869	1381	1381	1568
WP051	-5	3068	9586	4684	8279	8279	1736	5424	5424	6013
WP052	-2	3174	10022	4870	8647	8647	1796	5671	5671	6285
WP101	-42	8003	5080	7507	5895	7507	4528	2875	4528	5130
WP102	21	5355	2013	4696	2852	4696	3030	1139	3030	3367
WP103	21	4559	1788	4015	2487	4015	2580	1012	2580	2870
WP104	-1	409	262	384	303	384	232	148	232	262
WP105	7	449	222	406	281	406	254	125	254	285
WP106	16	5515	2246	4877	3074	4877	3121	1271	3121	3476
WP107	43	1076	887	1057	953	1057	609	502	609	699
WP108	-1	5763	2165	5053	3068	5053	3261	1225	3261	3623
WP109	30	6896	3633	6293	4493	6293	3902	2056	3902	4385
WP110	-6	445	456	458	464	464	252	258	258	300
WP111	7	1648	758	1478	987	1478	932	429	932	1042
WP112	-30	6927	2232	5986	3397	5986	3920	1263	3920	4337
WP113	-27	5220	1639	4501	2526	4501	2954	927	2954	3266
WP114	18	747	257	649	379	649	423	145	423	468
WP115	-2	4399	1158	3740	1952	3740	2489	655	2489	2742
WP116	145	3893	1092	3326	1781	3326	2203	618	2203	2430
WP117	7	3567	1968	3276	2394	3276	2018	1113	2018	2272
WP118	99	5140	2419	4622	3121	4622	2909	1369	2909	3255
WP119	35	4224	1256	3625	1988	3625	2390	711	2390	2640
WP120	-74	12681	4676	11098	6682	11098	7175	2646	7175	7968
WP121	98	2817	807	2410	1302	2410	1594	457	1594	1759
WP122	105	3071	744	2596	1312	2596	1738	421	1738	1911
WP123	-5	4627	1703	4048	2436	4048	2618	963	2618	2907
WP124	210	3384	933	2887	1535	2887	1915	528	1915	2112
WP125	186	1917	554	1642	890	1642	1085	313	1085	1197
WP126	-8	1549	377	1310	663	1310	877	213	877	964
WP127	-58	4608	1225	3921	2055	3921	2608	693	2608	2873
WP128	82	5981	1503	5068	2598	5068	3384	850	3384	3725
WP129	-92	4322	1144	3676	1923	3676	2445	647	2445	2694
WP130	-143	3359	821	2841	1441	2841	1901	464	1901	2091
WP131	173	4737	1711	4137	2468	4137	2680	968	2680	2975
WP132	-17	2954	720	2498	1266	2498	1672	408	1672	1839
WP133	49	4316	1225	3691	1986	3691	2442	693	2442	2694
WP134	25	11373	4464	10017	6206	10017	6435	2526	6435	7159
WP135	-13	8434	2349	7201	3845	7201	4772	1329	4772	5263
WP136	-138	8828	2381	7519	3963	7519	4995	1347	4995	5505
WP137	-12	663	534	649	577	649	375	302	375	431
WP138	-15	936	583	876	681	876	530	330	530	600
WP139	-60	1456	829	1343	998	1343	824	469	824	929
WP140	-4	2115	995	1902	1284	1902	1197	563	1197	1340
WP141	-54	959	378	845	524	845	542	214	542	603
WP142	64	5721	1983	4977	2915	4977	3237	1122	3237	3588
WP143	184	4188	1487	3652	2162	3652	2370	842	2370	2629
WP144	-224	4723	1726	4130	2476	4130	2673	976	2673	2967
WP145	-50	5751	2047	5016	2973	5016	3254	1158	3254	3610
WP146	60	989	406	875	553	875	559	230	559	623
WP147	10	2145	1067	1942	1348	1942	1213	604	1213	1361
WP148	67	1684	1041	1573	1218	1573	953	589	953	1078
WP149	49	1887	1331	1801	1495	1801	1067	753	1067	1216
WP150	47	1940	1537	1892	1669	1892	1098	870	1098	1258

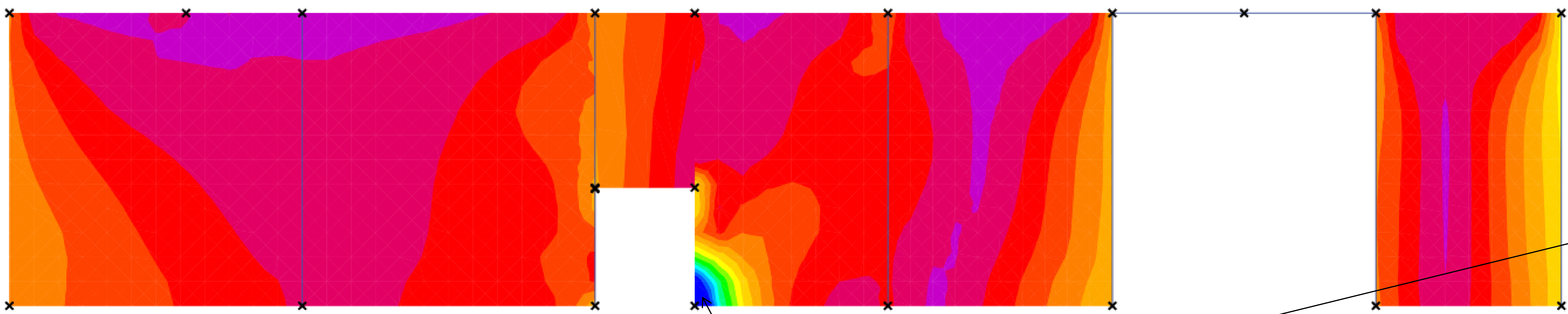
A08



1.0G + 0.30Q + 1.0SpecX + 0.30SpecY [mu = 1.25, sp = 0.90]



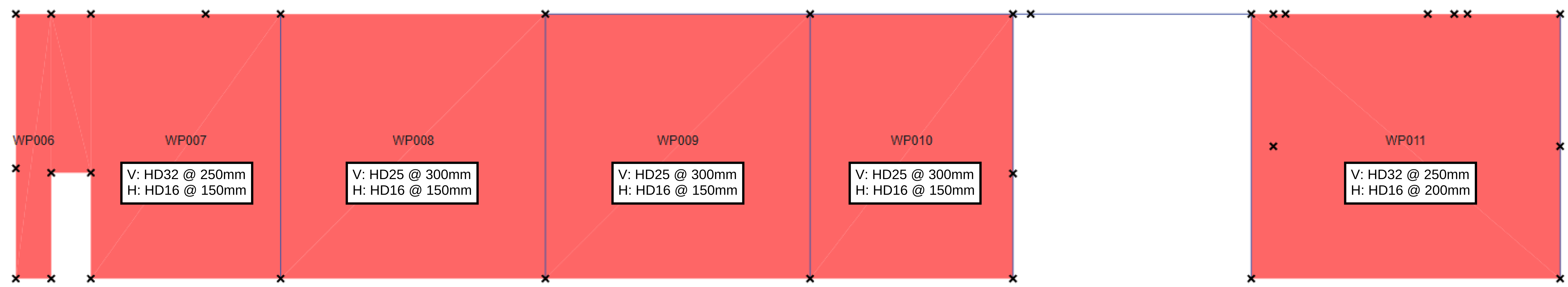
1.0G + 0.30Q + 0.30SpecX + 1.0SpecY [mu = 1.25, sp = 0.90]



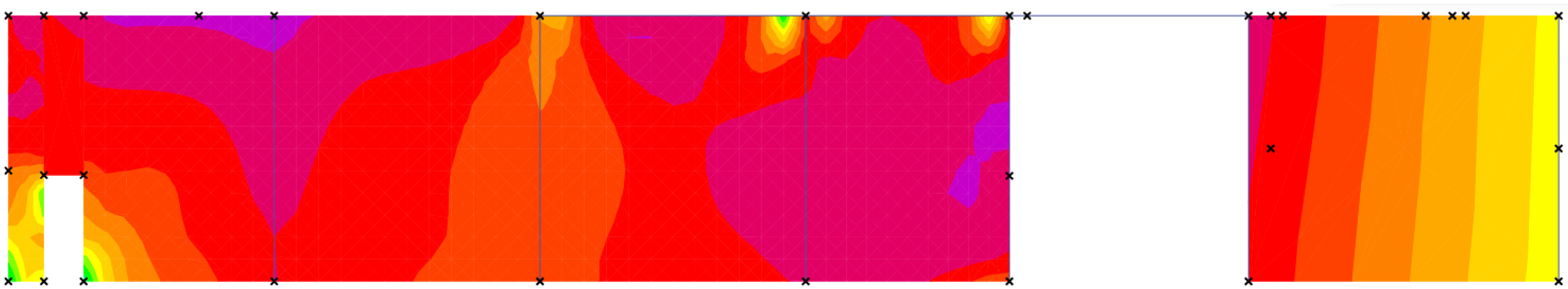
WP001	0.47
WP002	0.41
WP003	1.11
WP004	0.53
WP005	0.51

Can justify to HD32 - 300, when considering average stress over 1000mm.

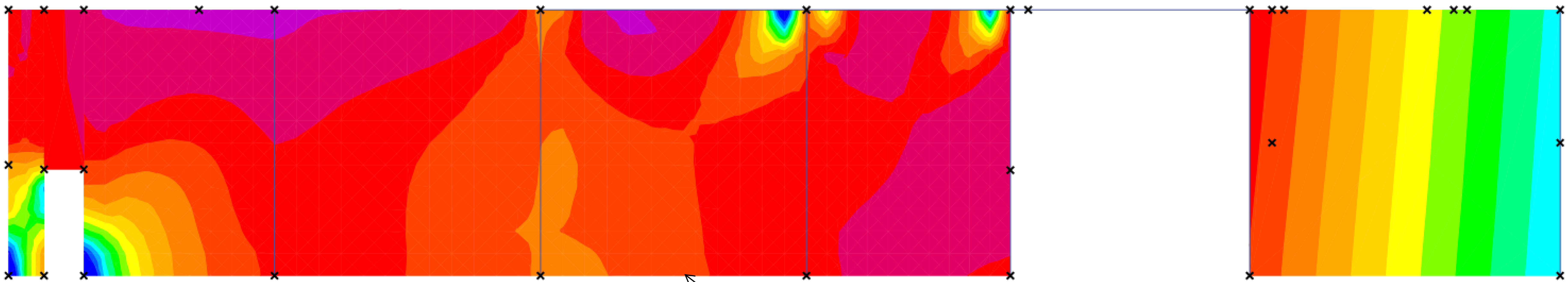
A06



1.0G + 0.30Q + 1.0SpecX + 0.30SpecY [mu = 1.25, sp = 0.90]



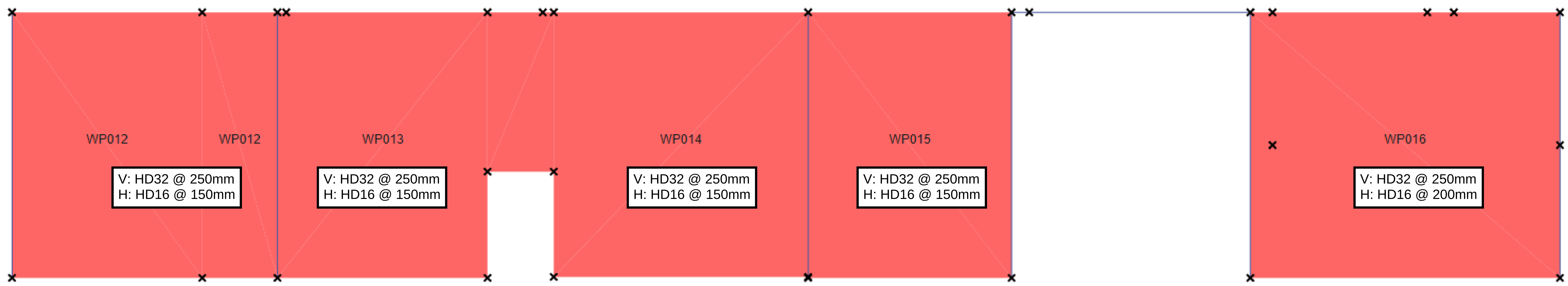
1.0G + 0.30Q + 0.30SpecX + 1.0SpecY [mu = 1.25, sp = 0.90]



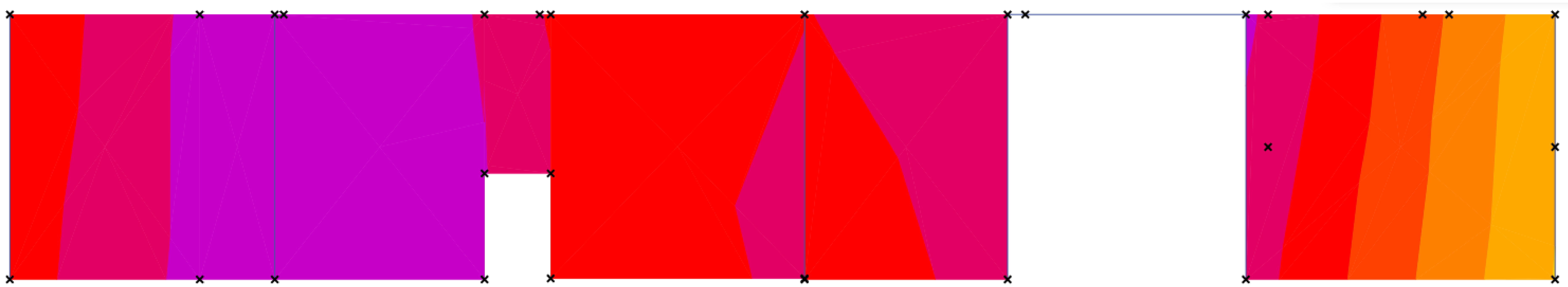
Can justify to HD25 - 300, when considering average stress over 1000mm.

WP006	0.32
WP007	0.77
WP008	0.51
WP009	1.23
WP010	0.94
WP011	0.82

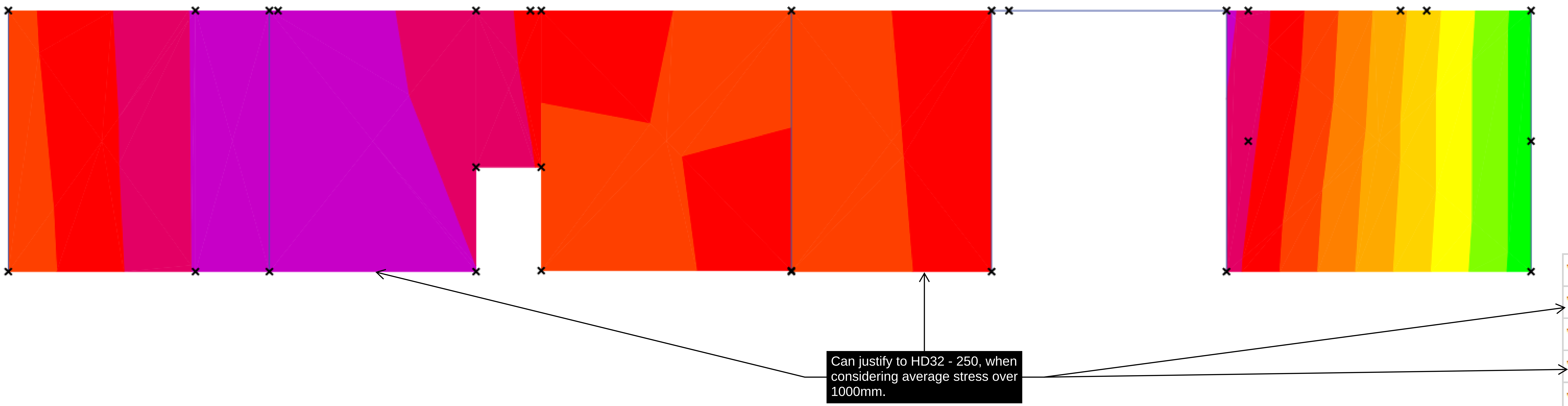
A04



1.0G + 0.30Q + 1.0SpecX + 0.30SpecY [mu = 1.25, sp = 0.90]

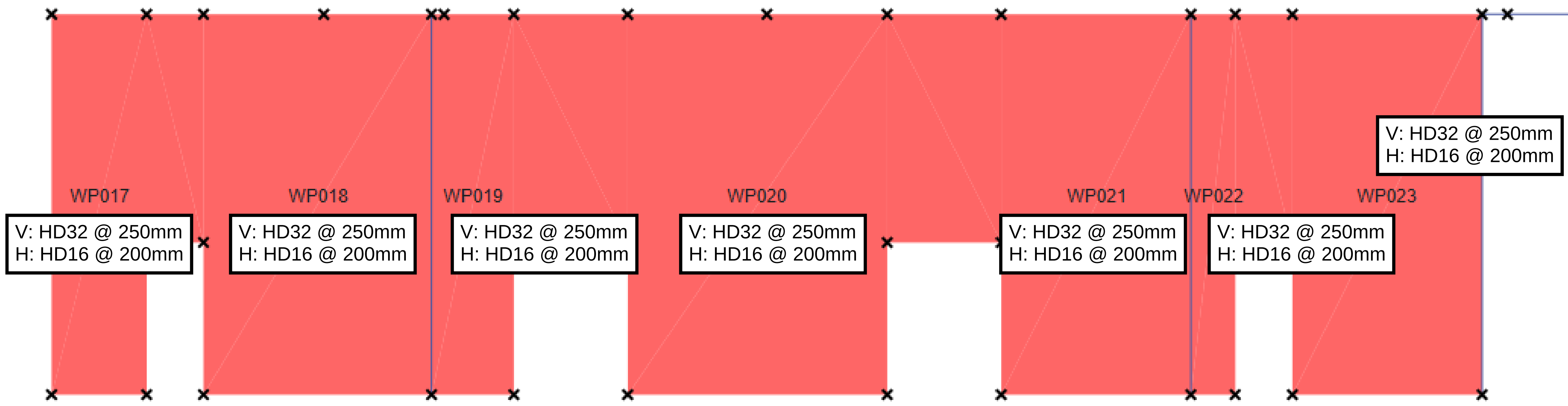


1.0G + 0.30Q + 0.30SpecX + 1.0SpecY [mu = 1.25, sp = 0.90]

