



UNIVERSITAS INDONESIA

**ANALISIS PENGGUNAAN APLIKASI *SOFTWARE* OPTIMASI
WASTE BESI PADA PEKERJAAN STRUKTUR BETON
BERTULANG PROYEK XYZ**

LAMPIRAN SKRIPSI

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**FAKULTAS TEKNIK UNIVERSITAS INDONESIA
PROGRAM STUDI TEKNIK SIPIL
DEPOK
DESEMBER 2008**

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KEKHUSUSAN MANAJEMEN KONSTRUKSI

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Judul Skripsi : Analisis Penggunaan Aplikasi *Software* Optimasi *Waste* Besi Pada Pekerjaan Struktur Beton Bertulang Proyek XYZ

NO	PERTANYAAN/SARAN	KETERANGAN
1	Unsur yang menyebabkan cara pemotongan akan mempegaruhi jumlah <i>waste</i> dan PT PP Persero telah melakukan uji coba walaupun belum menyeluruh dimasukkan ke dalam latar belakang	Sudah dijelaskan pada BAB 1 halaman 3 dan 5
2	Terdapat beberapa redaksional yang repetitif pada bagian perumusan masalah dan hipotesis	Sudah dijelaskan pada BAB 1 halaman 7 dan BAB 3 halaman 64
3	Pada kesimpulan membandingkan nilai <i>waste</i> hasil penelitian dengan perencanaan proyek	Sudah dijelaskan pada BAB 7 halaman 142
4	Jelaskan apa yang dimaksud dengan nilai <i>waste</i> yang terdapat pada proses awal aplikasi SOWB	Nilai <i>waste</i> pada proses awal aplikasi SOWB merupakan <i>conversion waste</i> yang pada langkah selanjutnya setelah di optimasi maka didapat nilai <i>waste</i> yang optimal. Nilai <i>waste</i> inilah yang merupakan <i>natural waste</i> yang terdapat dalam proyek. <i>Natural waste</i> adalah sisa material yang pasti terjadi, yang dilakukan dalam aplikasi SOWB adalah memperkecil nilai <i>natural waste</i> tersebut menjadi lebih optimal.
5	Perubahan judul menjadi Analisis Penggunaan Aplikasi <i>Software</i> Optimasi <i>Waste</i> Besi Pada Pekerjaan Struktur Beton Bertulang Proyek XYZ	Sudah dilakukan perubahan pada judul skripsi

NO	PERTANYAAN/SARAN	KETERANGAN
6	Dalam tujuan penelitian diganti menjadi untuk mengetahui tingkat optimasi aplikasi SOWB dalam mengoptimasi sisa material besi tulangan pada pekerjaan struktur beton bertulang	Sudah dijelaskan pada BAB 1 halaman 7
7	Jelaskan mengapa pada hasil proses awal nilai <i>waste</i> sebesar 4.25% padahal sudah menggunakan SOWB	Karena itu merupakan conversion waste yang terjadi pada proyek tersebut sehingga untuk mengurangi nilai <i>waste</i> tersebut maka diperlukan langkah optimasi agar nilai <i>natural waste</i> yang terjadi menjadi lebih optimal
8	Tuliskan di referensi tentang <i>natural waste</i>	Sudah dijelaskan pada BAB 2 halaman 39

Depok, 30 Desember 2008

Menyetujui,

Pembimbing I



Ayomi Dita R, ST, MT

Pembimbing II



Budi Suanda, ST, MT

**BAR BENDING SCHEDULE (BBS) / BESTAT BESI TULANGAN
PROYEK XYZ**

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
KOLOM									
1	K1 (7 Unit)								
		6.00	224	32	7	1344.00	25	3.85	5174.40
		6.00	224	32	7	1344.00	25	3.85	5174.40
		3.00	672	32	21	2016.00	25	3.85	7761.60
		4.50	1344	32	42	6048.00	25	3.85	23284.80
		3.16	1764	28	63	5574.24	13	1.04	5808.36
		0.91	3528	56	63	3210.48	13	1.04	3345.32
2	K1 (3 Unit)								
		4.50	192	32	6	864.00	25	3.85	3326.40
		3.16	196	28	7	619.36	13	1.04	645.37
		0.91	392	56	7	356.72	13	1.04	371.70
3	K2 (5 Unit)								
		6.00	160	32	5	960.00	25	3.85	3696.00
		6.00	160	32	5	960.00	25	3.85	3696.00
		3.00	480	32	15	1440.00	25	3.85	5544.00
		4.50	1120	28	40	5040.00	25	3.85	19404.00
		3.16	1540	28	55	4866.40	13	1.04	5070.79
		0.91	3080	56	55	2802.80	13	1.04	2920.52
4	K3 (7 Unit)								
		6.00	224	32	7	1344.00	25	3.85	5174.40
		6.00	224	32	7	1344.00	25	3.85	5174.40
		3.00	672	32	21	2016.00	25	3.85	7761.60
		4.50	1568	28	56	7056.00	25	3.85	27165.60
		3.16	2156	28	77	6812.96	13	1.04	7099.10
		0.91	4312	56	77	3923.92	13	1.04	4088.72
5	K4 (2 Unit)								
		6.00	64	32	2	384.00	25	3.85	1478.40
		6.00	64	32	2	384.00	25	3.85	1478.40
		3.00	192	32	6	576.00	25	3.85	2217.60
		4.50	828	46	18	3726.00	25	3.85	14345.10
		4.96	672	28	24	3333.12	13	1.04	3473.11
		0.71	2016	84	24	1431.36	13	1.04	1491.48
		2.01	672	28	24	1350.72	13	1.04	1407.45
6	K5 (4 Unit)								
		6.00	128	32	4	768.00	25	3.85	2956.80
		6.00	128	32	4	768.00	25	3.85	2956.80
		3.00	384	32	12	1152.00	25	3.85	4435.20
		4.50	112	28	4	504.00	25	3.85	1940.40
		2.56	224	28	8	573.44	13	1.04	597.52
		0.76	448	56	8	340.48	13	1.04	354.78
7	K5 (6 Unit)								
		4.50	1344	28	48	6048.00	25	3.85	23284.80
		2.56	1512	28	54	3870.72	13	1.04	4033.29
		0.76	3024	56	54	2298.24	13	1.04	2394.77
8	K6 (1 Unit)								
		6.00	32	32	1	192.00	25	3.85	739.20
		6.00	32	32	1	192.00	25	3.85	739.20
		3.00	96	32	3	288.00	25	3.85	1108.80
		4.50	216	24	9	972.00	25	3.85	3742.20
		2.56	336	28	12	860.16	13	1.04	896.29
		0.61	336	28	12	204.96	13	1.04	213.57
		0.91	336	28	12	305.76	13	1.04	318.60
9	K7 (1 Unit)								
		6.00	32	32	1	192.00	25	3.85	739.20
		6.00	32	32	1	192.00	25	3.85	739.20
		3.00	96	32	3	288.00	25	3.85	1108.80
		4.26	280	28	10	1192.80	19	3.85	4592.28
		2.36	336	28	12	792.96	13	1.04	826.26
		0.91	336	28	12	305.76	13	1.04	318.60
		0.51	336	28	12	171.36	13	1.04	178.56
10	K9 (1 Unit)								
		4.26	16	16	1	68.16	19	3.85	262.42
		1.12	28	28	1	31.36	10	0.62	19.35
		0.62	28	28	1	17.36	10	0.62	10.71
PELAT BASEMENT - 2									
2	Atas	7.50	120	120	1	900.00	16	1.58	1422.00
		12.00	480	480	1	5760.00	16	1.58	9100.80
		7.50	120	120	1	900.00	16	1.58	1422.00
	Bawah	5.65	120	120	1	678.00	16	1.58	1071.24
		12.00	480	480	1	5760.00	16	1.58	9100.80
		5.65	120	120	1	678.00	16	1.58	1071.24

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
	Atas	5.00	267	267	1	1335.00	13	1.04	1391.07
		12.00	267	267	1	3204.00	13	1.04	3338.57
		5.00	267	267	1	1335.00	13	1.04	1391.07
	Bawah	3.15	267	267	1	841.05	13	1.04	876.37
		12.00	267	267	1	3204.00	13	1.04	3338.57
		3.15	267	267	1	841.05	13	1.04	876.37
	Cakar Ayam	0.75	954	954	1	715.50	13	1.04	745.55
3	PELAT BASEMENT - 1								
1	ELEVASI - 1.00								
	Memanjang	12.00	92	92	1	1104.00	16	1.58	1744.32
		6.00	92	92	1	552.00	16	1.58	872.16
	Melintang	7.00	224	224	1	1568.00	16	1.58	2477.44
		0.56	110	110	1	61.60	13	1.04	64.19
2	ELEVASI -3.53								
	Melintang	3.60	50	50	1	180.00	10	0.62	111.06
	Memanjang	5.00	48	48	1	240.00	8	0.40	95.04
3	ELEVASI -3.75								
	Melintang	12.00	530	530	1	6360.00	10	0.62	3924.12
		8.00	530	530	1	4240.00	10	0.62	2616.08
	Memanjang	12.00	1200	1200	1	14400.00	13	1.04	15004.80
	Cakar Ayam	0.44	900	900	1	396.00	10	0.62	244.33
4	SLOPE BASEMENT - 2								
1	SLOPE 1 (S-1)								
	PANJANG = 18 m (7 Unit)								
	Tulangan Atas	12.00	56	8	7	672.00	25	3.85	2587.20
		7.40	56	8	7	414.40	25	3.85	1595.44
	Tulangan Bawah	7.00	84	12	7	588.00	25	3.85	2263.80
		7.40	56	8	7	414.40	25	3.85	1595.44
		12.00	56	8	7	672.00	25	3.85	2587.20
	Senggang	3.64	630	90	7	2293.20	13	1.04	2389.51
	Sepihak	1.19	1260	180	7	1499.40	13	1.04	1562.37
	Peminggang	12.00	28	4	7	336.00	13	1.04	350.11
		6.00	28	4	7	168.00	13	1.04	175.06
	PANJANG = 6 m (6 Unit)								
	Tulangan Atas	8.00	48	8	6	384.00	25	3.85	1478.40
	Tulangan Bawah	3.00	72	12	6	216.00	25	3.85	831.60
		8.00	48	8	6	384.00	25	3.85	1478.40
	Senggang	3.64	186	31	6	677.04	13	1.04	705.48
	Sepihak	1.19	372	62	6	442.68	13	1.04	461.27
	Peminggang	8.00	24	4	6	192.00	13	1.04	200.06
	PANJANG = 1.5 m (7 Unit)								
	Tulangan Atas	3.50	56	8	7	196.00	25	3.85	754.60
	Tulangan Bawah	3.50	56	8	7	196.00	25	3.85	754.60
		2.00	84	12	7	168.00	25	3.85	646.80
	Senggang	3.64	56	8	7	203.84	13	1.04	212.40
	Sepihak	1.18	112	16	7	132.16	13	1.04	137.71
	Peminggang	3.50	28	4	7	98.00	13	1.04	102.12
	PANJANG = 3 - 3.5 m (6 Unit)								
	Tulangan Atas	5.50	48	8	6	264.00	25	3.85	1016.40
	Tulangan Bawah	5.50	48	8	6	264.00	25	3.85	1016.40
		2.50	72	12	6	180.00	25	3.85	693.00
	Senggang	3.64	108	18	6	393.12	13	1.04	409.63
	Sepihak	1.19	216	36	6	257.04	13	1.04	267.84
	Peminggang	5.50	24	4	6	132.00	13	1.04	137.54
2	SLOPE 2 (S-2)								
	PANJANG = 4.5 m (6 Unit)								
	Tulangan Atas	6.50	60	10	6	390.00	25	3.85	1501.50
		3.00	18	3	6	54.00	25	3.85	207.90
	Tulangan Bawah	6.50	48	8	6	312.00	25	3.85	1201.20
		3.00	144	24	6	432.00	25	3.85	1663.20
	Senggang	3.74	276	46	6	1032.24	13	1.04	1075.59
	Sepihak	1.24	552	92	6	684.48	13	1.04	713.23
	Peminggang	6.50	24	4	6	156.00	13	1.04	162.55
	PANJANG = 1.5 m (9 Unit)								
	Tulangan Atas	3.50	90	10	9	315.00	25	3.85	1212.75
		3.00	27	3	9	81.00	25	3.85	311.85
	Tulangan Bawah	3.50	72	8	9	252.00	25	3.85	970.20
		2.00	216	24	9	432.00	25	3.85	1663.20
	Senggang	3.74	144	16	9	538.56	13	1.04	561.18
	Sepihak	1.24	288	32	9	357.12	13	1.04	372.12
	Peminggang	3.50	36	4	9	126.00	13	1.04	131.29
	PANJANG = 3 m (8 Unit)								
	Tulangan Atas	5.00	80	10	8	400.00	25	3.85	1540.00
		2.00	24	3	8	48.00	25	3.85	184.80
	Tulangan Bawah	5.00	64	8	8	320.00	25	3.85	1232.00
		2.50	192	24	8	480.00	25	3.85	1848.00

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
	Senggang	3.74	248	31	8	927.52	13	1.04	966.48
	Sepihak	1.24	496	62	8	615.04	13	1.04	640.87
	Peminggang	5.00	24	3	8	120.00	13	1.04	125.04
3	SLOPE 3 (S-3)								
	PANJANG = 53 m (1 Unit)								
	Tulangan	12.00	30	30	1	360.00	16	1.58	568.80
	Senggang	1.50	266	266	1	399.00	13	1.04	415.76
	Peminggang	12.00	10	10	1	120.00	13	1.04	125.04
5	SHEAR WALL DAN KOLOM LIFT								
1	KL1								
	Tulangan Pokok Horizontal	3.05	71	35.5	2	216.55	10	0.62	133.61
	Tulangan Pokok Vertikal	4.59	40	20	2	183.60	13	1.04	191.31
		4.83	40	20	2	193.20	16	1.58	305.26
		1.55	71	35.5	2	110.05	10	0.62	67.90
2	KL2								
	Tulangan Pokok Horizontal	3.70	80	40	2	296.00	13	1.04	308.43
	Tulangan Pokok Vertikal	1.10	142	71	2	156.20	8	0.40	61.86
3	KL3								
	Tulangan Pokok Horizontal	4.59	40	40	1	183.60	13	1.04	191.31
		4.59	10	10	1	45.90	16	1.58	72.52
	Tulangan Pokok Vertikal	4.85	36	35.5	1	172.18	10	0.62	106.23
		1.55	36	35.5	1	55.03	10	0.62	33.95
6	PIT LIFT								
	Tulangan Vertikal	3.59	194	194	1	696.46	10	0.62	429.72
	Senggang	2.80	36	36	1	100.80	10	0.62	62.19
		7.55	36	36	1	271.80	10	0.62	167.70
7	BALOK LANTAI BASEMENT 1								
1	ELEVASI - 1.00								
	MELINTANG (BAB-1) (8 Unit)								
	Tulangan Atas	6.60	128	16	8	844.80	19	2.23	1879.68
	Tulangan Bawah	6.60	16	2	8	105.60	13	1.04	110.04
	Senggang	1.84	368	46	8	677.12	13	1.04	705.56
	Sepihak	0.69	368	46	8	253.92	13	1.04	264.58
	MEMANJANG (BAB-2)								
	Tulangan Atas	12.00	4	4	1	48.00	22	2.98	143.04
		5.00	4	4	1	20.00	22	2.98	59.60
	Tulangan Ekstra	3.00	8	8	1	24.00	22	2.98	71.52
	Tulangan Bawah	12.00	4	4	1	48.00	22	2.98	143.04
		5.00	4	4	1	20.00	22	2.98	59.60
		2.00	6	6	1	12.00	22	2.98	35.76
	Senggang	3.84	112	112	1	430.08	13	1.04	448.14
	Sepihak	1.64	224	224	1	367.36	13	1.04	382.79
	Peminggang	12.00	8	8	1	96.00	13	1.04	100.03
		5.00	8	8	1	40.00	13	1.04	41.68
	MEMANJANG (BAB-1)								
	Tulangan Atas	12.00	16	16	1	192.00	19	2.23	427.20
		5.00	16	16	1	80.00	19	2.23	178.00
	Senggang	1.84	112	112	1	206.08	13	1.04	214.74
	Sepihak	0.69	112	112	1	77.28	13	1.04	80.53
	Tulangan Bawah	12.00	2	2	1	24.00	13	1.04	25.01
		5.00	2	2	1	10.00	13	1.04	10.42
	BALOK PENGHUBUNG (63 Unit)								
	Tulangan Atas	3.34	504	8	63	1683.36	22	2.98	5016.41
		2.84	504	8	63	1431.36	22	2.98	4265.45
	Tulangan Bawah	3.34	504	8	63	1683.36	22	2.98	5016.41
		2.14	504	8	63	1078.56	22	2.98	3214.11
	Peminggang	1.34	504	8	63	675.36	22	2.98	2012.57
		2.14	126	2	63	269.64	13	1.04	280.96
	Senggang	1.94	504	8	63	977.76	13	1.04	1018.83
	MELINTANG As 1 (BAB-2)								
	Tulangan Atas	12.00	4	4	1	48.00	22	2.98	143.04
	Tulangan Ekstra	3.00	4	4	1	12.00	22	2.98	35.76
	Tulangan Bawah	12.00	4	4	1	48.00	22	2.98	143.04
	Tulangan Ekstra	3.00	4	4	1	12.00	22	2.98	35.76
	Senggang	3.84	80	80	1	307.20	13	1.04	320.10
	Sepihak	1.64	160	160	1	262.40	13	1.04	273.42
	Peminggang	12.00	8	8	1	96.00	13	1.04	100.03
	MEMANJANG (BAB-2)								
	Tulangan Atas	12.00	20	20	1	240.00	22	2.98	715.20
	Tulangan Ekstra	3.00	64	64	1	192.00	22	2.98	572.16
	Tulangan Bawah	12.00	20	20	1	240.00	22	2.98	715.20
	Tulangan Ekstra	6.00	64	64	1	384.00	22	2.98	1144.32
	Senggang	3.84	354	354	1	1359.36	13	1.04	1416.45
	Sepihak	1.64	708	708	1	1161.12	13	1.04	1209.89
	Peminggang	12.00	40	40	1	480.00	13	1.04	500.16

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
		12.00	200	200	1	2400.00	16	1.58	3792.00
		2.50	708	708	1	1770.00	16	1.58	2796.60
2	ELEVASI -3.75								
	BB1-1 (7 Unit)								
	Tulangan Atas	12.00	21	3	7	252.00	22	2.98	750.96
		3.00	98	14	7	294.00	22	2.98	876.12
		5.00	49	7	7	245.00	22	2.98	730.10
		8.00	14	2	7	112.00	22	2.98	333.76
		3.00	7	1	7	21.00	22	2.98	62.58
	Tulangan Bawah	12.00	21	3	7	252.00	22	2.98	750.96
		8.00	14	2	7	112.00	22	2.98	333.76
		3.00	7	1	7	21.00	22	2.98	62.58
	Senggang	2.14	840	120	7	1797.60	13	1.04	1873.10
		1.74	630	90	7	1096.20	13	1.04	1142.24
	Sepihak	0.79	840	120	7	663.60	13	1.04	691.47
		0.59	630	90	7	371.70	13	1.04	387.31
	Peminggang	12.00	14	2	7	168.00	13	1.04	175.06
	BB1-2 (6 Unit)								
	Tulangan Atas	12.00	18	3	6	216.00	22	2.98	643.68
		3.00	36	6	6	108.00	22	2.98	321.84
		8.00	18	3	6	144.00	22	2.98	429.12
	Tulangan Bawah	12.00	18	3	6	216.00	22	2.98	643.68
		3.00	12	2	6	36.00	22	2.98	107.28
		8.00	18	3	6	144.00	22	2.98	429.12
	Senggang	2.14	720	120	6	1540.80	13	1.04	1605.51
		1.74	540	90	6	939.60	13	1.04	979.06
	Sepihak	0.79	720	120	6	568.80	13	1.04	592.69
		0.59	540	90	6	318.60	13	1.04	331.98
	Peminggang	12.00	12	2	6	144.00	13	1.04	150.05
	BB1-3 (2 Unit)								
	Tulangan Atas	12.00	3	3	1	36.00	22	2.98	107.28
		3.00	4	4	1	12.00	22	2.98	35.76
		8.00	3	3	1	24.00	22	2.98	71.52
	Tulangan Bawah	12.00	3	3	1	36.00	22	2.98	107.28
		3.00	2	2	1	6.00	22	2.98	17.88
		8.00	3	3	1	24.00	22	2.98	71.52
	Senggang	1.96	120	120	1	235.20	13	1.04	245.08
		1.74	90	90	1	156.60	13	1.04	163.18
	Sepihak	0.65	120	120	1	78.00	13	1.04	81.28
		0.59	90	90	1	53.10	13	1.04	55.33
	Peminggang	12.00	2	2	1	24.00	13	1.04	25.01
	BB1-4 (1 Unit)								
	Tulangan Atas	12.00	2	2	1	24.00	22	2.98	71.52
		8.00	2	2	1	16.00	22	2.98	47.68
		5.00	4	4	1	20.00	22	2.98	59.60
	Tulangan Bawah	12.00	2	2	1	24.00	22	2.98	71.52
		8.00	2	2	1	16.00	22	2.98	47.68
		3.00	3	3	1	9.00	22	2.98	26.82
	Senggang	1.44	130	130	1	187.20	22	2.98	557.86
	BB1-5 (1 Unit)								
	Tulangan Atas	7.20	2	2	1	14.40	22	2.98	42.91
		5.00	2	2	1	10.00	22	2.98	29.80
	Tulangan Bawah	7.20	2	2	1	14.40	22	2.98	42.91
		3.00	1	1	1	3.00	22	2.98	8.94
	Senggang	1.74	48	48	1	83.52	13	1.04	87.03
	Peminggang	7.20	2	2	1	14.40	13	1.04	15.00
	BB1-6 (1 Unit)								
	Tulangan Atas	12.00	2	2	1	24.00	22	2.98	71.52
		8.00	2	2	1	16.00	22	2.98	47.68
		3.00	4	4	1	12.00	22	2.98	35.76
	Tulangan Bawah	5.00	3	3	1	15.00	22	2.98	44.70
		12.00	2	2	1	24.00	22	2.98	71.52
		8.00	2	2	1	16.00	22	2.98	47.68
	Senggang	1.74	90	90	1	156.60	10	0.62	96.62
	Peminggang	12.00	2	2	1	24.00	10	0.62	14.81
		8.00	2	2	1	16.00	10	0.62	9.87
	BB1-7 (1 Unit)								
	Tulangan Atas	12.00	10	10	1	120.00	22	2.98	357.60
		5.00	18	18	1	90.00	22	2.98	268.20
	Tulangan Bawah	12.00	15	15	1	180.00	22	2.98	536.40
		3.00	8	8	1	24.00	22	2.98	71.52
	Senggang	1.84	353	353	1	649.52	13	1.04	676.80
	Peminggang	12.00	10	10	1	120.00	13	1.04	125.04
	BB1-8 (2 Unit)								
	Tulangan Atas	12.00	20	10	2	240.00	22	2.98	715.20
		5.00	18	9	2	90.00	22	2.98	268.20
	Tulangan Bawah	12.00	20	10	2	240.00	22	2.98	715.20
		3.00	16	8	2	48.00	22	2.98	143.04
	Senggang	2.24	706	353	2	1581.44	13	1.04	1647.86

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
	Peminggang	12.00	20	10	2	240.00	13	1.04	250.08
8	BALOK LANTAI 1 - 7								
1	B1 (1 Unit)								
	Tulangan Atas	12.00	21	3	7	252.00	22	2.98	750.96
		5.00	21	3	7	105.00	22	2.98	312.90
		4.00	98	14	7	392.00	22	2.98	1168.16
		3.00	70	10	7	210.00	22	2.98	625.80
	Tulangan Bawah	12.00	28	4	7	336.00	22	2.98	1001.28
		5.00	28	4	7	140.00	22	2.98	417.20
	Sengkang	1.74	1050	150	7	1827.00	13	1.04	1903.73
	Peminggang	12.00	14	2	7	168.00	13	1.04	175.06
		5.00	14	2	7	70.00	13	1.04	72.94
2	B2 (6 Unit)								
	Tulangan Atas	12.00	168	4	42	2016.00	22	2.98	6007.68
		5.00	168	4	42	840.00	22	2.98	2503.20
		6.00	336	8	42	2016.00	22	2.98	6007.68
		8.00	336	8	42	2688.00	22	2.98	8010.24
		3.00	252	6	42	756.00	22	2.98	2252.88
	Tulangan Bawah	12.00	210	5	42	2520.00	22	2.98	7509.60
		5.00	210	5	42	1050.00	22	2.98	3129.00
		7.00	42	1	42	294.00	22	2.98	876.12
	Sengkang	2.14	6300	150	42	13482.00	13	1.04	14048.24
	Peminggang	12.00	84	2	42	1008.00	13	1.04	1050.34
		5.00	84	2	42	420.00	13	1.04	437.64
3	B3 (1 Unit)								
	Tulangan Atas	12.00	21	3	7	252.00	22	2.98	750.96
		5.00	21	3	7	105.00	22	2.98	312.90
		6.00	42	6	7	252.00	22	2.98	750.96
		8.00	49	7	7	392.00	22	2.98	1168.16
		3.00	35	5	7	105.00	22	2.98	312.90
	Tulangan Bawah	12.00	28	4	7	336.00	22	2.98	1001.28
		5.00	28	4	7	140.00	22	2.98	417.20
	Sengkang	2.04	700	100	7	1428.00	13	1.04	1487.98
		1.64	350	50	7	574.00	13	1.04	598.11
	Peminggang	12.00	14	2	7	168.00	13	1.04	175.06
		5.00	14	2	7	70.00	13	1.04	72.94
4	B4 (2 Unit)								
	Tulangan Atas	7.00	42	3	14	294.00	22	2.98	876.12
		3.00	84	6	14	252.00	22	2.98	750.96
	Tulangan Bawah	7.00	42	3	14	294.00	22	2.98	876.12
	Sengkang	1.84	588	42	14	1081.92	10	0.62	667.54
	Peminggang	7.00	28	2	14	196.00	13	1.04	204.23
5	B5 (6 Unit)								
	Tulangan Atas	12.00	126	3	42	1512.00	22	2.98	4505.76
		5.00	126	3	42	630.00	22	2.98	1877.40
		6.00	126	3	42	756.00	22	2.98	2252.88
	Tulangan Bawah	8.00	126	3	42	1008.00	22	2.98	3003.84
		3.00	42	1	42	126.00	22	2.98	375.48
	Peminggang	12.00	126	3	42	1512.00	22	2.98	4505.76
		5.00	126	3	42	630.00	22	2.98	1877.40
	Sepihak	8.00	126	3	42	1008.00	22	2.98	3003.84
		3.00	42	1	42	126.00	22	2.98	375.48
	Sengkang	1.94	3360	80	42	6518.40	13	1.04	6792.17
		1.54	1680	40	42	2587.20	13	1.04	2695.86
6	B6 (2 Unit)								
	Tulangan Atas	12.00	42	3	14	504.00	22	2.98	1501.92
		7.00	28	2	14	196.00	22	2.98	584.08
		6.00	14	1	14	84.00	22	2.98	250.32
	Tulangan Bawah	12.00	42	3	14	504.00	22	2.98	1501.92
		7.00	28	2	14	196.00	22	2.98	584.08
		5.00	56	4	14	280.00	22	2.98	834.40
	Sengkang	1.94	938	67	14	1819.72	13	1.04	1896.15
		0.74	476	34	14	352.24	10	0.62	217.33
	Peminggang	12.00	28	2	14	336.00	13	1.04	350.11
		8.00	28	2	14	224.00	13	1.04	233.41
	Sepihak	0.79	1120	80	14	884.80	13	1.04	921.96
		0.44	476	34	14	209.44	10	0.62	129.22
7	B5A (1 Unit)								
	Tulangan Atas	12.00	21	3	7	252.00	22	2.98	750.96
	Tulangan Bawah	12.00	21	3	7	252.00	22	2.98	750.96
		7.00	28	4	7	196.00	22	2.98	584.08
	Sengkang	1.94	1407	201	7	2729.58	13	1.04	2844.22
		0.79	1407	201	7	1111.53	13	1.04	1158.21
	Sepihak	12.00	14	2	7	168.00	13	1.04	175.06
8	B6A (1 Unit)								
	Tulangan Bawah	12.00	21	3	7	252.00	22	2.98	750.96
	Tulangan Atas	12.00	21	3	7	252.00	22	2.98	750.96
		7.00	21	3	7	147.00	22	2.98	438.06
	Sengkang	1.94	1407	201	7	2729.58	13	1.04	2844.22

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
	Sepihak	0.79	1407	201	7	1111.53	13	1.04	1158.21
		12.00	14	2	7	168.00	13	1.04	175.06
9	B7 (1 Unit)								
	Tulangan Atas	8.00	14	2	7	112.00	22	2.98	333.76
		3.00	14	2	7	42.00	22	2.98	125.16
	Tulangan Bawah	8.00	14	2	7	112.00	22	2.98	333.76
		4.00	21	3	7	84.00	22	2.98	250.32
	Sengkang	1.74	336	48	7	584.64	10	0.62	360.72
	Sepihak	8.00	14	2	7	112.00	10	0.62	69.10
10	B8 (2 Unit)								
	Tulangan Atas	4.00	42	3	14	168.00	16	1.58	265.44
	Tulangan Bawah	4.00	42	3	14	168.00	16	1.58	265.44
	Sengkang	1.24	280	20	14	347.20	10	0.62	214.22
11	B9 (4 Unit)								
	Tulangan Atas	6.00	84	3	28	504.00	22	2.98	1501.92
		3.00	392	14	28	1176.00	22	2.98	3504.48
	Tulangan Bawah	6.00	112	4	28	672.00	22	2.98	2002.56
	Sengkang	1.74	2800	100	28	4872.00	13	1.04	5076.62
	Sepihak	0.69	2800	100	28	1932.00	13	1.04	2013.14
	Peminggang	6.00	56	2	28	336.00	13	1.04	350.11
12	B10 (1 Unit)								
	Tulangan Atas	12.00	28	4	7	336.00	22	2.98	1001.28
		6.00	294	42	7	1764.00	22	2.98	5256.72
		6.00	126	18	7	756.00	22	2.98	2252.88
	Tulangan Bawah	12.00	28	4	7	336.00	22	2.98	1001.28
	Sengkang	2.14	3255	465	7	6965.70	13	1.04	7258.26
	Peminggang	12.00	56	8	7	672.00	13	1.04	700.22
13	B11 (1 Unit)								
	Tulangan Atas	12.00	84	12	7	1008.00	22	2.98	3003.84
		6.00	280	40	7	1680.00	22	2.98	5006.40
	Tulangan Bawah	12.00	112	16	7	1344.00	22	2.98	4005.12
	Sengkang	2.14	3255	465	7	6965.70	13	1.04	7258.26
	Sepihak	0.79	3255	465	7	2571.45	13	1.04	2679.45
	Peminggang	12.00	56	8	7	672.00	13	1.04	700.22
14	B12 (1 Unit)								
	Tulangan Atas	12.00	105	15	7	1260.00	22	2.98	3754.80
		3.00	70	10	7	210.00	22	2.98	625.80
	Tulangan Bawah	5.00	98	14	7	490.00	22	2.98	1460.20
		7.00	378	54	7	2646.00	22	2.98	7885.08
	Sengkang	2.14	7420	1060	7	15878.80	13	1.04	16545.71
	Sepihak	0.79	7420	1060	7	5861.80	13	1.04	6108.00
	Peminggang	12.00	84	12	7	1008.00	13	1.04	1050.34
15	B13								
	Tulangan Atas = Tulangan Bawah	8.00	56	8	7	448.00	19	2.23	996.80
	Sengkang	1.24	245	35	7	303.80	10	0.62	187.44
9	DIAPHRAGMA WALL								
1	STEK DINDING								
		1.50	2840	2840	1	4260.00	19	2.23	9478.50
		1.50	2272	2272	1	3408.00	16	1.58	5384.64
		1.50	1168	1168	1	1752.00	16	1.58	2768.16
2	POTONGAN D, C, B								
	Tulangan Pokok	12.00	1894	1894	1	22728.00	19	2.23	50569.80
	Tulangan Ekstra	10.00	948	948	1	9480.00	32	6.32	59913.60
		8.00	948	948	1	7584.00	32	6.32	47930.88
		12.00	948	948	1	11376.00	32	6.32	71896.32
		4.00	948	948	1	3792.00	32	6.32	23965.44
	Peminggang	12.00	230	230	1	2760.00	16	1.58	4360.80
		8.00	230	230	1	1840.00	16	1.58	2907.20
		12.00	575	575	1	6900.00	16	1.58	10902.00
10	PELAT KONVENSIONAL								
	LANTAI 1 - 7								
	Tulangan Atas	7.20	364	52	7	2620.80	10	0.62	1617.03
	Tulangan Bawah	5.20	672	96	7	3494.40	8	0.40	1383.78
		0.50	210	30	7	105.00	8	0.40	41.58
11	PELAT LANTAI 1 As B-4								
	Tulangan Atas	7.20	30	30	1	216.00	8	0.40	85.54
		2.20	96	96	1	211.20	8	0.40	83.64
	Tulangan Bawah	4.00	60	60	1	240.00	8	0.40	95.04
		4.00	60	60	1	240.00	8	0.40	95.04
	Ceker Ayam	0.50	50	50	1	25.00	8	0.40	9.90
12	PENAMBAHAN TULANGAN UNTUK PRECAST LANTAI 1 - 7								
	BALOK BERTEMU HCS (7 Unit)								
		1.34	9835	1405	7	13178.90	10	0.62	8131.38

