

Tabel 1. Hitungan tulangan lentur tumpuan balok SNI gempa 2012

Type	b (mm)	h (mm)	b (mm)	h (mm)	s (mm)	D (mm)	D (mm)	Ø (mm)	f'c (Mpa)	fy (mpa)	Mu tump(Nmm)	Mu lap(Nmm)	Gaya geser(N)
BP1	500	700	300	500	40	25	16	10	25	400	937276300	864729400	690952
BP2	250	400	150	300	40	16	16	10	25	400	30784800	22697300	40613
BP3	300	700	300	600	40	19	19	10	25	400	597521600	667401400	462677
BP4	400	600	300	500	40	16	16	10	25	400	426021400	353861800	332607
BP6	500	700	400	600	40	25	25	10	25	400	1068046300	1010557300	4339039
BP7	700	600	700	600	40	25	25	10	25	400	600763500	332713200	326023
BP9	800	1000	400	600	40	25	25	10	25	400	2355223300	406829900	2528083
BP11	1000	1200	400	1200	40	29	22	10	25	400	3149201100	3735732600	2435291
BP12	1300	1600	700	1200	40	36	22	10	25	400	9136479100	3861395900	3654229
B1	500	800	300	500	40	25	16	10	25	400	1245078800	873570500	1112397
B2	300	600	300	500	40	19	19	10	25	400	473520900	470213100	332237
B3	300	700	300	500	40	19	19	10	25	400	513549100	448335800	352656
B4	400	650	300	500	40	19	19	10	25	400	489694600	606173000	843570
B5	300	400	150	300	40	16	16	8	25	400	167035800	180755300	274319
B6	300	500	300	500	40	19	19	10	25	400	319559400	222468800	164335
B7	500	700	300	600	40	25	19	10	25	400	943255700	704617600	497583
RB1	300	500	300	500	40	16	16	10	25	400	153146300	111019600	91618
RB2	300	500	300	500	40	13	13	10	25	400	166050300	119607600	94565
RB3	400	600	400	600	40	16	16	10	25	400	244170500	182242700	148802
RB4	300	600	150	400	40	16	16	10	25	400	24864200	11871000	22445
RB5	300	500	300	500	40	16	16	10	25	400	190600300	149907300	119105
RB6	300	500	300	500	40	16	16	10	25	400	231931800	213095200	144770

Tabel 2. Hitungan tulangan lentur tumpuan balok SNI gempa 2012

d' (mm)	d (mm)	Lb (mm)	β	φ	fys (Mpa)	ρ min	ρ b	ρ maks	Mn(Nmm)	Rn (N/mm²)	m	ρ hit	ρ koreksi
62.5	637.5	6000	0.85	0.8	240	0.0035	0.02709	0.02032	1171595375	5.765636601	18.82353	0.017197735	0.017197735
58	342	6000	0.85	0.8	240	0.0035	0.02709	0.02032	38481000	1.315994665	18.82353	0.003398704	0.020320313
59.5	640.5	6000	0.85	0.8	240	0.0035	0.02709	0.02032	746902000	6.068817805	18.82353	0.018336555	0.018336555
58	542	6000	0.85	0.8	240	0.0035	0.02709	0.02032	532526750	4.531926563	18.82353	0.012894755	0.012894755
62.5	637.5	8000	0.85	0.8	240	0.0035	0.02709	0.02032	1335057875	6.570065667	18.82353	0.020305921	0.020305921
62.5	537.5	6000	0.85	0.8	240	0.0035	0.02709	0.02032	750954375	3.713287491	18.82353	0.010277321	0.010277321
62.5	937.5	7850	0.85	0.8	240	0.0035	0.02709	0.02032	2944029125	4.187063644	18.82353	0.011771925	0.011771925
64.5	1135.5	7812	0.85	0.8	240	0.0035	0.02709	0.02032	3936501375	3.053065561	18.82353	0.008277535	0.008277535
68	1532	7812	0.85	0.8	240	0.0035	0.02709	0.02032	11420598875	3.743070398	18.82353	0.010369737	0.010369737
62.5	737.5	6000	0.85	0.8	240	0.0035	0.02709	0.02032	1556348500	5.722855731	18.82353	0.017039933	0.017039933
59.5	540.5	4700	0.85	0.8	240	0.0035	0.02709	0.02032	591901125	6.753618339	18.82353	0.021057325	0.020320313
59.5	640.5	6000	0.85	0.8	240	0.0035	0.02709	0.02032	641936375	5.215938506	18.82353	0.015220093	0.015220093
59.5	590.5	5200	0.85	0.8	240	0.0035	0.02709	0.02032	612118250	4.388696343	18.82353	0.012424654	0.012424654
56	344	6000	0.85	0.8	240	0.0035	0.02709	0.02032	208794750	5.881409715	18.82353	0.017628294	0.017628294
59.5	440.5	4700	0.85	0.8	240	0.0035	0.02709	0.02032	399449250	6.861965494	18.82353	0.021509244	0.020320313
62.5	637.5	4400	0.85	0.8	240	0.0035	0.02709	0.02032	1179069625	5.802418762	18.82353	0.017333966	0.017333966
58	442	6000	0.85	0.8	240	0.0035	0.02709	0.02032	191432875	3.266259819	18.82353	0.008913402	0.008913402
56.5	443.5	3000	0.85	0.8	240	0.0035	0.02709	0.02032	207562875	3.51755725	18.82353	0.009674862	0.009674862
58	542	6000	0.85	0.8	240	0.0035	0.02709	0.02032	305213125	2.597434718	18.82353	0.006947927	0.006947927
58	542	3850	0.85	0.8	240	0.0035	0.02709	0.02032	31080250	0.35266688	18.82353	0.000889107	0.0035
58	442	3850	0.85	0.8	240	0.0035	0.02709	0.02032	238250375	4.065067856	18.82353	0.011381953	0.011381953
58	442	4700	0.85	0.8	240	0.0035	0.02709	0.02032	289914750	4.946574087	18.82353	0.014287751	0.014287751