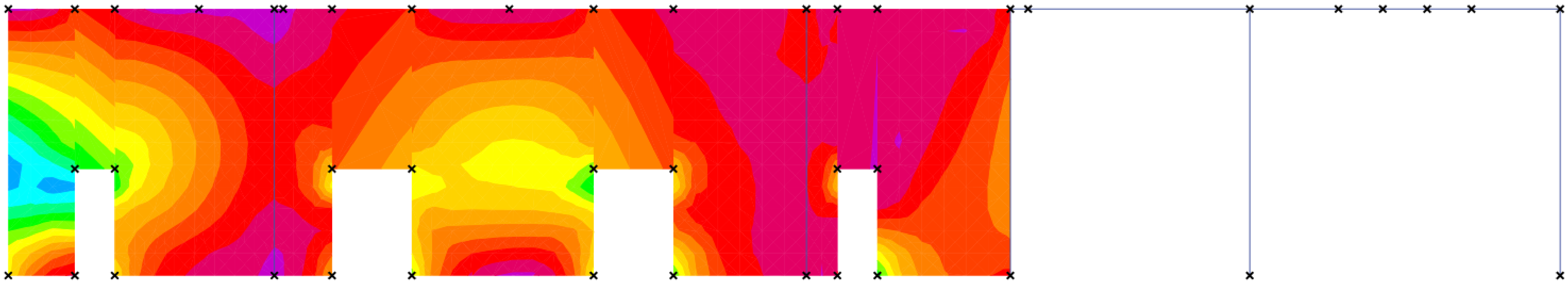


WP012	0.98
WP013	1.35
WP014	0.84
WP015	1.72
WP016	0.76

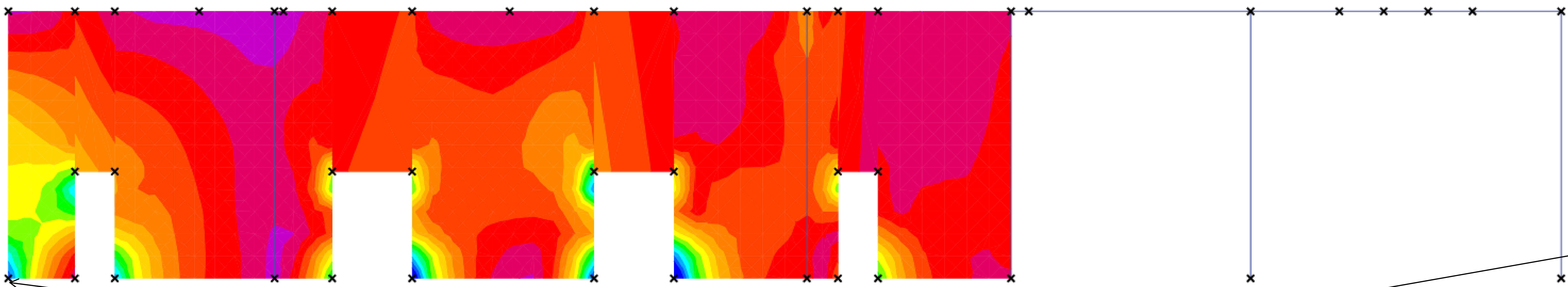
A01



1.0G + 0.30Q + 1.0SpecX + 0.30SpecY [mu = 1.25, sp = 0.90]



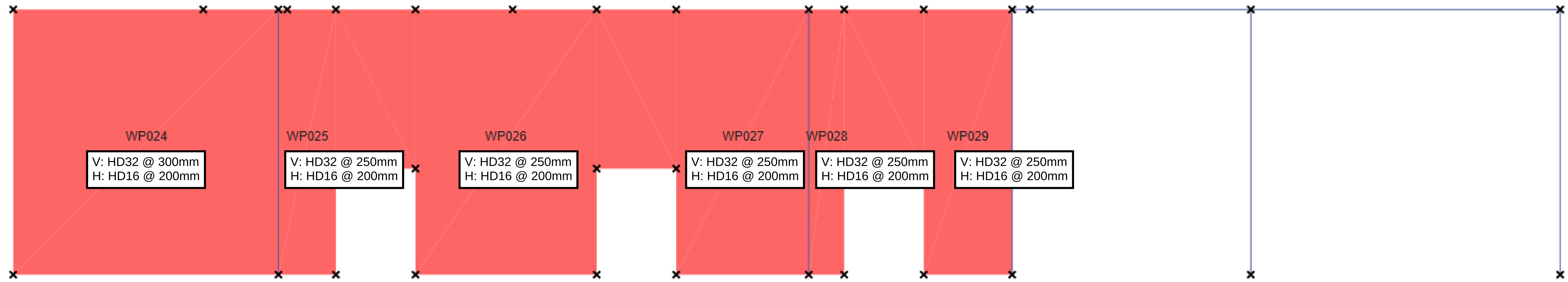
1.0G + 0.30Q + 0.30SpecX + 1.0SpecY [mu = 1.25, sp = 0.90]



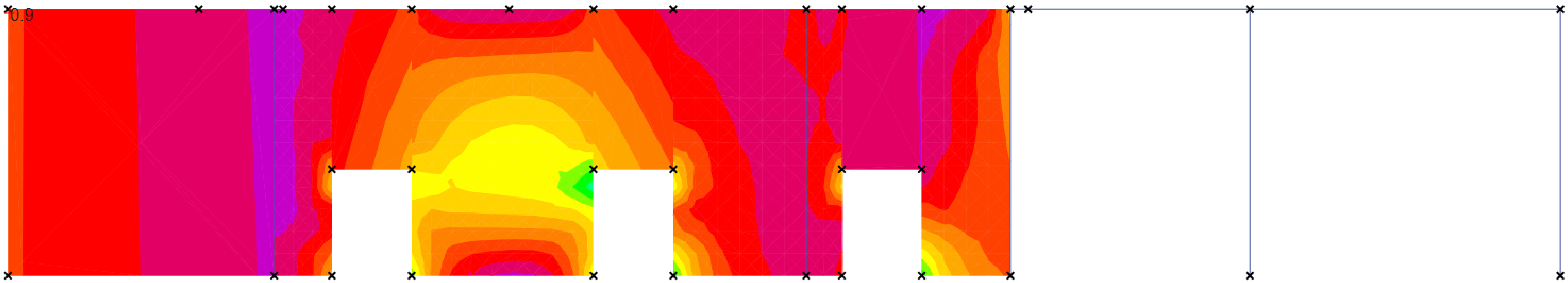
Can justify to HD32 - 250, when considering average stress over 1000mm.

WP017	1.02
WP018	0.47
WP019	0.96
WP020	0.63
WP021	0.80
WP022	0.15
WP023	0.40

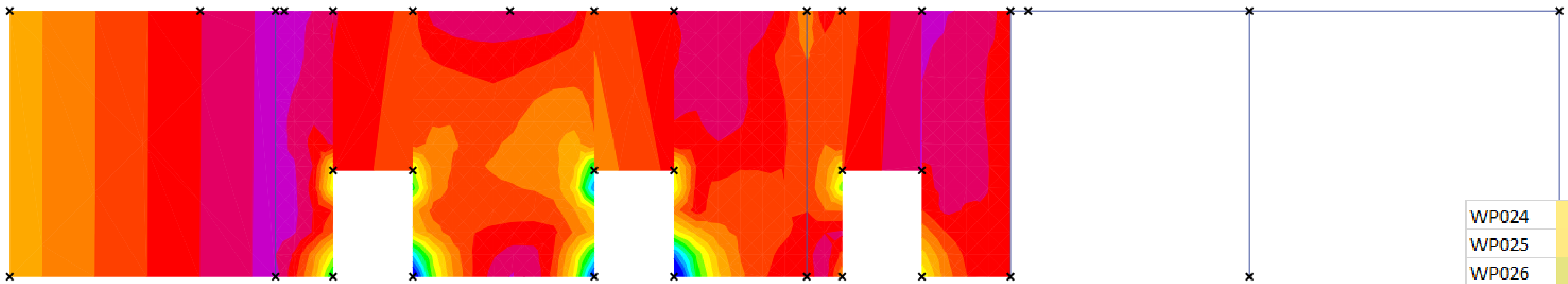
B01



1.0G + 0.30Q + 1.0SpecX + 0.30SpecY [mu = 1.25, sp = 0.90]

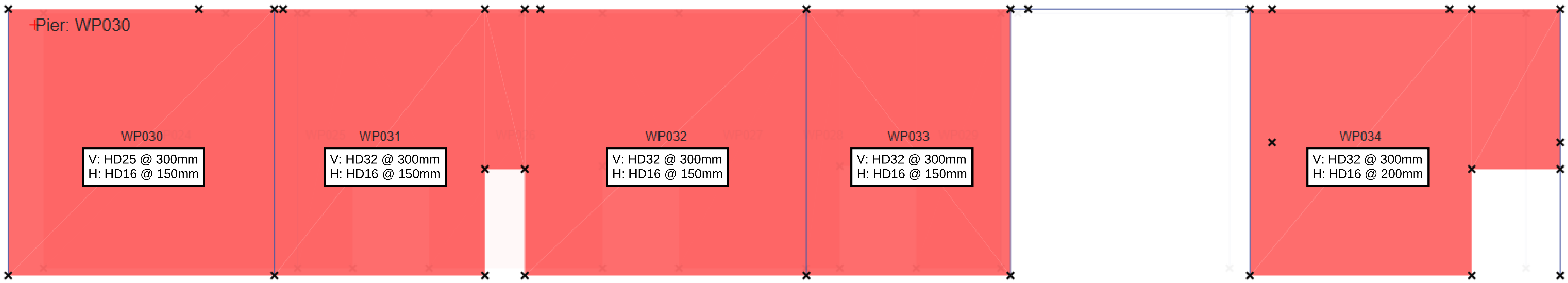


1.0G + 0.30Q + 0.30SpecX + 1.0SpecY [mu = 1.25, sp = 0.90]

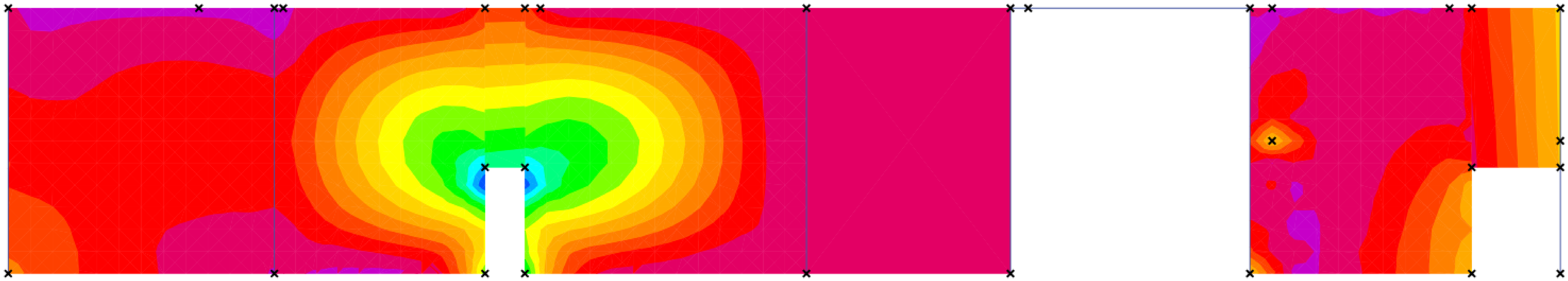


WP024	0.73
WP025	0.99
WP026	0.62
WP027	0.84
WP028	0.15
WP029	0.60

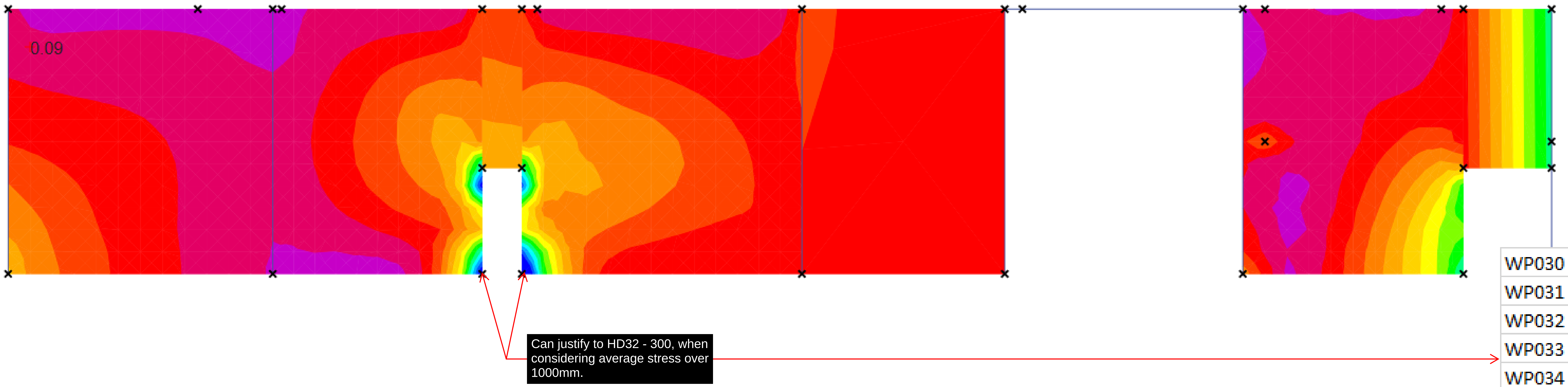
B04



1.0G + 0.30Q + 1.0SpecX + 0.30SpecY [mu = 1.25, sp = 0.90]

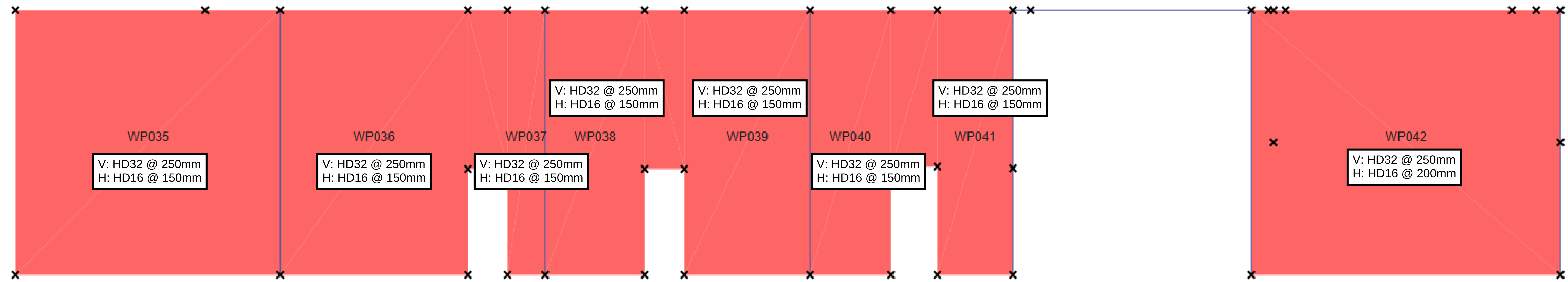


1.0G + 0.30Q + 0.30SpecX + 1.0SpecY [mu = 1.25, sp = 0.90]

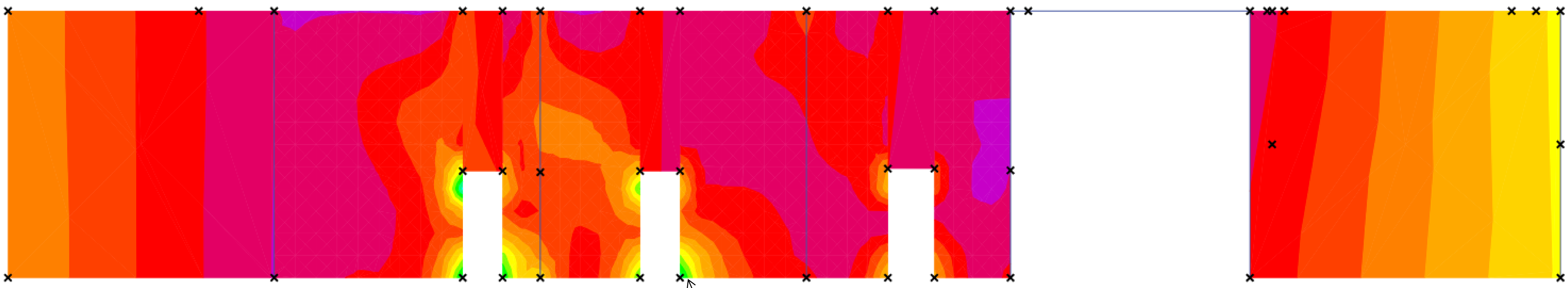


WP030	0.45
WP031	0.44
WP032	0.45
WP033	13.11
WP034	0.46

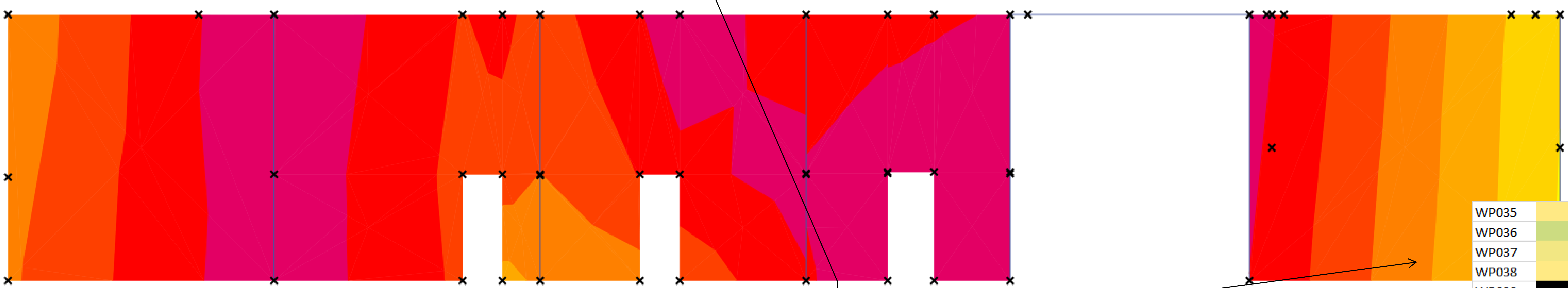
B06



1.0G + 0.30Q + 1.0SpecX + 0.30SpecY [mu = 1.25, sp = 0.90]