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
13	BALOK LANTAI 8								
1	B8-1 (1 Unit)								
	Tulangan Atas	12.00	3	3	1	36.00	22	2.98	107.28
		6.00	3	3	1	18.00	22	2.98	53.64
	Tulangan Bawah	3.00	6	6	1	18.00	22	2.98	53.64
		4.00	8	8	1	32.00	22	2.98	95.36
	Sengkang	1.74	150	150	1	261.00	13	1.04	271.96
	Peminggang	12.00	2	2	1	24.00	13	1.04	25.01
		6.00	2	2	1	12.00	13	1.04	12.50
2	B8-2 (6 Unit)								
	Tulangan Atas	12.00	24	4	6	288.00	25	3.85	1108.80
		9.00	120	20	6	1080.00	25	3.85	4158.00
		6.00	18	3	6	108.00	25	3.85	415.80
		3.00	12	2	6	36.00	25	3.85	138.60
	Tulangan Bawah	12.00	24	4	6	288.00	25	3.85	1108.80
		6.00	6	1	6	36.00	25	3.85	138.60
		6.00	18	3	6	108.00	25	3.85	415.80
		3.00	6	1	6	18.00	25	3.85	69.30
	Peminggang	12.00	12	2	6	144.00	13	1.04	150.05
		6.00	12	2	6	72.00	13	1.04	75.02
	Sengkang	2.24	600	100	6	1344.00	13	1.04	1400.45
		1.84	300	50	6	552.00	13	1.04	575.18
3	B8-3 (1 Unit)								
	Tulangan Atas	12.00	3	3	1	36.00	22	2.98	107.28
		9.00	14	14	1	126.00	22	2.98	375.48
		6.00	3	3	1	18.00	22	2.98	53.64
		3.00	5	5	1	15.00	22	2.98	44.70
	Tulangan Bawah	12.00	4	4	1	48.00	22	2.98	143.04
		6.00	4	4	1	24.00	22	2.98	71.52
	Peminggang	12.00	2	2	1	24.00	13	1.04	25.01
		6.00	2	2	1	12.00	13	1.04	12.50
	Sengkang	2.04	100	100	1	204.00	13	1.04	212.57
		1.64	50	50	1	82.00	13	1.04	85.44
4	B8-4 (2 Unit)								
	Tulangan Atas	7.00	6	3	2	42.00	22	2.98	125.16
		3.00	12	6	2	36.00	22	2.98	107.28
		7.00	6	3	2	42.00	22	2.98	125.16
		7.00	4	2	2	28.00	13	1.04	29.18
	Sengkang	1.84	126	63	2	231.84	10	0.62	143.05
5	B8-5 (6 Unit)								
	Tulangan Atas	12.00	18	3	6	216.00	22	2.98	643.68
		6.00	18	3	6	108.00	22	2.98	321.84
		9.00	18	3	6	162.00	22	2.98	482.76
		6.00	12	2	6	72.00	22	2.98	214.56
		3.00	6	1	6	18.00	22	2.98	53.64
	Tulangan Bawah	12.00	18	3	6	216.00	22	2.98	643.68
		6.00	24	4	6	144.00	22	2.98	429.12
	Peminggang	12.00	12	2	6	144.00	13	1.04	150.05
		6.00	12	2	6	72.00	13	1.04	75.02
	Sengkang	1.94	480	80	6	931.20	13	1.04	970.31
		1.55	204	34	6	316.20	13	1.04	329.48
	Sepihak	0.79	480	80	6	379.20	13	1.04	395.13
		0.59	204	34	6	120.36	13	1.04	125.42
6	B8-6 (2 Unit)								
	Tulangan Atas	12.00	6	3	2	72.00	22	2.98	214.56
		6.00	4	2	2	24.00	22	2.98	71.52
	Tulangan Bawah	12.00	6	3	2	72.00	22	2.98	214.56
	Peminggang	12.00	4	2	2	48.00	13	1.04	50.02
		6.00	4	2	2	24.00	13	1.04	25.01
	Sengkang	1.94	160	80	2	310.40	13	1.04	323.44
		0.79	160	80	2	126.40	13	1.04	131.71
	Sepihak	1.55	68	34	2	105.40	10	0.62	65.03
		0.59	68	34	2	40.12	10	0.62	24.75
7	B8-7 (2 Unit)								
	Tulangan Atas	8.00	4	2	2	32.00	22	2.98	95.36
		4.00	4	2	2	16.00	22	2.98	47.68
	Tulangan Bawah	8.00	4	2	2	32.00	22	2.98	95.36
		4.00	6	3	2	24.00	22	2.98	71.52
	Peminggang	8.00	4	2	2	32.00	10	0.62	19.74
	Sengkang	1.74	96	48	2	167.04	10	0.62	103.06
8	B8-8 (1 Unit)								
	Tulangan Atas	4.00	2	2	1	8.00	16	1.58	12.64
		4.00	4	4	1	16.00	19	2.23	35.60
	Sengkang	1.44	40	40	1	57.60	10	0.62	35.54
9	B8-9 (2 Unit)								
	Tulangan Atas	6.00	6	3	2	36.00	22	2.98	107.28

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
		3.00	28	14	2	84.00	22	2.98	250.32
	Tulangan Bawah	6.00	8	4	2	48.00	22	2.98	143.04
	Peminggang	6.00	4	2	2	24.00	13	1.04	25.01
	Sengkang	1.74	100	50	2	174.00	13	1.04	181.31
	Sepihak	0.69	100	50	2	69.00	13	1.04	71.90
10	B8-10 (2 Unit)								
	Tulangan Atas	12.00	24	12	2	288.00	25	3.85	1108.80
		6.00	80	40	2	480.00	25	3.85	1848.00
	Tulangan Bawah	12.00	32	16	2	384.00	25	3.85	1478.40
		3.00	14	7	2	42.00	25	3.85	161.70
	Peminggang	12.00	16	8	2	192.00	13	1.04	200.06
	Sengkang	2.24	930	465	2	2083.20	13	1.04	2170.69
11	B8-11 (1 Unit)								
	Tulangan Atas	12.00	12	12	1	144.00	25	3.85	554.40
		6.00	12	12	1	72.00	25	3.85	277.20
	Tulangan Bawah	12.00	16	16	1	192.00	25	3.85	739.20
		6.00	35	35	1	210.00	25	3.85	808.50
	Peminggang	12.00	8	8	1	96.00	13	1.04	100.03
	Sengkang	2.14	465	465	1	995.10	13	1.04	1036.89
		0.79	465	465	1	367.35	13	1.04	382.78
12	B8-12 (1 Unit)								
	Tulangan Atas	4.00	3	3	1	12.00	25	3.85	46.20
		2.00	1	1	1	2.00	25	3.85	7.70
		12.00	12	12	1	144.00	25	3.85	554.40
		5.00	6	6	1	30.00	25	3.85	115.50
	Tulangan Bawah	6.00	18	18	1	108.00	25	3.85	415.80
		5.00	6	6	1	30.00	25	3.85	115.50
		2.00	1	1	1	2.00	25	3.85	7.70
		4.00	3	3	1	12.00	25	3.85	46.20
		12.00	4	4	1	48.00	25	3.85	184.80
		4.00	40	40	1	160.00	25	3.85	616.00
	Peminggang	12.00	8	8	1	96.00	13	1.04	100.03
	Sengkang	1.64	35	35	1	57.40	13	1.04	59.81
		0.69	35	35	1	24.15	13	1.04	25.16
	Sepihak	2.34	465	465	1	1088.10	13	1.04	1133.80
		0.84	465	465	1	390.60	13	1.04	407.01
13	B8-13 (13 Unit)								
	Tulangan Atas	4.00	39	3	13	156.00	16	1.58	246.48
	Tulangan Bawah	4.00	26	2	13	104.00	16	1.58	164.32
	Sengkang	4.00	26	2	13	104.00	16	1.58	164.32
		1.54	312	24	13	480.48	10	0.62	296.46
14	B8-14 (16 Unit)								
	Tulangan Atas	4.00	48	3	16	192.00	16	1.58	303.36
		2.00	32	2	16	64.00	16	1.58	101.12
	Tulangan Bawah	4.00	32	2	16	128.00	16	1.58	202.24
	Sengkang	1.14	384	24	16	437.76	10	0.62	270.10
15	B8-15 (3 Unit)								
	Tulangan Atas	12.00	9	3	3	108.00	16	1.58	170.64
		5.00	36	12	3	180.00	16	1.58	284.40
	Tulangan Bawah	12.00	9	3	3	108.00	16	1.58	170.64
		3.00	3	1	3	9.00	16	1.58	14.22
	Peminggang	12.00	6	2	3	72.00	10	0.62	44.42
	Sengkang	1.64	330	110	3	541.20	10	0.62	333.92
14	PENAMBAHAN TULANGAN UNTUK PRECAST LANTAI 8								
	BALOK BERTEMU HCS (1 Unit)								
		1.34	1405	1405	1	1882.70	10	0.62	1161.63
15	BALOK LANTAI 9								
1	B9-1 (1 Unit)								
	Tulangan Atas	12.00	2	2	1	24.00	19	2.23	53.40
		6.00	1	1	1	6.00	19	2.23	13.35
		4.00	6	6	1	24.00	19	2.23	53.40
		5.00	4	4	1	20.00	19	2.23	44.50
	Tulangan Bawah	12.00	2	2	1	24.00	19	2.23	53.40
		4.00	2	2	1	8.00	19	2.23	17.80
		2.00	1	1	1	2.00	19	2.23	4.45
	Peminggang	12.00	2	2	1	24.00	10	0.62	14.81
	Sengkang	1.84	200	200	1	368.00	10	0.62	227.06
2	B9-2 (1 Unit)								
	Tulangan Atas	12.00	2	2	1	24.00	25	3.85	92.40
		5.00	5	5	1	25.00	25	3.85	96.25
		3.00	5	5	1	15.00	25	3.85	57.75
		6.00	1	1	1	6.00	25	3.85	23.10
		5.00	1	1	1	5.00	25	3.85	19.25
	Tulangan Bawah	12.00	2	2	1	24.00	25	3.85	92.40
		3.00	1	1	1	3.00	25	3.85	11.55
		5.00	3	3	1	15.00	25	3.85	57.75

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
	Peminggang	12.00	4	4	1	48.00	10	0.62	29.62
	Sengkang	2.14	200	200	1	428.00	10	0.62	264.08
3	B9-3 (1 Unit)								
	Tulangan Atas	12.00	6	6	1	72.00	25	3.85	277.20
		9.00	6	6	1	54.00	25	3.85	207.90
		4.00	4	4	1	16.00	25	3.85	61.60
		9.00	4	4	1	36.00	25	3.85	138.60
	Tulangan Bawah	7.00	4	4	1	28.00	25	3.85	107.80
		6.00	4	4	1	24.00	25	3.85	92.40
		12.00	4	4	1	48.00	25	3.85	184.80
	Peminggang	4.00	4	4	1	16.00	10	0.62	9.87
		12.00	6	6	1	72.00	10	0.62	44.42
		6.00	6	6	1	36.00	10	0.62	22.21
	Sengkang	1.84	60	60	1	110.40	10	0.62	68.12
		2.84	100	100	1	284.00	10	0.62	175.23
4	B9-4 (4 Unit)								
	Tulangan Atas	12.00	32	8	4	384.00	25	3.85	1478.40
		9.00	88	22	4	792.00	25	3.85	3049.20
	Tulangan Bawah	12.00	32	8	4	384.00	25	3.85	1478.40
		7.00	24	6	4	168.00	25	3.85	646.80
	Peminggang	4.00	16	4	4	64.00	13	1.04	66.69
		12.00	24	6	4	288.00	13	1.04	300.10
		6.00	24	6	4	144.00	13	1.04	150.05
	Sengkang	2.94	480	120	4	1411.20	13	1.04	1470.47
		1.94	240	60	4	465.60	13	1.04	485.16
5	B9-5 (4 Unit)								
	Tulangan Atas	12.00	32	8	4	384.00	25	3.85	1478.40
		9.00	44	11	4	396.00	25	3.85	1524.60
		9.00	24	6	4	216.00	25	3.85	831.60
	Tulangan Bawah	12.00	32	8	4	384.00	25	3.85	1478.40
		7.00	16	4	4	112.00	25	3.85	431.20
	Peminggang	4.00	16	4	4	64.00	13	1.04	66.69
		12.00	24	6	4	288.00	13	1.04	300.10
		6.00	24	6	4	144.00	13	1.04	150.05
	Sengkang	2.94	480	120	4	1411.20	13	1.04	1470.47
		1.94	240	60	4	465.60	13	1.04	485.16
6	B9-6 (2 Unit)								
	Tulangan Atas	12.00	12	6	2	144.00	25	3.85	554.40
		6.00	24	12	2	144.00	25	3.85	554.40
		6.00	12	6	2	72.00	25	3.85	277.20
		4.00	4	2	2	16.00	25	3.85	61.60
	Tulangan Bawah	12.00	6	3	2	72.00	25	3.85	277.20
		9.00	6	3	2	54.00	25	3.85	207.90
		6.00	6	3	2	36.00	25	3.85	138.60
	Peminggang	3.00	2	1	2	6.00	13	1.04	6.25
		12.00	8	4	2	96.00	13	1.04	100.03
	Sengkang	1.84	200	100	2	368.00	13	1.04	383.46
		2.24	160	80	2	358.40	13	1.04	373.45
7	B9-7 (2 Unit)								
	Tulangan Atas	12.00	6	3	2	72.00	25	3.85	277.20
		5.00	6	3	2	30.00	25	3.85	115.50
		6.00	8	4	2	48.00	25	3.85	184.80
	Peminggang	12.00	4	2	2	48.00	10	0.62	29.62
		5.00	4	2	2	20.00	10	0.62	12.34
	Tulangan Bawah	12.00	4	2	2	48.00	25	3.85	184.80
		5.00	4	2	2	20.00	25	3.85	77.00
		6.00	6	3	2	36.00	25	3.85	138.60
	Sengkang	2.24	160	80	2	358.40	10	0.62	221.13
		1.84	60	30	2	110.40	10	0.62	68.12
8	B9-8 (1 Unit)								
	Tulangan Atas	12.00	6	6	1	72.00	25	3.85	277.20
		6.00	4	4	1	24.00	25	3.85	92.40
		6.00	2	2	1	12.00	25	3.85	46.20
		5.00	4	4	1	20.00	25	3.85	77.00
	Tulangan Bawah	4.00	3	3	1	12.00	25	3.85	46.20
		10.00	3	3	1	30.00	25	3.85	115.50
		12.00	3	3	1	36.00	25	3.85	138.60
		6.00	1	1	1	6.00	25	3.85	23.10
	Peminggang	12.00	4	4	1	48.00	13	1.04	50.02
	Sengkang	1.84	110	110	1	202.40	13	1.04	210.90
		2.04	80	80	1	163.20	13	1.04	170.05
9	B9-9 (1 Unit)								
	Tulangan Atas	12.00	6	6	1	72.00	25	3.85	277.20
		12.00	1	1	1	12.00	25	3.85	46.20
		6.00	1	1	1	6.00	25	3.85	23.10
		5.00	10	10	1	50.00	25	3.85	192.50
		5.00	2	2	1	10.00	25	3.85	38.50
	Tulangan Bawah	12.00	3	3	1	36.00	25	3.85	138.60
		6.00	3	3	1	18.00	25	3.85	69.30
		4.00	4	4	1	16.00	25	3.85	61.60

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
		3.00	2	2	1	6.00	25	3.85	23.10
	Peminggang	12.00	4	4	1	48.00	10	0.62	29.62
	Sengkang	2.24	160	160	1	358.40	10	0.62	221.13
		1.64	50	50	1	82.00	10	0.62	50.59
10	B9-10 (1 Unit)								
	Tulangan Atas	12.00	2	2	1	24.00	22	2.98	71.52
		6.00	6	6	1	36.00	22	2.98	107.28
	Tulangan Bawah	12.00	2	2	1	24.00	22	2.98	71.52
		3.00	4	4	1	12.00	22	2.98	35.76
	Peminggang	12.00	2	2	1	24.00	13	1.04	25.01
	Sengkang	1.74	180	180	1	313.20	13	1.04	326.35
11	B9-11 (1 Unit)								
	Tulangan Atas	12.00	3	3	1	36.00	22	2.98	107.28
		6.00	6	6	1	36.00	22	2.98	107.28
	Tulangan Bawah	12.00	3	3	1	36.00	22	2.98	107.28
		3.00	1	1	1	3.00	22	2.98	8.94
	Peminggang	12.00	2	2	1	24.00	10	0.62	14.81
	Sengkang	1.64	100	100	1	164.00	10	0.62	101.19
12	B9-12 (1 Unit)								
	Tulangan Atas	8.00	3	3	1	24.00	22	2.98	71.52
	Tulangan Bawah	8.00	3	3	1	24.00	22	2.98	71.52
		4.00	3	3	1	12.00	22	2.98	35.76
	Peminggang	8.00	2	2	1	16.00	10	0.62	9.87
	Sengkang	1.64	70	70	1	114.80	10	0.62	70.83
13	B9-13 (2 Unit)								
	Tulangan Atas	3.00	4	2	2	12.00	13	1.04	12.50
	Tulangan Bawah	3.00	4	2	2	12.00	13	1.04	12.50
	Sengkang	0.84	56	28	2	47.04	8	0.40	18.63
14	B9-14 (9 Unit)								
	Tulangan Atas	3.00	63	7	9	189.00	22	2.98	563.22
		3.00	27	3	9	81.00	22	2.98	241.38
	Tulangan Bawah	3.00	18	2	9	54.00	22	2.98	160.92
	Sengkang	1.54	225	25	9	346.50	10	0.62	213.79
15	B9-15 (1 Unit)								
	Tulangan Atas	12.00	12	12	1	144.00	25	3.85	554.40
		6.00	3	3	1	18.00	25	3.85	69.30
		4.00	18	18	1	72.00	25	3.85	277.20
		5.00	3	3	1	15.00	25	3.85	57.75
		6.00	30	30	1	180.00	25	3.85	693.00
	Tulangan Bawah	12.00	12	12	1	144.00	25	3.85	554.40
		6.00	3	3	1	18.00	25	3.85	69.30
		6.00	2	2	1	12.00	25	3.85	46.20
		4.00	42	42	1	168.00	25	3.85	646.80
	Peminggang	4.00	12	12	1	48.00	13	1.04	50.02
		8.00	2	2	1	16.00	13	1.04	16.67
		12.00	18	18	1	216.00	13	1.04	225.07
	Sengkang	2.74	255	255	1	698.70	13	1.04	728.05
		2.34	50	50	1	117.00	13	1.04	121.91
	Sepihak	3.04	240	240	1	729.60	13	1.04	760.24
		1.24	35	35	1	43.40	13	1.04	45.22
16	B9-16 (2 Unit)								
	Tulangan Atas	12.00	12	6	2	144.00	25	3.85	554.40
		4.00	14	7	2	56.00	25	3.85	215.60
		6.00	16	8	2	96.00	25	3.85	369.60
	Tulangan Bawah	12.00	2	1	2	24.00	25	3.85	92.40
		6.00	4	2	2	24.00	25	3.85	92.40
		12.00	12	6	2	144.00	25	3.85	554.40
		4.00	6	3	2	24.00	25	3.85	92.40
	Peminggang	8.00	2	1	2	16.00	13	1.04	16.67
		12.00	8	4	2	96.00	13	1.04	100.03
	Sengkang	2.34	280	140	2	655.20	13	1.04	682.72
17	B9-17 (1 Unit)								
	Tulangan Atas	12.00	9	9	1	108.00	25	3.85	415.80
		6.00	3	3	1	18.00	25	3.85	69.30
		6.00	20	20	1	120.00	25	3.85	462.00
		4.00	9	9	1	36.00	25	3.85	138.60
		8.00	2	2	1	16.00	25	3.85	61.60
	Tulangan Bawah	12.00	9	9	1	108.00	25	3.85	415.80
		6.00	3	3	1	18.00	25	3.85	69.30
		4.00	25	25	1	100.00	25	3.85	385.00
		8.00	2	2	1	16.00	25	3.85	61.60
	Peminggang	12.00	18	18	1	216.00	13	1.04	225.07
		6.00	6	6	1	36.00	13	1.04	37.51
	Sengkang	3.04	240	240	1	729.60	13	1.04	760.24
		2.74	105	105	1	287.70	13	1.04	299.78
	Sepihak	1.09	105	105	1	114.45	13	1.04	119.26
18	B9-18 (1 Unit)								
	Tulangan Atas	8.00	3	3	1	24.00	25	3.85	92.40

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	Tulangan Bawah	3.00	2	2	1	6.00	25	3.85	23.10
		8.00	3	3	1	24.00	25	3.85	92.40
		4.00	1	1	1	4.00	25	3.85	15.40
	Peminggang	8.00	2	2	1	16.00	13	1.04	16.67
	Sengkang	2.14	48	48	1	102.72	13	1.04	107.03
19	B9-19 (1 Unit)								
	Tulangan Atas	12.00	5	5	1	60.00	25	3.85	231.00
		3.00	2	2	1	6.00	25	3.85	23.10
		6.00	7	7	1	42.00	25	3.85	161.70
	Tulangan Bawah	12.00	3	3	1	36.00	25	3.85	138.60
		4.00	2	2	1	8.00	25	3.85	30.80
		4.00	1	1	1	4.00	25	3.85	15.40
	Peminggang	12.00	6	6	1	72.00	13	1.04	75.02
	Sengkang	2.74	135	135	1	369.90	13	1.04	385.44
		1.09	75	75	1	81.75	13	1.04	85.18
20	B9-20 (1 Unit)								
	Tulangan Atas dan Tulangan Bawah	4.00	10	10	1	40.00	25	3.85	154.00
	Sengkang	1.55	35	35	1	54.25	10	0.62	33.47
21	B9-21 (1 Unit)								
	Tulangan Atas dan Tulangan Bawah	4.00	6	6	1	24.00	22	2.98	71.52
	Sengkang	1.55	35	35	1	54.25	10	0.62	33.47
22	B9-22 (6 Unit)								
	Tulangan Atas	4.00	24	4	6	96.00	10	0.62	59.23
	Tulangan Bawah	4.00	12	2	6	48.00	8	0.40	19.01
	Sengkang	1.34	102	17	6	136.68	8	0.40	54.13
23	B9-23 (4 Unit)								
	Tulangan Atas	12.00	8	2	4	96.00	16	1.58	151.68
		4.00	4	1	4	16.00	16	1.58	25.28
		6.00	40	10	4	240.00	16	1.58	379.20
	Tulangan Bawah	12.00	8	2	4	96.00	16	1.58	151.68
		5.00	8	2	4	40.00	16	1.58	63.20
	Sengkang	12.00	8	2	4	96.00	10	0.62	59.23
		1.54	480	120	4	739.20	10	0.62	456.09
24	B9-24 (20 Unit)								
	Tulangan Atas	4.00	80	4	20	320.00	16	1.58	505.60
	Tulangan Bawah	2.00	40	2	20	80.00	16	1.58	126.40
	Sengkang	1.14	560	28	20	638.40	10	0.62	393.89
16	PELAT LANTAI 9								
1	MELINTANG								
		12.00	824	824	1	9888.00	10	0.62	6100.90
		12.00	288	288	1	3456.00	10	0.62	2132.35
		4.00	288	288	1	1152.00	10	0.62	710.78
2	MEMANJANG								
		12.00	2100	2100	1	25200.00	10	0.62	15548.40
	Cakar Ayam	0.50	800	800	1	400.00	10	0.62	246.80
17	TRIBUN LANTAI 9								
1	BTR-1 (1 Unit)								
		12.00	4	4	1	48.00	16	1.58	75.84
		4.00	10	10	1	40.00	16	1.58	63.20
		12.00	4	4	1	48.00	22	2.98	143.04
		4.00	5	5	1	20.00	22	2.98	59.60
	Sengkang	1.24	200	200	1	248.00	16	1.58	391.84
		12.00	4	4	1	48.00	16	1.58	75.84
2	BTR-2 (3 Unit)								
		12.00	24	8	3	288.00	16	1.58	455.04
		4.00	132	44	3	528.00	16	1.58	834.24
		12.00	24	8	3	288.00	22	2.98	858.24
		3.00	90	30	3	270.00	22	2.98	804.60
		12.00	24	8	3	288.00	16	1.58	455.04
	Sengkang	1.54	1800	600	3	2772.00	16	1.58	4379.76
3	BTR-3 (2 Unit)								
		12.00	4	2	2	48.00	16	1.58	75.84
		4.00	24	12	2	96.00	16	1.58	151.68
		12.00	4	2	2	48.00	16	1.58	75.84
		4.00	6	3	2	24.00	16	1.58	37.92
	Sengkang	1.24	160	80	2	198.40	10	0.62	122.41
4	PELAT								
		12.00	480	480	1	5760.00	13	1.04	6001.92
		12.00	360	360	1	4320.00	10	0.62	2665.44
		1.90	1680	1680	1	3192.00	10	0.62	1969.46
		2.00	240	240	1	480.00	10	0.62	296.16
		12.00	120	120	1	1440.00	8	0.40	570.24
18	BALKON LANTAI 9								
1	BB9-1 (1 Unit)								
		4.00	12	12	1	48.00	13	1.04	50.02

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
		4.00	4	1	4	16.00	25	3.85	61.60
		6.00	16	4	4	96.00	25	3.85	369.60
		12.00	16	4	4	192.00	25	3.85	739.20
		6.00	8	2	4	48.00	25	3.85	184.80
		8.00	16	4	4	128.00	25	3.85	492.80
		4.00	16	4	4	64.00	10	0.62	39.49
		12.00	24	6	4	288.00	10	0.62	177.70
		4.00	24	6	4	96.00	10	0.62	59.23
	Sengkang	2.84	600	150	4	1704.00	10	0.62	1051.37
		1.74	240	60	4	417.60	10	0.62	257.66
5	BA-5 (4 Unit)								
		12.00	24	6	4	288.00	25	3.85	1108.80
		12.00	4	1	4	48.00	25	3.85	184.80
		6.00	24	6	4	144.00	25	3.85	554.40
		6.00	28	7	4	168.00	25	3.85	646.80
		3.00	8	2	4	24.00	25	3.85	92.40
		4.00	16	4	4	64.00	25	3.85	246.40
		12.00	16	4	4	192.00	25	3.85	739.20
		6.00	16	4	4	96.00	25	3.85	369.60
		6.00	4	1	4	24.00	25	3.85	92.40
		4.00	4	1	4	16.00	10	0.62	9.87
		10.00	8	2	4	80.00	10	0.62	49.36
		12.00	24	6	4	288.00	10	0.62	177.70
	Sengkang	1.84	400	100	4	736.00	10	0.62	454.11
		2.34	440	110	4	1029.60	10	0.62	635.26
6	BA-6 (2 Unit)								
		12.00	4	2	2	48.00	25	3.85	184.80
		3.00	4	2	2	12.00	25	3.85	46.20
		12.00	2	1	2	24.00	25	3.85	92.40
		6.00	4	2	2	24.00	25	3.85	92.40
		4.00	4	2	2	16.00	25	3.85	61.60
		12.00	4	2	2	48.00	10	0.62	29.62
		3.00	4	2	2	12.00	10	0.62	7.40
	Sengkang	1.74	50	25	2	87.00	10	0.62	53.68
		2.04	160	80	2	326.40	10	0.62	201.39
7	BA-7 (2 Unit)								
		8.00	6	6	1	48.00	22	2.98	143.04
		4.00	3	3	1	12.00	22	2.98	35.76
		8.00	2	2	1	16.00	10	0.62	9.87
	Sengkang	1.74	60	60	1	104.40	10	0.62	64.41
8	BA-8 (1 Unit)								
		3.00	4	4	1	12.00	13	1.04	12.50
	Sengkang	0.89	24	24	1	21.36	8	0.40	8.46
9	BA-9 (1 Unit)								
		12.00	6	6	1	72.00	22	2.98	214.56
		3.00	4	4	1	12.00	22	2.98	35.76
		4.00	2	2	1	8.00	22	2.98	23.84
		12.00	4	4	1	48.00	22	2.98	143.04
		12.00	1	1	1	12.00	22	2.98	35.76
		6.00	1	1	1	6.00	22	2.98	17.88
		12.00	4	4	1	48.00	10	0.62	29.62
	Sengkang	1.64	150	150	1	246.00	10	0.62	151.78
10	BA-10 (1 Unit)								
		12.00	6	6	1	72.00	22	2.98	214.56
		4.00	4	4	1	16.00	22	2.98	47.68
		6.00	2	2	1	12.00	22	2.98	35.76
		12.00	4	4	1	48.00	22	2.98	143.04
		6.00	3	3	1	18.00	22	2.98	53.64
		12.00	4	4	1	48.00	10	0.62	29.62
	Sengkang	1.54	150	150	1	231.00	10	0.62	142.53
11	BA-11 (1 Unit)								
		12.00	3	3	1	36.00	22	2.98	107.28
		3.00	2	2	1	6.00	22	2.98	17.88
		12.00	2	2	1	24.00	22	2.98	71.52
		12.00	2	2	1	24.00	10	0.62	14.81
	Sengkang	1.64	75	75	1	123.00	10	0.62	75.89
12	BA-12 (1 Unit)								
		12.00	15	15	1	180.00	25	3.85	693.00
		3.00	2	2	1	6.00	25	3.85	23.10
		4.00	12	12	1	48.00	25	3.85	184.80
		5.00	4	4	1	20.00	25	3.85	77.00
		12.00	12	12	1	144.00	25	3.85	554.40
		6.00	3	3	1	18.00	25	3.85	69.30
		4.00	7	7	1	28.00	25	3.85	107.80
		5.00	4	4	1	20.00	13	1.04	20.84
		12.00	4	4	1	48.00	13	1.04	50.02
		6.00	4	4	1	24.00	13	1.04	25.01
		12.00	18	18	1	216.00	13	1.04	225.07
	Sengkang	1.94	28	28	1	54.32	13	1.04	56.60

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
		3.14	210	210	1	659.40	13	1.04	687.09
		2.34	150	150	1	351.00	13	1.04	365.74
13	BA-13 (2 Unit)								
		6.00	12	6	2	72.00	22	2.98	214.56
		6.00	6	3	2	36.00	22	2.98	107.28
		6.00	4	2	2	24.00	10	0.62	14.81
	Sengkang	1.94	100	50	2	194.00	10	0.62	119.70
14	BA-14 (9 Unit)								
		12.00	27	3	9	324.00	22	2.98	965.52
		8.00	27	3	9	216.00	22	2.98	643.68
		6.00	90	10	9	540.00	22	2.98	1609.20
		6.00	27	3	9	162.00	22	2.98	482.76
		12.00	27	3	9	324.00	22	2.98	965.52
		8.00	27	3	9	216.00	22	2.98	643.68
		3.00	9	1	9	27.00	22	2.98	80.46
		6.00	18	2	9	108.00	10	0.62	66.64
		12.00	54	6	9	648.00	13	1.04	675.22
		3.00	54	6	9	162.00	13	1.04	168.80
	Sengkang	1.94	450	50	9	873.00	10	0.62	538.64
		2.34	1170	130	9	2737.80	13	1.04	2852.79
15	BA-15 (1 Unit)								
		12.00	9	9	1	108.00	25	3.85	415.80
		6.00	3	3	1	18.00	25	3.85	69.30
		3.00	1	1	1	3.00	25	3.85	11.55
		4.00	10	10	1	40.00	25	3.85	154.00
		4.00	2	2	1	8.00	25	3.85	30.80
		12.00	9	9	1	108.00	25	3.85	415.80
		4.00	5	5	1	20.00	25	3.85	77.00
		4.00	2	2	1	8.00	13	1.04	8.34
		12.00	18	18	1	216.00	13	1.04	225.07
	Sengkang	3.14	220	220	1	690.80	13	1.04	719.81
		1.94	30	30	1	58.20	13	1.04	60.64
16	BA-16 (21 Unit)								
		8.00	6	3	2	48.00	25	3.85	184.80
		3.00	16	8	2	48.00	25	3.85	184.80
		8.00	6	3	2	48.00	25	3.85	184.80
		4.00	4	2	2	16.00	25	3.85	61.60
		8.00	12	6	2	96.00	13	1.04	100.03
	Sengkang	1.64	120	60	2	196.80	13	1.04	205.07
17	BA-17 (1 Unit)								
		9.00	3	3	1	27.00	25	3.85	103.95
		3.00	2	2	1	6.00	25	3.85	23.10
		2.00	10	10	1	20.00	25	3.85	77.00
		9.00	3	3	1	27.00	25	3.85	103.95
		4.00	2	2	1	8.00	25	3.85	30.80
		7.00	6	6	1	42.00	13	1.04	43.76
		3.00	2	2	1	6.00	10	0.62	3.70
	Sengkang	1.94	25	25	1	48.50	10	0.62	29.92
		2.34	60	60	1	140.40	13	1.04	146.30
18	BA-18 (1 Unit)								
		4.00	3	3	1	12.00	22	2.98	35.76
		2.00	2	2	1	4.00	22	2.98	11.92
		4.00	3	3	1	12.00	22	2.98	35.76
		4.00	2	2	1	8.00	10	0.62	4.94
	Sengkang	1.55	30	30	1	46.50	10	0.62	28.69
19	BA-19 (1 Unit)								
		5.00	6	6	1	30.00	19	2.23	66.75
		5.00	2	2	1	10.00	10	0.62	6.17
	Sengkang	1.44	45	45	1	64.80	10	0.62	39.98
20	BA-20 (1 Unit)								
		2.20	4	4	1	8.80	13	1.04	9.17
	Sengkang	1.14	15	15	1	17.10	8	0.40	6.77
21	BA-21 (1 Unit)								
		3.00	4	4	1	12.00	13	1.04	12.50
		3.00	2	2	1	6.00	10	0.62	3.70
	Sengkang	1.14	25	25	1	28.50	10	0.62	17.58
22	BA-22 (6 Unit)								
		4.00	24	4	6	96.00	13	1.04	100.03
		4.00	12	2	6	48.00	13	1.04	50.02
		4.00	12	2	6	48.00	8	0.40	19.01
	Sengkang	1.14	240	40	6	273.60	8	0.40	108.35
23	BA-23 (4 Unit)								
		8.00	8	2	4	64.00	16	1.58	101.12
		3.00	40	10	4	120.00	16	1.58	189.60
		8.00	8	2	4	64.00	16	1.58	101.12
		4.00	8	2	4	32.00	16	1.58	50.56