Tabel 3. Hitungan tulangan lentur tumpuan balok SNI gempa 2012

$\rho_{min} < \rho_{perlu}$	$\rho_{perlu} < \rho_{max}$	As perlu(mm ²)	As tul(mm ²)	n tul.	n	n atas	s tul atas (mm)	n bawah	S tul bawah (mm)	As n (mm)	AS tulng tekan	n tul	n tekan
ok	ok	5481.777888	490.8738521	11.17	12	6	50	6	50	5890.486	2740.889	5.58	6
not ok	ok	1737.386719	201.0619298	8.64	9	5	17.5	4	28.6666667	1809.557	868.6934	4.32	5
ok	ok	3523.36907	283.528737	12.43	13	7	11.166667	6	17.2	3685.874	1761.685	6.21	7
ok	ok	2795.582833	201.0619298	13.90	14	7	31.3333333	7	31.3333333	2814.867	1397.791	6.95	7
ok	ok	6472.512388	490.8738521	13.19	14	7	37.5	7	37.5	6872.234	3236.256	6.59	7
ok	ok	3866.841853	490.8738521	7.88	8	8	57.142857	0	0	3926.991	1933.421	3.94	4
ok	ok	8828.943455	490.8738521	17.99	18	9	59.375	9	59.375	8835.729	4414.472	8.99	9
ok	ok	9399.141392	660.5198554	14.23	15	8	95.428571	7	116.166667	9907.798	4699.571	7.11	8
ok	ok	20652.36736	1017.87602	20.29	21	11	80.4	10	93.3333333	21375.4	10326.18	10.14	11
ok	ok	6283.475237	490.8738521	12.80	13	7	37.5	6	50	6381.36	3141.738	6.40	7
ok	not ok	3294.938672	283.528737	11.62	12	6	17.2	6	17.2	3402.345	1647.469	5.81	6
ok	ok	2924.540909	283.528737	10.31	11	6	17.2	5	26.25	3118.816	1462.27	5.16	6
ok	ok	2934.703291	283.528737	10.35	11	6	37.2	5	51.25	3118.816	1467.352	5.18	6
ok	ok	1819.239893	201.0619298	9.05	10	5	31	5	31	2010.619	909.6199	4.52	5
ok	not ok	2685.329297	283.528737	9.47	10	5	26.25	5	26.25	2835.287	1342.665	4.74	5
ok	ok	5525.201544	490.8738521	11.26	12	6	50	6	50	5890.486	2762.601	5.63	6
ok	ok	1181.917161	201.0619298	5.88	6	3	76	3	76	1206.372	590.9586	2.94	3
ok	ok	1287.240407	132.7322896	9.70	10	5	33.75	5	33.75	1327.323	643.6202	4.85	5
ok	ok	1506.310674	201.0619298	7.49	8	4	78.666667	4	78.6666667	1608.495	753.1553	3.75	4
not ok	ok	569.1	201.0619298	2.83	4	4	45.333333	0	-200	804.2477	284.55	1.42	2
ok	ok	1509.246963	201.0619298	7.51	8	4	45.333333	4	45.3333333	1608.495	754.6235	3.75	4
ok	ok	1894.555828	201.0619298	9.42	10	5	30	5	30	2010.619	947.2779	4.71	5

Tabel 4. Hitungan tulangan lentur tumpuan balok SNI gempa 2012

as' tekan	as min	as max	Asmax > ASn	a (mm)	c(mm)	Es	ϵ_s'	syarat ϵ_s'	R(mm)	Q(mm)	c+(mm)
2945.243	1115.625	9562.5	ok	110.8797	130.4468	0.011661	0.00156	tidak ok	-32.61169	12229.38	147.9066
1005.31	299.25	1923.75	ok	60.55512	71.24132	0.011402	0.00056	tidak ok	-13.35775	7747.494	102.3854
1984.701	672.525	6244.875	ok	106.7402	125.5767	0.012301	0.00158	tidak ok	-26.16182	13075.68	143.4654
1407.434	758.8	7588	ok	66.23217	77.92019	0.017868	0.00077	tidak ok	-19.48005	6779.057	104.0881
3436.117	1115.625	11156.25	ok	129.3597	152.1879	0.009567	0.00177	tidak ok	-38.04697	14267.61	163.4072
1963.495	1316.875	7525	ok	52.79988	62.1175	0.022959	-0.00002	tidak ok	-15.52938	5823.516	93.40541
4417.865	2625	33750	ok	103.9498	122.2938	0.019998	0.00147	tidak ok	-30.57346	11465.05	141.9278
5284.159	3974.25	42581.25	ok	87.0332	102.392	0.030269	0.00111	tidak ok	-21.94114	11321.63	130.583
11196.64	6970.6	104559	ok	147.3848	173.3938	0.023506	0.00182	tidak ok	-39.01361	19454.79	183.8475
3436.117	1290.625	11984.38	ok	110.8797	130.4468	0.013961	0.00156	tidak ok	-27.17641	14267.61	149.6761
1701.172	567.525	4864.5	ok	106.7402	125.5767	0.009912	0.00158	tidak ok	-31.39419	11207.72	141.8175
1701.172	672.525	5284.125	ok	88.95019	104.6473	0.015362	0.00129	tidak ok	-20.92946	11207.72	128.845
1701.172	826.7	6495.5	ok	66.71264	78.48546	0.019571	0.00073	tidak ok	-15.69709	8405.793	108.7143
1005.31	361.2	2580	ok	63.07825	74.20971	0.010907	0.00074	tidak ok	-18.55243	6233.616	99.65611
1417.644	462.525	3303.75	ok	88.95019	104.6473	0.009628	0.00129	tidak ok	-26.16182	9339.77	126.2828
2945.243	1115.625	9562.5	ok	110.8797	130.4468	0.011661	0.00156	tidak ok	-32.61169	12229.38	147.9066
603.1858	464.1	1989	ok	37.84695	44.52583	0.02678	-0.00091	tidak ok	-11.13146	3873.747	74.35848
663.6614	465.675	3326.25	ok	41.6415	48.99	0.024159	-0.00046	tidak ok	-12.2475	4151.903	77.8364
804.2477	758.8	4336	ok	37.84695	44.52583	0.033518	-0.00091	tidak ok	-11.13146	3873.747	74.35848
402.1239	569.1	1626	ok	25.2313	29.68388	0.051777	-0.00286	tidak ok	-7.420971	2582.498	58.77824
804.2477	464.1	2652	ok	50.4626	59.36777	0.019335	0.00007	tidak ok	-14.84194	5164.996	88.2264
1005.31	464.1	3315	ok	63.07825	74.20971	0.014868	0.00066	tidak ok	-18.55243	6456.245	101.0172