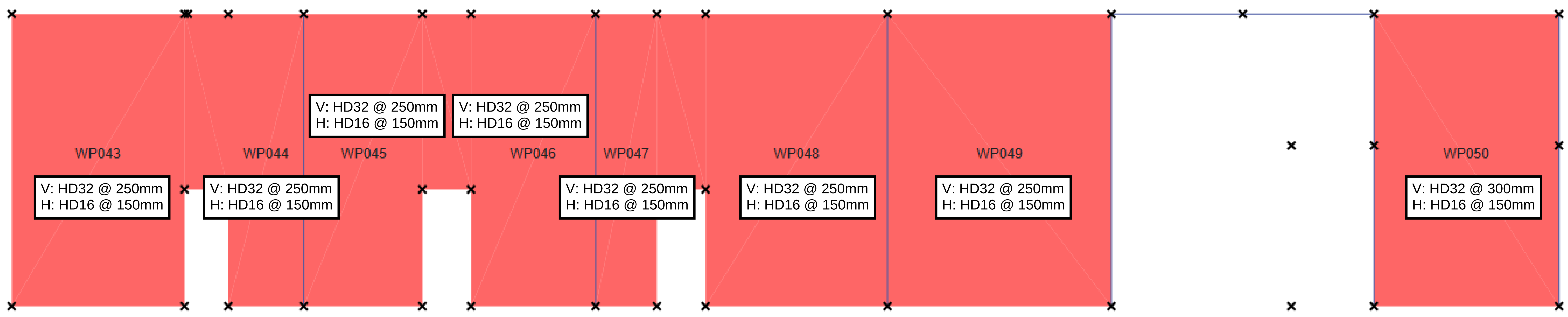
1.0G + 0.30Q + 0.30SpecX + 1.0SpecY [mu = 1.25, sp = 0.90]



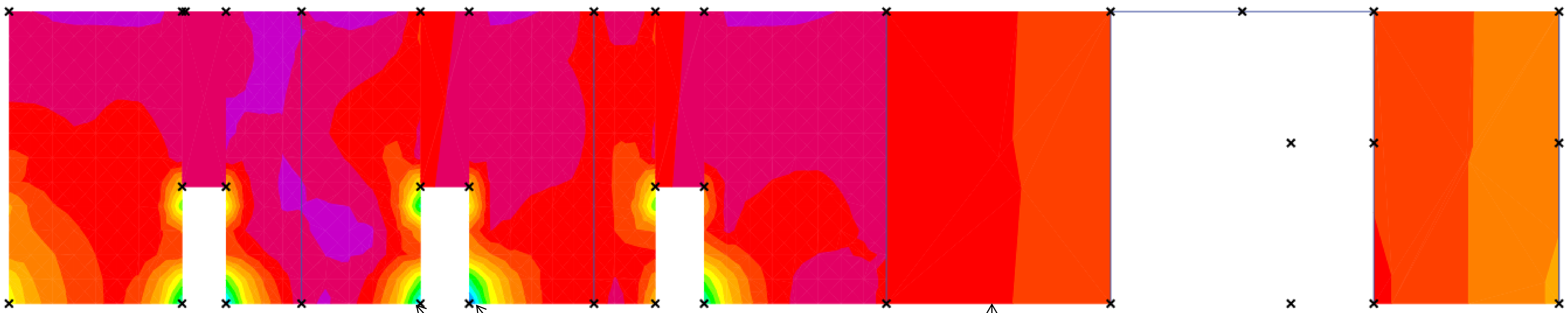
Can justify to HD32 - 250, when considering average stress over 1000mm.

WP035	0.94
WP036	0.50
WP037	0.67
WP038	0.86
WP039	1.27
WP040	0.68
WP041	0.66
WP042	0.88

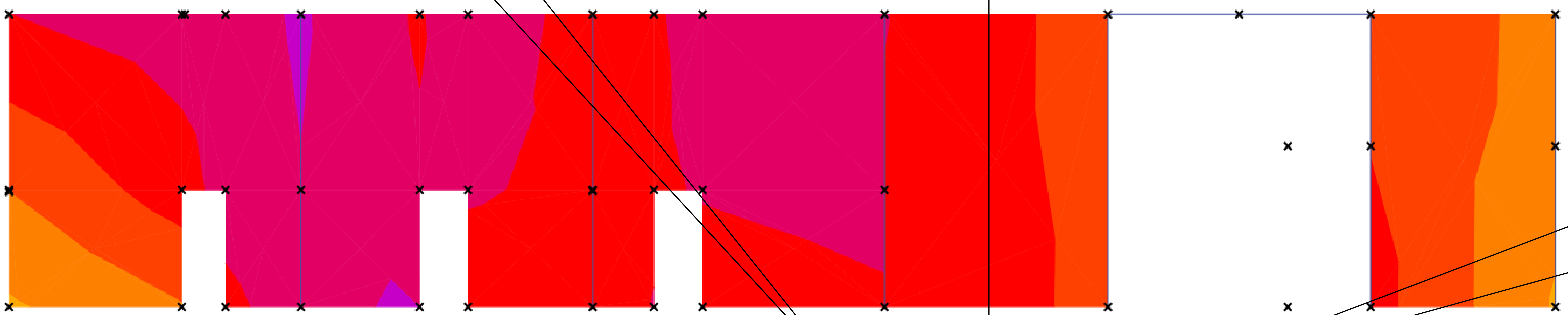
B08



1.0G + 0.30Q + 1.0SpecX + 0.30SpecY [mu = 1.25, sp = 0.90]



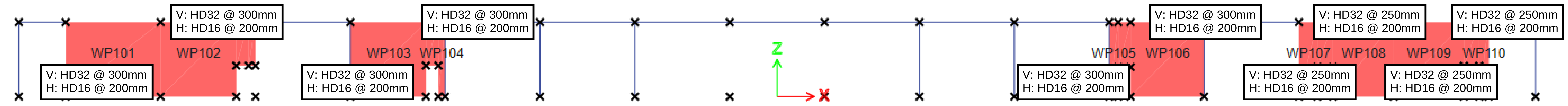
1.0G + 0.30Q + 0.30SpecX + 1.0SpecY [mu = 1.25, sp = 0.90]



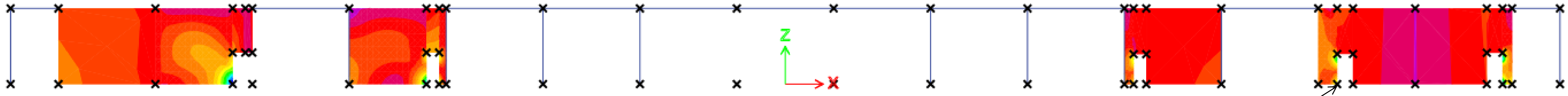
Can justify to HD32 - 250, when considering average stress over 1000mm.

WP043	0.79
WP044	0.31
WP045	1.32
WP046	2.97
WP047	0.72
WP048	0.69
WP049	1.38
WP050	0.76

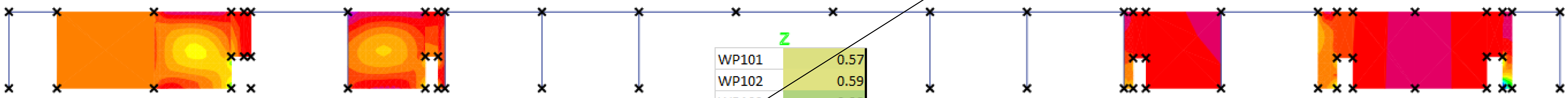
Y = 51.95



1.0G + 0.30Q + 1.0SpecX + 0.30SpecY [mu = 1.25, sp = 0.90]



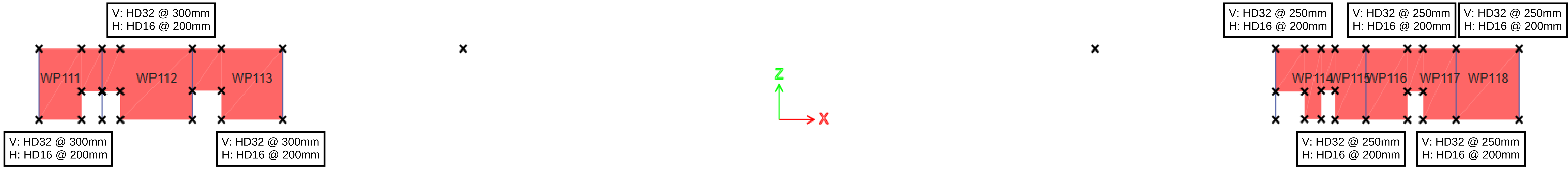
1.0G + 0.30Q + 0.30SpecX + 1.0SpecY [mu = 1.25, sp = 0.90]



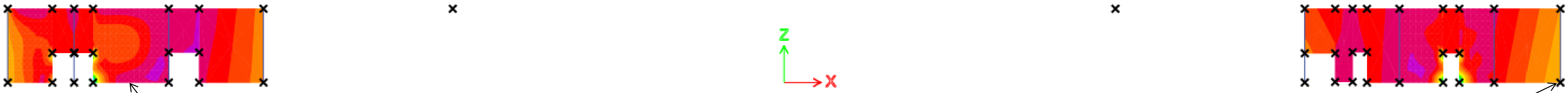
WP101	0.57
WP102	0.59
WP103	0.38
WP104	0.37
WP105	0.30
WP106	0.80
WP107	1.06
WP108	0.98
WP109	0.92
WP110	0.32

Can justify to HD32 - 300, when considering average stress over 1000mm.

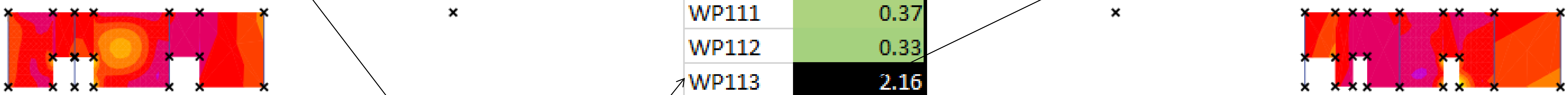
W-C1



1.0G + 0.30Q + 1.0SpecX + 0.30SpecY [mu = 1.25, sp = 0.90]



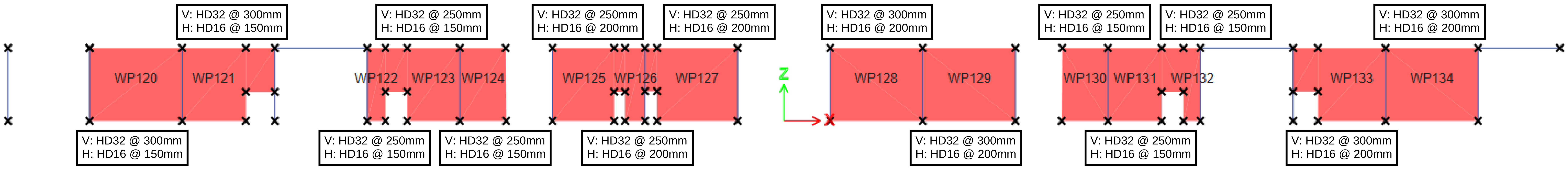
1.0G + 0.30Q + 0.30SpecX + 1.0SpecY [mu = 1.25, sp = 0.90]



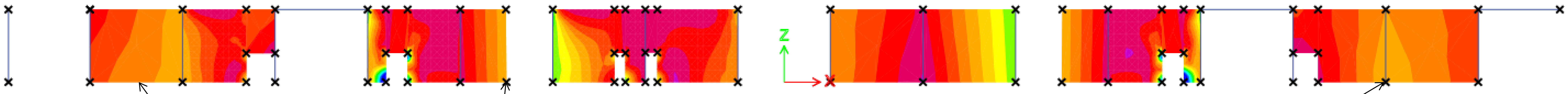
WP111	0.37
WP112	0.33
WP113	2.16
WP114	1.16
WP115	2.86
WP116	0.34
WP117	0.48
WP118	1.52

Can justify to HD32 - 300, when considering average stress over 1000mm.

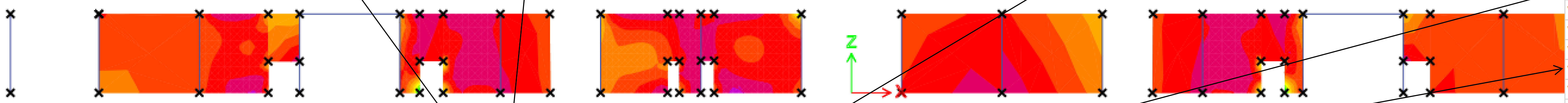
W-E



1.0G + 0.30Q + 1.0SpecX + 0.30SpecY [mu = 1.25, sp = 0.90]



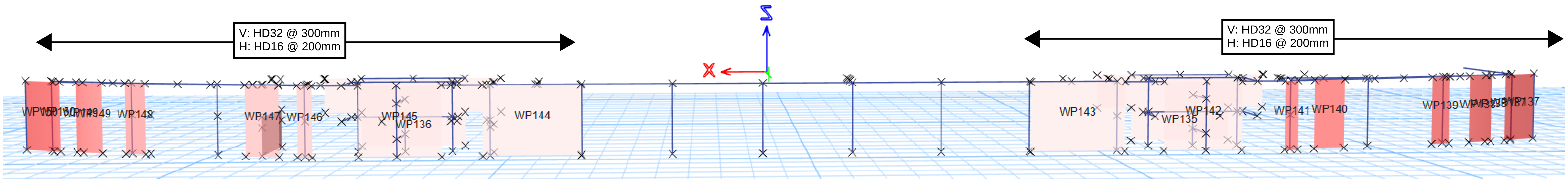
1.0G + 0.30Q + 0.30SpecX + 1.0SpecY [mu = 1.25, sp = 0.90]



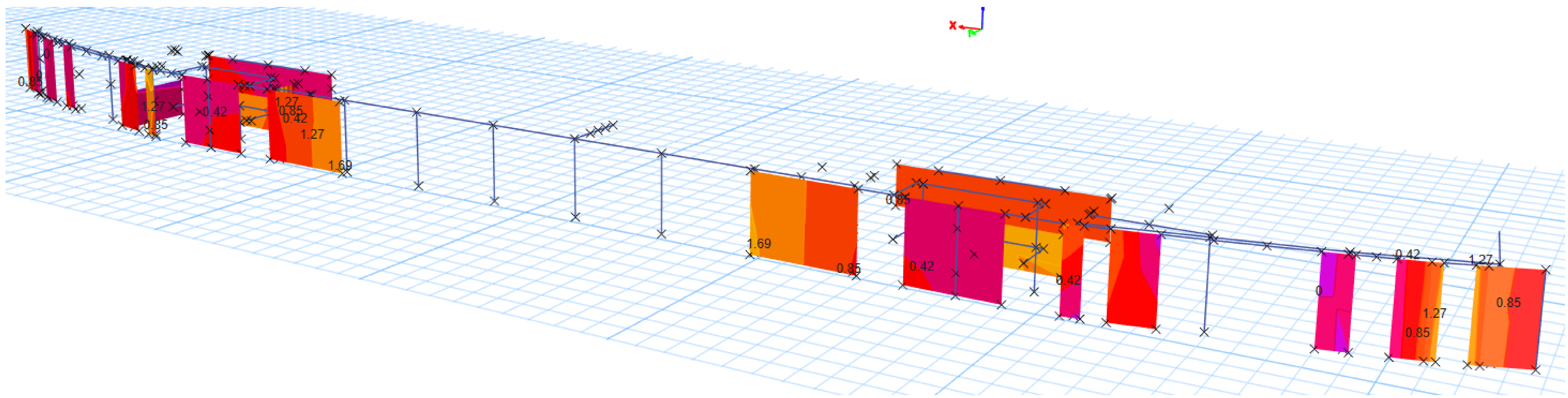
WP120	1.61
WP121	0.32
WP122	0.31
WP123	0.36
WP124	1.08
WP125	0.38
WP126	0.45
WP127	0.24
WP128	0.75
WP129	0.93
WP130	0.90
WP131	0.33
WP132	0.38
WP133	0.81
WP134	1.75

Can justify to HD32 - 300, when considering average stress over 1000mm.