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
	Senggang	8.00	8	2	4	64.00	10	0.62	39.49
		1.54	200	50	4	308.00	10	0.62	190.04
24	BA-24 (20 Unit)								
		4.00	40	2	20	160.00	16	1.58	252.80
		4.00	80	4	20	320.00	19	2.23	712.00
	Senggang	1.24	400	20	20	496.00	10	0.62	306.03
21	ATAP TANGGA								
1	PELAT								
		6.30	36	36	1	226.80	10	0.62	139.94
		4.00	60	60	1	240.00	10	0.62	148.08
2	BALOK BAT 1								
		6.30	8	8	1	50.40	16	1.58	79.63
		4.00	12	12	1	48.00	16	1.58	75.84
	Senggang	0.94	105	105	1	98.70	10	0.62	60.90
22	ATAP MESIN LIFT								
1	PELAT								
		10.00	90	90	1	900.00	10	0.62	555.30
		10.00	90	90	1	900.00	10	0.62	555.30
2	BAT-2								
		8.00	28	28	1	224.00	16	1.58	353.92
		5.00	10	10	1	50.00	16	1.58	79.00
		3.00	12	12	1	36.00	16	1.58	56.88
		4.00	12	12	1	48.00	16	1.58	75.84
		8.00	24	24	1	192.00	10	0.62	118.46
	Senggang	1.54	400	400	1	616.00	10	0.62	380.07
23	LIST PLANK LANTAI 8, 9 DAN ATAP								
	LIST PLANK LANTAI 8, 9 DAN ATAP								
		12.00	312	104	3	3744.00	10	0.62	2310.05
	Senggang	3.44	2310	770	3	7946.40	10	0.62	4902.93
24	TANGGA LANTAI 1 - 8								
1	PLAT AS 11- AS 12 (10 Unit)								
		2.24	110	11	10	246.40	13	1.04	256.75
		1.74	110	11	10	191.40	13	1.04	199.44
		6.80	110	11	10	748.00	13	1.04	779.42
		6.80	110	11	10	748.00	13	1.04	779.42
		2.90	110	11	10	319.00	13	1.04	332.40
		2.34	110	11	10	257.40	13	1.04	268.21
		0.84	1210	121	10	1016.40	13	1.04	1059.09
		1.64	800	80	10	1312.00	10	0.62	809.50
		3.60	200	20	10	720.00	13	1.04	750.24
2	BALOK (40 Unit)								
		3.60	240	6	40	864.00	16	1.58	1365.12
	Senggang	1.24	720	18	40	892.80	10	0.62	550.86
25	TANGGA BALKON LANTAI 9								
1	TANGGA BALKON LANTAI 9 AS B								
		2.24	96	96	1	215.04	13	1.04	224.07
		1.74	96	96	1	167.04	13	1.04	174.06
		0.64	600	600	1	384.00	13	1.04	400.13
		3.00	25	25	1	75.00	13	1.04	78.15
		4.40	96	96	1	422.40	13	1.04	440.14
		1.90	96	96	1	182.40	13	1.04	190.06
		1.67	96	96	1	160.32	13	1.04	167.05
		4.40	96	96	1	422.40	13	1.04	440.14
		3.14	45	45	1	141.30	10	0.62	87.18
		3.14	45	45	1	141.30	10	0.62	87.18
		3.55	32	32	1	113.60	13	1.04	118.37
	BALOK	3.60	6	6	1	21.60	16	1.58	34.13
		1.24	18	18	1	22.32	10	0.62	13.77
2	TANGGA BALKON LANTAI 9								
		4.94	8	8	1	39.52	13	1.04	41.18
		1.55	8	8	1	12.40	13	1.04	12.92
		3.84	8	8	1	30.72	13	1.04	32.01
		0.84	184	184	1	154.56	10	0.62	95.36
		1.20	23	23	1	27.60	10	0.62	17.03
		1.34	70	70	1	93.80	13	1.04	97.74
		4.80	16	16	1	76.80	13	1.04	80.03
		1.34	16	16	1	21.44	13	1.04	22.34
		3.60	6	6	1	21.60	16	1.58	34.13
	Senggang	2.24	20	20	1	44.80	10	0.62	27.64
	PELAT ATAP	3.20	28	28	1	89.60	13	1.04	93.36
		2.20	40	40	1	88.00	13	1.04	91.70
26	PONDASI TIPE P5								
1	BORED PILE								
		12.00	8	8	1	96.00	16	1.58	151.68

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
		6.00	8	8	1	48.00	16	1.58	75.84
		6.00	8	8	1	48.00	16	1.58	75.84
		12.00	12	12	1	144.00	10	0.62	88.85
		12.00	8	8	1	96.00	10	0.62	59.23
2	PILE CAP								
		2.00	14	14	1	28.00	13	1.04	29.18
		2.00	32	32	1	64.00	16	1.58	101.12
3	KOLOM 30 X 30								
		5.00	8	8	1	40.00	16	1.58	63.20
		1.14	23	23	1	26.22	10	0.62	16.18
27	GROUND TANK								
1	ALAS								
		12.00	64	64	1	768.00	13	1.04	800.26
		7.00	100	100	1	700.00	13	1.04	729.40
	Sengkang	1.34	163	163	1	218.42	10	0.62	134.77
		12.00	24	24	1	288.00	16	1.58	455.04
		7.00	24	24	1	168.00	16	1.58	265.44
2	DINDING								
		5.00	522	522	1	2610.00	16	1.58	4123.80
		12.00	88	88	1	1056.00	13	1.04	1100.35
		7.00	88	88	1	616.00	13	1.04	641.87
3	ATAP								
		12.00	133	133	1	1596.00	10	0.62	984.73
		7.00	84	84	1	588.00	10	0.62	362.80
	Sengkang	1.08	12	12	1	12.96	10	0.62	8.00
		0.70	24	24	1	16.80	10	0.62	10.37
		1.54	163	163	1	251.02	19	2.23	558.52
	Balok	12.00	24	24	1	288.00	19	2.23	640.80
		7.00	24	24	1	168.00	19	2.23	373.80



**REKAPITULASI BAR BENDING SCHEDULE (BBS) / BESTAT BESI TULANGAN
PROYEK XYZ**

NO	URAIAN PEKERJAAN	DIAMETER / Kg							TOTAL (Kg)	
		8	10	13	16	19	22	25		32
1	KOLOM		30.06	45,854.17		4,854.70		186,347.70	237,086.63	
2	PELAT BASEMENT 2			11,957.58	23,188.08				35,145.66	
3	PELAT BASEMENT 1	95.04	6,895.59	15,068.99	5,093.92				27,153.54	
4	SLOPE BASEMENT 2			12,400.26	568.80			32,835.88	45,804.94	
5	SHEAR WALL DAN KOLOM LIFT	61.86	341.69	691.05	377.78				1,472.38	
6	PIT LIFT		659.61						659.61	
7	BALOK LANTAI BASEMENT 1		121.30	18,803.52	6,588.60	2,484.88	34,830.24		62,828.54	
8	BALOK LANTAI 1 - 7		1,845.60	91,211.25	530.88	996.80	122,156.16		216,740.69	
9	DIAFRAGMA WALL				41,545.63	60,048.30			203,706.24	
10	PELAT KONVENSIONAL LANTAI 1 - 7	1,425.36	1,617.03						3,042.39	
11	PELAT LANTAI 1 AS B - 4	369.15							369.15	
12	PENAMBAHAN TUL. PRECAST BALOK KETEMU HCS LANTAI 1-7		8,131.38						8,131.38	
13	BALOK LANTAI 8		1,336.08	11,344.94	1,834.38	35.60	553.66	16,639.70	31,744.36	
14	PENAMBAHAN TUL. PRECAST BALOK KETEMU HCS LANTAI 8		1,161.63						1,161.63	
15	BALOK LANTAI 9	91.76	2,933.84	11,473.27	1,403.04	240.30	1,832.70	26,649.70	44,624.61	
16	PELAT LANTAI 9		24,739.23						24,739.23	
17	TRIBUN LANTAI 9	570.24	5,053.48	6,001.92	7,072.08		1,865.48		20,563.20	
18	BALKON LANTAI 9	54.17	1,683.18	150.05	423.44		902.94		3,213.78	
19	PELAT LANTAI ATAP		24,118.53						24,118.53	
20	BALOK LANTAI ATAP	142.58	5,820.10	6,820.43	695.20	1,054.65	8,555.58	11,492.25	34,580.79	
21	ATAP TANGGA		348.91		155.47				504.38	
22	ATAP M. LIFT		1,609.14		565.64				2,174.78	
23	LIST PLANK LANTAI 8, 9 DAN ATAP		7,212.98						7,212.98	
24	TANGGA LANTAI 1 - 8		1,360.36	4,424.96	1,365.12				7,150.44	
25	TANGGA BALKON LANTAI 9		328.17	2,703.45	68.26				3,099.88	
26	PONDASI TIPE P5		164.26	29.18	467.68				661.12	
27	GROUND TANK		1,500.66	3,271.88	4,844.28	1,573.12			11,189.94	
TOTAL KEBUTUHAN BESI TULANGAN (Kg)		2,810.16	99,012.81	242,206.90	96,788.28	71,288.35	170,696.76	273,965.23	203,706.24	1,160,474.72
TOTAL KEBUTUHAN BESI TULANGAN + WASTE 3 % (Kg)		2,894.46	101,983.19	249,473.10	99,691.93	73,427.00	175,817.66	282,184.19	209,817.43	1,195,288.96
TOTAL PANJANG BESI TULANGAN (m)		7,096.36	160,474.57	232,444.24	61,258.40	32,039.71	57,280.79	71,159.80	32,232.00	653,985.88
JUMLAH BATANG BESI TULANGAN (PER 12 m)		591.36	13,372.88	19,370.35	5,104.87	2,669.98	4,773.40	5,929.98	2,686.00	54,498.82

**DAFTAR SHEET REKAPITULASI OUTPUT SOWB
PROYEK XYZ**

NO	SHEET	URAIAN PEKERJAAN	DIAMETER (mm)
1	Sheet 1	Kolom	D25
	Sheet 2	Kolom	D19
	Sheet 3	Kolom	D13
	Sheet 4	Kolom	D10
2	Sheet 5	Pelat Basement 2	D16
	Sheet 6	Pelat Basement 2	D13
3	Sheet 7	Pelat Basement 1	D16
	Sheet 8	Pelat Basement 1	D13
	Sheet 9	Pelat Basement 1	D10
	Sheet 10	Pelat Basement 1	D8
4	Sheet 11	Slope Basement 2	D25
	Sheet 12	Slope Basement 2	D16
	Sheet 13	Slope Basement 2	D13
5	Sheet 14	Shear Wall dan Kolom Lift	D16
	Sheet 15	Shear Wall dan Kolom Lift	D13
	Sheet 16	Shear Wall dan Kolom Lift	D10
	Sheet 17	Shear Wall dan Kolom Lift	D8
6	Sheet 18	Pit Lift	D10
7	Sheet 19	Balok Lantai Basement 1	D22
	Sheet 20	Balok Lantai Basement 1	D19
	Sheet 21	Balok Lantai Basement 1	D16
	Sheet 22	Balok Lantai Basement 1	D13
	Sheet 23	Balok Lantai Basement 1	D10
8	Sheet 24	Balok Lantai 1 - 7	D22
	Sheet 25	Balok Lantai 1 - 7	D19
	Sheet 26	Balok Lantai 1 - 7	D16
	Sheet 27	Balok Lantai 1 - 7	D13
	Sheet 28	Balok Lantai 1 - 7	D10
9	Sheet 29	Diafragma Wall	D32
	Sheet 30	Diafragma Wall	D19
	Sheet 31	Diafragma Wall	D16
10	Sheet 32	Pelat Konvensional Lantai 1 - 7	D10
	Sheet 33	Pelat Konvensional Lantai 1 - 7	D8
11	Sheet 34	Pelat Lantai 1 As B - 4	D8
12	Sheet 35	Penambahan Tul. Precast Balok Ketemu HCS Lantai 1-7	D10
13	Sheet 36	Balok Lantai 8	D25
	Sheet 37	Balok Lantai 8	D22
	Sheet 38	Balok Lantai 8	D19
	Sheet 39	Balok Lantai 8	D16
	Sheet 40	Balok Lantai 8	D13
	Sheet 41	Balok Lantai 8	D10
14	Sheet 42	Penambahan Tul. Precast Balok Ketemu HCS Lantai 8	D10

NO	SHEET	URAIAN PEKERJAAN	DIAMETER (mm)
15	Sheet 43	Balok Lantai 9	D25
	Sheet 44	Balok Lantai 9	D22
	Sheet 45	Balok Lantai 9	D19
	Sheet 46	Balok Lantai 9	D16
	Sheet 47	Balok Lantai 9	D13
	Sheet 48	Balok Lantai 9	D10
	Sheet 49	Balok Lantai 9	D8
16	Sheet 50	Pelat Lantai 9	D10
17	Sheet 51	Tribun Lantai 9	D22
	Sheet 52	Tribun Lantai 9	D16
	Sheet 53	Tribun Lantai 9	D13
	Sheet 54	Tribun Lantai 9	D10
	Sheet 55	Tribun Lantai 9	D8
18	Sheet 56	Balkon Lantai 9	D22
	Sheet 57	Balkon Lantai 9	D16
	Sheet 58	Balkon Lantai 9	D13
	Sheet 59	Balkon Lantai 9	D10
	Sheet 60	Balkon Lantai 9	D8
19	Sheet 61	Pelat Lantai Atap	D10
20	Sheet 62	Balok Lantai Atap	D25
	Sheet 63	Balok Lantai Atap	D22
	Sheet 64	Balok Lantai Atap	D19
	Sheet 65	Balok Lantai Atap	D16
	Sheet 66	Balok Lantai Atap	D13
	Sheet 67	Balok Lantai Atap	D10
	Sheet 68	Balok Lantai Atap	D8
21	Sheet 69	Atap Tangga	D16
	Sheet 70	Atap Tangga	D10
22	Sheet 71	Atap Mesin Lift	D16
	Sheet 72	Atap Mesin Lift	D10
23	Sheet 73	List Plank Lantai 8, 9 dan Atap	D10
24	Sheet 74	Tangga Lantai 1 - 8	D16
	Sheet 75	Tangga Lantai 1 - 8	D13
	Sheet 76	Tangga Lantai 1 - 8	D10
25	Sheet 77	Tangga Balkon Lantai 9	D16
	Sheet 78	Tangga Balkon Lantai 9	D13
	Sheet 79	Tangga Balkon Lantai 9	D10
26	Sheet 80	Pondasi Tipe P5	D16
	Sheet 81	Pondasi Tipe P5	D13
	Sheet 82	Pondasi Tipe P5	D10
27	Sheet 83	Ground Tank	D19
	Sheet 84	Ground Tank	D16
	Sheet 85	Ground Tank	D13
	Sheet 86	Ground Tank	D10



Kasus Perhitungan 12/27/2008 6:53:37 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 25

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	600	450	300	4840200
2	Kebutuhan (batang)	1728	6724	2592	60332
Jml Batang Teoritis		4033.50			

Hasil

No		600	450	300	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	2	0	0	864	1200	0	1036800	0
2	Pola 2	0	2	1	2592	1200	0	3110400	0
3	Pola 3	0	2	0	770	900	300	693000	231000
		1728	6724	2592	4226			4840200	231000
Jml Batang Realistis		4226							
Persentase Waste		4.77%							

Kasus Perhitungan 12/26/2008 5:51:07 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 19

Input

No		Tipe 1	Total
1	Panjang (cm)	426	126096
2	Kebutuhan (batang)	296	76417
Jml Batang Teoritis		105.08	

Hasil

No		426	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	2	148	852	348	126096	51504
		296	148			126096	51504
Jml Batang Realistis		148					
Persentase Waste		40.85%					

Kasus Perhitungan 12/26/2008 5:52:34 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input																
No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Total				
1	Panjang (cm)	496	316	256	236	201	91	76	71	61	51	4400592				
2	Kebutuhan (batang)	672	5656	2072	336	672	11984	3472	2016	336	336	103969				
Jml Batang Teoritis		3667.16														
Hasil																
No		496	316	256	236	201	91	76	71	61	51	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	2	0	0	0	0	0	1	1	1	0	336	1200	0	403200	0
2	Pola 2	0	2	1	1	0	0	1	0	0	0	336	1200	0	403200	0
3	Pola 3	0	1	1	0	0	2	4	2	0	0	700	1200	0	840000	0
4	Pola 4	0	1	1	0	0	3	0	5	0	0	56	1200	0	67200	0
5	Pola 5	0	3	0	0	1	0	0	0	0	1	336	1200	0	403200	0
6	Pola 6	0	2	0	0	1	4	0	0	0	0	336	1197	3	402192	1008
7	Pola 7	0	1	2	0	0	4	0	0	0	0	490	1192	8	584080	3920
8	Pola 8	0	2	0	0	0	6	0	0	0	0	1029	1178	22	1212162	22638
9	Pola 9	0	0	0	0	0	13	0	0	0	0	72	1183	17	85176	1224
10	Pola 10	0	0	0	0	0	2	0	0	0	0	1	182	1018	182	1018
		672	5656	2072	336	672	11984	3472	2016	336	336	3692			4400592	29808
Jml Batang Realistis		3692														
Persentase Waste		0.68%														

Kasus Perhitungan 12/26/2008 5:53:46 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Total
1	Panjang (cm)	112	62	4872
2	Kebutuhan (batang)	28	28	104025
Jml Batang Teoritis		4.06		

Hasil

No		112	62	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	9	3	3	1194	6	3582	18
2	Pola 2	1	17	1	1166	34	1166	34
3	Pola 3	0	2	1	124	1076	124	1076
		28	28	5			4872	1128
Jml Batang Realistis		5						
Persentase Waste		23.15%						

Kasus Perhitungan 12/19/2008 1:25:19 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	1200	750	565	1467600
2	Kebutuhan (batang)	960	240	240	107720
Jml Batang Teoritis		1223.00			

Hasil

No		1200	750	565	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	960	1200	0	1152000	0
2	Pola 2	0	1	0	240	750	450	180000	108000
3	Pola 3	0	0	2	120	1130	70	135600	8400
		960	240	240	1320			1467600	116400
Jml Batang Realistis		1320							
Persentase Waste		7.93%							

Kasus Perhitungan 12/19/2008 1:25:40 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Total
1	Panjang (cm)	1200	500	315	75	1147560
2	Kebutuhan (batang)	534	534	534	954	110276
Jml Batang Teoritis		956.30				

Hasil

No		1200	500	315	75	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	534	1200	0	640800	0
2	Pola 2	0	1	1	5	190	1190	10	226100	1900
3	Pola 3	0	2	0	2	2	1150	50	2300	100
4	Pola 4	0	1	2	0	172	1130	70	194360	12040
5	Pola 5	0	2	0	0	84	1000	200	84000	16800
		534	534	534	954	982			1147560	30840
Jml Batang Realistis		982								
Persentase Waste		2.69%								

Kasus Perhitungan 12/19/2008 1:26:24 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	1200	700	600	322400
2	Kebutuhan (batang)	92	224	92	110684
Jml Batang Teoritis		268.67			

Hasil

No		1200	700	600	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	92	1200	0	110400	0
2	Pola 2	0	1	0	224	700	500	156800	112000
3	Pola 3	0	0	2	46	1200	0	55200	0
		92	224	92	362			322400	112000
Jml Batang Realistis		362							
Persentase Waste		34.74%							

Kasus Perhitungan 12/19/2008 1:26:56 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input

No		Tipe 1	Tipe 2	Total
1	Panjang (cm)	1200	56	1446160
2	Kebutuhan (batang)	1200	110	111994
Jml Batang Teoritis		1205.13		

Hasil

No		1200	56	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	1200	1200	0	1440000	0
2	Pola 2	0	21	5	1176	24	5880	120
3	Pola 3	0	5	1	280	920	280	920
		1200	110	1206			1446160	1040
Jml Batang Realistis		1206						
Persentase Waste		0.07%						

Kasus Perhitungan 12/19/2008 1:29:14 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Total
1	Panjang (cm)	1200	800	360	44	1117600
2	Kebutuhan (batang)	530	530	50	900	2010
Jml Batang Teoritis		931.33				

Hasil

No		1200	800	360	44	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	0	0	530	1200	0	636000	0	
2	Pola 2	0	1	0	9	100	1196	4	119600	400	
3	Pola 3	0	1	1	0	50	1160	40	58000	2000	
4	Pola 4	0	1	0	0	380	800	400	304000	152000	
		530	530	50	900	1060			1117600	154400	
Jml Batang Realistis		1060									
Persentase Waste		13.82%									

Kasus Perhitungan 12/19/2008 1:29:37 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 8

Input

No		Tipe 1	Total
1	Panjang (cm)	500	24000
2	Kebutuhan (batang)	48	2058
Jml Batang Teoritis		20.00	

Hasil

No		500	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	2	24	1000	200	24000	4800
		48	24			24000	4800
Jml Batang Realistis		24					
Persentase Waste		20.00%					

Kasus Perhitungan 12/19/2008 1:31:50 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 25

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Tipe 11	Total
1	Panjang (cm)	1200	800	740	700	650	550	500	350	300	250	200	852880
2	Kebutuhan (batang)	112	96	112	84	108	96	144	274	261	264	324	3933
Jml Batang Teoritis		710.73											

Hasil

No		1200	800	740	700	650	550	500	350	300	250	200	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	0	0	0	0	0	0	0	0	0	112	1200	0	134400	0	
2	Pola 2	0	1	0	0	0	0	0	0	0	0	2	96	1200	0	115200	0	
3	Pola 3	0	0	1	0	0	0	0	0	0	1	1	112	1190	10	133280	1120	
4	Pola 4	0	0	0	1	0	0	1	0	0	0	0	84	1200	0	100800	0	
5	Pola 5	0	0	0	0	1	1	0	0	0	0	0	96	1200	0	115200	0	
6	Pola 6	0	0	0	0	1	0	0	1	0	0	1	12	1200	0	14400	0	
7	Pola 7	0	0	0	0	0	0	1	0	1	0	2	4	1200	0	4800	0	
8	Pola 8	0	0	0	0	0	0	1	2	0	0	0	56	1200	0	67200	0	
9	Pola 9	0	0	0	0	0	0	0	2	0	2	0	75	1200	0	90000	0	
10	Pola 10	0	0	0	0	0	0	0	0	4	0	0	64	1200	0	76800	0	
11	Pola 11	0	0	0	0	0	0	0	0	1	2	0	1	800	400	800	400	
		112	96	112	84	108	96	144	274	261	264	324	712				852880	1520
Jml Batang Realistis		712																
Persentase Waste		0.18%																

Kasus Perhitungan 12/19/2008 1:32:31 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Total
1	Panjang (cm)	1200	36000
2	Kebutuhan (batang)	30	3963
Jml Batang Teoritis		30.00	

Hasil

No		1200	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	30	1200	0	36000	0
		30	30			36000	0
Jml Batang Realistis		30					
Persentase Waste		0.00%					

Kasus Perhitungan 12/19/2008 1:32:54 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Tipe 11	Tipe 12	Tipe 13	Total
1	Panjang (cm)	1200	800	650	600	550	500	374	364	350	150	124	119	118	1190044
2	Kebutuhan (batang)	38	24	24	28	24	24	668	980	64	266	1336	1848	112	9399
Jml Batang Teoritis		991.70													

Hasil

No		1200	800	650	600	550	500	374	364	350	150	124	119	118	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	0	0	0	0	0	38	1200	0	45600	0
2	Pola 2	0	1	0	0	0	0	0	0	0	1	2	0	0	24	1198	2	28752	48
3	Pola 3	0	0	1	0	1	0	0	0	0	0	0	0	0	24	1200	0	28800	0
4	Pola 4	0	0	0	2	0	0	0	0	0	0	0	0	0	14	1200	0	16800	0
5	Pola 5	0	0	0	0	0	1	0	0	2	0	0	0	0	24	1200	0	28800	0
6	Pola 6	0	0	0	0	0	0	1	0	0	0	0	0	7	16	1200	0	19200	0
7	Pola 7	0	0	0	0	0	0	1	0	1	0	0	4	0	16	1200	0	19200	0
8	Pola 8	0	0	0	0	0	0	2	0	0	3	0	0	0	80	1198	2	95840	160
9	Pola 9	0	0	0	0	0	0	2	0	0	2	1	0	0	1	1172	28	1172	28
10	Pola 10	0	0	0	0	0	0	3	0	0	0	0	0	0	158	1122	78	177276	12324
11	Pola 11	0	0	0	0	0	0	0	1	0	0	0	7	0	254	1197	3	304038	762
12	Pola 12	0	0	0	0	0	0	0	1	0	0	6	0	0	214	1108	92	237112	19688
13	Pola 13	0	0	0	0	0	0	0	2	0	0	3	0	0	1	1100	100	1100	100
14	Pola 14	0	0	0	0	0	0	0	3	0	0	0	0	0	170	1092	108	185640	18360
15	Pola 15	0	0	0	0	0	0	0	0	0	0	0	6	0	1	714	486	714	486
		38	24	24	28	24	24	668	980	64	266	1336	1848	112	1035			1190044	51956
Jml Batang Realistis		1035																	
Persentase Waste		4.37%																	

Kasus Perhitungan 12/19/2008 1:33:49 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Total
1	Panjang (cm)	483	459	60630
2	Kebutuhan (batang)	40	90	9529
Jml Batang Teoritis		50.53		

Hasil

No		483	459	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	2	0	20	966	234	19320	4680
2	Pola 2	0	2	45	918	282	41310	12690
		40	90	65			60630	17370
Jml Batang Realistis		65						
Persentase Waste		28.65%						

Kasus Perhitungan 12/19/2008 1:34:11 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input

No		Tipe 1	Total
1	Panjang (cm)	370	29600
2	Kebutuhan (batang)	80	9609
Jml Batang Teoritis			24.67

Hasil

No		370	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	3	26	1110	90	28860	2340
2	Pola 2	2	1	740	460	740	460
		80	27			29600	2800
Jml Batang Realistis			27				
Persentase Waste			9.46%				

Kasus Perhitungan 12/19/2008 1:34:45 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	485	305	155	5545
2	Kebutuhan (batang)	36	71	106	9822
Jml Batang Teoritis		46.29			

Hasil

No		485	305	155	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	2	0	1	18	1125	75	20250	1350
2	Pola 2	0	1	5	17	1080	120	18360	2040
3	Pola 3	0	2	3	1	1075	125	1075	125
4	Pola 4	0	3	0	17	915	285	15555	4845
5	Pola 5	0	1	0	1	305	895	305	895
		36	71	106	54			5545	9255
Jml Batang Realistis		54							
Persentase Waste		16.66%							

Kasus Perhitungan 12/19/2008 1:35:38 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 8

Input

No		Tipe 1	Total
1	Panjang (cm)	110	15620
2	Kebutuhan (batang)	142	9964
Jml Batang Teoritis			13.02

Hasil

No		110	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	10	14	1100	100	15400	1400
2	Pola 2	2	1	220	980	220	980
		142	15			15620	2380
Jml Batang Realistis			15				
Persentase Waste			15.24%				

Kasus Perhitungan 12/19/2008 1:36:10 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	755	359	280	106906
2	Kebutuhan (batang)	36	194	36	10230
Jml Batang Teoritis		89.09			

Hasil

No		755	359	280	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	1	0	36	1114	86	40104	3096
2	Pola 2	0	1	3	12	1199	1	14388	12
3	Pola 3	0	3	0	48	1077	123	51696	5904
4	Pola 4	0	2	0	1	718	482	718	482
		36	194	36	97			106906	9494
Jml Batang Realistis		97							
Persentase Waste		8.88%							

Kasus Perhitungan 12/19/2008 1:37:05 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 22

Input																		
No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Tipe 11	Tipe 12	Total				
1	Panjang (cm)	1200	800	720	600	500	334	300	284	214	200	144	134	1168800				
2	Kebutuhan (batang)	213	78	4	64	102	1008	278	504	504	6	130	504	13625				
Jml Batang Teoritis		974.00																
Hasil																		
No		1200	800	720	600	500	334	300	284	214	200	144	134	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	0	0	0	0	213	1200	0	255600	0
2	Pola 2	0	1	0	0	0	0	0	0	0	2	0	0	3	1200	0	3600	0
3	Pola 3	0	1	0	0	0	0	0	0	1	0	1	0	75	1158	42	86850	3150
4	Pola 4	0	0	1	0	0	1	0	0	0	0	1	0	4	1198	2	4792	8
5	Pola 5	0	0	0	2	0	0	0	0	0	0	0	0	32	1200	0	38400	0
6	Pola 6	0	0	0	0	1	0	0	0	0	0	3	2	17	1200	0	20400	0
7	Pola 7	0	0	0	0	1	0	0	0	2	0	0	2	85	1196	4	101660	340
8	Pola 8	0	0	0	0	0	1	1	0	2	0	0	1	129	1196	4	154284	516
9	Pola 9	0	0	0	0	0	1	0	3	0	0	0	0	168	1186	14	199248	2352
10	Pola 10	0	0	0	0	0	2	1	0	1	0	0	0	1	1182	18	1182	18
11	Pola 11	0	0	0	0	0	1	1	0	0	0	0	4	42	1170	30	49140	1260
12	Pola 12	0	0	0	0	0	3	0	0	0	0	0	1	3	1136	64	3408	192
13	Pola 13	0	0	0	0	0	3	0	0	0	0	0	0	218	1002	198	218436	43164
14	Pola 14	0	0	0	0	0	0	4	0	0	0	0	0	26	1200	0	31200	0
15	Pola 15	0	0	0	0	0	0	2	0	0	0	0	0	1	600	600	600	600
		213	78	4	64	102	1008	278	504	504	6	130	504	1017			1168800	51600
Jml Batang Realistis		1017																
Persentase Waste		4.41%																

Kasus Perhitungan 12/19/2008 1:38:19 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 19

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	1200	660	500	111680
2	Kebutuhan (batang)	16	128	16	13785
Jml Batang Teoritis		93.07			

Hasil

No		1200	660	500	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	16	1200	0	19200	0
2	Pola 2	0	1	1	16	1160	40	18560	640
3	Pola 3	0	1	0	112	660	540	73920	60480
		16	128	16	144			111680	61120
Jml Batang Realistis		144							
Persentase Waste		54.73%							

Kasus Perhitungan 12/19/2008 1:38:48 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Total
1	Panjang (cm)	1200	250	417000
2	Kebutuhan (batang)	200	708	14693
Jml Batang Teoritis		347.50		

Hasil

No		1200	250	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	200	1200	0	240000	0
2	Pola 2	0	4	177	1000	200	177000	35400
		200	708	377			417000	35400
Jml Batang Realistis		377						
Persentase Waste		8.49%						

Kasus Perhitungan 12/19/2008 1:39:19 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Tipe 11	Tipe 12	Tipe 13	Tipe 14	Tipe 15	Tipe 16	Total
1	Panjang (cm)	1200	720	660	500	384	224	214	196	194	184	174	164	79	69	65	59	1804560
2	Kebutuhan (batang)	116	2	16	10	546	706	1686	120	504	833	1308	1092	1560	480	120	1260	25052
Jml Batang Teoritis		1503.80																

Hasil

No		1200	720	660	500	384	224	214	196	194	184	174	164	79	69	65	59	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	116	1200	0	139200	0
2	Pola 2	0	1	0	0	0	0	0	0	1	0	0	0	2	1	0	1	2	1200	0	2400	0
3	Pola 3	0	0	1	0	0	0	1	1	0	0	0	0	0	0	2	0	16	1200	0	19200	0
4	Pola 4	0	0	0	1	0	2	0	0	0	0	0	0	0	1	1	2	10	1200	0	12000	0
5	Pola 5	0	0	0	0	1	0	0	1	1	1	0	0	0	0	1	3	78	1200	0	93600	0
6	Pola 6	0	0	0	0	1	0	0	1	0	0	1	2	0	0	0	2	26	1200	0	31200	0
7	Pola 7	0	0	0	0	1	2	0	0	1	0	1	0	0	0	0	0	343	1200	0	411600	0
8	Pola 8	0	0	0	0	1	0	0	0	1	0	0	0	7	1	0	0	81	1200	0	97200	0
9	Pola 9	0	0	0	0	1	0	3	0	0	0	1	0	0	0	0	0	18	1200	0	21600	0
10	Pola 10	0	0	0	0	0	0	2	0	0	0	0	2	4	1	0	1	247	1200	0	296400	0
11	Pola 11	0	0	0	0	0	0	2	0	0	2	0	0	1	3	0	2	1	1200	0	1200	0
12	Pola 12	0	0	0	0	0	0	2	0	0	2	0	0	0	5	0	1	27	1200	0	32400	0
13	Pola 13	0	0	0	0	0	0	3	0	0	1	0	0	0	2	0	4	1	1200	0	1200	0
14	Pola 14	0	0	0	0	0	0	2	0	0	1	1	0	0	0	0	7	96	1199	1	115104	96
15	Pola 15	0	0	0	0	0	0	1	0	0	0	0	6	0	0	0	0	91	1198	2	109018	182
16	Pola 16	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	200	1194	6	238800	1200
17	Pola 17	0	0	0	0	0	0	3	0	0	2	1	0	0	0	0	0	1	1184	16	1184	16
18	Pola 18	0	0	0	0	0	0	3	0	0	0	3	0	0	0	0	0	59	1164	36	68676	2124
19	Pola 19	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	107	1044	156	111708	16692
20	Pola 20	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	1	870	330	870	330
		116	2	16	10	546	706	1686	120	504	833	1308	1092	1560	480	120	1260	1521			1804560	20640
Jml Batang Realistis		1521																				
Persentase Waste		1.14%																				

Kasus Perhitungan 12/19/2008 1:41:51 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	1200	800	174	19660
2	Kebutuhan (batang)	2	2	90	25146
Jml Batang Teoritis		16.38			

Hasil

No		1200	800	174	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	2	1200	0	2400	0
2	Pola 2	0	1	2	2	1148	52	2296	104
3	Pola 3	0	0	6	14	1044	156	14616	2184
4	Pola 4	0	0	2	1	348	852	348	852
		2	2	90	19			19660	3140
Jml Batang Realistis		19							
Persentase Waste		15.97%							

Kasus Perhitungan 12/19/2008 1:42:23 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 22

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Total
1	Panjang (cm)	1200	800	700	600	500	400	300	4099200
2	Kebutuhan (batang)	1253	665	609	1414	882	119	1001	31089
Jml Batang Teoritis		3416.00							