Tabel 5. Hitungan tulangan lentur tumpuan balok SNI gempa 2012

c-(mm)	fs'	syarat fs	a (mm)	ND1	ND2	ND total	Z1(mm)	Z2(mm)	Mn1
82.68317	346.4615	ok	125.7206	1335781	1020413	2356194	574.6397	489.5934	767592837.7
75.66991	260.1078	ok	87.02759	462334.1	261488.9	723822.9	298.4862	239.6146	138000343.4
91.14171	351.1594	ok	121.9456	777402.9	696946.5	1474349	579.5272	497.0346	450526141
65.12804	265.668	ok	88.47492	752036.8	373910	1125947	497.7625	437.9119	374335754.9
87.31325	370.5119	ok	138.8961	1475771	1273122	2748894	568.0519	474.0928	838314705.4
62.34666	198.5243	ok	79.3946	1180995	389801.6	1570796	497.8027	444.0946	587902347.7
80.78086	335.7811	ok	120.6386	2050856	1483435	3534292	877.1807	795.5722	1798971552
86.70067	303.6367	ok	110.9955	2358655	1604464	3963119	1080.002	1004.917	2547352373
105.8203	378.0769	ok	156.2704	4316969	4233190	8550159	1453.865	1348.153	6276289058
95.32327	349.459	ok	127.2247	1351762	1200782	2552544	673.8877	587.8239	910935825.5
79.02918	348.2681	ok	120.5449	768473.8	592464.1	1360938	480.2275	398.6825	369042303.2
86.9861	322.9229	ok	109.5183	698178.9	549347.6	1247526	585.7409	511.655	408951912.5
77.32007	271.6162	ok	92.40711	785460.5	462066	1247526	544.2964	481.7857	427523339.1
62.55126	262.8406	ok	84.7077	540011.6	264236.1	804247.7	301.6462	244.3439	162892411.9
73.95916	317.3012	ok	107.3404	684294.9	449820	1134115	386.8298	314.2172	264705680.7
82.68317	346.4615	ok	125.7206	1335781	1020413	2356194	574.6397	489.5934	767592837.7
52.09556	131.9969	ok	63.20471	402930	79618.64	482548.6	410.3976	367.6415	165361522.5
53.3414	164.4711	ok	66.16094	421776	109153.2	530929.2	410.4195	365.6636	173105109.8
52.09556	131.9969	ok	63.20471	537240	106158.2	643398.2	510.3976	467.6415	274206029.5
43.93629	7.944124	ok	49.9615	318504.6	3194.522	321699.1	517.0192	483.2218	164672991.8
58.54252	205.5602	ok	74.99244	478076.8	165321.4	643398.2	404.5038	353.7736	193383878.3
63.91234	255.5042	ok	85.86461	547386.9	256860.8	804247.7	399.0677	340.9828	218444428.8

Tabel 6. Hitungan tulangan lentur tumpuan balok SNI gempa 2012

Type	Mn2	Mn total	Mr (Nmm)	syarat MR > MU
BP1	499587739.7	1267180577	1013744462	76468161.92
BP2	62656551.35	200656894.7	160525515.8	129740715.8
BP3	346406575.1	796932716.2	637546172.9	40024572.93
BP4	163739620.4	538075375.4	430460300.3	4438900.302
BP6	603578152	1441892857	1153514286	85467985.87
BP7	173108793.9	761011141.6	608808913.3	8045413.27
BP9	1180180043	2979151594	2383321276	28097975.53
BP11	1612353641	4159706014	3327764811	178563711.2
BP12	5706985423	11983274481	9586619585	450140484.9
B1	705848318.8	1616784144	1293427315	48348515.5
B2	236205039	605247342.2	484197873.8	10676973.76
B3	281076416.1	690028328.6	552022662.9	38473562.91
B4	222616801.2	650140140.3	520112112.3	30417512.25
B5	64564487.28	227456899.2	181965519.4	14929719.36
B6	141341182	406046862.6	324837490.1	5278090.107
B7	499587739.7	1267180577	1013744462	70488761.92
RB1	29271116.38	194632638.9	155706111.1	2559811.104
RB2	39913334.28	213018444.1	170414755.3	4364455.284
RB3	49643973.22	323850002.7	259080002.2	14909502.17
RB4	1543662.387	166216654.2	132973323.3	108109123.3
RB5	58486332.72	251870211	201496168.8	10895868.78
RB6	87585123	306029551.8	244823641.4	12891841.42

Tabel 7. Hitungan tulangan lentur lapangan balok SNI gempa 2012

Type	Mu(Nmm)	ρ min	ρ b	ρ maks	Mn (Nmm)	Rn	m	ρ hit	ρ koreksi	ρmin < ρperlu	ρperlu < ρmax
BP1	864729400	0.0035	0.0270938	0.020320313	1080911750	5.3193658	18.823529	0.0155842	0.015584	ok	ok
BP2	22697300	0.0035	0.0270938	0.020320313	28371625	0.9702686	18.823529	0.0024837	0.02032	not ok	ok
BP3	667401400	0.0035	0.0270938	0.020320313	834251750	6.7785625	18.823529	0.0211608	0.02032	ok	not ok
BP4	353861800	0.0035	0.0270938	0.020320313	442327250	3.7643078	18.823529	0.0104358	0.010436	ok	ok
BP6	1010557300	0.0035	0.0270938	0.020320313	1263196625	6.2164232	18.823529	0.0189047	0.018905	ok	ok
BP7	332713200	0.0035	0.0270938	0.020320313	415891500	2.0564827	18.823529	0.0054174	0.005417	ok	ok
BP9	406829900	0.0035	0.0270938	0.020320313	508537375	0.7232532	18.823529	0.00184	0.0035	not ok	ok
BP11	3735732600	0.0035	0.0270938	0.020320313	4669665750	3.621692	18.823529	0.0099943	0.009994	ok	ok
BP12	3861395900	0.0035	0.0270938	0.020320313	4826744875	1.5819526	18.823529	0.0041142	0.004114	ok	ok
B1	873570500	0.0035	0.0270938	0.020320313	1091963125	4.0152623	18.823529	0.0112238	0.011224	ok	ok
B2	470213100	0.0035	0.0270938	0.020320313	587766375	6.7064407	18.823529	0.0208625	0.02032	ok	not ok
B3	448335800	0.0035	0.0270938	0.020320313	560419750	4.5535898	18.823529	0.0129663	0.012966	ok	ok
B4	606173000	0.0035	0.0270938	0.020320313	757716250	5.4325885	18.823529	0.015987	0.015987	ok	ok
B5	180755300	0.0035	0.0270938	0.020320313	225944125	6.3644798	18.823529	0.0194842	0.019484	ok	ok
B6	222468800	0.0035	0.0270938	0.020320313	278086000	4.7771188	18.823529	0.0137125	0.013713	ok	ok
B7	704617600	0.0035	0.0270938	0.020320313	880772000	4.3344412	18.823529	0.012248	0.012248	ok	ok
RB1	111019600	0.0035	0.0270938	0.020320313	138774500	2.3677938	18.823529	0.0062921	0.006292	ok	ok
RB2	119607600	0.0035	0.0270938	0.020320313	149509500	2.5337297	18.823529	0.0067651	0.006765	ok	ok
RB3	182242700	0.0035	0.0270938	0.020320313	227803375	1.9386597	18.823529	0.0050905	0.005091	ok	ok
RB4	11871000	0.0035	0.0270938	0.020320313	14838750	0.168375	18.823529	0.0004226	0.0035	not ok	ok
RB5	149907300	0.0035	0.0270938	0.020320313	187384125	3.1971794	18.823529	0.0087064	0.008706	ok	ok
RB6	213095200	0.0035	0.0270938	0.020320313	266369000	4.5448326	18.823529	0.0129374	0.012937	ok	ok