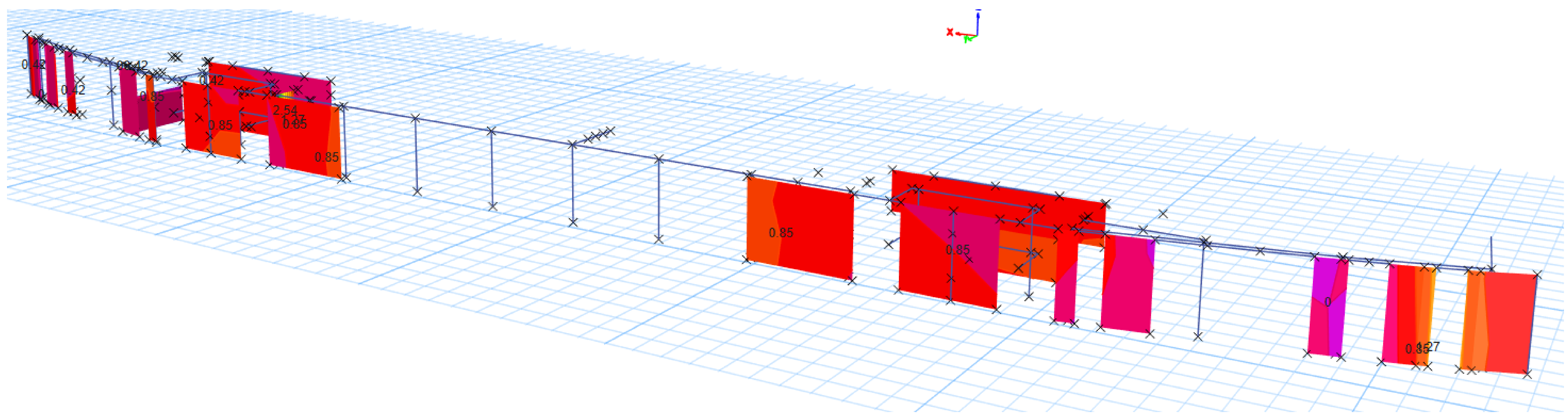
Back of Bowl



1.0G + 0.30Q + 1.0SpecX + 0.30SpecY [mu = 1.25, sp = 0.90]



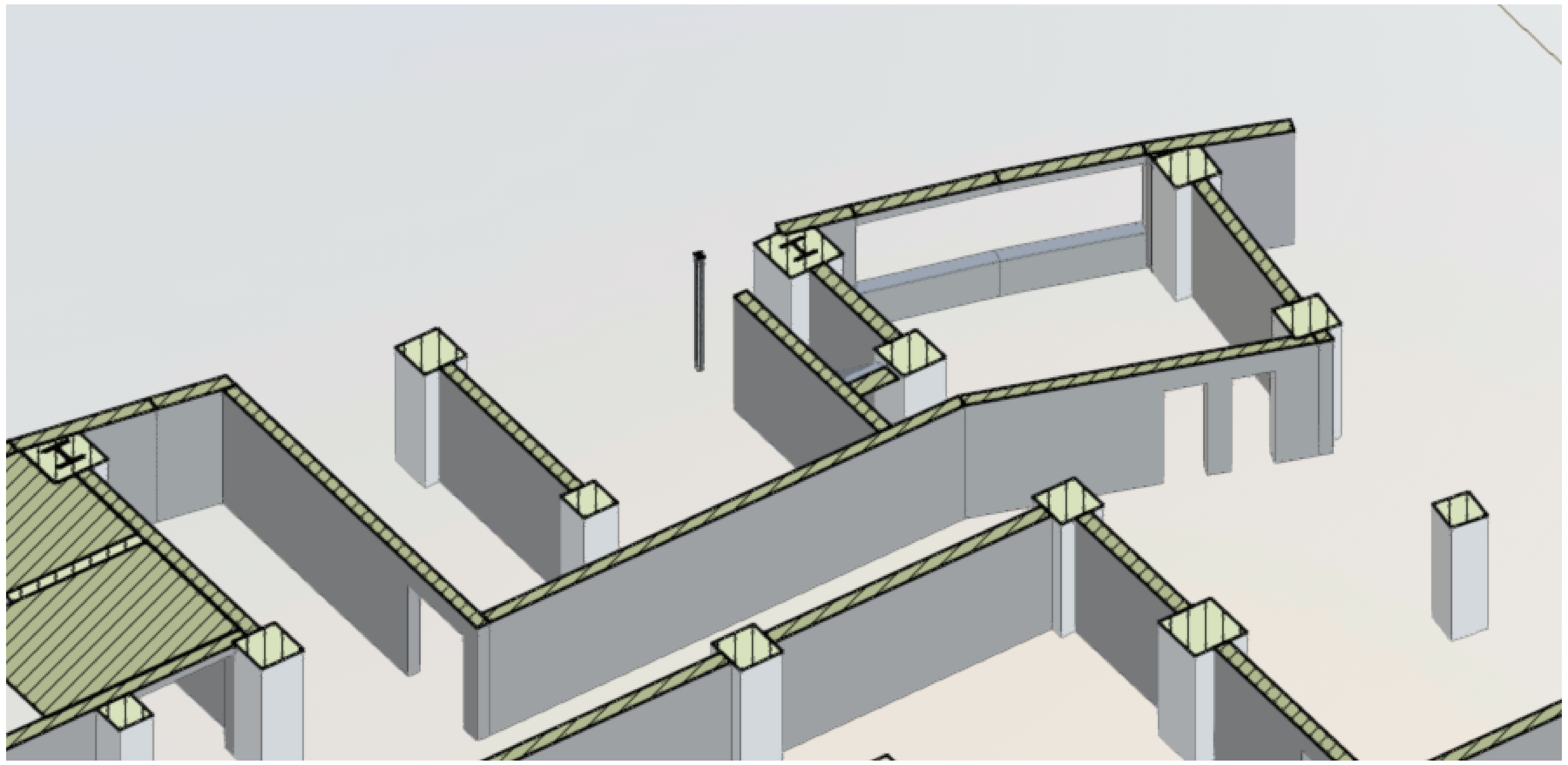
1.0G + 0.30Q + 0.30SpecX + 1.0SpecY [mu = 1.25, sp = 0.90]

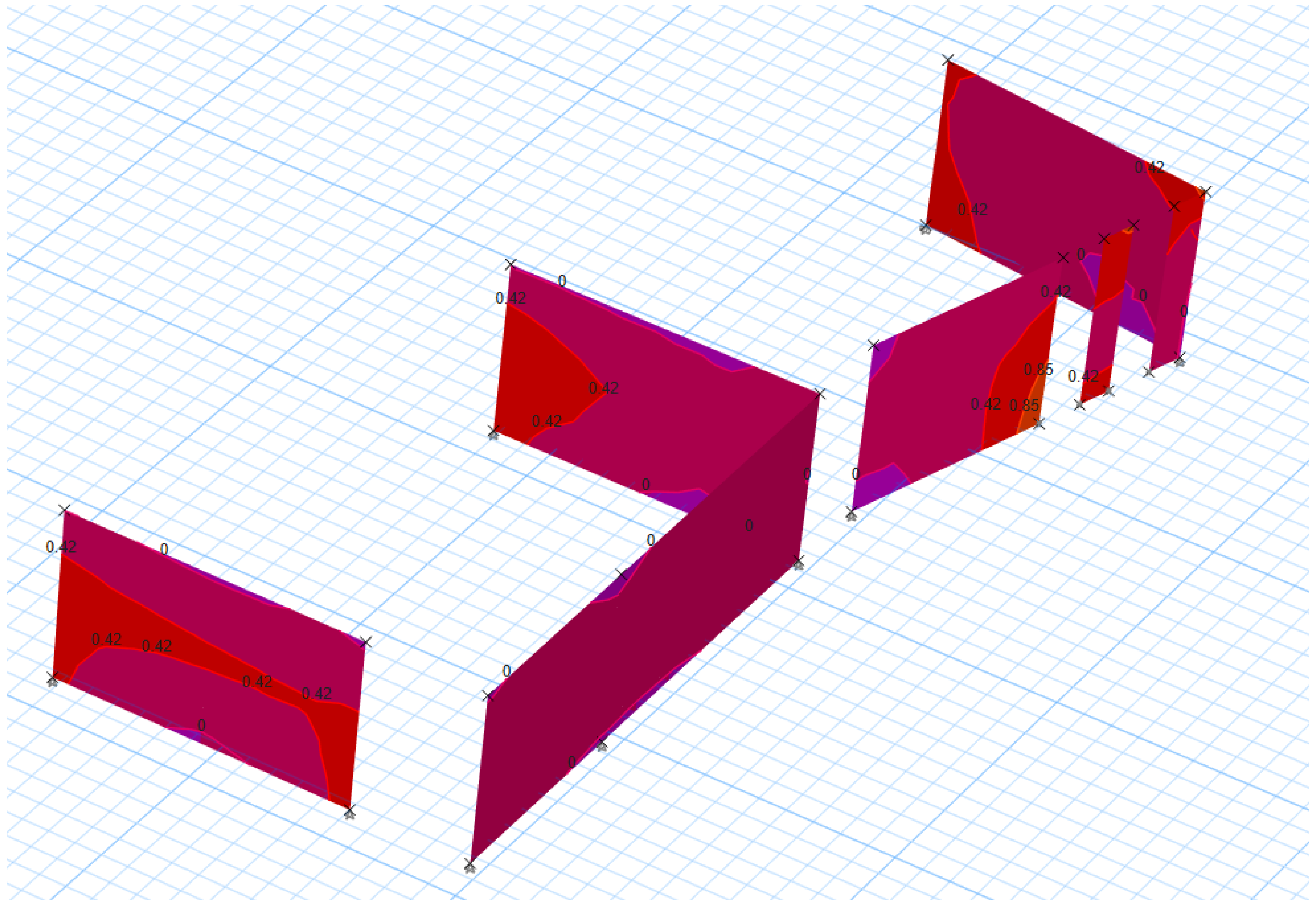


Stress Plots OKAY

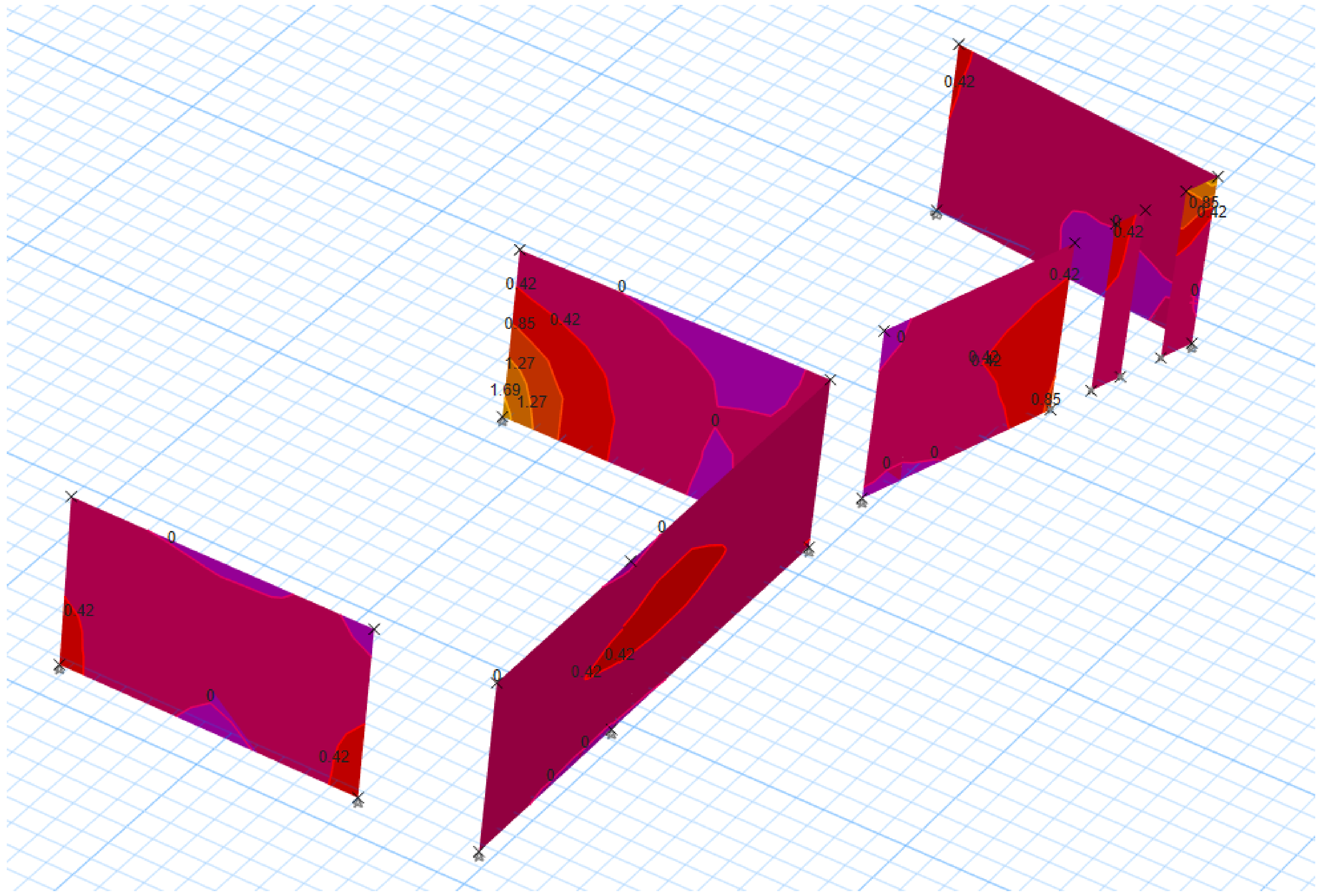
WP137	0.54
WP138	1.54
WP139	3.58
WP140	1.42
WP141	6.05
WP142	0.67
WP143	0.55
WP144	0.57
WP145	0.67
WP146	5.39
WP147	1.44
WP148	4.88
WP149	2.52
WP150	1.20