Hasil

No		1200	800	700	600	500	400	300	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	0	0	0	0	0	1253	1200	0	1503600	0	
2	Pola 2	0	1	0	0	0	1	0	119	1200	0	142800	0	
3	Pola 3	0	1	0	0	0	0	1	546	1100	100	600600	54600	
4	Pola 4	0	0	1	0	1	0	0	609	1200	0	730800	0	
5	Pola 5	0	0	0	2	0	0	0	707	1200	0	848400	0	
6	Pola 6	0	0	0	0	1	0	2	227	1100	100	249700	22700	
7	Pola 7	0	0	0	0	2	0	0	23	1000	200	23000	4600	
8	Pola 8	0	0	0	0	0	0	1	1	300	900	300	900	
		1253	665	609	1414	882	119	1001	3485			4099200	82800	
Jml Batang Realistis		3485												
Persentase Waste		2.02%												

Kasus Perhitungan 12/19/2008 1:43:18 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 19

Input

No		Tipe 1	Total
1	Panjang (cm)	800	44800
2	Kebutuhan (batang)	56	31145
Jml Batang Teoritis			37.33

Hasil

No		800	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	56	800	400	44800	22400
		56	56			44800	22400
Jml Batang Realistis			56				
Persentase Waste			50.00%				

Kasus Perhitungan 12/19/2008 1:43:38 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Total
1	Panjang (cm)	400	33600
2	Kebutuhan (batang)	84	31229
Jml Batang Teoritis		28.00	

Hasil

No		400	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	3	28	1200	0	33600	0
		84	28			33600	0
Jml Batang Realistis		28					
Persentase Waste		0.00%					

Kasus Perhitungan 12/19/2008 1:44:04 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input																			
No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Tipe 11	Tipe 12	Tipe 13	Total				
1	Panjang (cm)	1200	800	700	600	500	214	204	194	174	164	154	79	69	8753479				
2	Kebutuhan (batang)	364	28	28	56	112	20230	700	7112	3850	350	1680	14609	2800	83148				
Jml Batang Teoritis		7294.57																	
Hasil																			
No		1200	800	700	600	500	214	204	194	174	164	154	79	69	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	0	0	0	0	0	364	1200	0	436800	0
2	Pola 2	0	1	0	0	0	0	1	1	0	0	0	0	0	28	1198	2	33544	56
3	Pola 3	0	0	1	0	1	0	0	0	0	0	0	0	0	28	1200	0	33600	0
4	Pola 4	0	0	0	2	0	0	0	0	0	0	0	0	0	28	1200	0	33600	0
5	Pola 5	0	0	0	0	1	0	0	1	2	0	0	2	0	84	1200	0	100800	0
6	Pola 6	0	0	0	0	0	2	0	0	0	0	2	5	1	840	1200	0	1008000	0
7	Pola 7	0	0	0	0	0	2	0	0	0	2	0	3	3	175	1200	0	210000	0
8	Pola 8	0	0	0	0	0	1	1	1	1	0	0	0	6	239	1200	0	286800	0
9	Pola 9	0	0	0	0	0	1	0	0	3	0	0	5	1	1	1200	0	1200	0
10	Pola 10	0	0	0	0	0	2	3	0	0	0	0	2	0	144	1198	2	172512	288
11	Pola 11	0	0	0	0	0	3	1	1	0	0	0	2	0	1	1198	2	1198	2
12	Pola 12	0	0	0	0	0	1	0	1	0	0	0	10	0	942	1198	2	1128516	1884
13	Pola 13	0	0	0	0	0	1	0	5	0	0	0	0	0	1163	1184	16	1376992	18608
14	Pola 14	0	0	0	0	0	2	0	3	1	0	0	0	0	1	1184	16	1184	16
15	Pola 15	0	0	0	0	0	3	0	0	3	0	0	0	0	1146	1164	36	1333944	41256
16	Pola 16	0	0	0	0	0	5	0	0	0	0	0	1	0	1	1149	51	1149	51
17	Pola 17	0	0	0	0	0	5	0	0	0	0	0	0	0	2423	1070	130	2592610	314990
18	Pola 18	0	0	0	0	0	4	0	0	1	0	0	0	0	1	1030	170	1030	170
		364	28	28	56	112	20230	700	7112	3850	350	1680	14609	2800	7609			8753479	377321
Jml Batang Realistis		7609																	
Persentase Waste		4.31%																	

Kasus Perhitungan 12/21/2008 1:07:42 AM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Total
1	Panjang (cm)	800	184	174	124	74	44	299124
2	Kebutuhan (batang)	14	588	336	525	476	476	2415
Jml Batang Teoritis		249.27						

Hasil

No		800	184	174	124	74	44	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	3	4	14	1198	2	16772	28
2	Pola 2	0	5	0	0	2	3	117	1200	0	140400	0
3	Pola 3	0	2	2	0	0	11	1	1200	0	1200	0
4	Pola 4	0	1	0	7	2	0	1	1200	0	1200	0
5	Pola 5	0	0	2	0	2	16	3	1200	0	3600	0
6	Pola 6	0	0	3	0	5	7	1	1200	0	1200	0
7	Pola 7	0	0	1	1	11	2	1	1200	0	1200	0
8	Pola 8	0	0	4	4	0	0	81	1192	8	96552	648
9	Pola 9	0	0	0	9	1	0	21	1190	10	24990	210
10	Pola 10	0	0	0	3	11	0	1	1186	14	1186	14
11	Pola 11	0	0	0	1	14	0	1	1160	40	1160	40
12	Pola 12	0	0	0	0	16	0	8	1184	16	9472	128
13	Pola 13	0	0	0	0	2	1	1	192	1008	192	1008
		14	588	336	525	476	476	251			299124	2076
Jml Batang Realistis		251										
Persentase Waste		0.69%										

Kasus Perhitungan 12/19/2008 1:46:24 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 32

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Total
1	Panjang (cm)	1200	1000	800	400	3223200
2	Kebutuhan (batang)	948	948	948	948	89355
Jml Batang Teoritis		2686.00				

Hasil

No		1200	1000	800	400	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	948	1200	0	1137600	0
2	Pola 2	0	1	0	0	948	1000	200	948000	189600
3	Pola 3	0	0	1	1	948	1200	0	1137600	0
		948	948	948	948	2844			3223200	189600
Jml Batang Realistis		2844								
Persentase Waste		5.88%								

Kasus Perhitungan 12/19/2008 1:46:51 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 19

Input

No		Tipe 1	Tipe 2	Total
1	Panjang (cm)	1200	150	2698800
2	Kebutuhan (batang)	1894	2840	94089
Jml Batang Teoritis		2249.00		

Hasil

No		1200	150	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	1894	1200	0	2272800	0
2	Pola 2	0	8	355	1200	0	426000	0
		1894	2840	2249			2698800	0
Jml Batang Realistis		2249						
Persentase Waste		0.00%						

Kasus Perhitungan 12/19/2008 1:47:39 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Total
1	Panjang (cm)	1200	800	150	59	2629470
2	Kebutuhan (batang)	805	230	3440	16330	114894
Jml Batang Teoritis		2191.23				

Hasil

No		1200	800	150	59	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	0	0	805	1200	0	966000	0	
2	Pola 2	0	1	1	4	230	1186	14	272780	3220	
3	Pola 3	0	0	8	0	401	1200	0	481200	0	
4	Pola 4	0	0	2	15	1	1185	15	1185	15	
5	Pola 5	0	0	0	20	769	1180	20	907420	15380	
6	Pola 6	0	0	0	15	1	885	315	885	315	
		805	230	3440	16330	2207			2629470	18930	
Jml Batang Realistis		2207									
Persentase Waste		0.72%									

Kasus Perhitungan 12/19/2008 1:48:35 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Total
1	Panjang (cm)	720	262080
2	Kebutuhan (batang)	364	115258
Jml Batang Teoritis		218.40	

Hasil

No		720	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	364	720	480	262080	174720
		364	364			262080	174720
Jml Batang Realistis		364					
Persentase Waste		66.67%					

Kasus Perhitungan 12/19/2008 1:48:59 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 8

Input

No		Tipe 1	Tipe 2	Total
1	Panjang (cm)	520	50	359940
2	Kebutuhan (batang)	672	210	116140
Jml Batang Teoritis		299.95		

Hasil

No		520	50	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	2	3	70	1190	10	83300	700
2	Pola 2	2	0	266	1040	160	276640	42560
		672	210	336			359940	43260
Jml Batang Realistis		336						
Persentase Waste		12.02%						

Kasus Perhitungan 12/19/2008 1:49:25 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 8

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Total
1	Panjang (cm)	720	400	220	50	93220
2	Kebutuhan (batang)	30	120	96	50	116436
Jml Batang Teoritis		77.68				

Hasil

No		720	400	220	50	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	1	5	10	1190	10	11900	100	
2	Pola 2	1	0	2	0	20	1160	40	23200	800	
3	Pola 3	0	3	0	0	40	1200	0	48000	0	
4	Pola 4	0	0	5	0	9	1100	100	9900	900	
5	Pola 5	0	0	1	0	1	220	980	220	980	
		30	120	96	50	80			93220	2780	
Jml Batang Realistis		80									
Persentase Waste		2.98%									

Kasus Perhitungan 12/19/2008 1:49:55 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Total
1	Panjang (cm)	134	1317890
2	Kebutuhan (batang)	9835	126271
Jml Batang Teoritis		1098.24	

Hasil

No		134	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	8	1229	1072	128	1317488	157312
2	Pola 2	3	1	402	798	402	798
		9835	1230			1317890	158110
Jml Batang Realistis		1230					
Persentase Waste		12.00%					

Kasus Perhitungan 12/19/2008 1:50:23 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 25

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Total
1	Panjang (cm)	1200	900	600	500	400	300	200	432200
2	Kebutuhan (batang)	148	120	187	12	46	32	2	126818
Jml Batang Teoritis		360.17							

Hasil

No		1200	900	600	500	400	300	200	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	0	0	0	0	0	148	1200	0	177600	0	
2	Pola 2	0	1	0	0	0	1	0	32	1200	0	38400	0	
3	Pola 3	0	1	0	0	0	0	1	2	1100	100	2200	200	
4	Pola 4	0	1	0	0	0	0	0	86	900	300	77400	25800	
5	Pola 5	0	0	2	0	0	0	0	93	1200	0	111600	0	
6	Pola 6	0	0	1	1	0	0	0	1	1100	100	1100	100	
7	Pola 7	0	0	0	2	0	0	0	5	1000	200	5000	1000	
8	Pola 8	0	0	0	1	1	0	0	1	900	300	900	300	
9	Pola 9	0	0	0	0	3	0	0	15	1200	0	18000	0	
		148	120	187	12	46	32	2	383			432200	27400	
Jml Batang Realistis		383												
Persentase Waste		6.34%												

Kasus Perhitungan 12/19/2008 1:50:52 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 22

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Total
1	Panjang (cm)	1200	900	800	700	600	400	300	186700
2	Kebutuhan (batang)	58	32	8	12	82	18	57	127085
Jml Batang Teoritis		155.58							

Hasil

No		1200	900	800	700	600	400	300	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	58	1200	0	69600	0
2	Pola 2	0	1	0	0	0	0	1	32	1200	0	38400	0
3	Pola 3	0	0	1	0	0	1	0	8	1200	0	9600	0
4	Pola 4	0	0	0	1	0	1	0	10	1100	100	11000	1000
5	Pola 5	0	0	0	1	0	0	1	2	1000	200	2000	400
6	Pola 6	0	0	0	0	2	0	0	41	1200	0	49200	0
7	Pola 7	0	0	0	0	0	0	4	5	1200	0	6000	0
8	Pola 8	0	0	0	0	0	0	3	1	900	300	900	300
		58	32	8	12	82	18	57	157			186700	1700
Jml Batang Realistis		157											
Persentase Waste		0.91%											

Kasus Perhitungan 12/19/2008 1:51:21 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 19

Input

No		Tipe 1	Total
1	Panjang (cm)	400	1600
2	Kebutuhan (batang)	4	127089
Jml Batang Teoritis			1.33

Hasil

No		400	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	3	1	1200	0	1200	0
2	Pola 2	1	1	400	800	400	800
		4	2			1600	800
Jml Batang Realistis		2					
Persentase Waste		50.00%					

Kasus Perhitungan 12/19/2008 1:51:47 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Total
1	Panjang (cm)	1200	500	400	300	200	116100
2	Kebutuhan (batang)	18	36	173	3	32	127351
Jml Batang Teoritis		96.75					

Hasil

No		1200	500	400	300	200	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	18	1200	0	21600	0
2	Pola 2	0	2	0	0	1	18	1200	0	21600	0
3	Pola 3	0	0	3	0	0	57	1200	0	68400	0
4	Pola 4	0	0	1	2	1	1	1200	0	1200	0
5	Pola 5	0	0	1	0	4	1	1200	0	1200	0
6	Pola 6	0	0	0	1	4	1	1100	100	1100	100
7	Pola 7	0	0	0	0	5	1	1000	200	1000	200
		18	36	173	3	32	97			116100	300
Jml Batang Realistis		97									
Persentase Waste		0.26%									

Kasus Perhitungan 12/19/2008 1:52:24 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Tipe 11	Tipe 12	Tipe 13	Tipe 14	Tipe 15	Tipe 16	Total
1	Panjang (cm)	1200	700	600	234	224	214	204	194	184	174	164	155	84	79	69	59	1088766
2	Kebutuhan (batang)	64	4	36	465	1530	465	100	640	300	250	85	204	465	1105	135	204	133403
Jml Batang Teoritis		907.31																

Hasil

No		1200	700	600	234	224	214	204	194	184	174	164	155	84	79	69	59	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	64	1200	0	76800	0
2	Pola 2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	3	1	4	1200	0	4800	0
3	Pola 3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	18	1200	0	21600	0
4	Pola 4	0	0	0	1	0	0	1	2	0	0	0	0	0	1	0	5	40	1200	0	48000	0
5	Pola 5	0	0	0	1	0	0	1	1	0	1	0	2	1	0	0	0	60	1200	0	72000	0
6	Pola 6	0	0	0	1	0	1	0	1	0	0	1	2	1	0	0	0	42	1200	0	50400	0
7	Pola 7	0	0	0	1	0	1	0	1	0	0	0	0	5	0	2	0	61	1200	0	73200	0
8	Pola 8	0	0	0	1	0	1	0	1	0	0	0	0	1	6	0	0	58	1200	0	69600	0
9	Pola 9	0	0	0	1	0	0	0	0	0	3	0	0	0	6	0	0	14	1200	0	16800	0
10	Pola 10	0	0	0	2	1	2	0	0	0	0	0	0	0	1	0	0	93	1199	1	111507	93
11	Pola 11	0	0	0	0	1	0	0	0	0	2	1	0	0	5	1	0	1	1200	0	1200	0
12	Pola 12	0	0	0	0	5	0	0	0	0	0	0	0	0	1	0	0	287	1199	1	344113	287
13	Pola 13	0	0	0	0	1	2	0	2	0	0	0	0	0	2	0	0	1	1198	2	1198	2
14	Pola 14	0	0	0	0	0	1	0	1	0	0	0	0	0	10	0	0	24	1198	2	28752	48
15	Pola 15	0	0	0	0	0	4	0	0	1	0	0	0	0	2	0	0	3	1198	2	3594	6
16	Pola 16	0	0	0	0	0	2	0	3	1	0	0	0	0	0	0	0	40	1194	6	47760	240
17	Pola 17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	1164	36	37248	1152
18	Pola 18	0	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	1	1114	86	1114	86
19	Pola 19	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	42	1104	96	46368	4032
20	Pola 20	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	31	1044	156	32364	4836
21	Pola 21	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	1	348	852	348	852
		64	4	36	465	1530	465	100	640	300	250	85	204	465	1105	135	204	917			1088766	11634
Jml Batang Realistis		917																				
Persentase Waste		1.07%																				

Kasus Perhitungan 12/19/2008 1:57:11 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input																
No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Total				
1	Panjang (cm)	1200	800	184	174	164	155	154	144	114	59	216544				
2	Kebutuhan (batang)	6	4	126	96	330	68	312	40	384	68	134837				
Jml Batang Teoritis		180.45														
Hasil																
No		1200	800	184	174	164	155	154	144	114	59	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	0	0	6	1200	0	7200	0
2	Pola 2	0	1	0	0	1	0	0	0	0	4	4	1200	0	4800	0
3	Pola 3	0	0	4	0	0	0	0	0	2	4	13	1200	0	15600	0
4	Pola 4	0	0	4	0	0	2	1	0	0	0	18	1200	0	21600	0
5	Pola 5	0	0	2	3	0	2	0	0	0	0	1	1200	0	1200	0
6	Pola 6	0	0	0	1	0	0	0	0	9	0	39	1200	0	46800	0
7	Pola 7	0	0	0	6	0	1	0	0	0	0	9	1199	1	10791	9
8	Pola 8	0	0	0	0	1	3	0	0	5	0	1	1199	1	1199	1
9	Pola 9	0	0	0	0	1	5	0	1	1	0	2	1197	3	2394	6
10	Pola 10	0	0	0	0	1	2	0	5	0	0	4	1194	6	4776	24
11	Pola 11	0	0	0	0	1	0	2	5	0	0	3	1192	8	3576	24
12	Pola 12	0	0	0	0	7	0	0	0	0	0	45	1148	52	51660	2340
13	Pola 13	0	0	0	0	1	0	6	0	0	0	1	1088	112	1088	112
14	Pola 14	0	0	0	0	0	0	7	0	0	0	40	1078	122	43120	4880
15	Pola 15	0	0	0	0	0	0	2	3	0	0	1	740	460	740	460
Jml Batang Realistis		187														
Persentase Waste		3.63%														

Kasus Perhitungan 12/19/2008 1:58:39 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Total
1	Panjang (cm)	134	188270
2	Kebutuhan (batang)	1405	136242
Jml Batang Teoritis			156.89

Hasil

No		134	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	8	175	1072	128	187600	22400
2	Pola 2	5	1	670	530	670	530
		1405	176			188270	22930
Jml Batang Realistis			176				
Persentase Waste			12.18%				

Kasus Perhitungan 12/19/2008 1:59:09 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 25

Input											
No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Total
1	Panjang (cm)	1200	1000	900	800	700	600	500	400	300	692200
2	Kebutuhan (batang)	265	3	172	10	44	163	38	143	12	137092
Jml Batang Teoritis		576.83									

Hasil																
No		1200	1000	900	800	700	600	500	400	300	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	0	0	0	0	0	0	0	265	1200	0	318000	0	
2	Pola 2	0	1	0	0	0	0	0	0	0	3	1000	200	3000	600	
3	Pola 3	0	0	1	0	0	0	0	0	1	12	1200	0	14400	0	
4	Pola 4	0	0	1	0	0	0	0	0	0	160	900	300	144000	48000	
5	Pola 5	0	0	0	1	0	0	0	1	0	10	1200	0	12000	0	
6	Pola 6	0	0	0	0	1	0	1	0	0	38	1200	0	45600	0	
7	Pola 7	0	0	0	0	1	0	0	1	0	6	1100	100	6600	600	
8	Pola 8	0	0	0	0	0	2	0	0	0	81	1200	0	97200	0	
9	Pola 9	0	0	0	0	0	1	0	1	0	1	1000	200	1000	200	
10	Pola 10	0	0	0	0	0	0	0	3	0	42	1200	0	50400	0	
		265	3	172	10	44	163	38	143	12	618			692200	49400	
Jml Batang Realistis		618														
Persentase Waste		7.14%														

Kasus Perhitungan 12/19/2008 2:00:15 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 22

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Total
1	Panjang (cm)	1200	800	600	400	300	61500
2	Kebutuhan (batang)	10	6	12	9	113	137242
Jml Batang Teoritis		51.25					

Hasil

No		1200	800	600	400	300	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	10	1200	0	12000	0
2	Pola 2	0	1	0	1	0	6	1200	0	7200	0
3	Pola 3	0	0	2	0	0	6	1200	0	7200	0
4	Pola 4	0	0	0	3	0	1	1200	0	1200	0
5	Pola 5	0	0	0	0	4	28	1200	0	33600	0
6	Pola 6	0	0	0	0	1	1	300	900	300	900
		10	6	12	9	113	52			61500	900
Jml Batang Realistis		52									
Persentase Waste		1.46%									

Kasus Perhitungan 12/19/2008 2:00:58 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 19

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Total
1	Panjang (cm)	1200	600	500	400	200	10800
2	Kebutuhan (batang)	4	1	4	8	1	137260
Jml Batang Teoritis		9.00					

Hasil

No		1200	600	500	400	200	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	0	0	0	4	1200	0	4800	0	
2	Pola 2	0	1	0	1	1	1	1200	0	1200	0	
3	Pola 3	0	0	2	0	0	2	1000	200	2000	400	
4	Pola 4	0	0	0	3	0	2	1200	0	2400	0	
5	Pola 5	0	0	0	1	0	1	400	800	400	800	
		4	1	4	8	1	10			10800	1200	
Jml Batang Realistis		10										
Persentase Waste		11.11%										

Kasus Perhitungan 12/19/2008 2:01:38 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Total
1	Panjang (cm)	1200	600	500	400	200	88800
2	Kebutuhan (batang)	16	40	8	84	40	137448
Jml Batang Teoritis		74.00					

Hasil

No		1200	600	500	400	200	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	16	1200	0	19200	0
2	Pola 2	0	2	0	0	0	20	1200	0	24000	0
3	Pola 3	0	0	2	0	1	4	1200	0	4800	0
4	Pola 4	0	0	0	3	0	28	1200	0	33600	0
5	Pola 5	0	0	0	0	6	6	1200	0	7200	0
		16	40	8	84	40	74			88800	0
Jml Batang Realistis		74									
Persentase Waste		0.00%									

Kasus Perhitungan 12/19/2008 2:02:16 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input																						
No	Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Tipe 11	Tipe 12	Tipe 13	Tipe 14	Tipe 15	Tipe 16	Tipe 17	Total				
1	1200	800	600	400	304	300	294	274	234	224	214	204	194	184	174	124	109	1101082				
2	112	6	54	44	480	10	960	495	330	160	48	80	480	310	180	35	180	141412				
Jml Batang Teoritis		917.57																				
Hasil																						
No	1200	800	600	400	304	300	294	274	234	224	214	204	194	184	174	124	109	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112	1200	0	134400	0
2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1200	0	7200	0
3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	1200	0	32400	0
4	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	12	1200	0	14400	0
5	0	0	0	1	0	0	0	0	0	0	0	1	0	0	2	2	0	2	1200	0	2400	0
6	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	2	0	10	1200	0	12000	0
7	0	0	0	0	1	0	0	2	0	1	0	0	0	0	0	1	0	11	1200	0	13200	0
8	0	0	0	0	1	0	0	2	0	0	0	0	0	0	2	0	0	78	1200	0	93600	0
9	0	0	0	0	2	0	0	0	0	0	1	0	1	1	0	0	0	48	1200	0	57600	0
10	0	0	0	0	1	0	1	0	1	0	0	0	0	2	0	0	0	131	1200	0	157200	0
11	0	0	0	0	1	0	1	0	0	0	0	2	1	0	0	0	0	39	1200	0	46800	0
12	0	0	0	0	1	0	0	1	1	0	0	0	2	0	0	0	0	115	1200	0	138000	0
13	0	0	0	0	0	0	1	0	1	3	0	0	0	0	0	0	0	49	1200	0	58800	0
14	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	2	1200	0	2400	0
15	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	4	45	1198	2	53910	90
16	0	0	0	0	0	0	1	1	1	0	0	0	2	0	0	0	0	35	1190	10	41650	350
17	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	164	1176	24	192864	3936
18	0	0	0	0	0	0	1	1	0	0	0	0	3	0	0	0	0	1	1150	50	1150	50
19	0	0	0	0	0	0	0	2	0	0	0	0	3	0	0	0	0	13	1130	70	14690	910
20	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	23	1096	104	25208	2392
21	0	0	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	1	1016	184	1016	184
22	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	194	1006	194	1006
Jml Batang Realistis		925																				
Persentase Waste		0.81%																				

Kasus Perhitungan 12/19/2008 2:04:02 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Tipe 11	Tipe 12	Tipe 13	Total
1	Panjang (cm)	1200	800	600	500	400	284	224	214	184	164	155	154	114	475500
2	Kebutuhan (batang)	30	2	6	4	28	100	320	200	320	220	70	705	560	143977
Jml Batang Teoritis		396.25													

Hasil

No		1200	800	600	500	400	284	224	214	184	164	155	154	114	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	0	0	0	0	0	30	1200	0	36000	0
2	Pola 2	0	1	0	0	1	0	0	0	0	0	0	0	0	2	1200	0	2400	0
3	Pola 3	0	0	2	0	0	0	0	0	0	0	0	0	0	3	1200	0	3600	0
4	Pola 4	0	0	0	1	0	0	0	0	0	1	0	2	2	4	1200	0	4800	0
5	Pola 5	0	0	0	0	3	0	0	0	0	0	0	0	0	8	1200	0	9600	0
6	Pola 6	0	0	0	0	1	0	0	0	0	3	0	2	0	2	1200	0	2400	0
7	Pola 7	0	0	0	0	0	3	0	0	1	1	0	0	0	33	1200	0	39600	0
8	Pola 8	0	0	0	0	0	1	1	0	0	0	2	1	2	1	1200	0	1200	0
9	Pola 9	0	0	0	0	0	0	1	0	1	2	2	1	0	34	1200	0	40800	0
10	Pola 10	0	0	0	0	0	0	1	2	0	1	0	1	2	100	1198	2	119800	200
11	Pola 11	0	0	0	0	0	0	3	0	1	0	0	0	3	61	1198	2	73078	122
12	Pola 12	0	0	0	0	0	0	2	0	0	2	0	2	1	1	1198	2	1198	2
13	Pola 13	0	0	0	0	0	0	0	0	3	3	0	1	0	2	1198	2	2396	4
14	Pola 14	0	0	0	0	0	0	0	0	4	0	0	3	0	46	1198	2	55108	92
15	Pola 15	0	0	0	0	0	0	0	0	1	1	0	4	2	1	1192	8	1192	8
16	Pola 16	0	0	0	0	0	0	0	0	1	0	0	5	2	1	1182	18	1182	18
17	Pola 17	0	0	0	0	0	0	0	0	0	0	0	7	1	58	1192	8	69136	464
18	Pola 18	0	0	0	0	0	0	0	0	0	0	0	1	9	1	1180	20	1180	20
19	Pola 19	0	0	0	0	0	0	0	0	0	0	0	0	10	9	1140	60	10260	540
20	Pola 20	0	0	0	0	0	0	0	0	0	0	0	0	5	1	570	630	570	630
		30	2	6	4	28	100	320	200	320	220	70	705	560	398			475500	2100
Jml Batang Realistis		398																	
Persentase Waste		0.44%																	

Kasus Perhitungan 12/19/2008 2:05:22 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 8

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	400	134	84	23172
2	Kebutuhan (batang)	12	102	56	144147
Jml Batang Teoritis		19.31			

Hasil

No		400	134	84	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	3	0	0	4	1200	0	4800	0
2	Pola 2	0	2	11	5	1192	8	5960	40
3	Pola 3	0	8	1	1	1156	44	1156	44
4	Pola 4	0	8	0	10	1072	128	10720	1280
5	Pola 5	0	4	0	1	536	664	536	664
		12	102	56	21			23172	2028
Jml Batang Realistis		21							
Persentase Waste		8.75%							

Kasus Perhitungan 12/19/2008 2:06:10 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	1200	400	50	4009600
2	Kebutuhan (batang)	3212	288	800	148447
Jml Batang Teoritis		3341.33			

Hasil

No		1200	400	50	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	3212	1200	0	3854400	0
2	Pola 2	0	3	0	96	1200	0	115200	0
3	Pola 3	0	0	24	33	1200	0	39600	0
4	Pola 4	0	0	8	1	400	800	400	800
		3212	288	800	3342			4009600	800
Jml Batang Realistis		3342							
Persentase Waste		0.02%							

Kasus Perhitungan 12/19/2008 2:06:45 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 22

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	1200	400	300	62600
2	Kebutuhan (batang)	28	5	90	148570
Jml Batang Teoritis		52.17			

Hasil

No		1200	400	300	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	28	1200	0	33600	0
2	Pola 2	0	3	0	1	1200	0	1200	0
3	Pola 3	0	2	1	1	1100	100	1100	100
4	Pola 4	0	0	4	22	1200	0	26400	0
5	Pola 5	0	0	1	1	300	900	300	900
		28	5	90	53			62600	1000
Jml Batang Realistis		53							
Persentase Waste		1.60%							

Kasus Perhitungan 12/19/2008 2:07:10 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Total
1	Panjang (cm)	1200	400	154	124	447600
2	Kebutuhan (batang)	64	172	1800	200	150806
Jml Batang Teoritis		373.00				

Hasil

No		1200	400	154	124	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	0	0	64	1200	0	76800	0	
2	Pola 2	0	3	0	0	57	1200	0	68400	0	
3	Pola 3	0	1	1	5	1	1174	26	1174	26	
4	Pola 4	0	0	2	7	27	1176	24	31752	648	
5	Pola 5	0	0	6	2	3	1172	28	3516	84	
6	Pola 6	0	0	7	0	246	1078	122	265188	30012	
7	Pola 7	0	0	5	0	1	770	430	770	430	
		64	172	1800	200	399			447600	31200	
Jml Batang Realistis		399									
Persentase Waste		6.97%									

Kasus Perhitungan 12/19/2008 2:07:33 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input

No		Tipe 1	Total
1	Panjang (cm)	1200	576000
2	Kebutuhan (batang)	480	151286
Jml Batang Teoritis		480.00	

Hasil

No		1200	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	480	1200	0	576000	0
		480	480			576000	0
Jml Batang Realistis		480					
Persentase Waste		0.00%					

Kasus Perhitungan 12/19/2008 2:07:57 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Total
1	Panjang (cm)	1200	200	190	124	819040
2	Kebutuhan (batang)	360	240	1680	160	153726
Jml Batang Teoritis		682.53				

Hasil

No		1200	200	190	124	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	360	1200	0	432000	0
2	Pola 2	0	6	0	0	40	1200	0	48000	0
3	Pola 3	0	0	5	2	80	1198	2	95840	160
4	Pola 4	0	0	6	0	213	1140	60	242820	12780
5	Pola 5	0	0	2	0	1	380	820	380	820
		360	240	1680	160	694			819040	13760
Jml Batang Realistis		694								
Persentase Waste		1.68%								

Kasus Perhitungan 12/19/2008 2:08:15 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 8

Input

No		Tipe 1	Total
1	Panjang (cm)	1200	144000
2	Kebutuhan (batang)	120	153846
Jml Batang Teoritis		120.00	

Hasil

No		1200	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	120	1200	0	144000	0
		120	120			144000	0
Jml Batang Realistis		120					
Persentase Waste		0.00%					

Kasus Perhitungan 12/19/2008 2:08:41 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 22

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Total
1	Panjang (cm)	1200	600	500	400	300	30300
2	Kebutuhan (batang)	7	16	5	5	26	153905
Jml Batang Teoritis		25.25					

Hasil

No		1200	600	500	400	300	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	0	0	0	7	1200	0	8400	0	
2	Pola 2	0	2	0	0	0	8	1200	0	9600	0	
3	Pola 3	0	0	1	1	1	5	1200	0	6000	0	
4	Pola 4	0	0	0	0	4	5	1200	0	6000	0	
5	Pola 5	0	0	0	0	1	1	300	900	300	900	
		7	16	5	5	26	26			30300	900	
Jml Batang Realistis		26										
Persentase Waste		2.97%										

Kasus Perhitungan 12/19/2008 2:09:14 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Total
1	Panjang (cm)	1200	600	500	300	26800
2	Kebutuhan (batang)	8	8	20	8	153949
Jml Batang Teoritis		22.33				

Hasil

No		1200	600	500	300	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	0	0	8	1200	0	9600	0	
2	Pola 2	0	2	0	0	4	1200	0	4800	0	
3	Pola 3	0	0	1	2	4	1100	100	4400	400	
4	Pola 4	0	0	2	0	8	1000	200	8000	1600	
		8	8	20	8	24			26800	2000	
Jml Batang Realistis		24									
Persentase Waste		7.46%									

Kasus Perhitungan 12/19/2008 2:09:35 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input

No		Tipe 1	Tipe 2	Total
1	Panjang (cm)	1200	400	14400
2	Kebutuhan (batang)	6	18	153973
Jml Batang Teoritis		12.00		

Hasil

No		1200	400	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	6	1200	0	7200	0
2	Pola 2	0	3	6	1200	0	7200	0
		6	18	12			14400	0
Jml Batang Realistis		12						
Persentase Waste		0.00%						

Kasus Perhitungan 12/19/2008 2:09:54 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input															
No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Total				
1	Panjang (cm)	1200	600	500	400	194	180	154	134	114	272800				
2	Kebutuhan (batang)	60	50	180	10	110	70	85	35	220	154793				
Jml Batang Teoritis		227.33													
Hasil															
No		1200	600	500	400	194	180	154	134	114	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	0	60	1200	0	72000	0
2	Pola 2	0	2	0	0	0	0	0	0	0	25	1200	0	30000	0
3	Pola 3	0	0	1	0	3	0	0	0	1	36	1196	4	43056	144
4	Pola 4	0	0	1	0	2	0	2	0	0	1	1196	4	1196	4
5	Pola 5	0	0	1	0	0	1	0	3	1	11	1196	4	13156	44
6	Pola 6	0	0	1	0	0	1	1	1	2	2	1196	4	2392	8
7	Pola 7	0	0	1	0	0	3	1	0	0	19	1194	6	22686	114
8	Pola 8	0	0	1	0	0	0	3	0	2	20	1190	10	23800	200
9	Pola 9	0	0	1	0	0	0	0	0	6	21	1184	16	24864	336
10	Pola 10	0	0	1	1	0	0	1	0	1	2	1168	32	2336	64
11	Pola 11	0	0	2	0	0	0	0	0	1	1	1114	86	1114	86
12	Pola 12	0	0	2	0	0	0	0	0	0	33	1000	200	33000	6600
13	Pola 13	0	0	0	3	0	0	0	0	0	2	1200	0	2400	0
14	Pola 14	0	0	0	2	0	0	0	0	0	1	800	400	800	400
		60	50	180	10	110	70	85	35	220	234			272800	8000
Jml Batang Realistis		234													
Persentase Waste		2.93%													