Tabel 8. Hitungan tulangan lentur lapangan balok SNI gempa 2012

As perlu (mm)	As tul(mm ²)	jumlah tulangan(n)	n	n bawah	n atas	jarak tul atas(mm)	As total	As	jumlah tul	n	As' total
4967.4747	490.87385	10.11965633	11	5	6	50	5399.6124	2483.7373	5.0598282	6	2945.2431
1737.3867	201.06193	8.641052636	9	4	5	17.5	1809.5574	868.69336	4.3205263	5	1005.3096
3904.548	283.52874	13.77126033	14	7	7	11.166667	3969.4023	1952.274	6.8856302	7	1984.7012
2262.4724	201.06193	11.25261455	12	6	6	40.8	2412.7432	1131.2362	5.6263073	6	1206.3716
6025.8765	490.87385	12.27581481	13	6	7	37.5	6381.3601	3012.9383	6.1379074	7	3436.117
2038.3074	490.87385	4.152405719	5	0	5	118.75	2454.3693	1019.1537	2.0762029	3	1472.6216
2625	490.87385	5.347606088	6	3	3	312.5	2945.2431	1312.5	2.673803	2	981.7477
11348.575	660.51986	17.18127776	18	9	9	79.875	11889.357	5674.2876	8.5906389	9	5944.6787
8193.8213	1017.876	8.04992079	9	4	5	255	9160.8842	4096.9107	4.0249604	5	5089.3801
4138.7718	490.87385	8.431436596	9	4	5	68.75	4417.8647	2069.3859	4.2157183	5	2454.3693
3294.9387	283.52874	11.62118065	12	6	6	17.2	3402.3448	1647.4693	5.8105903	6	1701.1724
2491.4814	283.52874	8.78740341	9	4	5	26.25	2551.7586	1245.7407	4.3937017	5	1417.6437
3776.119	283.52874	13.31829369	14	7	7	27.833333	3969.4023	1888.0595	6.6591468	7	1984.7012
2010.7737	201.06193	10.00076773	11	5	6	21.6	2211.6812	1005.3868	5.0003839	6	1206.3716
1812.1098	283.52874	6.391273708	7	3	4	41.333333	1984.7012	906.05488	3.1956369	4	1134.1149
3904.0479	490.87385	7.953260996	8	4	4	100	3926.9908	1952.0239	3.9766305	4	1963.4954
834.33264	201.06193	4.149630096	5	2	3	76	1005.3096	417.16632	2.074815	3	603.18579
900.09176	132.73229	6.781256962	7	3	4	49.333333	929.12603	450.04588	3.3906285	4	530.92916
1103.6296	201.06193	5.489003092	6	3	3	126	1206.3716	551.81478	2.7445015	3	603.18579
569.1	201.06193	2.830471191	3	0	3	76	603.18579	284.55	1.4152356	2	402.12386
1154.4644	201.06193	5.741834954	6	3	3	76	1206.3716	577.23221	2.8709175	3	603.18579
1715.4971	201.06193	8.532182707	9	4	5	30	1809.5574	857.74856	4.2660914	5	1005.3096

Tabel 9. Hitungan tulangan lentur lapangan balok SNI gempa 2012

As min	As max	syarat AS max>AS n	a (mm)	c(mm)	ϵ_s	ϵ_s'	syarat ϵ_s'	R(mm)	Q(mm)	c+(mm)	c-(mm)
1115.625	8765.625	ok	92.399784	108.70563	0.01459	0.00128	tidak ok	-21.74113	12229.383	134.44454	90.962289
299.25	1923.75	ok	60.555122	71.24132	0.01140	0.00056	tidak ok	-13.35775	7747.4936	102.3854	75.669906
672.525	6725.25	ok	124.53027	146.5062	0.01012	0.00178	tidak ok	-36.62655	13075.678	156.69812	83.445022
758.8	6504	ok	56.770427	66.788738	0.02135	0.00039	tidak ok	-16.69718	5810.6202	94.731896	61.337527
1115.625	10359.375	ok	110.87974	130.44675	0.01166	0.00156	tidak ok	-27.17641	14267.614	149.67608	95.32327
1316.875	4703.125	ok	26.399938	31.058751	0.04892	-0.00304	tidak ok	-3.882344	4367.6368	70.084379	62.319691
2625	11250	ok	46.199892	54.352814	0.04875	-0.00045	tidak ok	-20.38231	2547.7882	74.817832	34.053221
3974.25	51097.5	ok	111.89983	131.64686	0.02288	0.00153	tidak ok	-32.91172	12736.834	150.47028	84.646844
6970.6	44811	ok	58.953905	69.357536	0.06327	0.00006	tidak ok	-13.00454	8843.0858	107.93717	81.92809
1290.625	8296.875	ok	73.919827	86.964503	0.02244	0.00084	tidak ok	-16.30584	10191.153	118.56548	85.953792
567.525	4864.5	ok	106.74023	125.57674	0.00991	0.00158	tidak ok	-31.39419	11207.724	141.81755	79.029177
672.525	4323.375	ok	71.160154	83.717828	0.01995	0.00087	tidak ok	-15.69709	9339.7702	113.60608	82.21189
826.7	8267	ok	93.397702	109.87965	0.01312	0.00138	tidak ok	-27.46991	9806.7587	130.23836	75.29854
361.2	2838	ok	63.078252	74.209709	0.01091	0.00074	tidak ok	-14.84194	7480.3386	102.59513	72.911246
462.525	2312.625	ok	53.370115	62.788371	0.01805	0.00016	tidak ok	-10.46473	7471.8161	97.535543	76.606086
1115.625	6375	ok	73.919827	86.964503	0.01899	0.00084	tidak ok	-21.74113	8152.9221	114.61523	71.132975
464.1	1657.5	ok	25.231301	29.683884	0.04167	-0.00286	tidak ok	-3.710485	3873.7468	66.060421	58.63945
465.675	2328.375	ok	24.984902	29.394002	0.04226	-0.00277	tidak ok	-4.899	3321.5222	62.739491	52.941491
758.8	3252	ok	28.385214	33.394369	0.04569	-0.00221	tidak ok	-8.348592	2905.3101	62.892236	46.195052
569.1	1219.5	ok	12.61565	14.841942	0.10655	-0.00872	tidak ok	0	2582.4979	50.818283	50.818283
464.1	1989	ok	37.846951	44.525825	0.02678	-0.00091	tidak ok	-11.13146	3873.7468	74.358477	52.095564
464.1	2983.5	ok	50.462602	59.367767	0.01934	0.00007	tidak ok	-11.13146	6456.2447	92.249605	69.986692