Mezzanine Level in Top Left Corner of West Stand

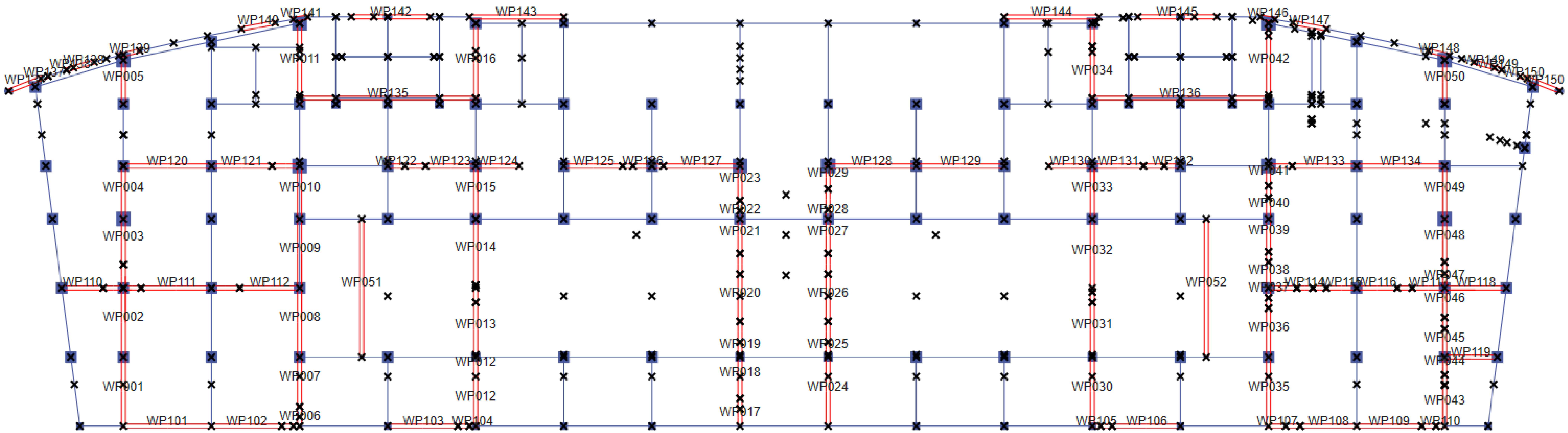




By inspection of the stress map apply:
V: HD25 - 300
H: HD16 - 200



Pier Labels - Analytical Model



Analytical NZS 3101:2006 Model Checks

	Pier	Height	Depth	Width	End Zone Length	Material	Cover	fc	Ec	fsy	Verti.Dia.	Verti. Spacing	Boundary Reo	Panel Reo	Horiz.Dia.	Horiz. Spacing	P	M3	V2	Maximum longitudinal bar diameter	Starter Dia Check	Maximum spacing of vertical reinforcement	Starter Spacing Check	Vertical reinforcement ratio	Minimum vertical reinforcement ratio	Ratio Check
0	WP001	6	6000	350	900	NZS3101-40MPa	35	40	29725	500	25	300	0.003	0.003	16	150	1938	2993	5981	50	1	450	1	0.005	0.003	1
1	WP002	6	6000	350	900	NZS3101-40MPa	35	40	29725	500	25	300	0.003	0.003	16	150	920	3594	8258	50	1	450	1	0.005	0.003	1
2	WP003	6	3958	350	594	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	150	2429	3752	4817	50	1	450	1	0.008	0.003	1
3	WP004	6	4600	350	690	NZS3101-40MPa	35	40	29725	500	25	300	0.003	0.003	16	150	843	2348	3761	50	1	450	1	0.005	0.003	1
4	WP005	6	3800	350	570	NZS3101-40MPa	35	40	29725	500	25	300	0.003	0.003	16	200	710	1685	1633	50	1	450	1	0.005	0.003	1
5	WP006	6	800	350	800	NZS3101-40MPa	35	40	29725	500	40	100	0.003	0.003	16	150	967	192	310	50	1	450	1	0.036	0.003	1
6	WP007	6	4300	350	645	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	3357	3750	3159	50	1	450	1	0.009	0.003	1
7	WP008	6	6000	350	900	NZS3101-40MPa	35	40	29725	500	25	300	0.003	0.003	16	150	1804	3391	7695	50	1	450	1	0.005	0.003	1
8	WP009	6	6000	350	900	NZS3101-40MPa	35	40	29725	500	25	300	0.003	0.003	16	150	2251	6874	6148	50	1	450	1	0.005	0.003	1
9	WP010	6	4600	350	690	NZS3101-40MPa	35	40	29725	500	25	300	0.003	0.003	16	150	460	4812	4821	50	1	450	1	0.005	0.003	1
10	WP011	6	7000	350	1050	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	4106	14702	1993	50	1	450	1	0.009	0.003	1
11	WP012	6	6000	350	900	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	1345	17152	4293	50	1	450	1	0.009	0.003	1
12	WP013	6	4750	350	713	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	1257	14210	5432	50	1	450	1	0.009	0.003	1
13	WP014	6	5750.8	350	863	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	1275	13471	4023	50	1	450	1	0.009	0.003	1
14	WP015	6	4600	350	690	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	1903	14053	6832	50	1	450	1	0.009	0.003	1
15	WP016	6	7000	350	1050	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	3789	14232	2058	50	1	450	1	0.009	0.003	1
16	WP017	6	1500	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	1108	457	289	50	1	450	1	0.009	0.003	1
17	WP018	6	3600	350	540	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	1704	2084	1934	50	1	450	1	0.009	0.003	1
18	WP019	6	1300	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	590	392	705	50	1	450	1	0.009	0.003	1
19	WP020	6	4100	350	615	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	169	5293	3029	50	1	450	1	0.009	0.003	1
20	WP021	6	3000	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	2121	2019	2643	50	1	450	1	0.009	0.003	1
21	WP022	6	700	350	700	NZS3101-40MPa	35	40	29725	500	40	100	0.003	0.003	16	200	241	77	129	50	1	450	1	0.036	0.003	1
22	WP023	6	3000	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	1772	1180	1749	50	1	450	1	0.009	0.003	1
23	WP024	6	6000	350	900	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	3157	7473	3046	50	1	450	1	0.008	0.003	1
24	WP025	6	1300	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	649	381	737	50	1	450	1	0.009	0.003	1
25	WP026	6	4100	350	615	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	24	5348	3089	50	1	450	1	0.009	0.003	1
26	WP027	6	3000	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	2166	2072	2579	50	1	450	1	0.009	0.003	1
27	WP028	6	800	350	800	NZS3101-40MPa	35	40	29725	500	40	100	0.003	0.003	16	200	261	108	166	50	1	450	1	0.036	0.003	1
28	WP029	6	2000	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	1425	573	1284	50	1	450	1	0.009	0.003	1
29	WP030	6	6000	350	900	NZS3101-40MPa	35	40	29725	500	25	300	0.003	0.003	16	150	1591	3200	4360	50	1	450	1	0.005	0.003	1
30	WP031	6	4750	350	713	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	150	782	4154	4011	50	1	450	1	0.008	0.003	1
31	WP032	6	6350	350	953	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	150	2577	5852	5948	50	1	450	1	0.008	0.003	1
32	WP033	6	4600	350	690	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	150	4955	8987	4205	50	1	450	1	0.008	0.003	1
33	WP034	6	5000	350	750	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	2074	3888	2279	50	1	450	1	0.008	0.003	1
34	WP035	6	6000	350	900	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	5478	8136	5124	50	1	450	1	0.009	0.003	1
35	WP036	6	4250	350	638	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	987	4256	4329	50	1	450	1	0.009	0.003	1
36	WP037	6	850	350	850	NZS3101-40MPa	35	40	29725	500	40	100	0.003	0.003	16	150	1153	551	1439	50	1	450	1	0.036	0.003	1
37	WP038	6	2250	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	948	1571	1815	50	1	450	1	0.009	0.003	1
38	WP039	6	2850	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	2269	2087	3102	50	1	450	1	0.009	0.003	1
39	WP040	6	1835.9	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	501	785	1512	50	1	450	1	0.009	0.003	1
40	WP041	6	1715.3	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	577	750	2055	50	1	450	1	0.009	0.003	1
41	WP042	6	7000	350	1050	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	3966	16141	2227	50	1	450	1	0.009	0.003	1
42	WP043	6	3550	350	533	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	1251	4010	2879	50	1	450	1	0.009	0.003	1
43	WP044	6	1550	350	525	NZS3101-40MPa	35	40	29725	500	40	100	0.003	0.003	16	150	1817	974	1397	50	1	450	1	0.036	0.003	1
44	WP045	6	2440	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	1713	2314	2892	50	1	450	1	0.009	0.003	1
45	WP046	6	2560	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	2682	2170	3462	50	1	450	1	0.009	0.003	1
46	WP047	6	1260	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	319	387	1124	50	1	450	1	0.009	0.003	1
47	WP048	6	3740	350	561	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	2244	3258	4821	50	1	450	1	0.009	0.003	1
48	WP049	6	4600	350	690	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	3163	8395	4314	50	1	450	1	0.009	0.003	1
49	WP050	6	3800	350	570	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	918	4258	1568	50	1	450	1	0.008	0.003	1
50	WP051	6	12000	350	1800	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	0	45698	6013	50	1	450	1	0.008	0.003	1
51	WP052	6	12000	350	1800	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	0	47716	6285	50	1	450	1	0.008	0.003	1
52	WP101	6	7650	350	1148	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	4977	8864	5130	50	1	450	1	0.008	0.003	1
53	WP102	6	6100	350	915	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	3275	5770	3367	50	1	450	1	0.008	0.003	1
54	WP103	6	6100	350	915	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	323	6163	2870	50	1	450	1	0.008	0.003	1
55	WP104	6	550	350	550	NZS3101-40MPa	35	40	29725	500	40	100	0.003	0.003	16	200	298	123	262	50	1	450	1	0.036	0.003	1
56	WP105	6	724.2	350	724.2	NZS3101-40MPa	35	40	29725	500	40	100	0.003	0.003	16	200	504	140	285	50	1	450	1	0.036	0.003	1
57	WP106	6	5925.8	350	889	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	1208	11508	3476	50	1	450	1	0.008	0.003	1
58	WP107	6	1492.6	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	1083	493	699	50	1	450	1	0.009	0.003	1
59	WP108	6	4907.8	350	737	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	1339	11390	3623	50	1	450	1	0.009	0.003	1
60	WP109	6	5657.6	350	849	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	1571	14317	4385	50	1	450	1	0.009	0.003	1
61	WP110	6	753	350	753	NZS3101-40MPa	35	40	29725	500	40	100	0.003	0.003	16	200	1260	182	300	50	1	450	1	0.036	0.003	1
62	WP111	6	3601	350	541	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	882	1699	1042	50	1	450	1	0.008	0.003	1
63	WP112	6	6117.5	350	918	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	979	4931	4337	50	1	450	1	0.008	0.003	1
64	WP113	6	5195.4	350	780	NZS3101-40MPa	36	40	29725	500	32	300	0.003	0.003	16	200	3988	9637	3266	50	1	450	1	0.008	0.003	1
65	WP114	6	1409.4	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	105	1132	468	50	1	450	1	0.009	0.003	1
66	WP115	6	2622	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	1789	4400	2742	50	1	450	1	0.009	0.003	1
67	WP116	6	3525.7	350	529	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	413	2067	2430	50	1	450	1	0.009	0.003	1
68	WP117	6	2815	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	1277	1307	2272	50	1	450	1	0.009	0.003	1
69	WP118	6	5357.9	350	804	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	3868	12396	3255	50	1	450	1	0.009	0.003	1
70	WP119	6	4571.5	350	686	NZS3101-40MPa	35	40	29725	500	32	225	0.003	0.003	16	200	799	9887	2640	50	1	450	1	0.010	0.003	1
71	WP120	6	7650	350	1148	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	150	4487	27289	7968	50	1	450	1	0.008	0.003	1
72	WP121	6	5259	350	789	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	150	1033	3762	1759	50	1	450	1	0.008	0.003	1
73	WP122	6	1500	350	525	NZS3101-40MPa	35	40	29725	500	40	100	0.003	0.003	16	150	2156	809	1911	50	1	450	1	0.036	0.003	1
74	WP123	6	4350	350	653	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	706	3182	2907	50	1	450	1	0.009	0.003	1
75	WP124	6	3775	350	567	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	2299	4974	2112	50	1	450	1	0.009	0.003	1
76	WP125	6	5100	350	765	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	3124	3183	1197	50	1	450	1	0.009	0.003	1
77	WP126	6	1650	350	525	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	739	467	964	50	1	450	1	0.009	0.003	1
78	WP127	6	6657.6	350	999	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	200	858	5795	2873	50	1	450	1	0.009	0.003	1
79	WP128	6	7650	350	1148	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	3570	14633	3725	50	1	450	1	0.008	0.003	1
80	WP129	6	7650	350	1148	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	4485	15738	2694	50	1	450	1	0.008	0.003	1
81	WP130	6	3775	350	567	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	2246	4205	2091	50	1	450	1	0.009	0.003	1
82	WP131	6	4450	350	668	NZS3101-40MPa	35	40	29725	500	32	250	0.003	0.003	16	150	567	3388	2975	50	1	450	1	0.009	0.003	1
83	WP132	6	1400	350	525	NZS3101-40MPa	35	40	29725	500	40	100	0.003	0.003	16	150	2047	836	1839	50	1	450	1	0.036	0.003	1
84	WP133	6	5591.5	350	839	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	150	2190	8845	2694	50	1	450	1	0.008	0.003	1
85	WP134	6	7650	350	1148	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	150	4135	31425	7159	50	1	450	1	0.008	0.003	1
86	WP135	6	9000	350	1350	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	65	1432	5263	50	1	450	1	0.008	0.003	1
87	WP136	6	9000	350	1350	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	313	17118	5505	50	1	450	1	0.008	0.003	1
88	WP137	6	3639.4	350.1	546	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	542	2748	431	50	1	450	1	0.008	0.003	1
89	WP138	6	2502.1	350.1	526	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	680	2723	600	50	1	450	1	0.008	0.003	1
90	WP139	6	1873.6	350	525	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	171	4024	929	50	1	450	1	0.008	0.003	1
91	WP140	6	2968.4	350	525	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	140	5305	1340	50	1	450	1	0.008	0.003	1
92	WP141	6	1263.3	350	525	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	105	2593	603	50	1	450	1	0.008	0.003	1
93	WP142	6	6853	350	1028	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	0	15185	3588	50	1	450	1	0.008	0.003	1
94	WP143	6	8200	350	1230	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	811	16047	2629	50	1	450	1	0.008	0.003	1
95	WP144	6	8200	350	1230	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	971	16419	2967	50	1	450	1	0.008	0.003	1
96	WP145	6	6853	350	1028	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	0	15193	3610	50	1	450	1	0.008	0.003	1
97	WP146	6	1263.3	350	525	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	96	2334	623	50	1	450	1	0.008	0.003	1
98	WP147	6	2968.4	350	525	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	147	5375	1361	50	1	450	1	0.008	0.003	1
99	WP148	6	1873.6	350	525	NZS3101-40MPa	35	40	29725	500	32	300	0.003	0.003	16	200	390	4765	1078	50	1	450	1	0.008	0.003	1
100	WP149	6	2502.1	350.1	526	NZS3101-40MPa	36	40	29725	500	32	300	0.003	0.003	16	200	256	5445	1216	50	1	450	1	0.008	0.003	1
101	WP150	6	3639.4	350.1	546	NZS3101-40MPa	37	40	29725	500	32	300	0.003	0.003	16	200	555	6085	1258	50	1	450	1	0.008	0.003	1