Kasus Perhitungan 12/19/2008 2:10:38 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 8

Input

No		Tipe 1	Total
1	Panjang (cm)	114	13680
2	Kebutuhan (batang)	120	154913
Jml Batang Teoritis		11.40	

Hasil

No		114	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	10	12	1140	60	13680	720
		120	12			13680	720
Jml Batang Realistis		12					
Persentase Waste		5.26%					

Kasus Perhitungan 12/19/2008 2:11:04 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Total
1	Panjang (cm)	1200	50	3909000
2	Kebutuhan (batang)	3220	900	159033
Jml Batang Teoritis		3257.50		

Hasil

No		1200	50	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	3220	1200	0	3864000	0
2	Pola 2	0	24	37	1200	0	44400	0
3	Pola 3	0	12	1	600	600	600	600
		3220	900	3258			3909000	600
Jml Batang Realistis		3258						
Persentase Waste		0.02%						

Kasus Perhitungan 12/19/2008 2:11:37 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 25

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Total
1	Panjang (cm)	1200	900	800	600	500	400	300	200	298500
2	Kebutuhan (batang)	139	6	28	106	4	66	33	10	159425
Jml Batang Teoritis		248.75								

Hasil

No		1200	900	800	600	500	400	300	200	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	139	1200	0	166800	0
2	Pola 2	0	1	0	0	0	0	1	0	6	1200	0	7200	0
3	Pola 3	0	0	1	0	0	1	0	0	28	1200	0	33600	0
4	Pola 4	0	0	0	2	0	0	0	0	53	1200	0	63600	0
5	Pola 5	0	0	0	0	2	0	0	1	2	1200	0	2400	0
6	Pola 6	0	0	0	0	0	3	0	0	12	1200	0	14400	0
7	Pola 7	0	0	0	0	0	1	2	1	2	1200	0	2400	0
8	Pola 8	0	0	0	0	0	0	4	0	5	1200	0	6000	0
9	Pola 9	0	0	0	0	0	0	2	3	1	1200	0	1200	0
10	Pola 10	0	0	0	0	0	0	1	3	1	900	300	900	300
		139	6	28	106	4	66	33	10	249			298500	300
Jml Batang Realistis		249												
Persentase Waste		0.10%												

Kasus Perhitungan 12/19/2008 2:12:14 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 22

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Total
1	Panjang (cm)	1200	800	600	400	300	200	287100
2	Kebutuhan (batang)	102	70	157	23	15	4	159796
Jml Batang Teoritis		239.25						

Hasil

No		1200	800	600	400	300	200	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	102	1200	0	122400	0
2	Pola 2	0	1	0	1	0	0	23	1200	0	27600	0
3	Pola 3	0	1	0	0	0	2	2	1200	0	2400	0
4	Pola 4	0	1	0	0	1	0	15	1100	100	16500	1500
5	Pola 5	0	1	0	0	0	0	30	800	400	24000	12000
6	Pola 6	0	0	2	0	0	0	78	1200	0	93600	0
7	Pola 7	0	0	1	0	0	0	1	600	600	600	600
		102	70	157	23	15	4	251			287100	14100
Jml Batang Realistis		251										
Persentase Waste		4.91%										

Kasus Perhitungan 12/19/2008 2:13:19 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 19

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Total
1	Panjang (cm)	1200	600	500	400	300	47400
2	Kebutuhan (batang)	7	1	6	84	6	159900
Jml Batang Teoritis		39.50					

Hasil

No		1200	600	500	400	300	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	7	1200	0	8400	0
2	Pola 2	0	1	0	0	2	1	1200	0	1200	0
3	Pola 3	0	0	1	1	1	4	1200	0	4800	0
4	Pola 4	0	0	2	0	0	1	1000	200	1000	200
5	Pola 5	0	0	0	3	0	26	1200	0	31200	0
6	Pola 6	0	0	0	2	0	1	800	400	800	400
		7	1	6	84	6	40			47400	600
Jml Batang Realistis		40									
Persentase Waste		1.27%									

Kasus Perhitungan 12/19/2008 2:13:53 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	800	400	300	44000
2	Kebutuhan (batang)	16	48	40	160004
Jml Batang Teoritis		36.67			

Hasil

No		800	400	300	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	1	0	16	1200	0	19200	0
2	Pola 2	0	3	0	10	1200	0	12000	0
3	Pola 3	0	2	1	1	1100	100	1100	100
4	Pola 4	0	0	4	9	1200	0	10800	0
5	Pola 5	0	0	3	1	900	300	900	300
		16	48	40	37			44000	400
Jml Batang Realistis		37							
Persentase Waste		0.91%							

Kasus Perhitungan 12/19/2008 2:14:47 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Tipe 11	Tipe 12	Total
1	Panjang (cm)	1200	800	700	600	500	400	314	300	234	220	194	164	654552
2	Kebutuhan (batang)	94	12	6	4	4	38	430	62	1380	4	58	120	162216
Jml Batang Teoritis		545.46												

Hasil

No		1200	800	700	600	500	400	314	300	234	220	194	164	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	0	0	0	0	94	1200	0	112800	0
2	Pola 2	0	1	0	0	0	1	0	0	0	0	0	0	12	1200	0	14400	0
3	Pola 3	0	0	1	0	1	0	0	0	0	0	0	0	4	1200	0	4800	0
4	Pola 4	0	0	1	0	0	0	0	1	0	0	1	0	2	1194	6	2388	12
5	Pola 5	0	0	0	2	0	0	0	0	0	0	0	0	2	1200	0	2400	0
6	Pola 6	0	0	0	0	0	3	0	0	0	0	0	0	8	1200	0	9600	0
7	Pola 7	0	0	0	0	0	2	0	0	1	0	0	1	1	1198	2	1198	2
8	Pola 8	0	0	0	0	0	0	1	1	0	0	3	0	18	1196	4	21528	72
9	Pola 9	0	0	0	0	0	0	1	0	2	1	1	0	2	1196	4	2392	8
10	Pola 10	0	0	0	0	0	0	2	0	1	0	0	2	59	1190	10	70210	590
11	Pola 11	0	0	0	0	0	0	1	0	3	0	0	1	1	1180	20	1180	20
12	Pola 12	0	0	0	0	0	0	3	0	1	0	0	0	97	1176	24	114072	2328
13	Pola 13	0	0	0	0	0	0	0	4	0	0	0	0	10	1200	0	12000	0
14	Pola 14	0	0	0	0	0	0	0	2	2	0	0	0	1	1068	132	1068	132
15	Pola 15	0	0	0	0	0	0	0	0	5	0	0	0	242	1170	30	283140	7260
16	Pola 16	0	0	0	0	0	0	0	0	4	1	0	0	1	1156	44	1156	44
17	Pola 17	0	0	0	0	0	0	0	0	0	1	0	0	1	220	980	220	980
Jml Batang Realistis		555																
Persentase Waste		1.75%																
															654552	11448		

Kasus Perhitungan 12/19/2008 2:15:49 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Tipe 11	Tipe 12	Tipe 13	Tipe 14	Tipe 15	Tipe 16	Tipe 17	Tipe 18	Tipe 19	Total
1	Panjang (cm)	1200	1000	800	600	500	400	300	284	234	204	194	184	174	164	155	154	144	124	114	943290
2	Kebutuhan (batang)	78	8	10	22	2	46	8	750	440	160	625	460	350	345	30	410	45	400	25	166430
Jml Batang Teoritis		786.08																			

Hasil

No		1200	1000	800	600	500	400	300	284	234	204	194	184	174	164	155	154	144	124	114	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	1200	0	93600	0
2	Pola 2	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	8	1194	6	9552	48
3	Pola 3	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1200	0	12000	0
4	Pola 4	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1200	0	13200	0
5	Pola 5	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4	1	0	0	2	1200	0	2400	0
6	Pola 6	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	12	1200	0	14400	0
7	Pola 7	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1200	0	2400	0
8	Pola 8	0	0	0	0	0	0	3	0	0	0	1	0	1	0	0	0	0	0	0	250	1200	0	300000	0
9	Pola 9	0	0	0	0	0	0	0	1	1	1	1	0	0	0	2	0	1	0	1	15	1200	0	18000	0
10	Pola 10	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	3	0	132	1198	2	158136	264
11	Pola 11	0	0	0	0	0	0	0	0	1	2	1	0	0	0	0	0	0	2	1	1	1198	2	1198	2
12	Pola 12	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	1	0	2	4	1198	2	4792	8
13	Pola 13	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	4	0	0	4	1198	2	4792	8
14	Pola 14	0	0	0	0	0	0	0	0	1	2	0	0	0	0	0	1	2	0	1	1	1198	2	1198	2
15	Pola 15	0	0	0	0	0	0	0	0	1	0	1	0	0	0	5	0	0	0	0	81	1198	2	97038	162
16	Pola 16	0	0	0	0	0	0	0	0	1	0	0	1	0	1	4	0	0	0	0	1	1198	2	1198	2
17	Pola 17	0	0	0	0	0	0	0	0	1	0	4	1	0	0	0	0	0	0	0	60	1194	6	71640	360
18	Pola 18	0	0	0	0	0	0	0	0	1	3	0	0	2	0	0	0	0	0	0	1	1194	6	1194	6
19	Pola 19	0	0	0	0	0	0	0	0	3	0	0	0	0	3	0	0	0	0	0	31	1194	6	37014	186
20	Pola 20	0	0	0	0	0	0	0	0	2	1	0	1	1	0	0	0	0	0	0	1	1194	6	1194	6
21	Pola 21	0	0	0	0	0	0	0	0	2	1	0	0	3	0	0	0	0	0	0	1	1194	6	1194	6
22	Pola 22	0	0	0	0	0	0	0	0	2	0	0	3	1	0	0	0	0	0	0	21	1194	6	25074	126
23	Pola 23	0	0	0	0	0	0	0	0	1	0	0	5	0	0	0	0	0	0	0	1	1154	46	1154	46
24	Pola 24	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	13	1104	96	14352	1248
25	Pola 25	0	0	0	0	0	0	0	0	0	0	2	4	0	0	0	0	0	0	0	1	1064	136	1064	136
26	Pola 26	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	53	1044	156	55332	8268
27	Pola 27	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	174	1026	174	1026
		78	8	10	22	2	46	8	750	440	160	625	460	350	345	30	410	45	400	25	796			943290	11910
Jml Batang Realistis		796																							
Persentase Waste		1.26%																							

Kasus Perhitungan 12/19/2008 2:22:00 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 8

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	400	114	89	36006
2	Kebutuhan (batang)	12	255	24	166721
Jml Batang Teoritis		30.01			

Hasil

No		400	114	89	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	3	0	0	4	1200	0	4800	0
2	Pola 2	0	5	7	3	1193	7	3579	21
3	Pola 3	0	8	3	1	1179	21	1179	21
4	Pola 4	0	10	0	23	1140	60	26220	1380
5	Pola 5	0	2	0	1	228	972	228	972
		12	255	24	32			36006	2394
Jml Batang Realistis		32							
Persentase Waste		6.65%							

Kasus Perhitungan 12/19/2008 2:22:39 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Total
1	Panjang (cm)	630	400	9840
2	Kebutuhan (batang)	8	12	166741
Jml Batang Teoritis		8.20		

Hasil

No		630	400	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	1	8	1030	170	8240	1360
2	Pola 2	0	3	1	1200	0	1200	0
3	Pola 3	0	1	1	400	800	400	800
		8	12	10			9840	2160
Jml Batang Realistis		10						
Persentase Waste		21.95%						

Kasus Perhitungan 12/19/2008 2:23:05 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	630	400	94	56550
2	Kebutuhan (batang)	36	60	105	166942
Jml Batang Teoritis		47.13			

Hasil

No		630	400	94	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	6	17	1194	6	20298	102
2	Pola 2	1	1	1	3	1124	76	3372	228
3	Pola 3	1	1	0	16	1030	170	16480	2720
4	Pola 4	0	3	0	13	1200	0	15600	0
5	Pola 5	0	2	0	1	800	400	800	400
		36	60	105	50			56550	3450
Jml Batang Realistis		50							
Persentase Waste		6.10%							

Kasus Perhitungan 12/19/2008 2:23:34 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Total
1	Panjang (cm)	800	500	400	300	35800
2	Kebutuhan (batang)	28	10	12	12	167004
Jml Batang Teoritis		29.83				

Hasil

No		800	500	400	300	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	1	0	12	1200	0	14400	0	
2	Pola 2	1	0	0	1	12	1100	100	13200	1200	
3	Pola 3	1	0	0	0	4	800	400	3200	1600	
4	Pola 4	0	2	0	0	5	1000	200	5000	1000	
		28	10	12	12	33			35800	3800	
Jml Batang Realistis		33									
Persentase Waste		10.61%									

Kasus Perhitungan 12/19/2008 2:23:59 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	1000	800	154	260800
2	Kebutuhan (batang)	180	24	400	167608
Jml Batang Teoritis		217.33			

Hasil

No		1000	800	154	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	1	180	1154	46	207720	8280
2	Pola 2	0	1	2	24	1108	92	26592	2208
3	Pola 3	0	0	7	24	1078	122	25872	2928
4	Pola 4	0	0	4	1	616	584	616	584
		180	24	400	229			260800	14000
Jml Batang Realistis		229							
Persentase Waste		5.37%							

Kasus Perhitungan 12/19/2008 2:24:29 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Total
1	Panjang (cm)	1200	344	1169040
2	Kebutuhan (batang)	312	2310	170230
Jml Batang Teoritis		974.20		

Hasil

No		1200	344	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	312	1200	0	374400	0
2	Pola 2	0	3	770	1032	168	794640	129360
		312	2310	1082			1169040	129360
Jml Batang Realistis		1082						
Persentase Waste		11.07%						

Kasus Perhitungan 12/19/2008 2:25:19 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Total
1	Panjang (cm)	360	86400
2	Kebutuhan (batang)	240	170470
Jml Batang Teoritis		72.00	

Hasil

No		360	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	3	80	1080	120	86400	9600
		240	80			86400	9600
Jml Batang Realistis		80					
Persentase Waste		11.11%					

Kasus Perhitungan 12/19/2008 2:25:39 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Total
1	Panjang (cm)	680	680	360	290	234	224	174	84	424660
2	Kebutuhan (batang)	110	110	200	110	110	110	110	1210	172540
Jml Batang Teoritis		353.88								

Hasil

No		680	680	360	290	234	224	174	84	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	2	2	55	1196	4	65780	220
2	Pola 2	1	0	0	1	0	1	0	0	55	1194	6	65670	330
3	Pola 3	0	1	0	1	0	1	0	0	55	1194	6	65670	330
4	Pola 4	0	1	0	0	0	0	0	6	55	1184	16	65120	880
5	Pola 5	0	0	1	0	0	0	0	10	77	1200	0	92400	0
6	Pola 6	0	0	2	0	2	0	0	0	55	1188	12	65340	660
7	Pola 7	0	0	3	0	0	0	0	0	4	1080	120	4320	480
8	Pola 8	0	0	1	0	0	0	0	0	1	360	840	360	840
		110	110	200	110	110	110	110	1210	357			424660	3740
Jml Batang Realistis		357												
Persentase Waste		0.88%												

Kasus Perhitungan 12/19/2008 2:26:14 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Total
1	Panjang (cm)	164	124	220480
2	Kebutuhan (batang)	800	720	174060
Jml Batang Teoritis		183.73		

Hasil

No		164	124	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	2	7	102	1196	4	121992	408
2	Pola 2	5	3	2	1192	8	2384	16
3	Pola 3	7	0	83	1148	52	95284	4316
4	Pola 4	5	0	1	820	380	820	380
		800	720	188			220480	5120
Jml Batang Realistis		188						
Persentase Waste		2.32%						

Kasus Perhitungan 12/19/2008 2:26:52 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Total
1	Panjang (cm)	360	4320
2	Kebutuhan (batang)	12	174072
Jml Batang Teoritis		3.60	

Hasil

No		360	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	3	4	1080	120	4320	480
		12	4			4320	480
Jml Batang Realistis		4					
Persentase Waste		11.11%					

Kasus Perhitungan 12/19/2008 2:28:39 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Tipe 11	Tipe 12	Tipe 13	Tipe 14	Tipe 15	Total
1	Panjang (cm)	494	480	440	384	355	320	300	224	220	190	174	167	155	134	64	259448
2	Kebutuhan (batang)	8	16	192	8	32	28	25	96	40	96	96	96	8	86	600	175499
Jml Batang Teoritis		216.21															

Hasil

No		494	480	440	384	355	320	300	224	220	190	174	167	155	134	64	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	0	0	0	0	2	2	2	4	1200	0	4800	0
2	Pola 2	1	0	0	0	0	0	0	0	0	0	1	2	0	1	1	4	1200	0	4800	0
3	Pola 3	0	1	0	0	1	0	0	0	0	0	0	1	0	1	1	16	1200	0	19200	0
4	Pola 4	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	28	1200	0	33600	0
5	Pola 5	0	0	2	0	0	0	0	0	0	0	0	0	0	5	5	68	1200	0	81600	0
6	Pola 6	0	0	0	1	0	0	0	0	1	0	0	2	0	1	2	8	1200	0	9600	0
7	Pola 7	0	0	0	0	1	0	0	1	0	0	0	1	0	1	5	16	1200	0	19200	0
8	Pola 8	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	6	1200	0	7200	0
9	Pola 9	0	0	0	0	0	0	1	0	2	0	0	0	0	2	3	1	1200	0	1200	0
10	Pola 10	0	0	0	0	0	0	0	1	0	0	1	4	0	1	0	10	1200	0	12000	0
11	Pola 11	0	0	0	0	0	0	0	1	0	0	3	0	0	1	5	22	1200	0	26400	0
12	Pola 12	0	0	0	0	0	0	0	4	0	0	1	0	0	0	2	11	1198	2	13178	22
13	Pola 13	0	0	0	0	0	0	0	3	0	0	3	0	0	0	0	1	1194	6	1194	6
14	Pola 14	0	0	0	0	0	0	0	1	1	3	1	0	0	0	0	1	1188	12	1188	12
15	Pola 15	0	0	0	0	0	0	0	0	2	4	0	0	0	0	0	14	1200	0	16800	0
16	Pola 16	0	0	0	0	0	0	0	0	1	5	0	0	0	0	0	1	1170	30	1170	30
17	Pola 17	0	0	0	0	0	0	0	0	0	5	1	0	0	0	1	1	1188	12	1188	12
18	Pola 18	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	4	1140	60	4560	240
19	Pola 19	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	1	570	630	570	630
		8	16	192	8	32	28	25	96	40	96	96	96	8	86	600	217			259448	952
Jml Batang Realistis		217																			
Persentase Waste		0.37%																			

Kasus Perhitungan 12/19/2008 2:29:53 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Total
1	Panjang (cm)	314	124	120	84	224	53188
2	Kebutuhan (batang)	90	18	23	184	20	175834
Jml Batang Teoritis		44.32					

Hasil

No		314	124	120	84	224	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	2	1	0	0	2	10	1200	0	12000	0
2	Pola 2	2	2	2	1	0	4	1200	0	4800	0
3	Pola 3	3	0	0	3	0	20	1194	6	23880	120
4	Pola 4	2	0	4	1	0	1	1192	8	1192	8
5	Pola 5	0	0	10	0	0	1	1200	0	1200	0
6	Pola 6	0	0	1	12	0	1	1128	72	1128	72
7	Pola 7	0	0	0	14	0	7	1176	24	8232	168
8	Pola 8	0	0	0	9	0	1	756	444	756	444
		90	18	23	184	20	45			53188	812
Jml Batang Realistis		45									
Persentase Waste		1.53%									

Kasus Perhitungan 12/19/2008 2:30:41 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Total
1	Panjang (cm)	1200	600	500	200	29600
2	Kebutuhan (batang)	8	16	8	32	175898
Jml Batang Teoritis		24.67				

Hasil

No		1200	600	500	200	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	8	1200	0	9600	0
2	Pola 2	0	2	0	0	8	1200	0	9600	0
3	Pola 3	0	0	2	1	4	1200	0	4800	0
4	Pola 4	0	0	0	6	4	1200	0	4800	0
5	Pola 5	0	0	0	4	1	800	400	800	400
		8	16	8	32	25			29600	400
Jml Batang Realistis		25								
Persentase Waste		1.35%								

Kasus Perhitungan 12/19/2008 2:31:08 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input

No		Tipe 1	Total
1	Panjang (cm)	200	2800
2	Kebutuhan (batang)	14	175912
Jml Batang Teoritis			2.33

Hasil

No		200	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	6	2	1200	0	2400	0
2	Pola 2	2	1	400	800	400	800
		14	3			2800	800
Jml Batang Realistis			3				
Persentase Waste			28.57%				

Kasus Perhitungan 12/19/2008 2:32:25 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Total
1	Panjang (cm)	1200	114	26622
2	Kebutuhan (batang)	20	23	175955
Jml Batang Teoritis		22.19		

Hasil

No		1200	114	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	20	1200	0	24000	0
2	Pola 2	0	10	2	1140	60	2280	120
3	Pola 3	0	3	1	342	858	342	858
		20	23	23			26622	978
Jml Batang Realistis		23						
Persentase Waste		3.67%						

Kasus Perhitungan 12/19/2008 2:32:56 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 19

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	1200	700	154	70702
2	Kebutuhan (batang)	24	24	163	176166
Jml Batang Teoritis		58.92			

Hasil

No		1200	700	154	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	24	1200	0	28800	0
2	Pola 2	0	1	3	24	1162	38	27888	912
3	Pola 3	0	0	7	13	1078	122	14014	1586
		24	24	163	61			70702	2498
Jml Batang Realistis		61							
Persentase Waste		3.53%							

Kasus Perhitungan 12/19/2008 2:33:17 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 16

Input

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	1200	700	500	306600
2	Kebutuhan (batang)	24	24	522	176736
Jml Batang Teoritis		255.50			

Hasil

No		1200	700	500	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	24	1200	0	28800	0
2	Pola 2	0	1	1	24	1200	0	28800	0
3	Pola 3	0	0	2	249	1000	200	249000	49800
		24	24	522	297			306600	49800
Jml Batang Realistis		297							
Persentase Waste		16.24%							

Kasus Perhitungan 12/19/2008 2:33:40 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 13

Input

No		Tipe 1	Tipe 2	Total
1	Panjang (cm)	1200	700	314000
2	Kebutuhan (batang)	152	188	177076
Jml Batang Teoritis		261.67		

Hasil

No		1200	700	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	152	1200	0	182400	0
2	Pola 2	0	1	188	700	500	131600	94000
		152	188	340			314000	94000
Jml Batang Realistis		340						
Persentase Waste		29.94%						

Kasus Perhitungan 12/19/2008 2:34:31 PM untuk Lokasi PROYEK XYZ dengan panjang besi 1200 berdiameter 10

Input

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Total
1	Panjang (cm)	1200	700	134	108	70	243218
2	Kebutuhan (batang)	133	84	163	12	24	177492
Jml Batang Teoritis		202.68					

Hasil

No		1200	700	134	108	70	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	0	0	0	133	1200	0	159600	0	
2	Pola 2	0	1	0	2	4	6	1196	4	7176	24	
3	Pola 3	0	1	3	0	0	54	1102	98	59508	5292	
4	Pola 4	0	1	1	0	0	1	834	366	834	366	
5	Pola 5	0	1	0	0	0	23	700	500	16100	11500	
		133	84	163	12	24	217			243218	17182	
Jml Batang Realistis		217										
Persentase Waste		7.06%										

**REKAPITULASI OUTPUT SOWB
PROYEK XYZ**

NO	DIAMETER (mm)	SHEET	JUMLAH BATANG TEORITIS	JUMLAH BATANG REALISTIS	TOTAL PANJANG (cm)	TOTAL WASTE (cm)	PERSENTASE WASTE
1	D25	Sheet 1	4,033.50	4,226.00	4,840,200.00	231,000.00	4.77%
	D19	Sheet 2	105.08	148.00	126,096.00	51,504.00	40.85%
	D13	Sheet 3	3,667.16	3,692.00	4,400,592.00	29,808.00	0.68%
	D10	Sheet 4	4.06	5.00	4,872.00	1,128.00	23.15%
2	D16	Sheet 5	1,223.00	1,320.00	1,467,600.00	116,400.00	7.93%
	D13	Sheet 6	956.30	982.00	1,147,560.00	30,840.00	2.69%
3	D16	Sheet 7	268.67	362.00	322,400.00	112,000.00	34.74%
	D13	Sheet 8	1,205.13	1,206.00	1,446,160.00	1,040.00	0.07%
	D10	Sheet 9	931.33	1,060.00	1,117,600.00	154,400.00	13.82%
	D8	Sheet 10	20.00	24.00	24,000.00	4,800.00	20.00%
4	D25	Sheet 11	710.73	712.00	852,880.00	1,520.00	0.18%
	D16	Sheet 12	30.00	30.00	36,000.00	0.00	0.00%
	D13	Sheet 13	991.70	1,035.00	1,190,044.00	51,956.00	4.37%
5	D16	Sheet 14	50.53	65.00	60,630.00	17,370.00	28.65%
	D13	Sheet 15	24.67	27.00	29,600.00	2,800.00	9.46%
	D10	Sheet 16	46.29	54.00	55,545.00	9,255.00	16.66%
	D8	Sheet 17	13.02	15.00	15,620.00	2,380.00	15.24%
6	D10	Sheet 18	89.09	97.00	106,906.00	9,494.00	8.88%
7	D22	Sheet 19	974.00	1,017.00	1,168,800.00	51,600.00	4.41%
	D19	Sheet 20	93.07	144.00	111,680.00	61,120.00	54.73%
	D16	Sheet 21	347.50	377.00	417,000.00	35,400.00	8.49%
	D13	Sheet 22	1,503.80	1,521.00	1,804,560.00	20,640.00	1.14%
	D10	Sheet 23	16.38	19.00	19,660.00	3,140.00	15.97%
8	D22	Sheet 24	3,416.00	3,485.00	4,099,200.00	82,800.00	2.02%
	D19	Sheet 25	37.33	56.00	44,800.00	22,400.00	50.00%
	D16	Sheet 26	28.00	28.00	33,600.00	0.00	0.00%
	D13	Sheet 27	7,294.57	7,609.00	8,753,479.00	377,321.00	4.31%
	D10	Sheet 28	249.27	251.00	299,124.00	2,076.00	0.69%
9	D32	Sheet 29	2,686.00	2,844.00	3,223,200.00	189,600.00	5.88%
	D19	Sheet 30	2,249.00	2,249.00	2,698,800.00	0.00	0.00%
	D16	Sheet 31	2,191.23	2,207.00	2,629,470.00	18,930.00	0.72%
10	D10	Sheet 32	218.40	364.00	262,080.00	174,720.00	66.67%
	D8	Sheet 33	299.95	336.00	359,940.00	43,260.00	12.02%
11	D8	Sheet 34	77.68	80.00	93,220.00	2,780.00	2.98%
12	D10	Sheet 35	1,098.24	1,230.00	1,317,890.00	158,110.00	12.00%
13	D25	Sheet 36	360.17	383.00	432,200.00	27,400.00	6.34%
	D22	Sheet 37	155.58	157.00	186,700.00	1,700.00	0.91%
	D19	Sheet 38	1.33	2.00	1,600.00	800.00	50.00%
	D16	Sheet 39	96.75	97.00	116,100.00	300.00	0.26%
	D13	Sheet 40	907.31	917.00	1,088,766.00	11,634.00	1.07%
	D10	Sheet 41	180.45	187.00	216,544.00	7,856.00	3.63%
14	D10	Sheet 42	156.89	176.00	188,270.00	22,930.00	12.18%
15	D25	Sheet 43	576.83	618.00	692,200.00	49,400.00	7.14%
	D22	Sheet 44	51.25	52.00	61,500.00	900.00	1.46%
	D19	Sheet 45	9.00	10.00	10,800.00	1,200.00	11.11%
	D16	Sheet 46	74.00	74.00	88,800.00	0.00	0.00%
	D13	Sheet 47	917.57	925.00	1,101,082.00	8,918.00	0.81%
	D10	Sheet 48	396.25	398.00	475,500.00	2,100.00	0.44%
	D8	Sheet 49	19.31	21.00	23,172.00	2,028.00	8.75%
16	D10	Sheet 50	3,341.33	3,342.00	4,009,600.00	800.00	0.02%
17	D22	Sheet 51	52.17	53.00	62,600.00	1,000.00	1.60%
	D16	Sheet 52	373.00	399.00	447,600.00	31,200.00	6.97%
	D13	Sheet 53	480.00	480.00	576,000.00	0.00	0.00%
	D10	Sheet 54	682.53	694.00	819,040.00	13,760.00	1.68%
	D8	Sheet 55	120.00	120.00	144,000.00	0.00	0.00%
18	D22	Sheet 56	25.25	26.00	30,300.00	900.00	2.97%
	D16	Sheet 57	22.33	24.00	26,800.00	2,000.00	7.46%
	D13	Sheet 58	12.00	12.00	14,400.00	0.00	0.00%
	D10	Sheet 59	227.33	234.00	272,800.00	8,000.00	2.93%
	D8	Sheet 60	11.40	12.00	13,680.00	720.00	5.26%
19	D10	Sheet 61	3,257.50	3,258.00	3,909,000.00	600.00	0.02%
20	D25	Sheet 62	248.75	249.00	298,500.00	300.00	0.10%
	D22	Sheet 63	239.25	251.00	287,100.00	14,100.00	4.91%
	D19	Sheet 64	39.50	40.00	47,400.00	600.00	1.27%
	D16	Sheet 65	36.67	37.00	44,000.00	400.00	0.91%
	D13	Sheet 66	545.46	555.00	654,552.00	11,448.00	1.75%
	D10	Sheet 67	786.08	796.00	943,290.00	11,910.00	1.26%
	D8	Sheet 68	30.01	32.00	36,006.00	2,394.00	6.65%
21	D16	Sheet 69	8.20	10.00	9,840.00	2,160.00	21.95%
	D10	Sheet 70	47.13	50.00	56,550.00	3,450.00	6.10%
22	D16	Sheet 71	29.83	33.00	35,800.00	3,800.00	10.61%
	D10	Sheet 72	217.33	229.00	260,800.00	14,000.00	5.37%
23	D10	Sheet 73	974.20	1,082.00	1,169,040.00	129,360.00	11.07%
24	D16	Sheet 74	72.00	80.00	86,400.00	9,600.00	11.11%
	D13	Sheet 75	353.88	357.00	424,660.00	3,740.00	0.88%
	D10	Sheet 76	183.73	188.00	220,480.00	5,120.00	2.32%
25	D16	Sheet 77	3.60	4.00	4,320.00	480.00	11.11%
	D13	Sheet 78	216.21	217.00	259,448.00	952.00	0.37%
	D10	Sheet 79	44.32	45.00	53,188.00	812.00	1.53%
26	D16	Sheet 80	24.67	25.00	29,600.00	400.00	1.35%
	D13	Sheet 81	2.33	3.00	2,800.00	800.00	28.57%
	D10	Sheet 82	22.19	23.00	26,622.00	978.00	3.67%
27	D19	Sheet 83	58.92	61.00	70,702.00	2,498.00	3.53%
	D16	Sheet 84	255.50	297.00	306,600.00	49,800.00	16.24%
	D13	Sheet 85	261.67	340.00	314,000.00	94,000.00	29.94%
	D10	Sheet 86	202.68	217.00	243,218.00	17,182.00	7.06%