Tabel 10. Hitungan tulangan lentur lapangan balok SNI gempa 2012

fs'	syarat fs	a (mm)	ND1	ND2	ND total	Z1(mm)	Z2(mm)	Mn1
321.07458	ok	114.27786	1214202.3	945642.69	2159844.949	580.36107	503.05546	704675720.8
260.10779	ok	87.027591	462334.08	261488.87	723822.9474	298.4862	239.6146	138000343.4
372.1734	ok	133.1934	849107.95	738652.98	1587760.927	573.9033	483.80188	487305850.7
232.64749	ok	80.522111	684437.95	280659.32	965097.2632	501.73894	447.2681	343409173
349.45897	ok	127.22467	1351762.1	1200781.9	2552544.031	573.88766	487.82392	775759612.4
64.930693	ok	59.571722	886129.37	95618.339	981747.7042	507.71414	467.41562	449900407.8
98.782587	ok	63.595157	1081117.7	96979.578	1178097.245	905.70242	862.68217	979170888.9
342.80635	ok	127.89973	2717869.4	2037873.6	4755742.959	1071.5501	985.02972	2912333281
222.0023	ok	91.746591	2534499.6	1129854.1	3664353.671	1486.1267	1424.0628	3766587492
283.71907	ok	100.78066	1070794.5	696351.37	1767145.868	687.10967	618.93452	735753253
348.26811	ok	120.54492	768473.84	592464.1	1360937.938	480.22754	398.68245	369042303.2
285.75624	ok	96.565164	615602.92	405100.53	1020703.453	592.21742	526.89392	364570772.2
325.88722	ok	110.70261	940972.18	646788.74	1587760.927	535.1487	460.26164	503560035.5
272.49907	ok	87.20586	555937.36	328735.14	884672.4913	300.39707	241.40487	167001952.8
233.97958	ok	82.905211	528520.72	265359.74	793880.4636	399.04739	342.96446	210904816.7
272.81834	ok	97.422943	1035118.8	535677.56	1570796.327	588.78853	522.88477	609466055.4
73.209536	ok	56.151358	357964.91	44158.952	402123.8597	413.92432	375.93958	148170381.4
59.670469	ok	53.328568	339969.62	31680.792	371650.4109	416.83572	380.76051	141711479.7
46.672561	ok	53.458401	454396.41	28152.225	482548.6316	515.2708	479.10776	234137199.6
-84.79291	ok	43.19554	275371.57	-34097.25	241274.3158	520.40223	491.18172	143303979
131.99687	ok	63.204705	402930	79618.635	482548.6316	410.39765	367.64152	165361522.5
222.76261	ok	78.412164	499877.55	223945.4	723822.9474	402.79392	349.7504	201347635

Tabel 11. Hitungan tulangan lentur lapangan balok SNI gempa 2012

Type	Mn2	Mn total	Mr (Nmm)	syarat MR > MU
BP1	475710719.7	1180386441	944309152.4	79579752.43
BP2	62656551.35	200656894.7	160525515.8	137828215.8
BP3	357361700	844667550.7	675734040.6	8332640.564
BP4	125529960.2	468939133.2	375151306.6	21289506.59
BP6	585770128.9	1361529741	1089223793	78666493.01
BP7	44693505.27	494593913	395675130.4	62961930.42
BP9	83662552.78	1062833442	850266753.4	443436853.4
BP11	2007366060	4919699341	3935759473	200026873.2
BP12	1608983236	5375570728	4300456582	439060682.1
B1	430995902.3	1166749155	933399324.2	59828824.21
B2	236205039	605247342.2	484197873.8	13984773.76
B3	213445009.4	578015781.6	462412625.3	14076825.3
B4	297692045.6	801252081.2	641001664.9	34828664.93
B5	79358262.96	246360215.8	197088172.6	16332872.64
B6	91008960.01	301913776.8	241531021.4	19062221.4
B7	280097639.7	889563695.1	711650956.1	7033356.119
RB1	16601097.7	164771479.1	131817183.3	20797583.32
RB2	12062794.37	153774274.1	123019419.2	3411819.242
RB3	13487949.7	247625149.3	198100119.5	15857419.46
RB4	-16747947.8	126556031.2	101244824.9	89373824.94
RB5	29271116.38	194632638.9	155706111.1	5798811.104
RB6	78324992.97	279672627.9	223738102.3	10642902.33