	Pier	Neutral axis depth	M Uti of Starter Reo	v_n	Shear Stress Check	V_c	Shear Bar Spacing	Shear Bar Spacing (Entire Wall)	Max spacing of horizontal reinforcement	Horizontal Spacing Check for Shear	A_v	A_vmin	Shear friction uti of dowels	Area of longitudinal bars restrained by one horizontal stirrup	Vertical spacing of horizontal stirrups	Max vertical spacing of horizontal stirrups	Stirrup Spacing check	A_te	Selected diameter of stirrup tie for antibuckling	Stirrup dia check	Ash =	Stirrup diameter for confinement	No of stirrup legs for confinement	Stirrup spacing for confinement zones
0	WP001	271	0.47	4.75	1	2481.21	176	165	450	1	2289	490	2.98	491	150	250	1	30.68	10	1	-24.38	10	2	200
1	WP002	367	0.41	6.55	1	2684.90	116	165	450	1	3469	490	3.04	491	150	250	1	30.68	10	1	-8.63	10	2	200
2	WP003	218	1.12	5.80	1	1406.58	127	165	450	1	3168	490	2.55	804	150	300	1	39.27	10	1	-14.56	10	2	200
3	WP004	257	0.53	3.89	1	2030.90	248	165	450	1	1622	490	1.91	491	150	250	1	30.68	10	1	-13.78	10	2	200
4	WP005	218	0.51	2.05	1	1674.95	821	820	450	1	330	490	1.02	491	200	250	1	40.91	10	1	-12.31	10	2	200
5	WP006	182	0.32	1.85	1	23.26	329	175	160	1	1220	490	0.14	1257	150	300	1	49.09	10	1	153.92	10	2	200
6	WP007	279	0.78	3.50	1	1384.55	245	175	450	1	1644	490	1.35	804	150	300	1	39.27	10	1	-4.95	10	2	200
7	WP008	285	0.51	6.11	1	2507.96	124	175	450	1	3230	490	3.66	491	150	250	1	30.68	10	1	-22.09	10	2	200
8	WP009	237	1.23	4.88	1	2418.61	167	175	450	1	2408	490	3.44	491	150	250	1	30.68	10	1	-29.96	10	2	200
9	WP010	295	0.94	4.99	1	2107.41	171	175	450	1	2349	490	2.15	491	150	250	1	30.68	10	1	-5.72	10	2	200
10	WP011	600	0.82	1.36	1	1671.53	821	820	450	1	352	490	0.41	804	200	300	1	52.36	10	1	15.44	10	2	200
11	WP012	699	0.98	3.41	1	2599.75	309	230	450	1	1302	490	0.76	804	150	300	1	39.27	10	1	45.60	10	2	200
12	WP013	534	1.36	5.45	1	2019.72	146	230	450	1	2749	490	1.26	804	150	300	1	39.27	10	1	41.53	10	2	200
13	WP014	671	0.84	3.33	1	2494.66	322	230	450	1	1247	490	0.74	804	150	300	1	39.27	10	1	45.76	10	2	200
14	WP015	438	1.72	7.07	1	1818.78	101	230	450	1	3962	490	1.85	804	150	300	1	39.27	10	1	24.71	10	2	200
15	WP016	628	0.76	1.40	1	1918.34	821	820	450	1	295	490	0.41	804	200	300	1	52.36	10	1	19.37	10	2	200
16	WP017	99	1.02	0.92	1	292.00	821	415	300	1	155	490	0.38	804	200	300	1	52.36	10	1	-4.15	10	2	200
17	WP018	317	0.47	2.56	1	1380.52	483	415	450	1	832	490	0.71	804	200	300	1	52.36	10	1	17.73	10	2	200
18	WP019	108	0.96	2.58	1	503.63	479	415	260	1	840	490	0.78	804	200	300	1	52.36	10	1	13.13	10	2	200
19	WP020	523	0.63	3.52	1	1926.46	312	415	450	1	1288	490	0.70	804	200	300	1	52.36	10	1	56.51	10	2	200
20	WP021	208	0.80	4.20	1	1010.29	192	415	450	1	2095	490	1.52	804	200	300	1	52.36	10	1	-0.49	10	2	200
21	WP022	186	0.15	0.88	1	286.57	821	415	140	0	-409	490	0.06	1257	200	300	1	65.45	10	1	191.69	10	2	164
22	WP023	244	0.40	2.78	1	1079.94	385	415	450	1	1043	490	0.88	804	200	300	1	52.36	10	1	11.07	10	2	200
23	WP024	415	0.73	2.42	1	2237.40	529	395	450	1	760	490	0.92	804	200	300	1	52.36	10	1	-0.85	10	2	200
24	WP025	105	0.99	2.70	1	491.74	426	395	260	1	944	490	0.86	804	200	300	1	52.36	10	1	10.36	10	2	200
25	WP026	536	0.62	3.59	1	1955.64	305	395	450	1	1319	490	0.69	804	200	300	1	52.36	10	1	59.42	10	2	200
26	WP027	203	0.84	4.09	1	1001.30	198	395	450	1	2031	490	1.51	804	200	300	1	52.36	10	1	-2.28	10	2	200
27	WP028	218	0.15	0.99	1	330.32	821	395	160	0	-340	490	0.06	1257	200	300	1	65.45	10	1	198.03	10	2	159
28	WP029	132	0.60	3.06	1	671.32	309	395	400	1	1300	490	1.16	804	200	300	1	52.36	10	1	-4.11	10	2	200
29	WP030	304	0.45	3.46	1	2550.62	296	220	450	1	1360	490	1.94	491	150	250	1	30.68	10	1	-18.99	10	2	200
30	WP031	482	0.45	4.02	1	2114.82	236	220	450	1	1702	490	1.06	804	150	300	1	39.27	10	1	30.83	10	2	200
31	WP032	500	0.45	4.46	1	2520.68	189	220	450	1	2130	490	1.48	804	150	300	1	39.27	10	1	8.60	10	2	200
32	WP033	74	13.49	4.35	1	1208.43	168	220	450	1	2390	490	5.82	804	150	300	1	39.27	10	1	-52.78	10	2	200
33	WP034	404	0.46	2.17	1	1975.81	757	755	450	1	531	490	0.73	804	200	300	1	52.36	10	1	10.54	10	2	200
34	WP035	340	0.94	4.07	1	1773.27	191	175	450	1	2108	490	1.85	804	150	300	1	39.27	10	1	-13.01	10	2	200
35	WP036	484	0.50	4.85	1	1834.62	174	175	450	1	2316	490	1.10	804	150	300	1	39.27	10	1	43.09	10	2	200
36	WP037	204	0.68	8.06	0	175.82	78	175	170	1	5125	490	0.62	1257	150	300	1	49.09	10	1	166.16	10	2	189
37	WP038	204	0.86	3.84	1	886.11	236	175	450	1	1705	490	1.06	804	150	300	1	39.27	10	1	20.09	10	2	200
38	WP039	159	1.28	5.18	1	908.86	142	175	450	1	2831	490	2.11	804	150	300	1	39.27	10	1	-13.90	10	2	200
39	WP040	172	0.69	3.92	1	777.60	238	175	367	1	1687	490	0.97	804	150	300	1	39.27	10	1	23.15	10	2	200
40	WP041	165	0.67	5.70	1	704.80	136	175	343	1	2966	490	1.49	804	150	300	1	39.27	10	1	25.42	10	2	200
41	WP042	613	0.88	1.51	1	1750.04	821	820	450	1	435	490	0.45	804	200	300	1	52.36	10	1	17.15	10	2	200
42	WP043	359	0.79	3.86	1	1447.17	239	160	450	1	1684	490	0.97	804	150	300	1	39.27	10	1	30.40	10	2	200
43	WP044	411	0.31	4.29	1	377.81	168	160	310	1	2395	490	0.28	1257	150	300	1	49.09	10	1	190.95	10	2	165
44	WP045	171	1.32	5.64	1	824.12	129	160	450	1	3106	490	2.07	804	150	300	1	39.27	10	1	-0.06	10	2	200
45	WP046	102	3.02	6.44	1	687.63	105	160	450	1	3837	490	4.05	804	150	300	1	39.27	10	1	-29.44	10	2	200
46	WP047	125	0.72	4.25	1	538.65	211	160	252	1	1905	490	1.08	804	150	300	1	39.27	10	1	29.01	10	2	200
47	WP048	306	0.69	6.14	1	1339.49	118	160	450	1	3402	490	1.94	804	150	300	1	39.27	10	1	11.62	10	2	200
48	WP049	331	1.38	4.47	1	1566.76	177	160	450	1	2275	490	1.53	804	150	300	1	39.27	10	1	1.82	10	2	200
49	WP050	361	0.76	1.96	1	1633.37	821	820	450	1	300	490	0.56	804	200	300	1	52.36	10	1	24.52	10	2	200
50	WP051	1427	0.65	2.39	1	5737.64	821	820	450	1	475	490	0.54	804	200	300	1	52.36	10	1	47.91	10	2	200
51	WP052	1427	0.68	2.49	1	5737.64	731	730	450	1	550	490	0.56	804	200	300	1	52.36	10	1	47.91	10	2	200
52	WP101	467	0.57	3.19	1	2662.31	295	355	450	1	1365	490	1.44	804	200	300	1	52.36	10	1	-8.74	10	2	200
53	WP102	404	0.59	2.63	1	2261.61	441	355	450	1	913	490	1.02	804	200	300	1	52.36	10	1	-3.73	10	2	200
54	WP103	670	0.38	2.24	1	2851.94	821	795	450	1	399	490	0.53	804	200	300	1	52.36	10	1	39.02	10	2	200
55	WP104	146	0.37	2.27	1	189.46	551	795	110	0	729	490	0.17	1257	200	300	1	65.45	10	1	191.99	10	2	164
56	WP105	174	0.30	1.87	1	245.50	821	505	145	0	464	490	0.13	1257	200	300	1	65.45	10	1	166.47	10	2	189
57	WP106	591	0.80	2.79	1	2591.72	467	505	450	1	862	490	0.76	804	200	300	1	52.36	10	1	29.06	10	2	200
58	WP107	102	1.06	2.23	1	497.08	552	300	299	1	729	490	0.91	804	200	300	1	52.36	10	1	-1.43	10	2	200
59	WP108	561	0.98	3.52	1	2078.86	287	300	450	1	1402	490	0.82	804	200	300	1	52.36	10	1	43.47	10	2	200
60	WP109	647	0.92	3.69	1	2390.91	263	300	450	1	1527	490	0.86	804	200	300	1	52.36	10	1	43.42	10	2	200
61	WP110	165	0.32	1.89	1	-154.77	219	300	151	0	1840	490	0.17	1257	200	300	1	65.45	10	1	145.57	10	2	200
62	WP111	328	0.37	1.38	1	1545.32	821	435	450	1	-108	490	0.40	804	200	300	1	52.36	10	1	20.70	10	2	200
63	WP112	613	0.33	3.38	1	2729.11	322	435	450	1	1248	490	0.88	804	200	300	1	52.36	10	1	29.52	10	2	200
64	WP113	223	2.16	2.99	1	1686.47	313	435	450	1	1284	490	1.67	804	200	300	1	52.36	10	1	-26.51	10	2	200
65	WP114	171	1.16	1.58	1	316.47	736	325	282	1	546	490	0.34	804	200	300	1	52.36	10	1	50.07	10	2	200
66	WP115	165	2.86	4.98	1	895.87	153	325	450	1	2632	490	1.77	804	200	300	1	52.36	10	1	-7.09	10	2	200
67	WP116	428	0.34	3.28	1	1603.20	347	325	450	1	1160	490	0.69	804	200	300	1	52.36	10	1	50.42	10	2	200
68	WP117	252	0.48	3.84	1	1090.60	234	325	450	1	1722	490	1.07	804	200	300	1	52.36	10	1	19.07	10	2	200
69	WP118	377	1.52	2.89	1	1788.22	338	325	450	1	1191	490	1.03	804	200	300	1	52.36	10	1	0.34	10	2	200
70	WP119	595	0.89	2.75	1	2025.94	492	490	450	1	817	490	0.53	804	200	300	1	52.36	10	1	59.04	10	2	200
71	WP120	509	1.61	4.96	1	2760.25	156	425	450	1	2570	490	2.04	804	150	300	1	39.27	10	1	-3.43	10	2	200
72	WP121	531	0.32	1.59	1	2307.96	821	425	450	1	18	490	0.43	804	150	300	1	39.27	10	1	30.30	10	2	200
73	WP122	358	0.32	6.07	1	285.97	107	340	300	1	3770	490	0.43	1257	150	300	1	49.09	10	1	165.31	10	2	190
74	WP123	512	0.36	3.18	1	1938.62	361	340	450	1	1113	490	0.68	804	150	300	1	39.27	10	1	46.84	10	2	200
75	WP124	301	1.08	2.66	1	1345.21	413	340	450	1	974	490	0.85	804	200	300	1	52.36	10	1	9.61	10	2	200
76	WP125	404	0.38	1.12	1	1813.72	821	770	450	1	-106	490	0.35	804	200	300	1	52.36	10	1	9.11	10	2	200
77	WP126	152	0.45	2.78	1	641.07	412	770	330	1	977	490	0.81	804	200	300	1	52.36	10	1	21.89	10	2	200
78	WP127	848	0.24	2.05	1	3011.73	821	770	450	1	308	490	0.43	804	200	300	1	52.36	10	1	56.24	10	2	200
79	WP128	595	0.75	2.32	1	2943.77	608	710	450	1	661	490	0.82	804	200	300	1	52.36	10	1	7.68	10	2	200
80	WP129	509	0.93	1.68	1	2760.82	821	710	450	1	272	490	0.69	804	200	300	1	52.36	10	1	-3.35	10	2	200
81	WP130	306	0.90	2.64	1	1355.68	424	350	450	1	948	490	0.83	804	150	300	1	39.27	10	1	10.72	10	2	200
82	WP131	558	0.33	3.18	1	2014.27	367	350	450	1	1097	490	0.67	804	150	300	1	39.27	10	1	54.33	10	2	200
83	WP132	328	0.38	6.25	1	260.07	103	350	280	1	3913	490	0.45	1257	150	300	1	49.09	10	1	161.08	10	2	195
84	WP133	465	0.81	2.29	1	2235.45	663	385	450	1	607	490	0.75	804	150	300	1	39.27	10	1	12.87	10	2	200
85	WP134	542	1.75	4.46	1	2830.81	183	385	450	1	2194	490	1.72	804	150	300	1	39.27	10	1	0.80	10	2	200
86	WP135	1056	0.04	2.78	1	4290.31	531	530	450	1	757	490	0.64	804	200	300	1	52.36	10	1	46.34	10	2	200
87	WP136	1034	0.45	2.91	1	4240.70	467	465	450	1	861	490	0.68	804	200	300	1	52.36	10	1	43.95	10	2	200
88	WP137	359	0.54	0.56	1	767.43	820	820	450	1	-133	490	0.15	804	200	300	1	52.36	10	1	28.14	10	2	200
89	WP138	195	1.54	1.14	1	476.05	820	820	450	1	323	490	0.34	804	200	300	1	52.36	10	1	7.81	10	2	200
90	WP139	171	3.58	2.36	1	333.91	333	330	375	1	1207	490	0.61	804	200	300	1	52.36	10	1	20.67	10	2	200
91	WP140	324	1.42	2.15	1	866.13	519	515	450	1	775	490	0.52	804	200	300	1	52.36	10	1	38.32	10	2	200
92	WP141	120	6.05	2.27	1	183.19	327	325	253	1	1230	490	0.61	804	200	300	1	52.36	10	1	24.49	10	2	200
93	WP142	807	0.67	2.49	1	3276.67	731	730	450	1	550	490	0.57	804	200	300	1	52.36	10	1	46.83	10	2	200
94	WP143	880	0.55	1.53	1	3758.61	821	820	450	1	-77	490	0.38	804	200	300	1	52.36	10	1	36.55	10	2	200
95	WP144	865	0.57	1.72	1	3726.61	821	820	450	1	70	490	0.43	804	200	300	1	52.36	10	1	34.80	10	2	200
96	WP145	807	0.67	2.51	1	3276.67	717	715	450	1	561	490	0.57	804	200	300	1	52.36	10	1	46.83	10	2	200
97	WP146	120	5.39	2.35	1	196.36	320	320	253	1	1256	490	0.63	804	200	300	1	52.36	10	1	24.49	10	2	200
98	WP147	323	1.44	2.18	1	867.33	504	500	450	1	798	490	0.53	804	200	300	1	52.36	10	1	38.11	10	2	200
99	WP148	155	4.88	2.74	1	310.80	268	265	375	1	1503	490	0.79	804	200	300	1	52.36	10	1	12.37	10	2	200
100	WP149	235	2.52	2.31	1	533.36	370	370	450	1	1087	490	0.60	804	200	300	1	52.36	10	1	23.59	10	2	200
101	WP150	359	1.20	1.65	1	992.84	820	820	450	1	470	490	0.43	804	200	300	1	52.36	10	1	27.98	10	2	200

N.b.
1. Piers specified at HD40 - 100, generally are wall with very small depths. The HD40 - 100 are only in place for calculation purposes These should actually follow the reinforcement layout in adjacent walls; which have been justified with the use of the vertical tension stress plots.
2. Some checks for the spacing of horizontal bars show a failing output in some small walls/pier. In reality these peaking areas of shear will be distributed over wider walls that are continuous through main reinforcement and steel drag beams on top.

Analytical NZS 3101:2006 Model Checks - Refinement of "Shear Friction Utilizations"

Pier	Shear friction uti of dowels
WP001	2.99
WP002	3.04
WP003	2.56
WP004	1.91
WP005	1.02
WP006	0.14
WP007	1.36
WP008	3.67
WP009	3.45
WP010	2.16
WP011	0.41
WP012	0.76
WP013	1.26
WP014	0.74
WP015	1.85
WP016	0.41
WP017	0.38
WP018	0.71
WP019	0.78
WP020	0.70
WP021	1.52
WP022	0.06
WP023	0.88
WP024	0.92
WP025	0.86
WP026	0.69
WP027	1.51
WP028	0.06
WP029	1.16
WP030	1.94
WP031	1.06
WP032	1.48
WP033	5.89
WP034	0.73
WP035	1.86
WP036	1.10
WP037	0.63
WP038	1.06
WP039	2.12
WP040	0.97
WP041	1.50
WP042	0.45
WP043	0.97
WP044	0.29
WP045	2.08
WP046	4.10
WP047	1.09
WP048	1.94
WP049	1.54
WP050	0.56
WP051	0.54
WP052	0.56
WP101	1.44
WP102	1.02
WP103	0.53
WP104	0.17
WP105	0.13
WP106	0.76
WP107	0.91
WP108	0.82
WP109	0.86
WP110	0.17
WP111	0.40
WP112	0.88
WP113	1.67
WP114	0.34
WP115	1.77
WP116	0.69
WP117	1.07
WP118	1.03
WP119	0.53
WP120	2.04
WP121	0.43
WP122	0.43
WP123	0.69
WP124	0.85
WP125	0.35
WP126	0.81
WP127	0.43
WP128	0.82
WP129	0.69
WP130	0.83
WP131	0.67
WP132	0.45
WP133	0.75
WP134	1.72
WP135	0.64
WP136	0.68
WP137	0.15
WP138	0.34
WP139	0.61
WP140	0.52
WP141	0.61
WP142	0.57
WP143	0.38
WP144	0.43
WP145	0.57
WP146	0.63
WP147	0.53
WP148	0.79
WP149	0.60
WP150	0.43

The shear walls shall be "hooked" into the columns. Hence also consider the shear friction capacity of the adjacent column rebar which is full developed into the foundations.

Shear Friction for Column:
phiV = phi x u.sf x (A.s x f.y)

Where:
phi = 0.70
u.sf = 1.0

See next page for column shear friction capacities. Shear capacity consider the existing shear utilizations of the columns.
V* come from the summation of the V* for each pier in range. See "Analytical NZS 3101:2006 Model Checks" for individual V*.
An example for WP001 - WP004 is given below:

For WP001 - WP004 (A08)
2 x 1000mm x 1000mm (B) = 36HD32 = 0.70 x 1.0 x (pi x 16^2 x 500MPa x 2 x 36) / 1000 = 20267kN
2 x 800mm x 800mm (B) = 16HD25 = 0.70 x 1.0 x (pi x 12.5^2 x 500MPa x 2 x 16) = 5497kN
Total Additional Capacity = 25,765kN > V* = 22,818kN (OKAY)

WP005 (A08):
1250 x 1250(B) + 1000 x 1000(A) = 22,510kN + 15,028kN > V* = 1,633kN (OKAY)

WP006 - WP010 (A06):
1000 x 1000 (B) + 1000 x 1000 (B) + 1250 x 1250 (C) = 9428kN + 9428kN + 10354kN =
29,210kN > V* of 22134kN (OKAY)

WP012 - WP015 (A04):
1000 x 1000 (B) + 1000 x 1000(A) = 9428kN + 15,028kN =
24,456kN > V* of 20580kN (OKAY)

WP017 - WP023 (A01):
1000 x 1000 (B) + 1250 x 1250(B) + 800 x 800(B) = 9428kN + 22510kN + 2748kN =
34,686kN > V* of 10478kN (OKAY)

WP024 - WP029 (B01):
1000 x 1000 (B) + 1250 x 1250(B) + 800 x 800(B) = 9428kN + 22510kN + 2748kN =
34,686kN > V* of 10900kN (OKAY)

WP030 - WP033 (B04):
1000 x 1000 (B) + 1000 x 1000(A) + 800 x 800(B) = 9428kN + 15,028kN =
24,456kN > V* of 20803kN (OKAY)

WP035 - WP041 (B06):
1000 x 1000 (B) + 1000 x 1000 (B) + 1250 x 1250 (C) = 9428kN + 9428kN + 10354kN =
29,210kN > V* of 19376kN (OKAY)

WP043 - WP049 (B08):
1250 x 1250(B) + 1000 x 1000(A) = 22,510kN + 15,028kN =
37,538kN > V* of 20890kN (OKAY)

WP101 - 102:
800 x 800(B) + 800 x 800(B) = 2748kN + 2748kN =
5,496kN < V* of 8497kN (NOT OKAY)
Further Refinement: Wall Reo Capacity + Column Reo Capacity = (5130/1.44 + 3367/1.02) + 5496 = 6863kN < V* of 8497kN (NOT OKAY, change vert reo to HD32 - 250)

WP113 - WP118:
1000 x 1000(B) + 800 x 800(B) + 1250 x 1250 (C) = 2748kN + 10354kN =
13,102kN < V* of 14434kN

Further refinement: Wall Reo Capacity + Column Reo Capacity = [3266/1.67 + 468/0.34 + 2742/1.77 + 2430/0.69 + 2272/1.07 + 3255/1.03] + 13102 = 26,788kN >> V* (OKAY)