REKAPITULASI OUTPUT SOWB PER DIAMETER
PROYEK XYZ

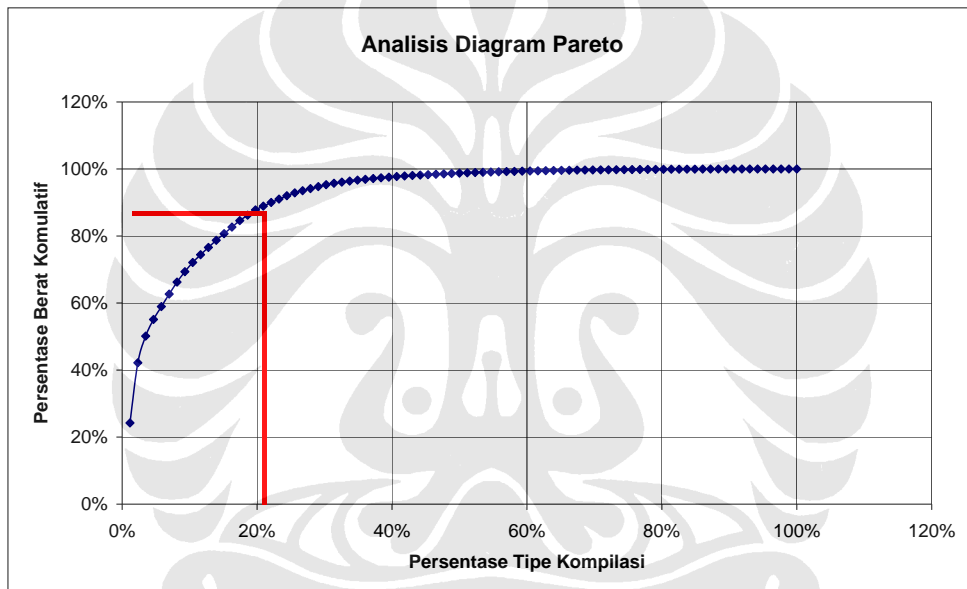
DIAMETER (mm)	SHEET	JUMLAH BATANG TEORITIS	JUMLAH BATANG REALISTIS	TOTAL PANJANG		TOTAL BERAT		PERSENTASE WASTE
				BESI (cm)	WASTE (cm)	BESI (Kg)	WASTE (Kg)	
D32	Sheet 29	2.686.00	2.844.00	3,223,200.00	189,600.00	203,706.24	11,982.72	5.88%
TOTAL		2,686.00	2,844.00	3,223,200.00	189,600.00	203,706.24	11,982.72	5.88%
D25	Sheet 11	710.73	712.00	852,880.00	1,520.00	32,835.88	58.52	0.18%
D25	Sheet 36	360.17	383.00	432,200.00	27,400.00	16,639.70	1,054.90	6.34%
D25	Sheet 43	576.83	618.00	692,200.00	49,400.00	26,649.70	1,901.90	7.14%
D25	Sheet 62	248.75	249.00	298,500.00	300.00	11,492.25	11.55	0.10%
D25	Sheet 1	4,033.50	4,226.00	4,840,200.00	231,000.00	186,347.70	8,893.50	4.77%
TOTAL		5,929.98	6,188.00	7,115,980.00	309,620.00	273,965.23	11,920.37	4.35%
D22	Sheet 19	974.00	1,017.00	1,168,800.00	51,600.00	34,830.24	1,537.68	4.41%
D22	Sheet 24	3,416.00	3,485.00	4,099,200.00	82,800.00	122,156.16	2,467.44	2.02%
D22	Sheet 37	155.58	157.00	186,700.00	1,700.00	5,563.66	50.66	0.91%
D22	Sheet 44	51.25	52.00	61,500.00	900.00	1,832.70	26.82	1.46%
D22	Sheet 51	52.17	53.00	62,600.00	1,000.00	1,865.48	29.80	1.60%
D22	Sheet 56	25.25	26.00	30,300.00	900.00	902.94	26.82	2.97%
D22	Sheet 63	239.25	251.00	287,100.00	14,100.00	8,555.58	420.18	4.91%
TOTAL		4,913.50	5,041.00	5,896,200.00	153,000.00	175,706.76	4,559.40	2.59%
D19	Sheet 2	105.08	148.00	126,096.00	51,504.00	2,805.64	1,145.96	40.85%
D19	Sheet 20	93.07	144.00	111,680.00	61,120.00	2,484.88	1,359.92	54.73%
D19	Sheet 25	37.33	56.00	44,800.00	22,400.00	996.80	498.40	50.00%
D19	Sheet 30	2,249.00	2,249.00	2,698,800.00	0.00	60,048.30	0.00	0.00%
D19	Sheet 38	1.33	2.00	1,600.00	800.00	35.60	17.80	50.00%
D19	Sheet 45	9.00	10.00	10,800.00	1,200.00	240.30	26.70	11.11%
D19	Sheet 64	39.50	40.00	47,400.00	600.00	1,054.65	13.35	1.27%
D19	Sheet 83	58.92	61.00	70,702.00	2,498.00	1,573.12	55.58	3.53%
TOTAL		2,593.23	2,710.00	3,111,878.00	140,122.00	69,239.29	3,117.71	4.50%
D16	Sheet 5	1,223.00	1,320.00	1,467,600.00	116,400.00	23,188.08	1,839.12	7.93%
D16	Sheet 7	268.67	362.00	322,400.00	112,000.00	5,093.92	1,769.60	34.74%
D16	Sheet 12	30.00	30.00	36,000.00	0.00	568.80	0.00	0.00%
D16	Sheet 14	50.53	65.00	60,630.00	17,370.00	957.95	274.45	28.65%
D16	Sheet 21	347.50	377.00	417,000.00	35,400.00	6,588.60	559.32	8.49%
D16	Sheet 26	28.00	28.00	33,600.00	0.00	530.88	0.00	0.00%
D16	Sheet 31	2,191.23	2,207.00	2,629,470.00	18,930.00	41,545.63	299.09	0.72%
D16	Sheet 39	96.75	97.00	116,100.00	300.00	1,834.38	4.74	0.26%
D16	Sheet 46	74.00	74.00	88,800.00	0.00	1,403.04	0.00	0.00%
D16	Sheet 52	373.00	399.00	447,600.00	31,200.00	7,072.08	492.96	6.97%
D16	Sheet 57	22.33	24.00	26,800.00	2,000.00	423.44	31.60	7.46%
D16	Sheet 65	36.67	37.00	44,000.00	400.00	695.20	6.32	0.91%
D16	Sheet 69	8.20	10.00	9,840.00	2,160.00	155.47	34.13	21.95%
D16	Sheet 71	29.83	33.00	35,800.00	3,800.00	565.64	60.04	10.61%
D16	Sheet 74	72.00	80.00	86,400.00	9,600.00	1,365.12	151.68	11.11%
D16	Sheet 77	3.60	4.00	4,320.00	480.00	68.26	7.58	11.11%
D16	Sheet 80	24.67	25.00	29,600.00	400.00	467.68	6.32	1.35%
D16	Sheet 84	255.50	297.00	306,600.00	49,800.00	4,844.28	786.84	16.24%
TOTAL		5,135.48	5,469.00	6,162,560.00	400,240.00	97,368.45	6,323.79	6.49%
D13	Sheet 3	3,667.16	3,692.00	4,400,592.00	29,808.00	45,854.17	310.60	0.68%
D13	Sheet 6	956.30	982.00	1,147,560.00	30,840.00	11,957.58	321.35	2.89%
D13	Sheet 8	1,205.13	1,206.00	1,446,160.00	1,040.00	15,068.99	10.84	0.07%
D13	Sheet 13	991.70	1,035.00	1,190,044.00	51,956.00	12,400.26	541.38	4.37%
D13	Sheet 15	24.67	27.00	29,600.00	2,800.00	308.43	29.18	9.46%
D13	Sheet 22	1,503.80	1,521.00	1,804,560.00	20,640.00	18,803.52	215.07	1.14%
D13	Sheet 27	7,294.57	7,609.00	8,753,479.00	377,321.00	91,211.25	3,931.68	4.31%
D13	Sheet 40	907.31	917.00	1,088,766.00	11,634.00	11,344.94	121.23	1.07%
D13	Sheet 47	917.57	925.00	1,101,082.00	8,918.00	11,473.27	92.93	0.81%
D13	Sheet 53	480.00	480.00	576,000.00	0.00	6,001.92	0.00	0.00%
D13	Sheet 58	12.00	12.00	14,400.00	0.00	150.05	0.00	0.00%
D13	Sheet 66	545.46	555.00	654,552.00	11,448.00	6,820.43	119.29	1.75%
D13	Sheet 75	353.88	357.00	424,660.00	3,740.00	4,424.96	38.97	0.88%
D13	Sheet 78	216.21	217.00	259,448.00	952.00	2,703.45	9.92	0.37%
D13	Sheet 81	2.33	3.00	2,800.00	800.00	29.18	8.34	28.57%
D13	Sheet 85	261.67	340.00	314,000.00	94,000.00	3,271.88	979.48	29.94%
TOTAL		19,339.76	19,878.00	23,207,703.00	645,897.00	241,824.27	6,730.25	2.78%
D10	Sheet 4	4.06	5.00	4,872.00	1,128.00	30.06	6.96	23.15%
D10	Sheet 9	931.33	1,060.00	1,117,600.00	154,400.00	6,895.59	952.65	13.82%
D10	Sheet 16	46.29	54.00	55,545.00	9,255.00	342.71	57.10	16.66%
D10	Sheet 18	89.09	97.00	106,906.00	9,494.00	659.61	58.58	8.88%
D10	Sheet 23	16.38	19.00	19,660.00	3,140.00	121.30	19.37	15.97%
D10	Sheet 28	249.27	251.00	299,124.00	2,076.00	1,845.60	12.81	0.89%
D10	Sheet 32	218.40	364.00	262,080.00	174,720.00	1,617.03	1,078.02	66.67%
D10	Sheet 35	1,098.24	1,230.00	1,317,890.00	158,110.00	8,131.38	975.54	12.00%
D10	Sheet 41	180.45	187.00	216,544.00	7,856.00	1,336.08	48.47	3.63%
D10	Sheet 42	156.89	176.00	188,270.00	22,930.00	1,161.63	141.48	12.18%
D10	Sheet 48	396.25	398.00	475,500.00	2,100.00	2,933.84	12.96	0.44%
D10	Sheet 50	3,341.33	3,342.00	4,009,600.00	800.00	24,739.23	4.94	0.02%
D10	Sheet 54	682.53	694.00	819,040.00	13,760.00	5,053.48	84.90	1.68%
D10	Sheet 59	227.33	234.00	272,800.00	8,000.00	1,683.18	49.36	2.93%
D10	Sheet 61	3,257.50	3,258.00	3,909,000.00	600.00	24,118.53	3.70	0.02%
D10	Sheet 67	786.08	796.00	943,290.00	11,910.00	5,820.10	73.48	1.26%
D10	Sheet 70	47.13	50.00	56,550.00	3,450.00	348.91	21.29	6.10%
D10	Sheet 72	217.33	229.00	260,800.00	14,000.00	1,609.14	86.38	5.37%
D10	Sheet 73	974.20	1,082.00	1,169,040.00	129,360.00	7,212.98	798.15	11.07%
D10	Sheet 76	183.73	188.00	220,480.00	5,120.00	1,360.36	31.59	2.32%
D10	Sheet 79	44.32	45.00	53,188.00	812.00	328.17	5.01	1.53%
D10	Sheet 82	22.19	23.00	26,622.00	978.00	164.26	6.03	3.67%
D10	Sheet 86	202.68	217.00	243,218.00	17,182.00	1,500.66	106.01	7.06%
TOTAL		13,373.00	13,999.00	16,047,619.00	751,181.00	99,013.81	4,634.79	4.68%
D8	Sheet 10	20.00	24.00	24,000.00	4,800.00	95.04	19.01	20.00%
D8	Sheet 17	13.02	15.00	15,620.00	2,380.00	61.86	9.42	15.24%
D8	Sheet 33	299.95	336.00	359,940.00	43,260.00	1,425.36	171.31	12.02%
D8	Sheet 34	77.68	80.00	93,220.00	2,780.00	369.15	11.01	2.98%
D8	Sheet 49	19.31	21.00	23,172.00	2,028.00	91.76	8.03	8.75%
D8	Sheet 55	120.00	120.00	144,000.00	0.00	570.24	0.00	0.00%
D8	Sheet 60	11.40	12.00	13,680.00	720.00	54.17	2.85	5.26%
D8	Sheet 68	30.01	32.00	36,006.00	2,394.00	142.58	9.48	6.65%
TOTAL		591.37	640.00	709,638.00	58,362.00	2,810.17	231.11	8.22%

**TOTAL WASTE SOWB PROSES AWAL
PROYEK XYZ**

REKAPITULASI OUTPUT SOWB	DIAMETER								TOTAL
	8	10	13	16	19	22	25	32	
JUMLAH BATANG TEORITIS	591.37	13,373.00	19,339.76	5,135.48	2,593.23	4,913.50	5,929.98	2,686.00	54,562.32
JUMLAH BATANG REALISTIS	640.00	13,999.00	19,878.00	5,469.00	2,710.00	5,041.00	6,188.00	2,844.00	56,769.00
TOTAL PANJANG (cm)	709,638.00	16,047,619.00	23,207,703.00	6,162,560.00	3,111,878.00	5,896,200.00	7,115,980.00	3,223,200.00	65,474,778.00
TOTAL WASTE (cm)	58,362.00	751,181.00	645,897.00	400,240.00	140,122.00	153,000.00	309,620.00	189,600.00	2,648,022.00
PERSENTASE WASTE (%)	8.22%	4.68%	2.78%	6.49%	4.50%	2.59%	4.35%	5.88%	4.04%
TOTAL BERAT (Kg)	2,810.17	99,013.81	241,824.27	97,368.45	69,239.29	175,706.76	273,965.23	203,706.24	1,163,634.20
TOTAL BERAT WASTE(Kg)	231.11	4,634.79	6,730.25	6,323.79	3,117.71	4,559.40	11,920.37	11,982.72	49,500.14
PERSENTASE WASTE (%)	8.22%	4.68%	2.78%	6.49%	4.50%	2.59%	4.35%	5.88%	4.25%

**REKAPITULASI OUTPUT SOWB PER DIAMETER
PROYEK XYZ**

NO	DIAMETER (mm)	SHEET	PERSENTASE WASTE	TOTAL BERAT		KOMULATIF BERAT (Kg)	PERSENTASE TIPE KOMPILASI	PERSENTASE BERAT	PERSENTASE BERAT KOMULATIF
				BESI (Kg)	WASTE (Kg)				
1	D32	Sheet 29	5.88%	203,706.24	11,982.72	11,982.72	1%	24%	24%
2	D25	Sheet 1	4.77%	186,347.70	8,893.50	20,876.22	2%	18%	42%
3	D13	Sheet 27	4.31%	91,211.25	3,931.68	24,807.90	3%	8%	50%
4	D22	Sheet 24	2.02%	122,156.16	2,467.44	27,275.34	5%	5%	55%
5	D25	Sheet 43	7.14%	26,649.70	1,901.90	29,177.24	6%	4%	59%
6	D16	Sheet 5	7.93%	23,188.08	1,839.12	31,016.36	7%	4%	63%
7	D16	Sheet 7	34.74%	5,093.92	1,769.60	32,785.96	8%	4%	66%
8	D22	Sheet 19	4.41%	34,830.24	1,537.68	34,323.64	9%	3%	69%
9	D19	Sheet 20	54.72%	2,484.88	1,359.92	35,683.56	10%	3%	72%
10	D19	Sheet 2	40.85%	2,805.64	1,145.96	36,829.53	12%	2%	74%
11	D10	Sheet 32	66.67%	1,617.03	1,078.02	37,907.55	13%	2%	77%
12	D25	Sheet 36	6.34%	16,639.70	1,054.90	38,962.45	14%	2%	79%
13	D13	Sheet 85	29.93%	3,271.88	979.48	39,941.93	15%	2%	81%
14	D10	Sheet 35	12.00%	8,131.38	975.54	40,917.47	16%	2%	83%
15	D10	Sheet 9	13.82%	6,895.59	952.65	41,870.12	17%	2%	85%
16	D10	Sheet 73	11.07%	7,212.98	798.15	42,668.27	19%	2%	86%
17	D16	Sheet 84	16.24%	4,844.28	786.84	43,455.11	20%	2%	88%
18	D16	Sheet 21	8.49%	6,588.60	559.32	44,014.43	21%	1%	89%
19	D13	Sheet 13	4.37%	12,400.26	541.38	44,555.81	22%	1%	90%
20	D19	Sheet 25	50.01%	996.80	498.40	45,054.21	23%	1%	91%
21	D16	Sheet 52	6.97%	7,072.08	492.96	45,547.17	24%	1%	92%
22	D22	Sheet 63	4.91%	8,555.58	420.18	45,967.35	26%	1%	93%
23	D13	Sheet 6	2.69%	11,957.58	321.35	46,288.70	27%	1%	94%
24	D13	Sheet 3	0.68%	45,854.17	310.60	46,599.30	28%	1%	94%
25	D16	Sheet 31	0.72%	41,545.63	299.09	46,898.40	29%	1%	95%
26	D16	Sheet 14	28.64%	957.95	274.45	47,172.84	30%	1%	95%
27	D13	Sheet 22	1.14%	18,803.52	215.07	47,387.91	31%	0%	96%
28	D8	Sheet 33	12.02%	1,425.36	171.31	47,559.22	33%	0%	96%
29	D16	Sheet 74	11.11%	1,365.12	151.68	47,710.90	34%	0%	96%
30	D10	Sheet 42	12.18%	1,161.63	141.48	47,852.38	35%	0%	97%
31	D13	Sheet 40	1.07%	11,344.94	121.23	47,973.61	36%	0%	97%
32	D13	Sheet 66	1.75%	6,820.43	119.29	48,092.89	37%	0%	97%
33	D10	Sheet 86	7.07%	1,500.66	106.01	48,198.91	38%	0%	97%
34	D13	Sheet 47	0.81%	11,473.27	92.93	48,291.83	40%	0%	98%
35	D10	Sheet 72	5.37%	1,609.14	86.38	48,378.21	41%	0%	98%
36	D10	Sheet 54	1.68%	5,053.48	84.90	48,463.11	42%	0%	98%
37	D10	Sheet 67	1.26%	5,820.10	73.48	48,536.60	43%	0%	98%
38	D16	Sheet 71	10.63%	565.64	60.04	48,596.64	44%	0%	98%
39	D10	Sheet 18	8.88%	659.61	58.58	48,655.21	45%	0%	98%
40	D25	Sheet 11	0.18%	32,835.88	58.52	48,713.73	47%	0%	98%
41	D10	Sheet 16	16.66%	342.71	57.10	48,770.84	48%	0%	99%
42	D19	Sheet 83	3.53%	1,573.12	55.58	48,826.42	49%	0%	99%
43	D22	Sheet 37	0.91%	5,563.66	50.66	48,877.08	50%	0%	99%
44	D10	Sheet 59	2.93%	1,683.18	49.36	48,926.44	51%	0%	99%
45	D10	Sheet 41	3.63%	1,336.08	48.47	48,974.91	52%	0%	99%
46	D13	Sheet 75	0.88%	4,424.96	38.97	49,013.88	53%	0%	99%
47	D16	Sheet 69	21.95%	155.47	34.13	49,048.01	55%	0%	99%
48	D16	Sheet 57	7.48%	423.44	31.60	49,079.61	56%	0%	99%
49	D10	Sheet 76	2.32%	1,360.36	31.59	49,111.20	57%	0%	99%
50	D22	Sheet 51	1.59%	1,865.48	29.80	49,141.00	58%	0%	99%
51	D13	Sheet 15	9.44%	308.43	29.18	49,170.17	59%	0%	99%
52	D22	Sheet 44	1.46%	1,832.70	26.82	49,196.99	60%	0%	99%
53	D22	Sheet 56	2.97%	902.94	26.82	49,223.81	62%	0%	99%
54	D19	Sheet 45	11.11%	240.30	26.70	49,250.51	63%	0%	99%
55	D10	Sheet 70	6.09%	348.91	21.29	49,271.80	64%	0%	100%
56	D10	Sheet 23	16.00%	121.30	19.37	49,291.17	65%	0%	100%
57	D8	Sheet 10	20.00%	95.04	19.01	49,310.18	66%	0%	100%
58	D19	Sheet 38	50.38%	35.60	17.80	49,327.98	67%	0%	100%
59	D19	Sheet 64	1.27%	1,054.65	13.35	49,341.33	69%	0%	100%
60	D10	Sheet 48	0.44%	2,933.84	12.96	49,354.29	70%	0%	100%
61	D10	Sheet 28	0.69%	1,845.60	12.81	49,367.10	71%	0%	100%
62	D25	Sheet 62	0.10%	11,492.25	11.55	49,378.65	72%	0%	100%
63	D8	Sheet 34	2.99%	369.15	11.01	49,389.66	73%	0%	100%
64	D13	Sheet 8	0.07%	15,068.99	10.84	49,400.49	74%	0%	100%
65	D13	Sheet 78	0.37%	2,703.45	9.92	49,410.41	76%	0%	100%
66	D8	Sheet 68	6.63%	142.58	9.48	49,419.89	77%	0%	100%
67	D8	Sheet 17	15.21%	61.86	9.42	49,429.32	78%	0%	100%
68	D13	Sheet 81	28.76%	29.18	8.34	49,437.66	79%	0%	100%
69	D8	Sheet 49	8.75%	91.76	8.03	49,445.69	80%	0%	100%
70	D16	Sheet 77	11.11%	68.26	7.58	49,453.27	81%	0%	100%
71	D10	Sheet 4	23.15%	30.06	6.96	49,460.23	83%	0%	100%
72	D16	Sheet 65	0.90%	695.20	6.32	49,466.55	84%	0%	100%
73	D16	Sheet 80	1.34%	467.68	6.32	49,472.87	85%	0%	100%
74	D10	Sheet 82	3.65%	164.26	6.03	49,478.90	86%	0%	100%
75	D10	Sheet 79	1.53%	328.17	5.01	49,483.91	87%	0%	100%
76	D10	Sheet 50	0.02%	24,739.23	4.94	49,488.85	88%	0%	100%
77	D16	Sheet 39	0.26%	1,834.38	4.74	49,493.59	90%	0%	100%
78	D10	Sheet 61	0.02%	24,118.53	3.70	49,497.29	91%	0%	100%
79	D8	Sheet 60	5.26%	54.17	2.85	49,500.14	92%	0%	100%
80	D19	Sheet 30	0.00%	60,048.30	0.00	49,500.14	93%	0%	100%
81	D13	Sheet 53	0.00%	6,001.92	0.00	49,500.14	94%	0%	100%
82	D16	Sheet 46	0.00%	1,403.04	0.00	49,500.14	95%	0%	100%
83	D8	Sheet 55	0.00%	570.24	0.00	49,500.14	97%	0%	100%
84	D16	Sheet 12	0.00%	568.80	0.00	49,500.14	98%	0%	100%
85	D16	Sheet 26	0.00%	530.88	0.00	49,500.14	99%	0%	100%
86	D13	Sheet 58	0.00%	150.05	0.00	49,500.14	100%	0%	100%
TOTAL				1,163,634.20	49,500.14		SUMBU X	0%	SUMBU Y



Kasus Perhitungan 12/20/2008 12:27:02 PM untuk Lokasi PROYEK GPO DEPHAN RI dengan panjang besi 1200 berdiameter 10

Input PROYEK XYZ

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Total
1	Panjang (cm)	800	720	184	174	124	124	74	44	561204
2	Kebutuhan (batang)	14	364	588	336	280	245	476	476	15291
Jml Batang Teoritis		467.67								

Hasil

No		800	720	184	174	124	124	74	44	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	3	4	14	1198	2	16772	28
2	Pola 2	0	1	0	2	0	0	0	3	140	1200	0	168000	0
3	Pola 3	0	1	1	0	0	0	4	0	108	1200	0	129600	0
4	Pola 4	0	1	0	2	0	1	0	0	28	1192	8	33376	224
5	Pola 5	0	1	1	0	1	0	2	0	1	1176	24	1176	24
6	Pola 6	0	1	1	0	1	1	0	0	87	1152	48	100224	4176
7	Pola 7	0	0	1	0	7	1	0	0	27	1176	24	31752	648
8	Pola 8	0	0	1	0	3	5	0	0	1	1176	24	1176	24
9	Pola 9	0	0	1	0	0	8	0	0	12	1176	24	14112	288
10	Pola 10	0	0	5	0	0	2	0	0	1	1168	32	1168	32
11	Pola 11	0	0	6	0	0	0	0	0	57	1104	96	62928	5472
12	Pola 12	0	0	5	0	0	0	0	0	1	920	280	920	280
		14	364	588	336	280	245	476	476	477			561204	11196
Jml Batang Realistis		477												
Persentase Waste		1.99%												

Kasus Perhitungan 12/25/2008 6:54:05 AM untuk Lokasi PROYEK GPO DEPHAN RI dengan panjang besi 1200 berdiameter 10

Input PROYEK XYZ

No		Tipe 1	Total
1	Panjang (cm)	134	1506160
2	Kebutuhan (batang)	11240	285962
Jml Batang Teoritis		1255.13	

Hasil

No		134	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	8	1405	1072	128	1506160	179840
		11240	1405			1506160	179840
Jml Batang Realistis		1405					
Persentase Waste		11.94%					

Kasus Perhitungan 12/27/2008 12:18:00 PM untuk Lokasi PROYEK GPO DEPHAN RI dengan panjang besi 1200 berdiameter 13

Input PROYEK XYZ

No	Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Tipe 11	Tipe 12	Tipe 13	Tipe 14	Tipe 15	Tipe 16	Tipe 17	Tipe 18	Tipe 19	Tipe 20	Tipe 21	Tipe 22	Tipe 23	Total																						
1	1200	800	700	600	500	496	316	256	236	214	204	201	194	174	164	154	91	79	76	71	69	61	51	13154071																						
2	Kebutuhan (batang)																						364	28	28	56	112	672	5656	2072	336	20230	700	672	7112	3850	350	1680	11984	14609	3472	2016	2800	336	336	98862
Jml Batang Teoritis		10961.73																																												

Hasil

No	1200	800	700	600	500	496	316	256	236	214	204	201	194	174	164	154	91	79	76	71	69	61	51	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)																				
1	Pola 1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	364	1200	0	436800	0																			
2	Pola 2	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	28	1200	0	33600	0																			
3	Pola 3	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	1200	0	33600	0																			
4	Pola 4	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28	1200	0	33600	0																			
5	Pola 5	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	3	1	0	2	84	1200	0	100800	0																				
6	Pola 6	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	3	1	7	24	1200	0	28800	0																				
7	Pola 7	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	6	2	1	0	2	294	1200	0	352800	0																				
8	Pola 8	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	9	0	2	1200	0	2400	0																				
9	Pola 9	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	5	0	0	0	0	0	0	352	1200	0	422400	0																				
10	Pola 10	0	0	0	0	0	2	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	308	1200	0	369600	0																				
11	Pola 11	0	0	0	0	0	1	2	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	882	1200	0	1058400	0																				
12	Pola 12	0	0	0	0	0	0	1	2	0	1	1	0	1	0	0	1	0	0	0	0	0	0	672	1200	0	806400	0																				
13	Pola 13	0	0	0	0	0	0	1	0	0	1	1	0	1	0	1	0	0	0	2	0	0	0	28	1200	0	33600	0																				
14	Pola 14	0	0	0	0	0	0	1	0	0	1	0	0	1	1	0	0	0	0	2	0	0	0	322	1200	0	386400	0																				
15	Pola 15	0	0	0	0	0	0	1	0	0	1	0	0	1	0	1	0	1	0	0	1	0	0	1300	1200	0	1560000	0																				
16	Pola 16	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	1	4	0	0	1	0	0	56	1200	0	67200	0																				
17	Pola 17	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	2	7	0	0	0	0	200	1200	0	240000	0																				
18	Pola 18	0	0	0	0	0	0	1	0	0	0	0	2	1	0	0	1	1	2	0	0	0	0	1	1200	0	1200	0																				
19	Pola 19	0	0	0	0	0	0	1	0	0	2	0	1	0	0	0	2	1	0	0	0	0	0	1495	1199	1	1792505	1495																				
20	Pola 20	0	0	0	0	0	0	0	3	0	0	2	0	0	0	1	1	0	0	0	0	0	0	1868	1200	0	2241600	0																				
21	Pola 21	0	0	0	0	0	0	0	3	0	0	0	0	0	0	4	0	0	0	0	0	0	0	1	1200	0	1200	0																				
22	Pola 22	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	1	0	0	0	0	0	0	1527	1200	0	1832400	0																				
23	Pola 23	0	0	0	0	0	0	0	2	0	0	0	0	0	0	5	4	0	0	0	0	0	0	902	1199	1	1081498	902																				
24	Pola 24	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3	9	0	0	0	0	0	1	1198	2	1198	2																				
25	Pola 25	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	7	0	0	0	0	0	0	153	1195	5	182835	765																				
26	Pola 26	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	11	0	0	0	0	0	0	1	1174	26	1174	26																				
27	Pola 27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	43	1185	15	50955	645																				
28	Pola 28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	0	1	1106	94	1106	94																				
Jml Batang Realistis		364																						28	28	56	112	672	5656	2072	336	20230	700	672	7112	3850	350	1680	11984	14609	3472	2016	2800	336	336	10965	13154071	3929
Persentase Waste		10965																						0.03%																								

**REKAPITULASI OUTPUT SOWB PER DIAMETER OPTIMASI 1
PROYEK XYZ**

DIAMETER (mm)	SHEET	JUMLAH BATANG TEORITIS	JUMLAH BATANG REALISTIS	TOTAL PANJANG		TOTAL BERAT		PERSENTASE WASTE
				BESI (cm)	WASTE (cm)	BESI (Kg)	WASTE (Kg)	
D32	Sheet 29	2,686.00	2,844.00	3,223,200.00	189,600.00	203,706.24	11,982.72	5.88%
TOTAL		2,686.00	2,844.00	3,223,200.00	189,600.00	203,706.24	11,982.72	5.88%
D25	Sheet 11	710.73	712.00	852,880.00	1,520.00	32,835.88	58.52	0.18%
D25	Sheet 36	360.17	383.00	432,200.00	27,400.00	16,639.70	1,054.90	6.34%
D25	Sheet 43	576.83	618.00	692,200.00	49,400.00	26,649.70	1,901.90	7.14%
D25	Sheet 62	248.75	249.00	298,500.00	300.00	11,492.25	11.55	0.10%
D25	Sheet 1	4,033.50	4,226.00	4,840,200.00	231,000.00	186,347.70	8,893.50	4.77%
TOTAL		5,929.98	6,188.00	7,115,980.00	309,620.00	273,965.23	11,920.37	4.35%
D22	Sheet 19	974.00	1,017.00	1,168,800.00	51,600.00	34,830.24	1,537.68	4.41%
D22	Sheet 24	3,416.00	3,485.00	4,099,200.00	82,800.00	122,156.16	2,467.44	2.02%
D22	Sheet 37	155.58	157.00	186,700.00	1,700.00	5,563.66	50.66	0.91%
D22	Sheet 44	51.25	52.00	61,500.00	900.00	1,832.70	26.82	1.46%
D22	Sheet 51	52.17	53.00	62,600.00	1,000.00	1,865.48	29.80	1.60%
D22	Sheet 56	25.25	26.00	30,300.00	900.00	902.94	26.82	2.97%
D22	Sheet 63	239.25	251.00	287,100.00	14,100.00	8,555.58	420.18	4.91%
TOTAL		4,913.50	5,041.00	5,896,200.00	153,000.00	175,706.76	4,559.40	2.59%
D19	Sheet 2	105.08	148.00	126,096.00	51,504.00	2,805.64	1,145.96	40.85%
D19	Sheet 20	93.07	144.00	111,680.00	61,120.00	2,484.88	1,359.92	54.73%
D19	Sheet 25	37.33	56.00	44,800.00	22,400.00	996.80	498.40	50.00%
D19	Sheet 30	2,249.00	2,249.00	2,698,800.00	0.00	60,048.30	0.00	0.00%
D19	Sheet 38	1.33	2.00	1,600.00	800.00	35.60	17.80	50.00%
D19	Sheet 45	9.00	10.00	10,800.00	1,200.00	240.30	26.70	11.11%
D19	Sheet 64	39.50	40.00	47,400.00	600.00	1,054.65	13.35	1.27%
D19	Sheet 83	58.92	61.00	70,702.00	2,498.00	1,573.12	55.58	3.53%
TOTAL		2,593.23	2,710.00	3,111,878.00	140,122.00	69,239.29	3,117.71	4.50%
D16	Sheet 5	1,223.00	1,320.00	1,467,600.00	116,400.00	23,188.08	1,839.12	7.93%
D16	Sheet 7	268.67	362.00	322,400.00	112,000.00	5,093.92	1,769.60	34.74%
D16	Sheet 12	30.00	30.00	36,000.00	0.00	568.80	0.00	0.00%
D16	Sheet 14	50.53	65.00	60,630.00	17,370.00	957.95	274.45	28.65%
D16	Sheet 21	347.50	377.00	417,000.00	35,400.00	6,588.60	559.32	8.49%
D16	Sheet 26	28.00	28.00	33,600.00	0.00	530.88	0.00	0.00%
D16	Sheet 31	2,191.23	2,207.00	2,629,470.00	18,930.00	41,545.63	299.09	0.72%
D16	Sheet 39	96.75	97.00	116,100.00	300.00	1,834.38	4.74	0.26%
D16	Sheet 46	74.00	74.00	88,800.00	0.00	1,403.04	0.00	0.00%
D16	Sheet 52	373.00	399.00	447,600.00	31,200.00	7,072.08	492.96	6.97%
D16	Sheet 57	22.33	24.00	26,800.00	2,000.00	423.44	31.60	7.46%
D16	Sheet 65	36.67	37.00	44,000.00	400.00	695.20	6.32	0.91%
D16	Sheet 69	8.20	10.00	9,840.00	2,160.00	155.47	34.13	21.95%
D16	Sheet 71	29.83	33.00	35,800.00	3,800.00	565.64	60.04	10.61%
D16	Sheet 74	72.00	80.00	86,400.00	9,600.00	1,365.12	151.68	11.11%
D16	Sheet 77	3.60	4.00	4,320.00	480.00	68.26	7.58	11.11%
D16	Sheet 80	24.67	25.00	29,600.00	400.00	467.68	6.32	1.35%
D16	Sheet 84	255.50	297.00	306,600.00	49,800.00	4,844.28	786.84	16.24%
TOTAL		5,135.48	5,469.00	6,162,560.00	400,240.00	97,368.45	6,323.79	6.49%
D13	Sheet 3							
D13	Sheet 6	956.30	982.00	1,147,560.00	30,840.00	11,957.58	321.35	2.69%
D13	Sheet 8	1,205.13	1,206.00	1,446,160.00	1,040.00	15,068.99	10.84	0.07%
D13	Sheet 13	991.70	1,035.00	1,190,044.00	51,956.00	12,400.26	541.38	4.37%
D13	Sheet 15	24.67	27.00	29,600.00	2,800.00	308.43	29.18	9.46%
D13	Sheet 22	1,503.80	1,521.00	1,804,560.00	20,640.00	18,803.52	215.07	1.14%
D13	Sheet 3 + 27	10,961.73	10,965.00	13,154,071.00	3,929.00	137,065.42	40.84	0.03%
D13	Sheet 40	907.31	917.00	1,088,766.00	11,634.00	11,344.94	121.23	1.07%
D13	Sheet 47	917.57	925.00	1,101,082.00	8,918.00	11,473.27	92.93	0.81%
D13	Sheet 53	480.00	480.00	576,000.00	0.00	6,001.92	0.00	0.00%
D13	Sheet 58	12.00	12.00	14,400.00	0.00	150.05	0.00	0.00%
D13	Sheet 66	545.46	555.00	654,552.00	11,448.00	6,820.43	119.29	1.75%
D13	Sheet 75	353.88	357.00	424,660.00	3,740.00	4,424.96	38.97	0.88%
D13	Sheet 78	216.21	217.00	259,448.00	952.00	2,703.45	9.92	0.37%
D13	Sheet 81	2.33	3.00	2,800.00	800.00	29.18	8.34	28.57%
D13	Sheet 85	261.67	340.00	314,000.00	94,000.00	3,271.88	979.48	29.94%
TOTAL		19,339.76	19,542.00	23,207,703.00	242,697.00	241,824.27	2,528.90	1.05%
D10	Sheet 4	4.06	5.00	4,872.00	1,128.00	30.06	6.96	23.15%
D10	Sheet 9	931.33	1,060.00	1,117,600.00	154,400.00	6,895.59	952.65	13.82%
D10	Sheet 16	46.29	54.00	55,545.00	9,255.00	342.71	57.10	16.66%
D10	Sheet 18	89.09	97.00	106,906.00	9,494.00	659.61	58.58	8.88%
D10	Sheet 23	16.38	19.00	19,660.00	3,140.00	121.30	19.37	15.97%
D10	Sheet 28 + 32	467.67	477.00	561,204.00	11,196.00	3,462.63	69.08	1.99%
D10	Sheet 35 + 42	1,255.13	1,405.00	1,506,160.00	179,840.00	9,293.01	1,109.61	11.94%
D10	Sheet 41	180.45	187.00	216,544.00	7,856.00	1,336.08	48.47	3.63%
D10	Sheet 48	396.25	398.00	475,500.00	2,100.00	2,933.84	12.96	0.44%
D10	Sheet 50	3,341.33	3,342.00	4,009,600.00	800.00	24,739.23	4.94	0.02%
D10	Sheet 54	682.53	694.00	819,040.00	13,760.00	5,053.48	84.90	1.68%
D10	Sheet 59	227.33	234.00	272,800.00	8,000.00	1,683.18	49.36	2.93%
D10	Sheet 61	3,257.50	3,258.00	3,909,000.00	600.00	24,118.53	3.70	0.02%
D10	Sheet 67	786.08	796.00	943,290.00	11,910.00	5,820.10	73.48	1.26%
D10	Sheet 70	47.13	50.00	56,550.00	3,450.00	348.91	21.29	6.10%
D10	Sheet 72	217.33	229.00	260,800.00	14,000.00	1,609.14	86.38	5.37%
D10	Sheet 73	974.20	1,082.00	1,169,040.00	129,360.00	7,212.98	798.15	11.07%
D10	Sheet 76	183.73	188.00	220,480.00	5,120.00	1,360.36	31.59	2.32%
D10	Sheet 79	44.32	45.00	53,188.00	812.00	328.17	5.01	1.53%
D10	Sheet 82	22.19	23.00	26,622.00	978.00	164.26	6.03	3.67%
D10	Sheet 86	202.68	217.00	243,218.00	17,182.00	1,500.66	106.01	7.06%
TOTAL		13,373.00	13,860.00	16,047,619.00	584,381.00	99,013.81	3,605.63	3.64%
D8	Sheet 10	20.00	24.00	24,000.00	4,800.00	95.04	19.01	20.00%
D8	Sheet 17	13.02	15.00	15,620.00	2,380.00	61.86	9.42	15.24%
D8	Sheet 33	299.95	336.00	359,940.00	43,260.00	1,425.36	171.31	12.02%
D8	Sheet 34	77.68	80.00	93,220.00	2,780.00	369.15	11.01	2.98%
D8	Sheet 49	19.31	21.00	23,172.00	2,028.00	91.76	8.03	8.75%
D8	Sheet 55	120.00	120.00	144,000.00	0.00	570.24	0.00	0.00%
D8	Sheet 60	11.40	12.00	13,680.00	720.00	54.17	2.85	5.26%
D8	Sheet 68	30.01	32.00	36,006.00	2,394.00	142.58	9.48	6.65%
TOTAL		591.37	640.00	709,638.00	58,362.00	2,810.17	231.11	8.22%