Tabel 12. Hitungan tulangan geser balok SNI gempa 2012

type	b(mm)	h(mm)	b(mm)	h(mm)	s (mm)	D(mm)	D(mm)	Ø (mm)	f'c(Mpa)	fy(mpa)	Mu tump(Nmm)	Mu lap(Nmm)	Gaya geser(N)
BP1	500	700	300	500	40	25	16	10	25	400	937276300	864729400	690952
BP2	250	400	150	300	40	16	16	10	25	400	30784800	22697300	40613
BP3	300	700	300	600	40	19	19	10	25	400	597521600	667401400	462677
BP4	400	600	300	500	40	16	16	10	25	400	426021400	353861800	332607
BP6	500	700	400	600	40	25	25	10	25	400	1068046300	1010557300	4339039
BP7	700	600	700	600	40	25	25	10	25	400	600763500	332713200	326023
BP9	800	1000	400	600	40	25	25	10	25	400	2355223300	406829900	2528083
BP11	1000	1200	500	1200	40	25	22	10	25	400	3149201100	3735732600	2435291
BP12	1300	1600	700	1200	40	36	22	13	25	400	9136479100	3861395900	3654229
B1	500	800	300	500	40	25	16	10	25	400	1245078800	873570500	1112397
B2	300	600	300	500	40	19	19	10	25	400	473520900	470213100	332237
B3	300	700	300	500	40	19	19	10	25	400	513549100	448335800	352656
B4	400	650	300	500	40	19	19	10	25	400	489694600	606173000	843570
B5	300	400	150	300	40	16	16	8	25	400	167035800	180755300	274319
B6	300	500	300	500	40	19	19	10	25	400	319559400	222468800	164335
B7	500	700	300	600	40	25	19	10	25	400	943255700	704617600	497583
RB1	300	500	300	500	40	16	16	10	25	400	153146300	111019600	91618
RB2	300	500	300	500	40	13	13	10	25	400	166050300	119607600	94565
RB3	400	600	400	600	40	16	16	10	25	400	244170500	182242700	148802
RB4	300	600	150	400	40	16	16	10	25	400	24864200	11871000	22445
RB5	300	500	300	500	40	16	16	10	25	400	190600300	149907300	119105
RB6	300	500	300	500	40	16	16	10	25	400	231931800	213095200	144770

Tabel 13. Hitungan tulangan geser balok SNI gempa 2012

d'(mm)	d(mm)	Lb(mm)	β	ϕ	fys(Mpa)	ki(mm)	Ka(mm)	Ln(mm)	As n (mm)	a	Φ
62.5	637.5	6000	0.85	0.8	240	400	400	5600	2814.867	110.8797407	0.55
58	342	6000	0.85	0.8	240	400	400	5600	603.1858	60.5551224	0.55
59.5	640.5	6000	0.85	0.8	240	400	400	5600	4819.989	106.7402304	0.55
58	542	6000	0.85	0.8	240	400	400	5600	4423.362	66.23216512	0.55
62.5	637.5	8000	0.85	0.8	240	500	500	7500	4417.865	129.3596975	0.55
62.5	537.5	6000	0.85	0.8	240	500	500	5500	3926.991	52.79987653	0.55
62.5	937.5	7850	0.85	0.8	240	400	400	7450	4417.865	103.9497569	0.55
62.5	1137.5	7812	0.85	0.8	240	500	500	7312	11403.98	87.03320448	0.55
71	1529	7812	0.85	0.8	240	400	400	7412	16345.71	147.384763	0.55
62.5	737.5	6000	0.85	0.8	240	500	500	5500	2814.867	110.8797407	0.55
59.5	540.5	4700	0.85	0.8	240	400	400	4300	5670.575	106.7402304	0.55
59.5	640.5	6000	0.85	0.8	240	400	400	5600	2835.287	88.950192	0.55
59.5	590.5	5200	0.85	0.8	240	400	400	4800	2835.287	66.712644	0.55
56	344	6000	0.85	0.8	240	500	500	5500	804.2477	63.0782525	0.55
59.5	440.5	4700	0.85	0.8	240	400	400	4300	3118.816	88.950192	0.55
62.5	637.5	4400	0.85	0.8	240	400	400	4000	3402.345	110.8797407	0.55
58	442	6000	0.85	0.8	240	400	400	5600	1206.372	37.8469515	0.55
56.5	443.5	3000	0.85	0.8	240	400	400	2600	1327.323	41.64150262	0.55
58	542	6000	0.85	0.8	240	400	400	5600	1608.495	37.8469515	0.55
58	542	3850	0.85	0.8	240	400	400	3450	402.1239	25.231301	0.55
58	442	3850	0.85	0.8	240	400	400	3450	1608.495	50.462602	0.55
58	442	4700	0.85	0.8	240	400	400	4300	2010.619	63.0782525	0.55

Tabel 14. Hitungan tulangan geser balok SNI gempa 2012

Vult (N)	Vdeath (N)	Vlive (N)	VE (N)	Mnki=Mnka (Nmm)	Vg (N)	Ø0	Mkap,b	Vu,2 (N)	Vu,3 (N)
690952	329053	110408	551576	655368744.5	505271.6	1.25	819210930.6	735337.9127	2778053.25
40613	19484	5792	65823	75210618.14	29172.8	1.25	94013272.68	54134.75817	302996.4
462677	121883	33916	508967	1131983724	180175.6	1.25	1414979655	542929.2937	2301250.35
332607	77831	19258	260186	900391206	112655.2	1.25	1125489007	399660.2119	1194724.65
4339039	1928409	1024541	584150	1012256763	3338631.8	1.25	1265320954	3741756.635	5554027.5
326023	176237	2898	117651	802834099.6	214382.4	1.25	1003542624	480548.7335	682225.95
2528083	1410508	345858	402587	1564852059	2038467.6	1.25	1956065074	2507973.678	3535049.7
2435291	1214173	459656	806917	4990306498	1916663.6	1.25	6237883123	3206839.829	5146571.85
3654229	1580707	900775	367579	9515212524	2797623.4	1.25	11894015655	5184080.652	4149387.9
1112397	277808	47139	888344	767963425.2	380508.6	1.25	959954281.5	643886.0289	4072239.15
332237	53465	17132	305548	1104922568	81290	1.25	1381153210	535032.2893	1357428.45
352656	71238	22301	316927	675960753	107786.6	1.25	844950941.2	324413.6653	1429309.35
843570	128000	32173	791805	631864973.4	185773	1.25	789831216.7	425429.0882	3493762.65
274319	52280	26817	255072	100518378	89553	1.25	125647972.5	126013.7703	1154354.25
164335	64043	29318	132684	494051539.7	106169.6	1.25	617564424.7	312545.5671	655301.85
497583	88812	28045	517588	792147712.4	134619.4	1.25	990184640.4	487914.9942	2296569.45
91618	52822	4699	47190	204154997.8	68085.4	1.25	255193747.3	135288.1068	258595.05
94565	34085	7675	47660	224412737.8	48577	1.25	280515922.3	202052.8851	244020
148802	90303	14416	29768	336546481.3	122779.6	1.25	420683101.7	234089.3554	234980.55
22445	13818	2230	9197	85151231.15	18811.6	1.25	106439038.9	62944.83348	55477.8
119105	69878	13298	22288	268148220.5	97151.6	1.25	335185275.7	238026.3933	180944.4
144770	79164	16151	76553	330112221.6	111147.8	1.25	412640277	251053.1872	421603.35