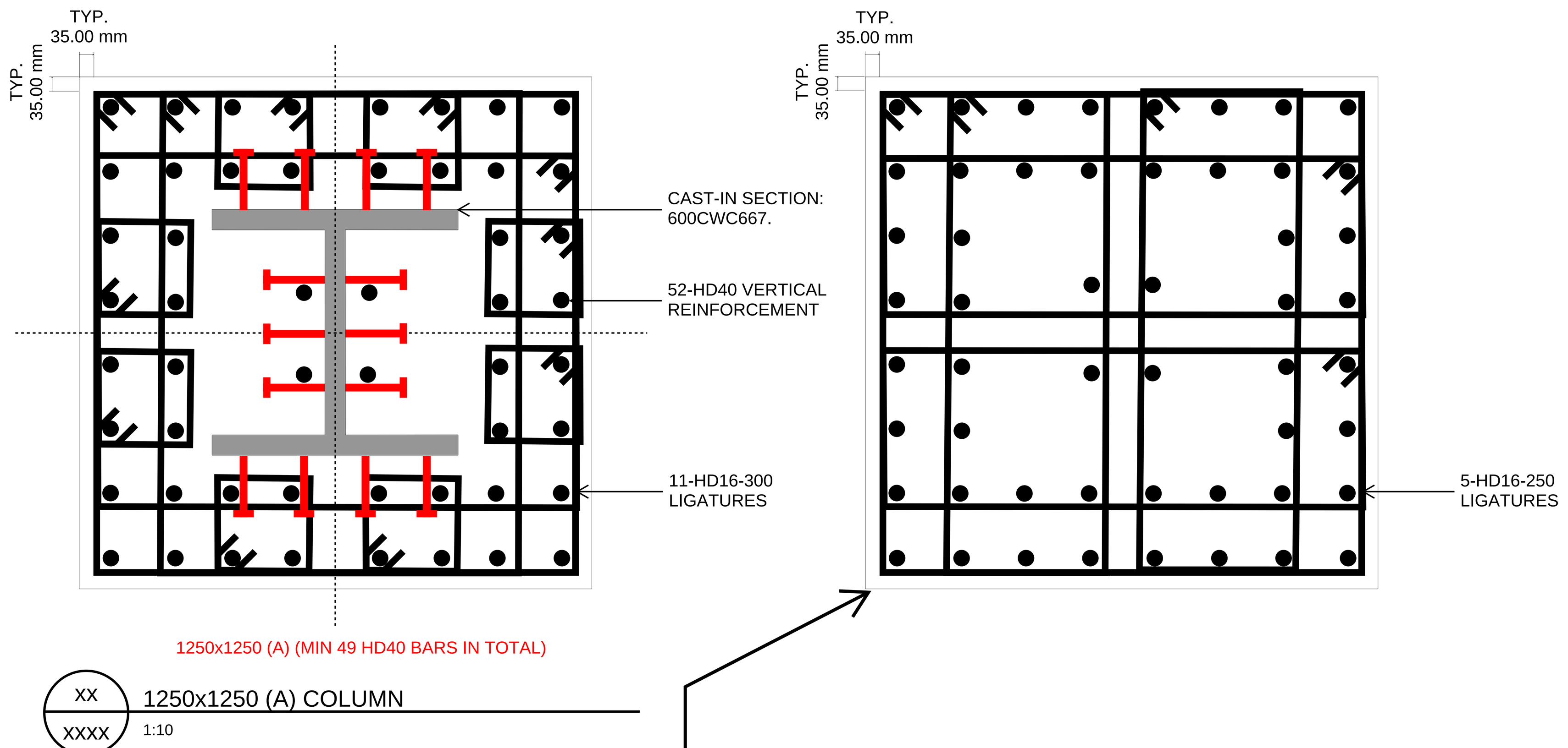
WP120 - WP121:
1000 x 1000(A) + 1000 x 1000(A) + 1250 x 1250 (C) = 15028kN + 10354kN =
25,382kN > V* of 9727kN (OKAY)

WP133 - 134:
1250 x 1250(C) + 1000 x 1000(A) + 1000 x 1000(A) = 10,354kN + 15028kN + 15028kN =
25,382kN > V* (9854kN) (OKAY)

WESTERN STAND - LEVEL 00
COLUMN SHEAR FRICTION
CAPACITIES

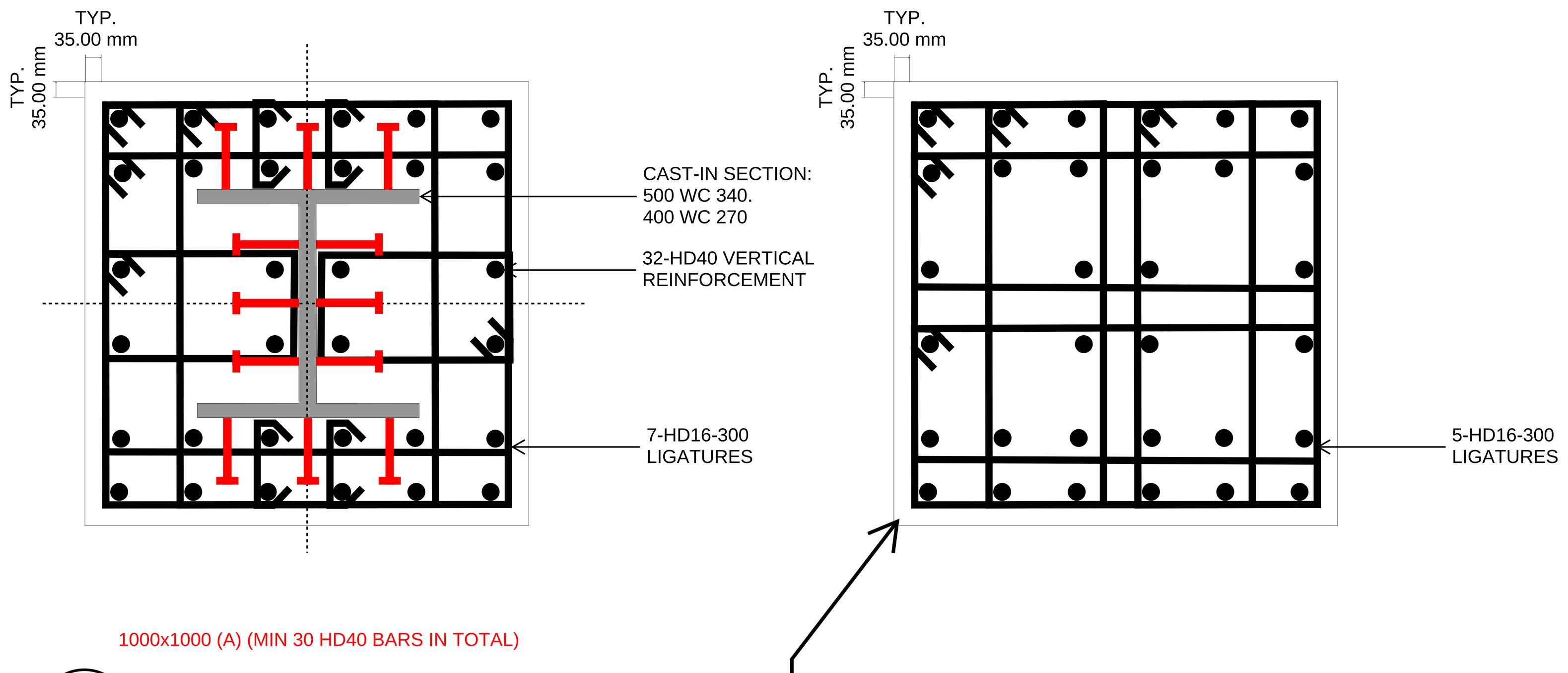
Shear Friction:
phiV = phi x u.sf x (A.s x f.y)

Where:
phi = 0.70
u.sf = 1.0



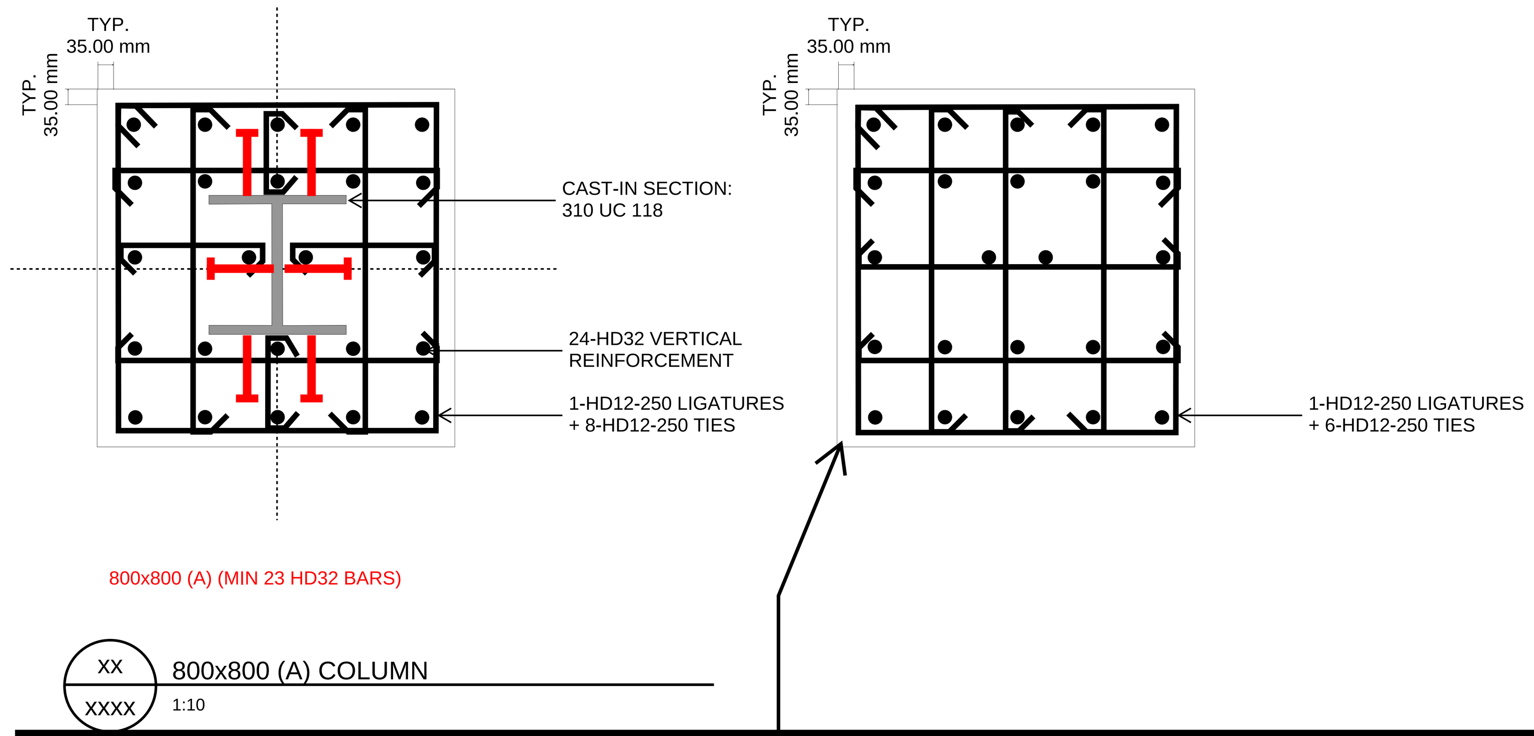
1250x1250 (A) COLUMN

phiV = 0.70 x 1.0 x (pi x 20mm^2 x 52 bars x 500MPa) /1000 = 22870kN - 215 = 22655kN



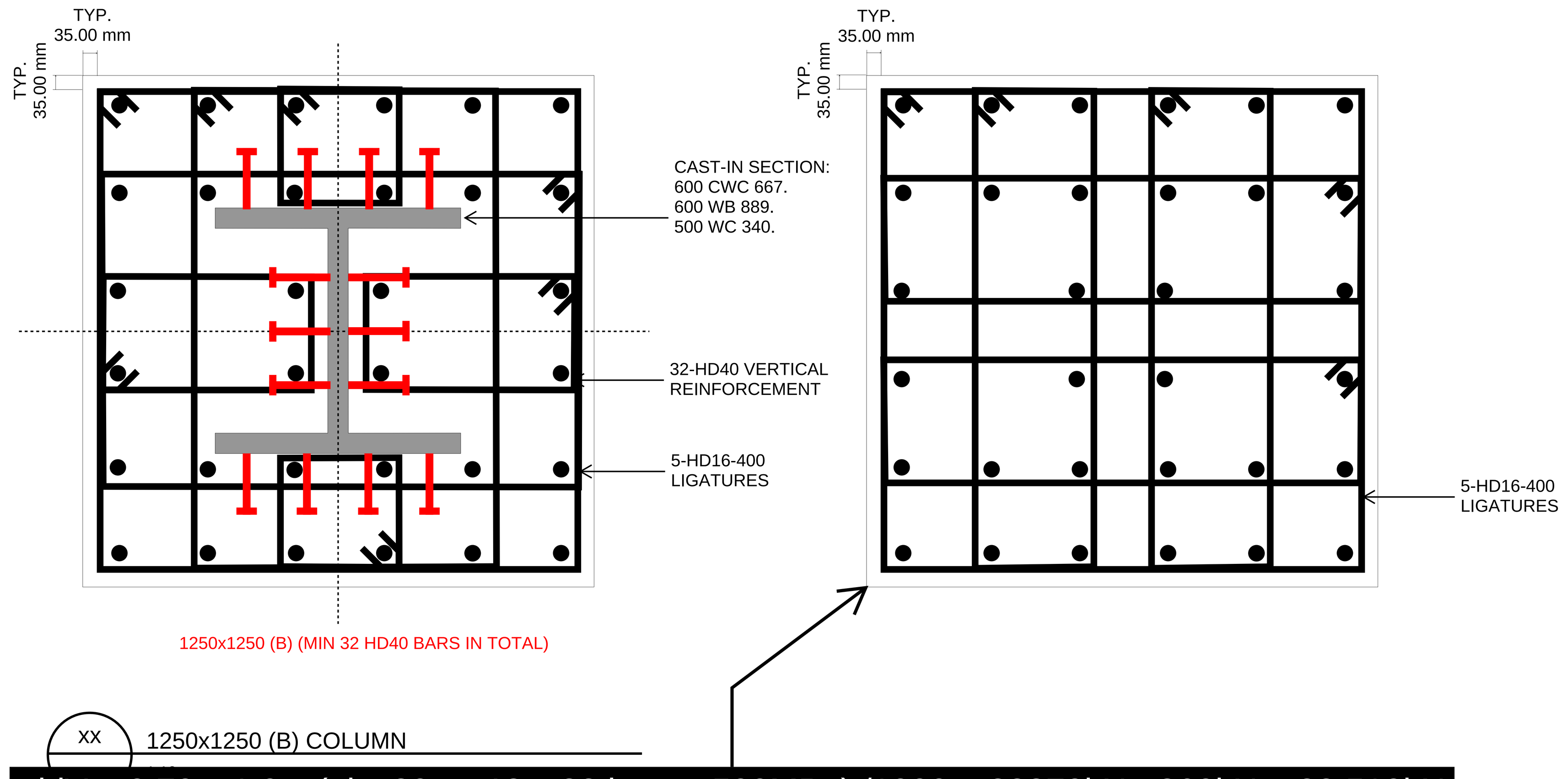
1000x1000 (A) COLUMN

phiV = 0.70 x 1.0 x (pi x 20mm^2 x 36 bars x 500MPa) /1000 = 15833kN - 805kN = 15028kN



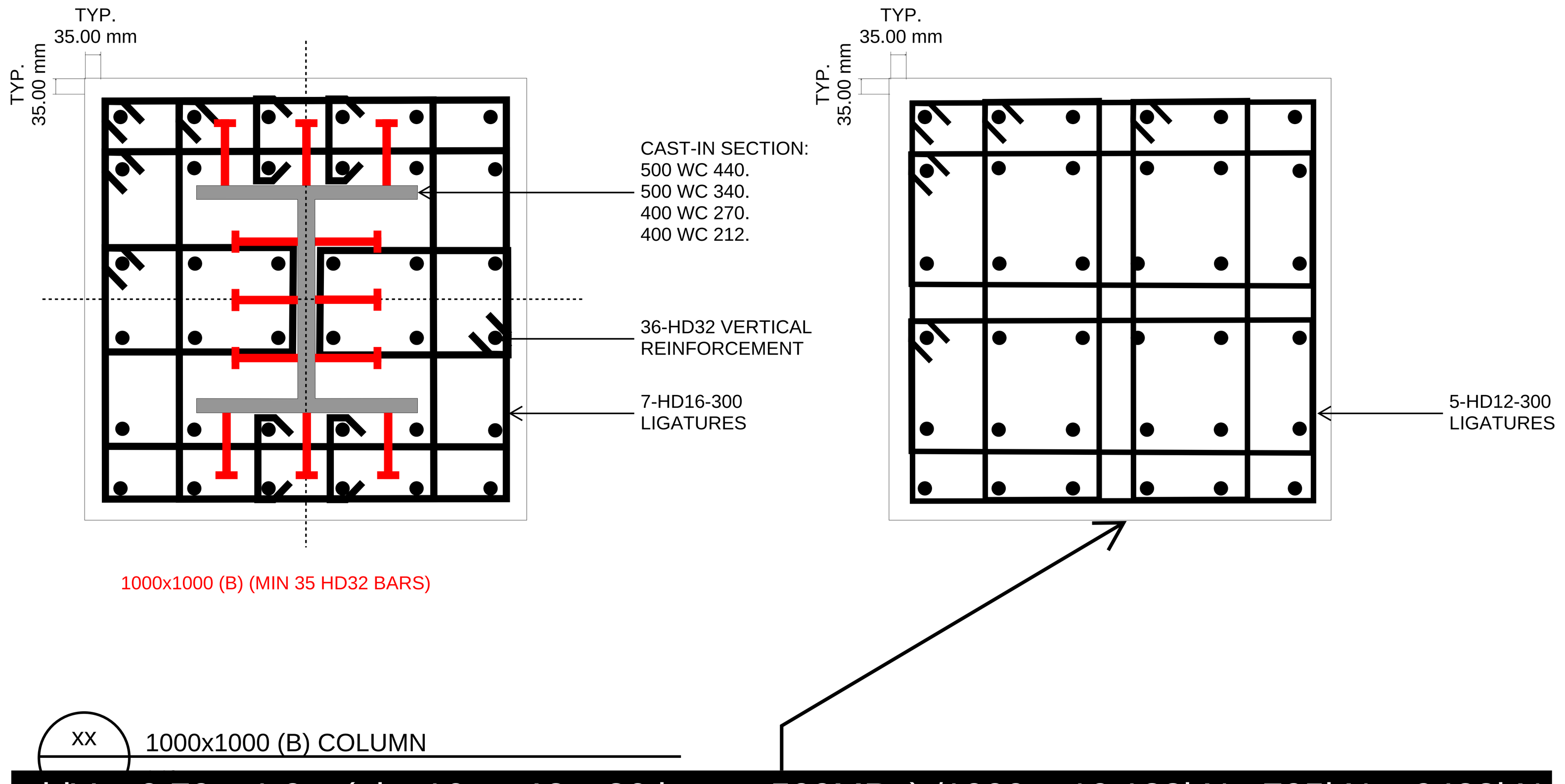
800x800 (A) COLUMN

phiV = 0.70 x 1.0 x (pi x 16mm^2 x 24 bars x 500MPa) /1000 = 6755kN - 165kN = 6590kN