**TOTAL WASTE SOWB OPTIMASI 1
PROYEK XYZ**

REKAPITULASI OUTPUT SOWB	DIAMETER								TOTAL
	8	10	13	16	19	22	25	32	
JUMLAH BATANG TEORITIS	591.37	13,373.00	19,339.76	5,135.48	2,593.23	4,913.50	5,929.98	2,686.00	54,562.32
JUMLAH BATANG REALISTIS	640.00	13,860.00	19,542.00	5,469.00	2,710.00	5,041.00	6,188.00	2,844.00	56,294.00
TOTAL PANJANG (cm)	709,638.00	16,047,619.00	23,207,703.00	6,162,560.00	3,111,878.00	5,896,200.00	7,115,980.00	3,223,200.00	65,474,778.00
TOTAL WASTE (cm)	58,362.00	584,381.00	242,697.00	400,240.00	140,122.00	153,000.00	309,620.00	189,600.00	2,078,022.00
PERSENTASE WASTE (%)	8.22%	3.64%	1.05%	6.49%	4.50%	2.59%	4.35%	5.88%	3.17%
TOTAL BERAT (Kg)	2,810.17	99,013.81	241,824.27	97,368.45	69,239.29	175,706.76	273,965.23	203,706.24	1,163,634.20
TOTAL BERAT WASTE(Kg)	231.11	3,605.63	2,528.90	6,323.79	3,117.71	4,559.40	11,920.37	11,982.72	44,269.64
PERSENTASE WASTE (%)	8.22%	3.64%	1.05%	6.49%	4.50%	2.59%	4.35%	5.88%	3.80%

**REKAPITULASI NILAI WASTE SOWB
PROYEK XYZ**

NO	DIAMETER (mm)	SHEET	NILAI WASTE (cm)	JUMLAH BESI	TOTAL WASTE (cm)
1	D25	Sheet 1	300	770	231,000
	D19	Sheet 2	348	148	51,504
	D13	Sheet 3	3	336	1,008
			8	490	3,920
			22	1,029	22,638
			17	72	1,224
			1,018	1	1,018
	D10	Sheet 4	6	3	18
			34	1	34
			1,076	1	1,076
2	D16	Sheet 5	450	240	108,000
			70	120	8,400
	D13	Sheet 6	10	190	1,900
			50	2	100
			70	172	12,040
			200	84	16,800
3	D16	Sheet 7	500	224	112,000
	D13	Sheet 8	24	5	120
			920	1	920
	D10	Sheet 9	4	100	400
			40	50	2,000
			400	380	152,000
	D8	Sheet 10	200	24	4,800
4	D25	Sheet 11	10	112	1,120
			400	1	400
	D16	Sheet 12	0	0	0
	D13	Sheet 13	2	24	48
			2	80	160
			28	1	28
			78	158	12,324
			3	254	762
			92	214	19,688
			100	1	100
			108	170	18,360
			486	1	486
5	D16	Sheet 14	234	20	4,680
			282	45	12,690
	D13	Sheet 15	90	26	2,340
			460	1	460
	D10	Sheet 16	75	18	1,350
			120	17	2,040
			125	1	125
			285	17	4,845
			895	1	895
	D8	Sheet 17	100	14	1,400
			980	1	980
6	D10	Sheet 18	86	36	3,096
			1	12	12
			123	48	5,904
			482	1	482
7	D22	Sheet 19	42	75	3,150
			2	4	8
			4	85	340
			4	129	516

NO	DIAMETER (mm)	SHEET	NILAI WASTE (cm)	JUMLAH BESI	TOTAL WASTE (cm)
			14	168	2,352
			18	1	18
			30	42	1,260
			64	3	192
			198	218	43,164
			600	1	600
	D19	Sheet 20	40	16	640
			540	112	60,480
	D16	Sheet 21	200	177	35,400
	D13	Sheet 22	1	96	96
			2	91	182
			6	200	1,200
			16	1	16
			36	59	2,124
			156	107	16,692
			330	1	330
	D10	Sheet 23	52	2	104
			156	14	2,184
			852	1	852
8	D22	Sheet 24	100	546	54,600
			100	227	22,700
			200	23	4,600
			900	1	900
	D19	Sheet 25	400	56	22,400
	D16	Sheet 26	0	0	0
	D13	Sheet 27	2	28	56
			2	144	288
			2	1	2
			2	942	1,884
			16	1,163	18,608
			16	1	16
			36	1,146	41,256
			51	1	51
			130	2,423	314,990
			170	1	170
	D10	Sheet 28	2	14	28
			8	81	648
			10	4	40
			10	1	10
			10	16	160
			14	1	14
			16	9	144
			1,032	1	1,032
9	D32	Sheet 29	150	1	150
			300	1	300
	D19	Sheet 30	20	50	1,000
	D16	Sheet 31	15	248	3,720
			15	142	2,130
			20	1	20
			600	1	600
10	D10	Sheet 32	480	364	174,720
	D8	Sheet 33	10	70	700
			160	266	42,560
11	D8	Sheet 34	10	10	100
			40	20	800
			100	9	900
			980	1	980
12	D10	Sheet 35	128	1,229	157,312
			798	1	798

NO	DIAMETER (mm)	SHEET	NILAI WASTE (cm)	JUMLAH BESI	TOTAL WASTE (cm)
13	D25	Sheet 36	100	2	200
			300	86	25,800
			100	1	100
			200	5	1,000
			300	1	300
	D22	Sheet 37	100	10	1,000
			200	2	400
			300	1	300
	D19	Sheet 38	800	1	800
	D16	Sheet 39	100	1	100
			200	1	200
	D13	Sheet 40	1	93	93
			1	287	287
			2	1	2
			2	24	48
			2	3	6
			6	40	240
			36	32	1,152
			86	1	86
			96	42	4,032
			156	31	4,836
			852	1	852
	D10	Sheet 41	1	9	9
			1	1	1
			3	2	6
			6	4	24
			8	3	24
			52	45	2,340
			112	1	112
			122	40	4,880
			460	1	460
14	D10	Sheet 42	128	175	22,400
			530	1	530
15	D25	Sheet 43	200	3	600
			300	160	48,000
			100	6	600
			200	1	200
	D22	Sheet 44	900	1	900
	D19	Sheet 45	200	2	400
			800	1	800
	D16	Sheet 46	0	0	0
	D13	Sheet 47	2	45	90
			10	35	350
			24	164	3,936
			50	1	50
			70	13	910
			104	23	2,392
			184	1	184
			1,006	1	1,006
	D10	Sheet 48	2	100	200
			2	61	122
			2	1	2
			2	2	4
			2	46	92
			8	1	8
			18	1	18
			8	58	464
			20	1	20
			60	9	540

NO	DIAMETER (mm)	SHEET	NILAI WASTE (cm)	JUMLAH BESI	TOTAL WASTE (cm)
			630	1	630
	D8	Sheet 49	8	5	40
			44	1	44
			128	10	1,280
			664	1	664
16	D10	Sheet 50	800	1	800
17	D22	Sheet 51	100	1	100
			900	1	900
	D16	Sheet 52	26	1	26
			24	27	648
			28	3	84
			122	246	30,012
			430	1	430
	D13	Sheet 53	0	0	0
	D10	Sheet 54	2	80	160
			60	213	12,780
			820	1	820
	D8	Sheet 55	0	0	0
18	D22	Sheet 56	900	1	900
	D16	Sheet 57	100	4	400
			200	8	1,600
	D13	Sheet 58	0	0	0
	D10	Sheet 59	4	36	144
			4	1	4
			4	11	44
			4	2	8
			6	19	114
			10	20	200
			16	21	336
			32	2	64
			86	1	86
			200	33	6,600
			400	1	400
	D8	Sheet 60	60	12	720
19	D10	Sheet 61	600	1	600
20	D25	Sheet 62	300	1	300
	D22	Sheet 63	100	15	1,500
			400	30	12,000
			600	1	600
	D19	Sheet 64	200	1	200
			400	1	400
	D16	Sheet 65	100	1	100
			300	1	300
	D13	Sheet 66	6	2	12
			2	1	2
			4	18	72
			4	2	8
			10	59	590
			20	1	20
			24	97	2,328
			132	1	132
			30	242	7,260
			44	1	44
			980	1	980
	D10	Sheet 67	6	8	48
			2	132	264
			2	1	2
			2	4	8
			2	4	8

NO	DIAMETER (mm)	SHEET	NILAI WASTE (cm)	JUMLAH BESI	TOTAL WASTE (cm)
			2	1	2
			2	81	162
			2	1	2
			6	60	360
			6	1	6
			6	31	186
			6	1	6
			6	1	6
			6	21	126
			46	1	46
			96	13	1,248
			136	1	136
			156	53	8,268
			1,026	1	1,026
	D8	Sheet 68	7	3	21
			21	1	21
			60	23	1,380
			972	1	972
21	D16	Sheet 69	170	8	1,360
			800	1	800
	D10	Sheet 70	6	17	102
			76	3	228
			170	16	2,720
			400	1	400
22	D16	Sheet 71	100	12	1,200
			400	4	1,600
			200	5	1,000
	D10	Sheet 72	46	180	8,280
			92	24	2,208
			122	24	2,928
			584	1	584
23	D10	Sheet 73	168	770	129,360
24	D16	Sheet 74	120	80	9,600
	D13	Sheet 75	4	55	220
			6	55	330
			6	55	330
			16	55	880
			12	55	660
			120	4	480
			840	1	840
	D10	Sheet 76	4	102	408
			8	2	16
			52	83	4,316
			380	1	380
25	D16	Sheet 77	120	4	480
	D13	Sheet 78	2	11	22
			6	1	6
			12	1	12
			30	1	30
			12	1	12
			60	4	240
			630	1	630
	D10	Sheet 79	6	20	120
			8	1	8
			72	1	72
			24	7	168
			444	1	444
26	D16	Sheet 80	400	1	400
	D13	Sheet 81	800	1	800

NO	DIAMETER (mm)	SHEET	NILAI WASTE (cm)	JUMLAH BESI	TOTAL WASTE (cm)
	D10	Sheet 82	60	2	120
			858	1	858
27	D19	Sheet 83	38	24	912
			122	13	1,586
	D16	Sheet 84	200	249	49,800
	D13	Sheet 85	500	188	94,000
	D10	Sheet 86	4	6	24
			98	54	5,292
			366	1	366
			500	23	11,500
TOTAL					2,447,412



Kasus Perhitungan 12/27/2008 8:40:36 PM untuk Lokasi PROYEK GPO DEPHAN RI dengan panjang besi 1200 berdiameter 25

Input PROYEK XYZ

No		Tipe 1	Tipe 2	Tipe 3	Total
1	Panjang (cm)	600	450	300	4766400
2	Kebutuhan (batang)	1728	6724	2346	22424
Jml Batang Teoritis		3972.00			

Hasil

No		600	450	300	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	2	0	0	864	1200	0	1036800	0
2	Pola 2	0	2	1	2346	1200	0	2815200	0
3	Pola 3	0	2	0	1016	900	300	914400	304800
		1728	6724	2346	4226			4766400	304800
Jml Batang Realistis		4226							
Persentase Waste		6.39%							

Kasus Perhitungan 12/26/2008 11:41:16 PM untuk Lokasi PROYEK GPO DEPHAN RI dengan panjang besi 1200 berdiameter 13

Input PROYEK XYZ

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Tipe 10	Tipe 11	Tipe 12	Tipe 13	Total
1	Panjang (cm)	1200	800	700	600	500	214	204	194	174	164	154	79	69	8665545
2	Kebutuhan (batang)	364	28	28	56	112	20230	700	7028	3850	350	1573	14199	2470	60886
Jml Batang Teoritis		7221.29													

Hasil

No		1200	800	700	600	500	214	204	194	174	164	154	79	69	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	0	0	0	0	0	364	1200	0	436800	0
2	Pola 2	0	1	0	0	0	0	1	1	0	0	0	0	0	28	1198	2	33544	56
3	Pola 3	0	0	1	0	1	0	0	0	0	0	0	0	0	28	1200	0	33600	0
4	Pola 4	0	0	0	2	0	0	0	0	0	0	0	0	0	28	1200	0	33600	0
5	Pola 5	0	0	0	0	1	0	0	1	2	0	0	2	0	84	1200	0	100800	0
6	Pola 6	0	0	0	0	0	2	0	0	0	0	2	5	1	786	1200	0	943200	0
7	Pola 7	0	0	0	0	0	2	0	0	0	2	0	3	3	175	1200	0	210000	0
8	Pola 8	0	0	0	0	0	1	2	0	0	0	1	1	5	1	1200	0	1200	0
9	Pola 9	0	0	0	0	0	1	1	1	1	0	0	0	6	192	1200	0	230400	0
10	Pola 10	0	0	0	0	0	1	0	0	3	0	0	5	1	2	1200	0	2400	0
11	Pola 11	0	0	0	0	0	2	3	0	0	0	0	2	0	159	1198	2	190482	318
12	Pola 12	0	0	0	0	0	3	1	1	0	0	0	2	0	1	1198	2	1198	2
13	Pola 13	0	0	0	0	0	1	0	1	0	0	0	10	0	924	1198	2	1106952	1848
14	Pola 14	0	0	0	0	0	1	0	3	0	0	0	5	0	1	1191	9	1191	9
15	Pola 15	0	0	0	0	0	1	0	5	0	0	0	0	0	1159	1184	16	1372256	18544
16	Pola 16	0	0	0	0	0	3	0	1	2	0	0	0	0	1	1184	16	1184	16
17	Pola 17	0	0	0	0	0	3	0	0	3	0	0	0	0	1160	1164	36	1350240	41760
18	Pola 18	0	0	0	0	0	5	0	0	0	0	0	0	0	2445	1070	130	2616150	317850
19	Pola 19	0	0	0	0	0	0	0	0	2	0	0	0	0	1	348	852	348	852
		364	28	28	56	112	20230	700	7028	3850	350	1573	14199	2470	7539			8665545	381255
Jml Batang Realistis		7539																	
Persentase Waste		4.40%																	

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Input PROYEK XYZ

No		Tipe 1	Total
1	Panjang (cm)	134	1397888
2	Kebutuhan (batang)	10432	10432
Jml Batang Teoritis		1164.91	

Hasil

No		134	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	8	1304	1072	128	1397888	166912
		10432	1304			1397888	166912
Jml Batang Realistis		1304					
Persentase Waste		11.94%					

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Input PROYEK XYZ

No		Tipe 1	Total
1	Panjang (cm)	344	669424
2	Kebutuhan (batang)	1946	71859
Jml Batang Teoritis			557.85

Hasil

No		344	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	3	648	1032	168	668736	108864
2	Pola 2	2	1	688	512	688	512
		1946	649			669424	109376
Jml Batang Realistis			649				
Persentase Waste			16.34%				

REKAPITULASI OUTPUT SOWB PER DIAMETER OPTIMASI 2
PROYEK XYZ

DIAMETER (mm)	SHEET	JUMLAH BATANG TEORITIS	JUMLAH BATANG REALISTIS	TOTAL PANJANG		TOTAL BERAT		PERSENTASE WASTE
				BESI (cm)	WASTE (cm)	BESI (Kg)	WASTE (Kg)	
D32	Sheet 29	2,686.00	2,844.00	3,223,200.00	189,600.00	203,706.24	11,982.72	5.88%
TOTAL		2,686.00	2,844.00	3,223,200.00	189,600.00	203,706.24	11,982.72	5.88%
D25	Sheet 11	710.73	712.00	852,880.00	1,520.00	32,835.88	58.52	0.18%
D25	Sheet 36	360.17	383.00	432,200.00	27,400.00	16,639.70	1,054.90	6.34%
D25	Sheet 43	576.83	618.00	692,200.00	49,400.00	26,649.70	1,901.90	7.14%
D25	Sheet 62	248.75	249.00	298,500.00	300.00	11,492.25	11.55	0.10%
D25	Sheet 1	3,972.00	4,226.00	4,766,400.00	304,800.00	183,506.40	11,734.80	6.39%
TOTAL		5,868.48	6,188.00	7,042,180.00	383,420.00	271,123.93	14,761.67	5.44%
D22	Sheet 19	974.00	1,017.00	1,168,800.00	51,600.00	34,830.24	1,537.68	4.41%
D22	Sheet 24	3,416.00	3,485.00	4,099,200.00	82,800.00	122,156.16	2,467.44	2.02%
D22	Sheet 37	155.58	157.00	186,700.00	1,700.00	5,563.66	50.66	0.91%
D22	Sheet 44	51.25	52.00	61,500.00	900.00	1,832.70	26.82	1.46%
D22	Sheet 51	52.17	53.00	62,600.00	1,000.00	1,865.48	29.80	1.60%
D22	Sheet 56	25.25	26.00	30,300.00	900.00	902.94	26.82	2.97%
D22	Sheet 63	239.25	251.00	287,100.00	14,100.00	8,555.58	420.18	4.91%
TOTAL		4,913.50	5,041.00	5,896,200.00	153,000.00	175,706.76	4,559.40	2.59%
D19	Sheet 2	105.08	148.00	126,096.00	51,504.00	2,805.64	1,145.96	40.85%
D19	Sheet 20	93.07	144.00	111,680.00	61,120.00	2,484.88	1,359.92	54.73%
D19	Sheet 25	37.33	56.00	44,800.00	22,400.00	996.80	498.40	50.00%
D19	Sheet 30	2,249.00	2,249.00	2,698,800.00	0.00	60,048.30	0.00	0.00%
D19	Sheet 38	1.33	2.00	1,600.00	800.00	35.60	17.80	50.00%
D19	Sheet 45	9.00	10.00	10,800.00	1,200.00	240.30	26.70	11.11%
D19	Sheet 64	39.50	40.00	47,400.00	600.00	1,054.65	13.35	1.27%
D19	Sheet 83	58.92	61.00	70,702.00	2,498.00	1,573.12	55.58	3.53%
TOTAL		2,593.23	2,710.00	3,111,878.00	140,122.00	69,239.29	3,117.71	4.50%
D16	Sheet 5	1,223.00	1,320.00	1,467,600.00	116,400.00	23,188.08	1,839.12	7.93%
D16	Sheet 7	268.67	362.00	322,400.00	112,000.00	5,093.92	1,769.60	34.74%
D16	Sheet 12	30.00	30.00	36,000.00	0.00	568.80	0.00	0.00%
D16	Sheet 14	50.53	65.00	60,630.00	17,370.00	957.95	274.45	28.65%
D16	Sheet 21	347.50	377.00	417,000.00	35,400.00	6,588.60	559.32	8.49%
D16	Sheet 26	28.00	28.00	33,600.00	0.00	530.88	0.00	0.00%
D16	Sheet 31	2,191.23	2,207.00	2,629,470.00	18,930.00	41,545.63	299.09	0.72%
D16	Sheet 39	96.75	97.00	116,100.00	300.00	1,834.38	4.74	0.28%
D16	Sheet 46	74.00	74.00	88,800.00	0.00	1,403.04	0.00	0.00%
D16	Sheet 52	373.00	399.00	447,600.00	31,200.00	7,072.08	492.96	6.97%
D16	Sheet 57	22.33	24.00	26,800.00	2,000.00	423.44	31.60	7.48%
D16	Sheet 65	36.67	37.00	44,000.00	400.00	695.20	6.32	0.91%
D16	Sheet 69	8.20	10.00	9,840.00	2,160.00	155.47	34.13	21.96%
D16	Sheet 71	29.83	33.00	35,800.00	3,800.00	565.84	60.04	10.61%
D16	Sheet 74	72.00	80.00	86,400.00	9,600.00	1,365.12	151.68	11.11%
D16	Sheet 77	3.60	4.00	4,320.00	480.00	68.26	7.58	11.11%
D16	Sheet 80	24.67	25.00	29,600.00	400.00	467.68	6.32	1.35%
D16	Sheet 84	255.50	297.00	306,600.00	49,800.00	4,844.28	786.84	16.24%
TOTAL		5,135.48	5,469.00	6,162,560.00	400,240.00	97,368.45	6,323.79	6.49%
D13	Sheet 3							
D13	Sheet 6	956.30	982.00	1,147,560.00	30,840.00	11,957.58	321.35	2.69%
D13	Sheet 8	1,205.13	1,206.00	1,446,160.00	1,040.00	15,068.89	10.84	0.07%
D13	Sheet 13	991.70	1,035.00	1,190,044.00	51,956.00	12,400.26	541.38	4.37%
D13	Sheet 15	24.67	27.00	29,600.00	2,800.00	308.42	29.18	9.46%
D13	Sheet 22	1,503.80	1,521.00	1,804,560.00	20,640.00	18,803.52	215.07	1.14%
D13	Sheet 3 + 27	10,961.73	10,965.00	13,154,071.00	3,929.00	137,065.42	40.94	0.03%
D13	Sheet 40	907.31	917.00	1,088,766.00	11,634.00	11,344.94	121.23	1.07%
D13	Sheet 47	917.57	925.00	1,101,082.00	8,916.00	11,473.27	92.93	0.81%
D13	Sheet 53	480.00	480.00	576,000.00	0.00	6,001.92	0.00	0.00%
D13	Sheet 58	12.00	12.00	14,400.00	0.00	150.05	0.00	0.00%
D13	Sheet 66	545.46	555.00	654,552.00	11,448.00	6,820.43	119.29	1.75%
D13	Sheet 75	353.88	357.00	424,660.00	3,740.00	4,424.96	38.97	0.88%
D13	Sheet 78	216.21	217.00	259,448.00	952.00	2,703.45	9.92	0.37%
D13	Sheet 81	2.33	3.00	2,800.00	800.00	29.18	8.34	28.57%
D13	Sheet 85	261.67	340.00	314,000.00	94,000.00	3,271.88	979.48	29.94%
TOTAL		19,339.76	19,542.00	23,207,703.00	242,697.00	241,824.27	2,528.90	1.05%
D10	Sheet 4	4.06	5.00	4,872.00	1,128.00	30.06	6.96	23.15%
D10	Sheet 9	931.33	1,060.00	1,117,600.00	154,400.00	6,895.59	952.65	13.82%
D10	Sheet 16	46.29	54.00	55,545.00	9,255.00	342.71	57.10	16.66%
D10	Sheet 18	89.09	97.00	106,906.00	9,494.00	659.61	58.58	8.88%
D10	Sheet 23	16.38	19.00	19,660.00	3,140.00	121.30	19.37	15.97%
D10	Sheet 28 + 32	467.67	477.00	561,204.00	11,196.00	3,462.63	69.08	1.99%
D10	Sheet 35 + 42	1,164.91	1,304.00	1,397,888.00	166,912.00	8,624.97	1,029.85	11.94%
D10	Sheet 41	180.45	187.00	216,544.00	7,856.00	1,336.08	48.47	3.63%
D10	Sheet 48	396.25	398.00	475,500.00	2,100.00	2,933.84	12.96	0.44%
D10	Sheet 50	3,341.33	3,342.00	4,009,600.00	800.00	24,739.23	4.94	0.02%
D10	Sheet 54	682.53	694.00	819,040.00	13,760.00	5,053.48	84.90	1.68%
D10	Sheet 59	227.33	234.00	272,800.00	8,000.00	1,683.18	49.36	2.93%
D10	Sheet 61	3,257.50	3,258.00	3,909,000.00	600.00	24,118.53	3.70	0.02%
D10	Sheet 67	786.08	796.00	943,290.00	11,910.00	5,820.10	73.48	1.26%
D10	Sheet 70	47.13	50.00	56,550.00	3,450.00	348.91	21.29	6.10%
D10	Sheet 72	217.33	229.00	260,800.00	14,000.00	1,609.14	86.38	5.37%
D10	Sheet 73	557.85	649.00	669,424.00	109,376.00	4,130.35	674.85	16.34%
D10	Sheet 76	183.73	188.00	220,480.00	5,120.00	1,360.36	31.59	2.32%
D10	Sheet 79	44.32	45.00	53,188.00	812.00	328.17	5.01	1.53%
D10	Sheet 82	22.19	23.00	26,622.00	978.00	164.26	6.03	3.67%
D10	Sheet 86	202.68	217.00	243,218.00	17,182.00	1,500.66	106.01	7.06%
TOTAL		12,866.43	13,326.00	15,439,731.00	551,469.00	95,263.14	3,402.56	3.57%
D8	Sheet 10	20.00	24.00	24,000.00	4,800.00	95.04	19.01	20.00%
D8	Sheet 17	13.02	15.00	15,620.00	2,380.00	61.86	9.42	15.24%
D8	Sheet 33	299.95	336.00	359,940.00	43,260.00	1,425.36	171.31	12.02%
D8	Sheet 34	77.68	80.00	93,220.00	2,780.00	369.15	11.01	2.98%
D8	Sheet 49	19.31	21.00	23,172.00	2,028.00	91.76	8.03	8.75%
D8	Sheet 55	120.00	120.00	144,000.00	0.00	570.24	0.00	0.00%
D8	Sheet 60	11.40	12.00	13,680.00	720.00	54.17	2.85	5.26%
D8	Sheet 68	30.01	32.00	36,006.00	2,394.00	142.58	9.48	6.65%
TOTAL		591.37	640.00	709,638.00	58,362.00	2,810.17	231.11	8.22%

**TOTAL WASTE SOWB OPTIMASI 2
PROYEK XYZ**

REKAPITULASI OUTPUT SOWB	DIAMETER							TOTAL	
	8	10	13	16	19	22	25		32
JUMLAH BATANG TEORITIS	591.37	12,866.43	19,339.76	5,135.48	2,593.23	4,913.50	5,868.48	2,686.00	53,994.25
JUMLAH BATANG REALISTIS	640.00	13,326.00	19,542.00	5,469.00	2,710.00	5,041.00	6,188.00	2,844.00	55,760.00
TOTAL PANJANG (cm)	709,638.00	15,439,731.00	23,207,703.00	6,162,560.00	3,111,878.00	5,896,200.00	7,042,180.00	3,223,200.00	64,793,090.00
WASTE AWAL (cm)	58,362.00	551,469.00	242,697.00	400,240.00	140,122.00	153,000.00	383,420.00	189,600.00	2,118,910.00
TOTAL WASTE TERPAKAI (cm)	0.00	233,488.00	87,934.00	0.00	0.00	0.00	73,800.00	0.00	395,222.00
TOTAL WASTE (cm)	58,362.00	317,981.00	154,763.00	400,240.00	140,122.00	153,000.00	309,620.00	189,600.00	1,723,688.00
PERSENTASE WASTE (%)	8.22%	3.57%	1.05%	6.49%	4.50%	2.59%	5.44%	5.88%	2.66%
TOTAL BERAT (Kg)	2,810.17	95,263.14	241,824.27	97,368.45	69,239.29	175,706.76	271,123.93	203,706.24	1,157,042.24
BERAT WASTE (Kg)	231.11	3,402.56	2,528.90	6,323.79	3,117.71	4,559.40	14,761.67	11,982.72	46,907.88
BERAT WASTE TERPAKAI (Kg)	0.00	1,440.62	0.00	0.00	0.00	0.00	2,841.30	0.00	4,281.92
TOTAL WASTE (Kg)	231.11	1,961.94	2,528.90	6,323.79	3,117.71	4,559.40	11,920.37	11,982.72	42,625.96
PERSENTASE WASTE (%)	8.22%	3.57%	1.05%	6.49%	4.50%	2.59%	5.44%	5.88%	3.68%

**BAR BENDING SCHEDULE (BBS) / BESTAT BESI TULANGAN DIAFRAGMA WALL SETELAH OPTIMASI 3
PROYEK XYZ**

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)
9 DIAFRAGMA WALL									
1	P1 6 m (1 Panel)								
		3.00	21	21	1	63.00	32	6.32	398.16
		6.00	21	21	1	126.00	32	6.32	796.32
		12.00	21	21	1	252.00	32	6.32	1592.64
		9.00	41	41	1	369.00	32	6.32	2332.08
		4.50	21	21	1	94.50	32	6.32	597.24
		12.00	71	71	1	852.00	16	1.58	1346.16
		0.60	607	607	1	364.20	16	1.58	575.44
		12.00	2	2	1	24.00	19	2.225	53.40
		7.00	2	2	1	14.00	19	2.225	31.15
		6.00	2	2	1	12.00	19	2.225	26.70
		0.60	40	40	1	24.00	19	2.225	53.40
		1.20	230	230	1	276.00	16	1.58	436.08
		1.20	86	86	1	103.20	16	1.58	163.06
2	P1 6 m (15 Panel)								
		3.00	945	63	15	2835.00	32	6.32	17917.20
		6.00	315	21	15	1890.00	32	6.32	11944.80
		12.00	315	21	15	3780.00	32	6.32	23889.60
		9.00	615	41	15	5535.00	32	6.32	34981.20
		12.00	1065	71	15	12780.00	16	1.58	20192.40
		0.60	9180	612	15	5508.00	16	1.58	8702.64
		12.00	30	2	15	360.00	19	2.225	801.00
		7.00	30	2	15	210.00	19	2.225	467.25
		6.00	30	2	15	180.00	19	2.225	400.50
		0.60	600	40	15	360.00	19	2.225	801.00
		1.20	3480	232	15	4176.00	16	1.58	6598.08
		1.20	1305	87	15	1566.00	16	1.58	2474.28
3	P2 6.445 m (1 Panel)								
		3.00	69	69	1	207.00	32	6.32	1308.24
		6.00	23	23	1	138.00	32	6.32	872.16
		12.00	23	23	1	276.00	32	6.32	1744.32
		9.00	45	45	1	405.00	32	6.32	2559.60
		12.00	71	71	1	852.00	16	1.58	1346.16
		0.60	680	680	1	408.00	16	1.58	644.64
		12.00	2	2	1	24.00	19	2.225	53.40
		7.00	2	2	1	14.00	19	2.225	31.15
		6.00	2	2	1	12.00	19	2.225	26.70
		0.60	40	40	1	24.00	19	2.225	53.40
		1.20	251	251	1	300.60	16	1.58	474.95
		1.20	94	94	1	112.22	16	1.58	177.31
4	P4 5.69 m (1 Panel)								
		3.00	60	60	1	180.00	32	6.32	1137.60
		6.00	20	20	1	120.00	32	6.32	758.40
		12.00	20	20	1	240.00	32	6.32	1516.80
		9.00	39	39	1	351.00	32	6.32	2218.32
		11.85	71	71	1	841.35	16	1.58	1329.33
		0.60	572	572	1	343.20	16	1.58	542.26
		12.00	2	2	1	24.00	19	2.225	53.40
		7.00	2	2	1	14.00	19	2.225	31.15
		6.00	2	2	1	12.00	19	2.225	26.70
		0.60	40	40	1	24.00	19	2.225	53.40
		1.20	214	214	1	257.14	16	1.58	406.29
		1.20	80	80	1	96.00	16	1.58	151.68
5	P5 2.7 m (1 Panel)								
		3.00	30	30	1	90.00	32	6.32	568.80
		6.00	10	10	1	60.00	32	6.32	379.20
		12.00	10	10	1	120.00	32	6.32	758.40
		9.00	19	19	1	171.00	32	6.32	1080.72
		5.25	71	71	1	372.75	16	1.58	588.95
		0.60	250	250	1	150.15	16	1.58	237.24
		12.00	2	2	1	24.00	19	2.225	53.40
		7.00	2	2	1	14.00	19	2.225	31.15
		6.00	2	2	1	12.00	19	2.225	26.70
		0.60	40	40	1	24.00	19	2.225	53.40
		1.20	90	90	1	108.00	16	1.58	170.64
		1.20	34	34	1	40.32	16	1.58	63.71
6	P6 6.768 m (2 Panel)								
	PANEL A = 3.768 m	3.00	45	45	1	135.00	32	6.32	853.20
		6.00	15	15	1	90.00	32	6.32	568.80
		12.00	15	15	1	180.00	32	6.32	1137.60
		9.00	29	29	1	261.00	32	6.32	1649.52
		8.59	71	71	1	609.61	16	1.58	963.18
		0.60	393	393	1	235.95	16	1.58	372.80
		1.00	161	161	1	161.49	16	1.58	255.15
		1.00	60	60	1	60.29	16	1.58	95.26
		12.00	2	2	1	24.00	19	2.225	53.40
		6.00	2	2	1	12.00	19	2.225	26.70
	PANEL B = 2.7 m	3.00	27	27	1	81.00	32	6.32	511.92
		6.00	9	9	1	54.00	32	6.32	341.28
		12.00	9	9	1	108.00	32	6.32	682.56
		9.00	17	17	1	153.00	32	6.32	966.96
		5.25	71	71	1	372.75	16	1.58	588.95
		0.60	250	250	1	150.15	16	1.58	237.24
		12.00	2	2	1	24.00	19	2.225	53.40
		7.00	2	2	1	14.00	19	2.225	31.15
		6.00	2	2	1	12.00	19	2.225	26.70
		0.60	40	40	1	24.00	19	2.225	53.40
		1.20	90	90	1	108.00	16	1.58	170.64
		1.20	34	34	1	40.32	16	1.58	63.71