Tabel 15. Hitungan tulangan geser daerah sendi plastis balok SNI gempa 2012

Vu,b terpakai	Vsperlu (N)	Vs max	syarat Vs max > Vs perlu	n	av (mm²)	S (mm)	s<200	n	n + 1	Av pakai (mm²)	Vs pakai	syarat VS pakai >Vs
567917.227	1032576.78	1062500	29923.22331	10	785.39816	116.374803	100	14.0	15	1178.09725	1802488.785	769912.0083
47522.5841	86404.6984	285000	198595.3016	2	157.07963	149.2175366	140	10.0	11	863.93798	506514.4955	420109.7971
418734.218	761334.941	640500	-120834.9414	7	549.77871	111.0049984	100	14.0	15	1178.09725	1810971.085	1049636.144
322297.414	585995.298	722666.667	136671.369	6	471.2389	104.6062248	100	14.0	15	1178.09725	1532468.896	946473.5988
3105658.01	5646650.92	1062500	-4584150.922	30	2356.1945	63.842756	60	31.3	33	2591.81394	6609125.545	962474.6235
386623.299	702951.453	1254166.67	551215.2135	7	549.77871	100.8909703	100	13.8	15	1178.09725	1519745.446	816793.993
1876772.25	3412313.18	2500000	-912313.1806	20	1570.7963	103.5746588	100	18.6	20	1570.79633	3534291.735	121978.5547
2209088.1	4016523.83	3791666.67	-224857.159	20	1570.7963	106.7658044	100	18.3	20	1570.79633	4288273.972	271750.1465
3045262.7	5536841.28	6625666.67	1088825.388	12	1592.7875	105.5636711	100	18.5	20	2654.64579	9741488.199	4204646.921
471207.503	856740.915	1229166.67	372425.7522	7	549.77871	113.5825671	100	13.8	15	1178.09725	2085232.124	1228491.209
400527.66	728232.11	540500	-187732.1096	8	628.31853	111.9223922	110	9.8	11	863.93798	1018818.498	290586.388
250204.039	454916.435	640500	185583.5648	6	471.2389	159.2354943	150	9.3	11	863.93798	885363.6416	430447.2064
320755.806	583192.375	787333.333	204140.9582	6	471.2389	114.5144887	100	12.0	13	1021.01761	1446986.16	863793.7852
110250.593	200455.624	344000	143544.376	5	251.32741	103.5121427	100	13.8	14	703.716754	580988.5524	380532.9284
248510.068	451836.488	440500	-11336.48791	6	471.2389	110.2597458	100	10.8	12	942.477796	996387.526	544551.0381
332392.09	604349.254	1062500	458150.7459	5	392.69908	99.41761174	90	11.1	13	1021.01761	1735729.941	1131380.687
113931.913	207148.932	442000	234851.0676	4	314.15927	160.8794913	150	9.3	11	863.93798	610976.9393	403828.0069
133121.766	242039.575	443500	201460.4251	4	314.15927	138.1555567	130	5.0	6	471.238898	385835.9101	143796.3352
188776.344	343229.717	722666.667	379436.9494	4	314.15927	119.0626429	110	12.7	14	1099.55743	1300276.639	957046.9222
43167.3844	78486.1534	542000	463513.8466	1	78.539816	130.168939	120	7.2	9	706.858347	766234.4482	687748.2948
177036.442	321884.44	442000	120115.5598	5	392.69908	129.4176213	120	7.2	9	706.858347	624862.7788	302978.3386
199441.323	362620.587	442000	79379.41339	5	392.69908	114.8790778	110	9.8	11	863.93798	833150.3717	470529.7851

Tabel 16. Hitungan tulangan geser daerah luar sendi plastis balok SNI gempa 2012

Vu,b terpakai	Vc (N)	Vs max	Vs (N)	Vs max	syarat Vs max > Vs	n	Av (mm2)	S(mm)	s<200
400496.5417	265625	1062500	462550.5304	1062500	599949.4696	4	314.1592654	103.915928	100
40910.4101	71250	285000	3132.563822	285000	281867.4362	1	78.53981634	2057.91438	150
294539.1418	160125	640500	375400.7124	640500	265099.2876	5	392.6990817	160.803378	150
244934.6156	180666.6667	722666.6667	264668.998	722666.6667	457997.6687	4	314.1592654	154.403567	150
2469559.379	265625	1062500	4224482.962	1062500	-3161982.962	40	3141.592654	113.780475	100
292697.865	313541.6667	1254166.667	218636.2696	1254166.667	1035530.397	3	235.619449	139.020433	130
1245570.82	625000	2500000	1639674.219	2500000	860325.7815	12	942.4777961	129.329047	120
1211336.38	947916.6667	3791666.667	1254513.114	3791666.667	2537153.552	6	471.238898	102.548325	150
906444.7551	1656416.667	6625666.667	-8335.293819	6625666.667	6634001.96	0	0	0	150
298528.977	307291.6667	1229166.667	235488.2916	1229166.667	993678.3751	2	157.0796327	118.065721	110
266023.0313	135125	540500	348553.2387	540500	191946.7613	4	314.1592654	116.919699	110
175994.4134	160125	640500	159864.8426	640500	480635.1574	2	157.0796327	151.041847	150
216082.5244	196833.3333	787333.3333	196043.9837	787333.3333	591289.3496	2	157.0796327	113.55271	110
94487.41612	86000	344000	85795.30203	344000	258204.698	3	150.7964474	145.109982	140
184474.5696	110125	440500	225283.3084	440500	215216.6916	4	314.1592654	147.427334	140
176869.1854	265625	1062500	55955.33706	1062500	1006544.663	0	0	0	150
92575.71881	110500	442000	57819.48875	442000	384180.5113	1	78.53981634	144.095078	150
64190.64733	110875	443500	5835.267874	443500	437664.7321	1	78.53981634	1432.6297	150
143463.3335	180666.6667	722666.6667	80175.75794	722666.6667	642490.9087	1	78.53981634	127.42579	120
23389.93522	135500	542000	-92972.84505	542000	634972.845	0	0	0	150
116046.4909	110500	442000	100493.6198	442000	341506.3802	1	78.53981634	82.9057978	150
147829.4581	110500	442000	158280.8329	442000	283719.1671	3	235.619449	157.912431	150