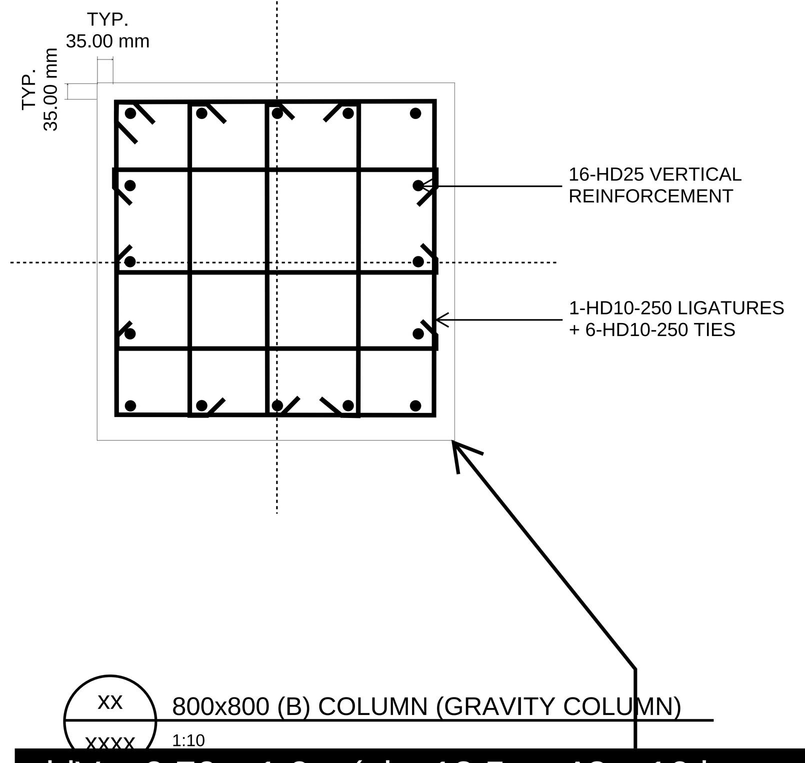
1250x1250 (B) COLUMN

phiV = 0.70 x 1.0 x (pi x 20mm^2 x 32 bars x 500MPa) /1000 = 22870kN - 360kN = 22,510kN



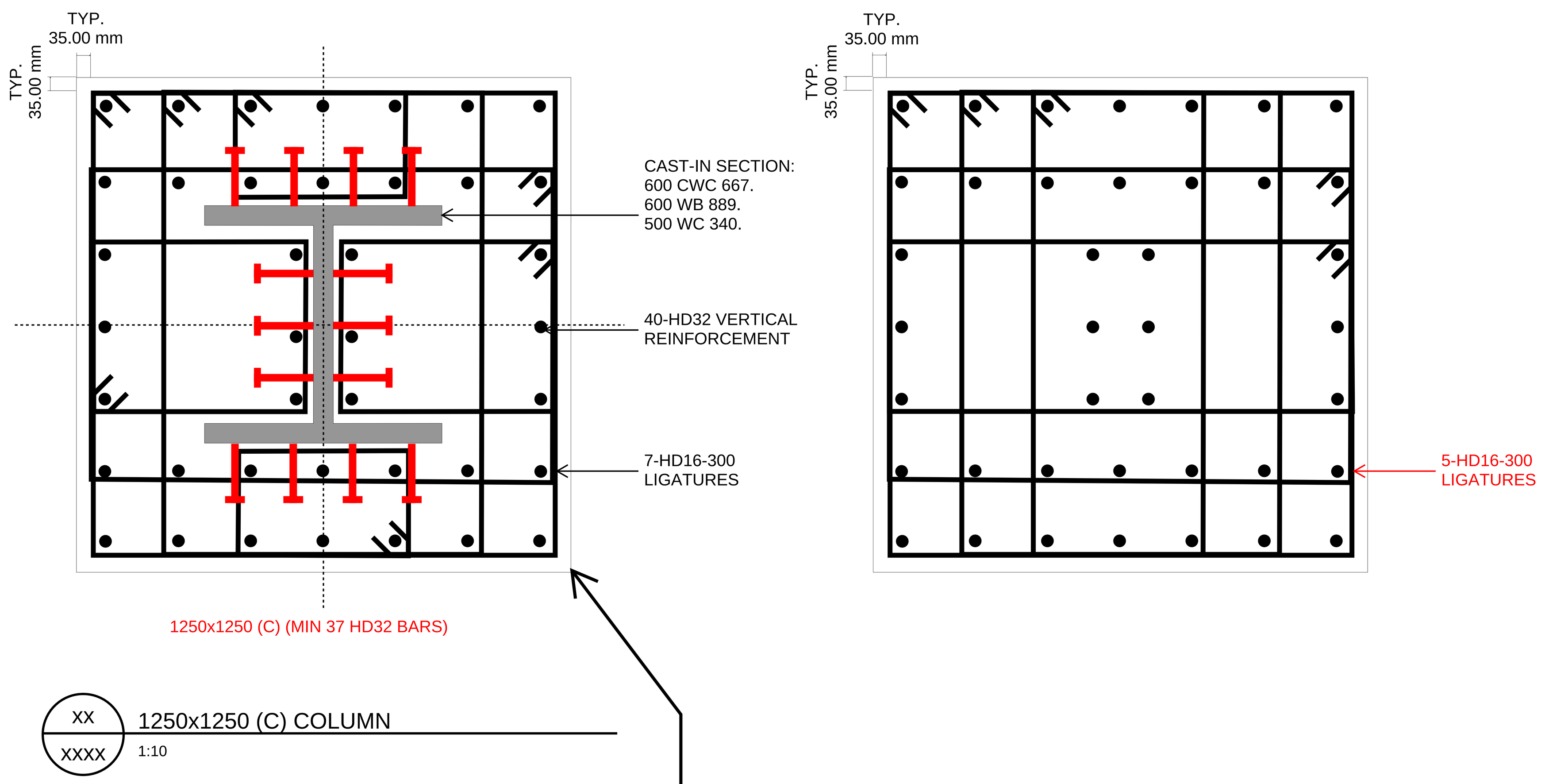
1000x1000 (B) COLUMN

phiV = 0.70 x 1.0 x (pi x 16mm^2 x 36 bars x 500MPa) /1000 = 10,133kN - 705kN = 9428kN



800x800 (B) COLUMN (GRAVITY COLUMN)

phiV = 0.70 x 1.0 x (pi x 12.5mm^2 x 16 bars x 500MPa) /1000 = 2748kN



1250x1250 (C) COLUMN

phiV = 0.70 x 1.0 x (pi x 16mm^2 x 40 bars x 500MPa) /1000 = 11259kN - 905kN = 10,354kN

Design Summary

1250x1250 (A)
DESIGN LOADS
Nc* = 25590 kN
Nt* = 25245 kN
M*(etabs) = 1255 kNm (CRITICAL)
M*min = 757 kNm (BASED ON MAX 30mm ECC.)
V* (ETABS) = 215 kN

-> REQUIRED VERTICAL REINFORCEMENT = 49 - 40HD

1250x1250 (B)
DESIGN LOADS
Nc* = 15100 kN
Nt* = 14761 kN
M*(etabs) = 1485 kNm (CRITICAL)
M*min = 443 kNm (BASED ON MAX 30mm ECC.)
V* (ETABS) = 360 kN

-> REQUIRED VERTICAL REINFORCEMENT = 32 - HD40

1250x1250 (C)
DESIGN LOADS
Nc* = 8695 kN
Nt* = 8355 kN
M*(etabs) = 1965 kNm (CRITICAL)
M*min = 251 kNm (BASED ON MAX 30mm ECC.)
V* (ETABS) = 905 kN

-> REQUIRED VERTICAL REINFORCEMENT = 37 - HD32

1000x1000 (A)
DESIGN LOADS
Nc* = 14055 kN
Nt* = 13715 kN
M*(etabs) = 1210 kNm (CRITICAL)
M*min = 411 kNm (BASED ON MAX 30mm ECC.)
V* (ETABS) = 805 kN

-> REQUIRED VERTICAL REINFORCEMENT = 30 - HD40

1000x1000 (B)
DESIGN LOADS
Nc* = 7840 kN
Nt* = 7500 kN
M*(etabs) = 1307 kNm (CRITICAL)
M*min = 225 kNm (BASED ON MAX 30mm ECC.)
V* (ETABS) = 710 kN

-> REQUIRED VERTICAL REINFORCEMENT = 35 - HD32

800x800 (A)
DESIGN LOADS
Nc* = 4510 kN
Nt* = 4170 kN
M*(etabs) = 735 kNm (CRITICAL)
M*min = 125 kNm (BASED ON MAX 30mm ECC.)
V* (ETABS) = 165 kN

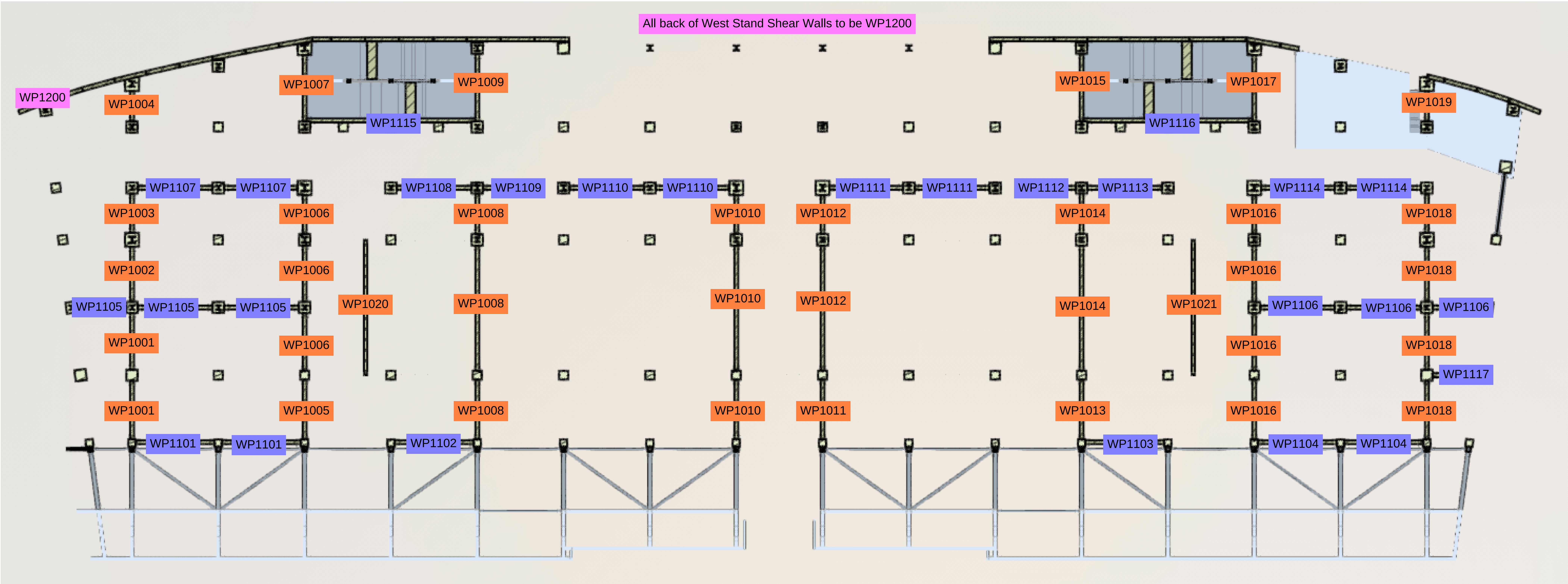
-> REQUIRED VERTICAL REINFORCEMENT = 23 - HD32

800x800 (B) (GRAVITY ONLY)
DESIGN LOADS
Nc* = 4000 kN
Nt* = - (NOT CHECKED FOR)
M* = 150 kNm (CRITICAL)
M*min = 120 kNm (BASED ON MAX 30mm ECC.)

-> MIN REQUIRED VERTICAL REINFORCEMENT = 16 - HD25

Subtract existing shear demands on columns.

Pier Labels - REVIT Model (Grouped)



Schedule of Reinforcement based on REVIT Model Labels (Grouped)

	Drossbach			Main wall		Vertical Reo Splice		Horizontal Shear		Confinement			
Grouped Wall Labe	Size	Duct Diameter	Spacing	Size (2 layers)	Spacing2	Central bar Lengt	Sleve Length	Size4	Spacing5	Size7	Drossbach Zone Spacing	Cover (mm	Concrete strength (MP
WP1001	25	50	300	20	300	1300	1350	16	150	10	150	35	40
WP1002	32	60	300	25	300	1550	1600	16	150	10	150	35	40
WP1003	25	50	300	20	300	1300	1350	16	150	10	150	35	40
WP1004	25	50	300	20	300	1300	1350	16	200	10	150	35	40
WP1005	32	60	250	25	250	1550	1600	16	150	10	150	35	40
WP1006	25	50	300	20	300	1300	1350	16	150	10	150	35	40
WP1007	32	60	250	25	250	1550	1600	16	200	10	150	35	40
WP1008	32	60	250	25	250	1550	1600	16	150	10	150	35	40
WP1009	32	60	250	25	250	1550	1600	16	200	10	150	35	40
WP1010	32	60	250	25	250	1550	1600	16	200	10	150	35	40
WP1011	32	60	300	25	300	1550	1600	16	200	10	150	35	40
WP1012	32	60	250	25	250	1550	1600	16	200	10	150	35	40
WP1013	25	50	300	20	300	1300	1350	16	150	10	150	35	40
WP1014	32	60	300	25	300	1550	1600	16	150	10	150	35	40
WP1015	32	60	300	25	300	1550	1600	16	200	10	150	35	40
WP1016	32	60	250	25	250	1550	1600	16	150	10	150	35	40
WP1017	32	60	250	25	250	1550	1600	16	200	10	150	35	40
WP1018	32	60	250	25	250	1550	1600	16	150	10	150	35	40
WP1019	32	60	300	25	300	1550	1600	16	150	10	150	35	40
WP1020	32	60	300	25	300	1550	1600	16	200	10	150	35	40
WP1021	32	60	300	25	300	1550	1600	16	200	10	150	35	40
WP1101	32	60	300	25	300	1550	1600	16	200	10	150	35	40
WP1102	32	60	300	25	300	1550	1600	16	200	10	150	35	40
WP1103	32	60	300	25	300	1550	1600	16	200	10	150	35	40
WP1104	32	60	250	25	250	1550	1600	16	200	10	150	35	40
WP1105	32	60	300	25	300	1550	1600	16	200	10	150	35	40
WP1106	32	60	250	25	250	1550	1600	16	200	10	150	35	40
WP1107	32	60	300	25	300	1550	1600	16	150	10	150	35	40
WP1108	32	60	250	25	250	1550	1600	16	150	10	150	35	40
WP1109	32	60	250	25	250	1550	1600	16	150	10	150	35	40
WP1110	32	60	250	25	250	1550	1600	16	200	10	150	35	40
WP1111	32	60	300	25	300	1550	1600	16	200	10	150	35	40
WP1112	32	60	250	25	250	1550	1600	16	150	10	150	35	40
WP1113	32	60	250	25	250	1550	1600	16	150	10	150	35	40
WP1114	32	60	300	25	300	1550	1600	16	150	10	150	35	40
WP1115	32	60	300	25	300	1550	1600	16	200	10	150	35	40
WP1116	32	60	300	25	300	1550	1600	16	200	10	150	35	40
WP1117	32	60	225	25	225	1500	1550	16	200	10	150	35	40
WP1200	32	60	300	25	300	1550	1600	16	200	10	150	35	40
Mezzanine Walls	25	50	300	20	300	1300	1350	16	200	10	200	35	40