NO	BENTUK	PANJANG POTONGAN (m)	JUMLAH POTONGAN	BANYAK POTONGAN	JUMLAH UNIT	JUMLAH PANJANG (m)	DIAMETER (mm)	KONVERSI (Kg/m)	BERAT (Kg)		
7	P8 6.054 m (1 Panel)	3.00	60	60	1	180.00	32	6.32	1137.60		
		6.00	20	20	1	120.00	32	6.32	758.40		
		12.00	20	20	1	240.00	32	6.32	1516.80		
		9.00	41	41	1	369.00	32	6.32	2332.08		
		12.00	71	71	1	852.00	16	1.58	1346.16		
		0.60	607	607	1	364.20	16	1.58	575.44		
		2.30	71	71	1	163.30	16	1.58	258.01		
		12.00	2	2	1	24.00	19	2.225	53.40		
		7.00	2	2	1	14.00	19	2.225	31.15		
		6.00	2	2	1	12.00	19	2.225	26.70		
		0.60	40	40	1	24.00	19	2.225	53.40		
		1.20	230	230	1	276.00	16	1.58	436.08		
		1.20	86	86	1	103.20	16	1.58	163.06		
		8	P9 4.971 m (1 Panel)	3.00	48	48	1	144.00	32	6.32	910.08
6.00	16			16	1	96.00	32	6.32	606.72		
12.00	16			16	1	192.00	32	6.32	1213.44		
9.00	31			31	1	279.00	32	6.32	1763.28		
9.09	71			71	1	645.39	16	1.58	1019.72		
0.60	393			393	1	235.95	16	1.58	372.80		
12.00	2			2	1	24.00	19	2.225	53.40		
7.00	2			2	1	14.00	19	2.225	31.15		
6.00	2			2	1	12.00	19	2.225	26.70		
0.60	40			40	1	24.00	19	2.225	53.40		
1.20	184			184	1	221.14	16	1.58	349.41		
1.20	69			69	1	82.56	16	1.58	130.44		
9	P18 DAN P21 5.4 m (2 Panel)			3.00	108	54	2	324.00	32	6.32	2047.68
				6.00	36	18	2	216.00	32	6.32	1365.12
		12.00	36	18	2	432.00	32	6.32	2730.24		
		9.00	70	35	2	630.00	32	6.32	3981.60		
		11.85	142	71	2	1682.70	16	1.58	2658.67		
		0.60	1001	501	2	600.60	16	1.58	948.95		
		12.00	4	2	2	48.00	19	2.225	106.80		
		7.00	4	2	2	28.00	19	2.225	62.30		
		6.00	4	2	2	24.00	19	2.225	53.40		
		0.60	80	40	2	48.00	19	2.225	106.80		
		1.20	463	231	2	555.43	16	1.58	877.58		
		1.20	173	86	2	207.36	16	1.58	327.63		
		10	P25 6.031 m (1 Panel)	3.00	60	60	1	180.00	32	6.32	1137.60
				6.00	20	20	1	120.00	32	6.32	758.40
12.00	20			20	1	240.00	32	6.32	1516.80		
9.00	41			41	1	369.00	32	6.32	2332.08		
11.85	71			71	1	841.35	16	1.58	1329.33		
0.60	607			607	1	364.20	16	1.58	575.44		
12.00	2			2	1	24.00	19	2.225	53.40		
7.00	2			2	1	14.00	19	2.225	31.15		
6.00	2			2	1	12.00	19	2.225	26.70		
0.60	40			40	1	24.00	19	2.225	53.40		
1.20	230			230	1	276.00	16	1.58	436.08		
1.20	86			86	1	103.20	16	1.58	163.06		

Kasus Perhitungan 12/26/2008 1:37:03 PM untuk Lokasi PROYEK GPO DEPHAN RI dengan panjang besi 1200 berdiameter 32

Input PROYEK XYZ

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Total
1	Panjang (cm)	1200	900	600	450	300	2249550
2	Kebutuhan (batang)	505	988	505	21	1473	3548
Jml Batang Teoritis		1874.63					

Hasil

No		1200	900	600	450	300	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	0	0	0	505	1200	0	606000	0	
2	Pola 2	0	1	0	0	1	988	1200	0	1185600	0	
3	Pola 3	0	0	2	0	0	252	1200	0	302400	0	
4	Pola 4	0	0	1	0	2	1	1200	0	1200	0	
5	Pola 5	0	0	0	2	1	10	1200	0	12000	0	
6	Pola 6	0	0	0	1	2	1	1050	150	1050	150	
7	Pola 7	0	0	0	0	4	117	1200	0	140400	0	
8	Pola 8	0	0	0	0	3	1	900	300	900	300	
		505	988	505	21	1473	1875			2249550	450	
Jml Batang Realistis		1875										
Persentase Waste		0.02%										

Kasus Perhitungan 12/26/2008 1:37:34 PM untuk Lokasi PROYEK GPO DEPHAN RI dengan panjang besi 1200 berdiameter 19

Input PROYEK XYZ

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Total
1	Panjang (cm)	1200	700	600	60	188600
2	Kebutuhan (batang)	52	50	52	1000	4702
Jml Batang Teoritis		157.17				

Hasil

No		1200	700	600	60	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)	
1	Pola 1	1	0	0	0	52	1200	0	62400	0	
2	Pola 2	0	1	0	8	50	1180	20	59000	1000	
3	Pola 3	0	0	2	0	26	1200	0	31200	0	
4	Pola 4	0	0	0	20	30	1200	0	36000	0	
		52	50	52	1000	158			188600	1000	
Jml Batang Realistis		158									
Persentase Waste		0.53%									

Kasus Perhitungan 12/26/2008 1:38:05 PM untuk Lokasi PROYEK GPO DEPHAN RI dengan panjang besi 1200 berdiameter 16

Input PROYEK XYZ

No		Tipe 1	Tipe 2	Tipe 3	Tipe 4	Tipe 5	Tipe 6	Tipe 7	Tipe 8	Tipe 9	Total
1	Panjang (cm)	1200	1185	909	859	525	230	120	100	60	3882048
2	Kebutuhan (batang)	1278	284	71	71	142	71	7507	222	14541	28889
Jml Batang Teoritis		3235.04									

Hasil

No		1200	1185	909	859	525	230	120	100	60	Banyak Besi	Jml Pjg (cm)	Waste (cm)	Total Pjg (cm)	Total Waste (cm)
1	Pola 1	1	0	0	0	0	0	0	0	0	1278	1200	0	1533600	0
2	Pola 2	0	1	0	0	0	0	0	0	0	284	1185	15	336540	4260
3	Pola 3	0	0	1	0	0	1	0	0	1	71	1199	1	85129	71
4	Pola 4	0	0	0	1	0	0	0	1	4	71	1199	1	85129	71
5	Pola 5	0	0	0	0	1	0	0	0	11	142	1185	15	168270	2130
6	Pola 6	0	0	0	0	0	0	10	0	0	750	1200	0	900000	0
7	Pola 7	0	0	0	0	0	0	5	6	0	1	1200	0	1200	0
8	Pola 8	0	0	0	0	0	0	2	9	1	1	1200	0	1200	0
9	Pola 9	0	0	0	0	0	0	0	12	0	11	1200	0	13200	0
10	Pola 10	0	0	0	0	0	0	0	3	15	1	1200	0	1200	0
11	Pola 11	0	0	0	0	0	0	0	1	18	1	1180	20	1180	20
12	Pola 12	0	0	0	0	0	0	0	0	20	629	1200	0	754800	0
13	Pola 13	0	0	0	0	0	0	0	0	10	1	600	600	600	600
		1278	284	71	71	142	71	7507	222	14541	3241			3882048	7152

Jml Batang Realistis	3241
Persentase Waste	0.18%

REKAPITULASI OUTPUT SOWB PER DIAMETER OPTIMASI 3
PROYEK XYZ

DIAMETER (mm)	SHEET	JUMLAH BATANG TEORITIS	JUMLAH BATANG REALISTIS	TOTAL PANJANG		TOTAL BERAT		PERSENTASE WASTE
				BESI (cm)	WASTE (cm)	BESI (kg)	WASTE (kg)	
D32	Sheet 29	1,874.63	1,875.00	2,249,550.00	450.00	142,171.56	28.44	0.02%
TOTAL		1,874.63	1,875.00	2,249,550.00	450.00	142,171.56	28.44	0.02%
D25	Sheet 11	710.73	712.00	852,880.00	1,520.00	32,835.88	58.52	0.18%
D25	Sheet 36	360.17	383.00	432,200.00	27,400.00	16,639.70	1,054.90	6.34%
D25	Sheet 43	576.83	618.00	692,200.00	49,400.00	26,649.70	1,901.90	7.14%
D25	Sheet 62	248.75	249.00	298,500.00	300.00	11,492.25	11.55	0.10%
D25	Sheet 1	3,972.00	4,226.00	4,766,400.00	304,800.00	183,506.40	11,734.80	6.39%
TOTAL		5,868.48	6,188.00	7,042,180.00	383,420.00	271,123.93	14,761.67	5.44%
D22	Sheet 19	974.00	1,017.00	1,168,800.00	51,600.00	34,830.24	1,537.68	4.41%
D22	Sheet 24	3,416.00	3,485.00	4,099,200.00	82,800.00	122,156.16	2,467.44	2.02%
D22	Sheet 37	155.58	157.00	186,700.00	1,700.00	5,563.66	50.66	0.91%
D22	Sheet 44	51.25	52.00	61,500.00	900.00	1,832.70	26.82	1.46%
D22	Sheet 51	52.17	53.00	62,600.00	1,000.00	1,865.48	29.80	1.60%
D22	Sheet 56	25.25	26.00	30,300.00	900.00	902.94	26.82	2.97%
D22	Sheet 63	239.25	251.00	287,100.00	14,100.00	8,555.58	420.18	4.91%
TOTAL		4,913.50	5,041.00	5,896,200.00	153,000.00	175,706.76	4,559.40	2.59%
D19	Sheet 2	105.08	148.00	126,096.00	51,504.00	2,805.64	1,145.96	40.85%
D19	Sheet 20	93.07	144.00	111,680.00	61,120.00	2,484.88	1,359.92	54.73%
D19	Sheet 25	37.33	56.00	44,800.00	22,400.00	996.80	498.40	50.00%
D19	Sheet 30	157.17	158.00	188,600.00	1,000.00	4,196.35	22.25	0.53%
D19	Sheet 38	1.33	2.00	1,600.00	800.00	35.60	17.80	50.00%
D19	Sheet 45	9.00	10.00	10,800.00	1,200.00	240.30	26.70	11.11%
D19	Sheet 64	39.50	40.00	47,400.00	600.00	1,054.65	13.35	1.27%
D19	Sheet 83	58.92	61.00	70,702.00	2,498.00	1,573.12	55.58	3.53%
TOTAL		501.40	619.00	601,678.00	141,122.00	13,387.34	3,139.96	23.45%
D16	Sheet 5	1,223.00	1,320.00	1,467,600.00	116,400.00	23,188.08	1,839.12	7.93%
D16	Sheet 7	268.67	362.00	322,400.00	112,000.00	5,093.92	1,769.60	34.74%
D16	Sheet 12	30.00	30.00	36,000.00	0.00	568.80	0.00	0.00%
D16	Sheet 14	50.53	65.00	60,630.00	17,370.00	957.95	274.45	28.65%
D16	Sheet 21	347.50	377.00	417,000.00	35,400.00	6,588.60	559.32	8.49%
D16	Sheet 26	28.00	28.00	33,600.00	0.00	530.88	0.00	0.00%
D16	Sheet 31	3,235.04	3,241.00	3,882,048.00	7,152.00	61,336.36	113.00	0.18%
D16	Sheet 39	96.75	97.00	116,100.00	300.00	1,834.38	4.74	0.26%
D16	Sheet 46	74.00	74.00	88,800.00	0.00	1,403.04	0.00	0.00%
D16	Sheet 52	373.00	399.00	447,600.00	31,200.00	7,072.08	492.96	6.97%
D16	Sheet 57	22.33	24.00	26,800.00	2,000.00	423.44	31.60	7.46%
D16	Sheet 65	36.67	37.00	44,000.00	400.00	695.20	6.32	0.91%
D16	Sheet 69	8.20	10.00	9,840.00	2,160.00	155.47	34.13	21.95%
D16	Sheet 71	29.83	33.00	35,800.00	3,800.00	565.64	60.04	10.61%
D16	Sheet 74	72.00	80.00	86,400.00	9,600.00	1,365.12	151.68	11.11%
D16	Sheet 77	3.60	4.00	4,320.00	480.00	68.26	7.58	11.11%
D16	Sheet 80	24.67	25.00	29,600.00	400.00	467.68	6.32	1.35%
D16	Sheet 84	255.50	297.00	306,600.00	49,800.00	4,844.28	786.84	16.24%
TOTAL		6,179.29	6,503.00	7,415,138.00	388,462.00	117,159.18	6,137.70	5.24%
D13	Sheet 3							
D13	Sheet 6	956.30	982.00	1,147,560.00	30,840.00	11,957.58	321.35	2.69%
D13	Sheet 8	1,205.13	1,206.00	1,446,160.00	1,040.00	15,068.99	10.84	0.07%
D13	Sheet 13	991.70	1,035.00	1,190,044.00	51,956.00	12,400.26	541.38	4.37%
D13	Sheet 15	24.67	27.00	29,600.00	2,800.00	308.43	29.18	9.46%
D13	Sheet 22	1,503.80	1,521.00	1,804,560.00	20,840.00	18,803.52	215.07	1.14%
D13	Sheet 3 + 27	10,961.73	10,965.00	13,154,071.00	3,929.00	137,065.42	40.94	0.03%
D13	Sheet 40	907.31	917.00	1,088,766.00	11,634.00	11,344.94	121.23	1.07%
D13	Sheet 47	917.57	925.00	1,101,082.00	8,918.00	11,473.27	92.93	0.81%
D13	Sheet 53	480.00	480.00	576,000.00	0.00	6,001.92	0.00	0.00%
D13	Sheet 58	12.00	12.00	14,400.00	0.00	150.05	0.00	0.00%
D13	Sheet 66	545.46	555.00	654,552.00	11,448.00	6,820.43	119.29	1.75%
D13	Sheet 75	353.88	357.00	424,660.00	3,740.00	4,424.96	38.97	0.88%
D13	Sheet 78	216.21	217.00	259,448.00	952.00	2,703.45	9.92	0.37%
D13	Sheet 81	2.33	3.00	2,800.00	800.00	29.18	8.34	28.57%
D13	Sheet 85	261.67	340.00	314,000.00	94,000.00	3,271.88	979.48	29.94%
TOTAL		19,339.76	19,542.00	23,207,703.00	242,697.00	241,824.27	2,528.90	1.05%
D10	Sheet 4	4.06	5.00	4,872.00	1,128.00	30.06	6.96	23.15%
D10	Sheet 9	931.33	1,060.00	1,117,600.00	154,400.00	6,895.59	952.65	13.82%
D10	Sheet 16	46.29	54.00	55,545.00	9,255.00	342.71	57.10	16.66%
D10	Sheet 18	89.09	97.00	106,906.00	9,494.00	659.61	58.58	8.88%
D10	Sheet 23	16.38	19.00	19,660.00	3,140.00	121.30	19.37	15.97%
D10	Sheet 28 + 32	467.67	477.00	561,204.00	11,196.00	3,462.63	69.08	1.99%
D10	Sheet 35 + 42	1,164.91	1,304.00	1,397,888.00	166,912.00	8,624.97	1,029.85	11.94%
D10	Sheet 41	180.45	187.00	216,544.00	7,856.00	1,336.08	48.47	3.63%
D10	Sheet 48	396.25	398.00	475,500.00	2,100.00	2,933.84	12.96	0.44%
D10	Sheet 50	3,341.33	3,342.00	4,009,600.00	800.00	24,739.23	4.94	0.02%
D10	Sheet 54	682.53	694.00	819,040.00	13,760.00	5,053.48	84.90	1.68%
D10	Sheet 59	227.33	234.00	272,800.00	8,000.00	1,683.18	49.36	2.93%
D10	Sheet 61	3,257.50	3,258.00	3,909,000.00	600.00	24,118.53	3.70	0.02%
D10	Sheet 67	786.08	796.00	943,290.00	11,910.00	5,820.10	73.48	1.26%
D10	Sheet 70	47.13	50.00	56,550.00	3,450.00	348.91	21.29	6.10%
D10	Sheet 72	217.33	229.00	260,800.00	14,000.00	1,609.14	86.38	5.37%
D10	Sheet 73	557.85	649.00	669,424.00	109,376.00	4,130.35	674.85	16.34%
D10	Sheet 76	183.73	188.00	220,480.00	5,120.00	1,360.36	31.59	2.32%
D10	Sheet 79	44.32	45.00	53,188.00	812.00	328.17	5.01	1.53%
D10	Sheet 82	22.19	23.00	26,622.00	978.00	164.26	6.03	3.67%
D10	Sheet 86	202.68	217.00	243,218.00	17,182.00	1,500.66	106.01	7.06%
TOTAL		12,866.43	13,326.00	15,439,731.00	551,469.00	95,263.14	3,402.56	3.57%
D8	Sheet 10	20.00	24.00	24,000.00	4,800.00	95.04	19.01	20.00%
D8	Sheet 17	13.02	15.00	15,620.00	2,380.00	61.86	9.42	15.24%
D8	Sheet 33	299.95	336.00	359,940.00	43,260.00	1,425.36	171.31	12.02%
D8	Sheet 34	77.68	80.00	93,220.00	2,780.00	369.15	11.01	2.98%
D8	Sheet 49	19.31	21.00	23,172.00	2,028.00	91.76	8.03	8.75%
D8	Sheet 55	120.00	120.00	144,000.00	0.00	570.24	0.00	0.00%
D8	Sheet 60	11.40	12.00	13,680.00	720.00	54.17	2.85	5.26%
D8	Sheet 68	30.01	32.00	36,006.00	2,394.00	142.58	9.48	6.65%
TOTAL		591.37	640.00	709,638.00	58,362.00	2,810.17	231.11	8.22%

**TOTAL WASTE SOWB OPTIMASI 3
PROYEK XYZ**

REKAPITULASI OUTPUT SOWB	DIAMETER								TOTAL
	8	10	13	16	19	22	25	32	
JUMLAH BATANG TEORITIS	591.37	12,866.43	19,339.76	6,179.29	501.40	4,913.50	5,868.48	1,874.63	52,134.86
JUMLAH BATANG REALISTIS	640.00	13,326.00	19,542.00	6,503.00	619.00	5,041.00	6,188.00	1,875.00	53,734.00
TOTAL PANJANG (cm)	709,638.00	15,439,731.00	23,207,703.00	7,415,138.00	601,678.00	5,896,200.00	7,042,180.00	2,249,550.00	62,561,818.00
WASTE AWAL (cm)	58,362.00	551,469.00	242,697.00	388,462.00	141,122.00	153,000.00	383,420.00	450.00	1,918,982.00
TOTAL WASTE TERPAKAI (cm)	0.00	233,488.00	87,934.00	0.00	0.00	0.00	73,800.00	0.00	395,222.00
TOTAL WASTE (cm)	58,362.00	317,981.00	154,763.00	388,462.00	141,122.00	153,000.00	309,620.00	450.00	1,523,760.00
PERSENTASE WASTE (%)	8.22%	3.57%	1.05%	5.24%	23.45%	2.59%	5.44%	0.02%	2.44%
TOTAL BERAT (Kg)	2,810.17	95,263.14	241,824.27	117,159.18	13,387.34	175,706.76	271,123.93	142,171.56	1,059,446.34
BERAT WASTE (Kg)	231.11	3,402.56	2,528.90	6,137.70	3,139.96	4,559.40	14,761.67	28.44	34,789.75
BERAT WASTE TERPAKAI (Kg)	0.00	1,440.62	0.00	0.00	0.00	0.00	2,841.30	0.00	4,281.92
TOTAL WASTE (Kg)	231.11	1,961.94	2,528.90	6,137.70	3,139.96	4,559.40	11,920.37	28.44	30,507.83
PERSENTASE WASTE (%)	8.22%	3.57%	1.05%	5.24%	23.45%	2.59%	5.44%	0.02%	2.88%

REKAPITULASI OUTPUT SOWB PER DIAMETER OPTIMASI 4
PROYEK XYZ

DIAMETER (mm)	SHEET	JUMLAH BATANG TEORITIS	JUMLAH BATANG REALISTIS	TOTAL PANJANG		TOTAL BERAT		PERSENTASE WASTE
				BESI (cm)	WASTE (cm)	BESI (Kg)	WASTE (Kg)	
D32	Sheet 29	1,874.63	1,875.00	2,249,550.00	450.00	142,171.56	28.44	0.02%
TOTAL		1,874.63	1,875.00	2,249,550.00	450.00	142,171.56	28.44	0.02%
D25	Sheet 11	710.73	712.00	852,880.00	1,520.00	32,836.88	58.52	0.18%
D25	Sheet 36	360.17	383.00	432,200.00	27,400.00	16,639.70	1,054.90	6.34%
D25	Sheet 43	576.83	618.00	692,200.00	49,400.00	26,649.70	1,901.90	7.14%
D25	Sheet 62	248.75	249.00	298,500.00	300.00	11,492.25	11.55	0.10%
D25	Sheet 1	3,972.00	4,226.00	4,766,400.00	304,800.00	183,508.40	11,734.80	6.39%
TOTAL		5,868.48	6,188.00	7,042,180.00	383,420.00	271,123.93	14,761.67	5.44%
D22	Sheet 19							
D22	Sheet 24	3,416.00	3,485.00	4,099,200.00	82,800.00	122,156.16	2,467.44	2.02%
D22	Sheet 37	155.58	157.00	186,700.00	1,700.00	5,563.66	50.66	0.91%
D22	Sheet 44	51.25	52.00	61,500.00	900.00	1,832.70	26.82	1.46%
D22	Sheet 51	52.17	53.00	62,600.00	1,000.00	1,865.48	29.80	1.60%
D22	Sheet 56	25.25	26.00	30,300.00	900.00	902.94	26.82	2.97%
D22	Sheet 63	239.25	251.00	287,100.00	14,100.00	8,555.58	420.18	4.91%
TOTAL		3,939.50	4,024.00	4,727,400.00	101,400.00	140,876.52	3,021.72	2.14%
D19	Sheet 2	105.08	148.00	126,096.00	51,504.00	2,805.64	1,145.96	40.85%
D19	Sheet 19 + 20	1,360.23	1,416.00	1,632,272.00	66,928.00	36,318.05	1,489.15	4.10%
D19	Sheet 25	37.33	56.00	44,800.00	22,400.00	996.80	498.40	50.00%
D19	Sheet 30	157.17	158.00	188,600.00	1,000.00	4,196.35	22.25	0.53%
D19	Sheet 38	1.33	2.00	1,600.00	800.00	35.60	17.80	50.00%
D19	Sheet 45	9.00	10.00	10,800.00	1,200.00	240.30	26.70	11.11%
D19	Sheet 64	39.50	40.00	47,400.00	600.00	1,054.65	13.35	1.27%
D19	Sheet 83	58.92	61.00	70,702.00	2,498.00	1,573.12	55.58	3.53%
TOTAL		1,768.56	1,891.00	2,122,270.00	146,930.00	47,220.51	3,269.19	6.92%
D16	Sheet 5	1,223.00	1,320.00	1,467,600.00	116,400.00	23,188.08	1,839.12	7.93%
D16	Sheet 7							
D16	Sheet 12	30.00	30.00	36,000.00	0.00	568.80	0.00	0.00%
D16	Sheet 14	50.53	65.00	60,630.00	17,370.00	957.95	274.45	28.65%
D16	Sheet 21	347.50	377.00	417,000.00	35,400.00	6,588.60	559.32	8.49%
D16	Sheet 26	28.00	28.00	33,600.00	0.00	530.88	0.00	0.00%
D16	Sheet 31	3,235.04	3,241.00	3,882,048.00	7,152.00	61,336.36	113.00	0.18%
D16	Sheet 39	96.75	97.00	116,100.00	300.00	1,834.38	4.74	0.26%
D16	Sheet 46	74.00	74.00	88,800.00	0.00	1,403.04	0.00	0.00%
D16	Sheet 52	373.00	399.00	447,600.00	31,200.00	7,072.08	492.96	6.97%
D16	Sheet 57	22.33	24.00	26,800.00	2,000.00	423.44	31.60	7.46%
D16	Sheet 65	36.67	37.00	44,000.00	400.00	695.20	6.32	0.91%
D16	Sheet 69	8.20	10.00	9,840.00	2,160.00	155.47	34.13	21.95%
D16	Sheet 71	29.83	33.00	35,800.00	3,800.00	565.64	60.04	10.61%
D16	Sheet 74	72.00	80.00	86,400.00	9,600.00	1,365.12	151.68	11.11%
D16	Sheet 77	3.60	4.00	4,320.00	480.00	68.26	7.58	11.11%
D16	Sheet 80	24.67	25.00	29,600.00	400.00	467.68	6.32	1.35%
D16	Sheet 84	255.50	297.00	306,600.00	49,800.00	4,844.28	786.84	16.24%
TOTAL		5,910.62	6,141.00	7,092,738.00	276,462.00	112,065.26	4,368.10	3.90%
D13	Sheet 3							
D13	Sheet 6	956.30	982.00	1,147,560.00	30,840.00	11,957.58	321.35	2.69%
D13	Sheet 7 + 8	1,613.47	1,750.00	1,936,160.00	163,840.00	20,174.79	1,707.21	8.46%
D13	Sheet 13	991.70	1,035.00	1,190,044.00	51,956.00	12,400.26	541.38	4.37%
D13	Sheet 15	24.67	27.00	29,600.00	2,800.00	308.43	29.18	9.46%
D13	Sheet 22	1,503.80	1,521.00	1,804,560.00	20,640.00	18,803.52	215.07	1.14%
D13	Sheet 3 + 27	10,961.73	10,965.00	13,154,071.00	3,929.00	137,065.42	40.94	0.03%
D13	Sheet 40	907.31	917.00	1,088,766.00	11,634.00	11,344.94	121.23	1.07%
D13	Sheet 47	917.57	925.00	1,101,082.00	8,918.00	11,473.27	92.93	0.81%
D13	Sheet 53	480.00	480.00	576,000.00	0.00	6,001.92	0.00	0.00%
D13	Sheet 58	12.00	12.00	14,400.00	0.00	150.05	0.00	0.00%
D13	Sheet 66	645.46	655.00	654,552.00	11,448.00	6,820.43	119.29	1.75%
D13	Sheet 75	353.88	357.00	424,660.00	3,740.00	4,424.96	38.97	0.88%
D13	Sheet 78	216.21	217.00	259,448.00	952.00	2,703.45	9.92	0.37%
D13	Sheet 81	2.33	3.00	2,800.00	800.00	29.18	8.34	28.57%
D13	Sheet 85	261.67	340.00	314,000.00	94,000.00	3,271.88	979.48	29.94%
TOTAL		19,748.10	20,086.00	23,697,703.00	405,497.00	246,930.07	4,225.28	1.71%
D10	Sheet 4	4.06	5.00	4,872.00	1,128.00	30.06	6.96	23.15%
D10	Sheet 9	931.33	1,060.00	1,117,600.00	154,400.00	6,895.59	952.65	13.82%
D10	Sheet 16	46.29	54.00	55,545.00	9,255.00	342.71	57.10	16.66%
D10	Sheet 18	89.09	97.00	106,906.00	9,494.00	659.51	58.58	8.88%
D10	Sheet 23	16.38	19.00	19,660.00	3,140.00	121.30	19.37	15.97%
D10	Sheet 28 + 32	467.67	477.00	561,204.00	11,196.00	3,462.63	69.08	1.99%
D10	Sheet 35 + 42	1,164.91	1,304.00	1,397,888.00	166,912.00	8,624.97	1,029.85	11.94%
D10	Sheet 41	180.45	187.00	216,544.00	7,856.00	1,336.08	48.47	3.63%
D10	Sheet 48	396.25	398.00	475,500.00	2,100.00	2,933.84	12.96	0.44%
D10	Sheet 50	3,341.33	3,342.00	4,009,600.00	800.00	24,739.23	4.94	0.02%
D10	Sheet 54	682.53	694.00	819,040.00	13,760.00	5,053.48	84.90	1.68%
D10	Sheet 59	227.33	234.00	272,800.00	8,000.00	1,683.18	49.36	2.93%
D10	Sheet 61	3,257.50	3,258.00	3,909,000.00	600.00	24,118.53	3.70	0.02%
D10	Sheet 67	786.08	796.00	943,290.00	11,910.00	5,820.10	73.48	1.26%
D10	Sheet 70	47.13	50.00	56,550.00	3,450.00	348.91	21.29	6.10%
D10	Sheet 72	217.33	229.00	260,800.00	14,000.00	1,609.14	86.38	5.37%
D10	Sheet 73	557.85	649.00	669,424.00	109,376.00	4,130.35	674.85	16.34%
D10	Sheet 76	183.73	188.00	220,480.00	5,120.00	1,360.36	31.59	2.32%
D10	Sheet 79	44.32	45.00	53,188.00	812.00	328.17	5.01	1.53%
D10	Sheet 82	22.19	23.00	26,232.00	978.00	164.26	6.03	3.67%
D10	Sheet 86	202.68	217.00	243,218.00	17,182.00	1,500.66	106.01	7.06%
TOTAL		12,866.43	13,326.00	15,439,731.00	551,469.00	95,263.14	3,402.56	3.57%
D8	Sheet 10	20.00	24.00	24,000.00	4,800.00	95.04	19.01	20.00%
D8	Sheet 17	13.02	15.00	15,620.00	2,380.00	61.86	9.42	15.24%
D8	Sheet 33	299.95	336.00	359,940.00	43,260.00	1,425.36	171.31	12.02%
D8	Sheet 34	77.68	80.00	93,220.00	2,780.00	369.15	11.01	2.98%
D8	Sheet 49	19.31	21.00	23,172.00	2,028.00	91.76	8.03	8.75%
D8	Sheet 55	120.00	120.00	144,000.00	0.00	570.24	0.00	0.00%
D8	Sheet 60	11.40	12.00	13,680.00	720.00	54.17	2.85	5.26%
D8	Sheet 68	30.01	32.00	36,006.00	2,394.00	142.58	9.48	6.65%
TOTAL		591.37	640.00	709,638.00	58,362.00	2,810.17	231.11	8.22%

**TOTAL WASTE SOWB OPTIMASI 4
PROYEK XYZ**

REKAPITULASI OUTPUT SOWB	DIAMETER								TOTAL
	8	10	13	16	19	22	25	32	
JUMLAH BATANG TEORITIS	591.37	12,866.43	19,748.10	5,910.62	1,768.56	3,939.50	5,868.48	1,874.63	52,567.69
JUMLAH BATANG REALISTIS	640.00	13,326.00	20,086.00	6,141.00	1,891.00	4,024.00	6,188.00	1,875.00	54,171.00
TOTAL PANJANG (cm)	709,638.00	15,439,731.00	23,697,703.00	7,092,738.00	2,122,270.00	4,727,400.00	7,042,180.00	2,249,550.00	63,081,210.00
WASTE AWAL (cm)	58,362.00	551,469.00	405,497.00	276,462.00	146,930.00	101,400.00	383,420.00	450.00	1,923,990.00
TOTAL WASTE TERPAKAI (cm)	0.00	233,488.00	87,934.00	0.00	0.00	0.00	73,800.00	0.00	395,222.00
TOTAL WASTE (cm)	58,362.00	317,981.00	317,563.00	276,462.00	146,930.00	101,400.00	309,620.00	450.00	1,528,768.00
PERSENTASE WASTE (%)	8.22%	3.57%	1.71%	3.90%	6.92%	2.14%	5.44%	0.02%	2.42%
TOTAL BERAT (Kg)	2,810.17	95,263.14	246,930.07	112,065.26	47,220.51	140,876.52	271,123.93	142,171.56	1,058,461.15
BERAT WASTE (Kg)	231.11	3,402.56	4,225.28	4,368.10	3,269.19	3,021.72	14,761.67	28.44	33,308.08
BERAT WASTE TERPAKAI (Kg)	0.00	1,440.62	916.27	0.00	0.00	0.00	2,841.30	0.00	5,198.19
TOTAL WASTE (Kg)	231.11	1,961.94	3,309.00	4,368.10	3,269.19	3,021.72	11,920.37	28.44	28,109.88
PERSENTASE WASTE (%)	8.22%	3.57%	1.71%	3.90%	6.92%	2.14%	5.44%	0.02%	2.66%