Tabel 17. Hitungan tulangan geser daerah luar sendi plastis balok SNI gempa 2012

tipe	n	n + 1	av (mm²)	Vs pakai	syarat VS pakai > Vs
BP1	28.0	30	2356.19	3604977.57	3142427.04
BP2	18.7	20	1570.8	859539.75	856407.1862
BP3	18.7	20	1570.8	1609752.076	1234351.363
BP4	18.7	20	1570.8	1362194.575	1097525.577
BP6	37.5	39	3063.05	4686470.841	461987.8793
BP7	21.2	23	1806.42	1792520.27	1573884
BP9	31.0	33	2591.81	4859651.136	3219976.918
BP11	24.4	26	2042.04	3716504.109	2461990.995
BP12	24.7	26	3451.04	8442623.106	8450958.4
B1	25.0	26	2042.04	3285820.316	3050332.025
B2	19.5	21	1649.34	1945017.132	1596463.893
B3	18.7	20	1570.8	1609752.076	1449887.233
B4	21.8	23	1806.42	2327320.398	2131276.414
B5	19.6	21	1055.58	622487.7348	536692.4327
B6	15.4	17	1335.18	1008249.282	782965.9739
B7	13.3	15	1178.1	1201659.19	1145703.853
RB1	18.7	20	1570.8	1110867.162	1053047.674
RB2	8.7	10	785.398	557318.5367	551483.2689
RB3	23.3	25	1963.5	2128429.023	2048253.265
RB4	11.5	13	1021.02	885426.4735	978399.3185
RB5	11.5	13	1021.02	722063.6555	621570.0357
RB6	14.3	16	1256.64	888693.7298	730412.8969

Tabel 18. Hitungan tulangan lentur kolom SNI gempa 2012

Tipe	b (mm)	l (mm)	b (mm)	l (mm)	H (mm)	ds (mm)	D (mm)	D (mm)	Ø(mm)	f'c (Mpa)	f'y (Mpa)	d' (mm)	d (mm)
K1	1000	1000	400	800	3500	40	36	22	13	30	400	71	929
K2	800	900	400	800	3500	40	36	22	13	30	400	71	829
K3	700	800	400	800	3500	40	36	22	13	30	400	71	729
K4	1000	1000	500	500	3500	40	36	19	13	30	400	71	929
K5	600	600	400	400	3500	40	22	19	10	30	400	61	539

Tabel 19. Hitungan tulangan lentur kolom SNI gempa 2012

M1b (Nmm)	M2b (Nmm)	Pu(N)	b > 300	b/h > 0,4	Hk/b < 16	K	r (mm)	k.lu / r	<	pg (%)	Ast (mm2)	n	Ast total (mm)
1091091200	2013405400	1183597	1000	1	3.5	1	300	11.66667	27.49704	0.025	25000	24	24429.02
1430941000	1707429300	707786	800	0.889	4.375	1	270	12.96296	23.94319	0.025	18000	20	20357.52
787402100	984781000	474474	700	0.875	5	1	240	14.58333	24.40515	0.025	14000	16	16286.02
3853399300	6071351700	3171087	1000	1	3.5	1	300	11.66667	26.38377	0.025	25000	18	18321.77
357462300	244317500	170727	600	1	5.833	1	180	19.44444	16.44273	0.025	9000	6	2280.796

Tabel 20. Hitungan tulangan lentur kolom SNI gempa 2012

ρ (%)	Ø < 0,65	Ø koreksi	Ag (mm2)	(Newton)	Øpnmax	syarat Øpnmax >(N)	cb (mm)	a (mm)	εs'	f's (Mpa)	f's < (mpa)	ND1 (N)	ND2 (N)	NT (N)
2.629	0.889	0.65	1000000	3000000	18128500	15128500	557.4	473.8	0.0026	523.574	400	12081645	4574335	4885805
3.069	0.876667	0.65	720000	2160000	13052520	10892520	497.4	422.8	0.0026	514.355	400	8624916	3811946	4071504
3.191	0.86125	0.65	560000	1680000	10151960	8471960	437.4	371.8	0.0025	502.606	400	6636451.5	3049557	3257203
1.972	0.889	0.65	1000000	3000000	18128500	15128500	557.4	473.8	0.0026	523.574	400	12081645	3430751	3664354
0.705	0.831667	0.65	360000	1080000	6526260	5446260	323.4	274.9	0.0024	486.827	400	4205817	427079.1	456159.3

Tabel 21. Hitungan tulangan lentur kolom SNI gempa 2012

Pnb (N)	ϕPnb	syarat $Pu < \phi Pnb$	Md,k (Nmm)	MI,k (Nmm)	Me,k (Nmm)	Mu,k (Nmm)	Mn(Nmm)	ϕMn	syarat $\phi Mn > Mu$
11770174.94	7650613.71	6467016.71	344074600	238557400	2051597000	9228471000	11562782407	9250225926	21754925.85
8365357.615	5437482.45	4729696.45	785226900	207264600	1226569500	6193707975	8230348266	6584278613	390570637.82
6428804.792	4178723.115	3704249.115	42195800	17044000	977900000	4169381790	5707376943	4565901554	396519764.27
11848042.45	7701227.595	4530140.595	2721039100	1413685600	665274800	7135615095	9466772107	7573417686	437802590.93
4176736.848	2714878.951	2544151.951	185701600	44816500	150316000	873371205	1119764829	895811862.9	22440657.87

Tabel 22. Hitungan tulangan geser kolom SNI gempa 2012

Nu (N)	Vd,k (N)	VI,k (N)	Ve,k (N)	Vu,max (N)	Vc (N)	Vn (N)	Vc < Vn perlu begel	Vs (N)	n asumsi
1183597	292213	198762	968967	4585185	919754.081	7641975.25	ya	6722221.169	21
707786	320982	85031	642715	3125717	647926.414	5209527.75	ya	4561601.336	19
474474	51052	19949	475420	2071315	494030.387	3452191.75	ya	2958161.363	15
3171087	1403948	753474	648813	4990308	1040147.29	8317179.5	ya	7277032.205	23
170727	78627	19007	85085	459872.7	305222.944	766454.5	ya	461231.5565	5

Tabel 23. Hitungan tulangan geser kolom SNI gempa 2012

Av asumsi (mm²)	fy	S	S pakai (mm)	n	n+1	Av (mm²)	Vs pakai (N)	(Vs + Vc)ϕ	syarat Vu < (Vs + Vc)ϕ
2787.378082	240	92.45066	90	19.44444	21	2787.378	6905264.635	5086262.165	ok
2521.913503	240	109.9964	100	17.5	19	2521.914	5017599.105	3682591.587	ok
1990.984344	240	117.7565	110	15.90909	17	2256.449	3588984.579	2653959.727	ok
3052.842661	240	93.53563	90	19.44444	21	2787.378	6905264.635	5164517.754	ok
392.6990817	240	110.1389	110	15.90909	17	1335.177	1570168.008	1219004.119	ok

