2.2 Load tables for walls constructed with 20MPa blocks:

The tables in this section are for walls where the design is based on either the height or the length of the wall. Refer to page 4 of Section 2 above to determine if wall height or wall length governs the design of the wall.

Alternatively for the wall under consideration, determine the maximum design load based on height and the maximum design load based on length using the charts below, and adopt the larger of the two values.

20MPa Blocks, Minimum C25/30 Grout *

* Note: For further guidance on grout refer Part 1 Section 5 of this Design Manual. C25/30 is the minimum grout strength for reinforced masonry.

Tables: (Chamfered blocks)

Table CH200-20-1: 20MPa blocks, a_v = 0.75, height governs
Table CH200-20-2: 20MPa blocks, a_v = 1.00, height governs

Table CL200-20-1: 20MPa blocks, a_h = 0.75, length governs
Table CL200-20-2: 20MPa blocks, a_h = 1.0, length governs
Table CL200-20-3: 20MPa blocks, a_h = 2.0, length governs
Table CL200-20-4: 20MPa blocks, a_h = 2.5, length governs

Table CH200-20-1

200 MORTARLESS WALL (CHAMFERED BLOCKS)

Block: 20 MPa **Wall Span: VERTICAL** **a_v = 0.75**

Grout: C16/20 min. Category 1 masonry units (refer BS 5628-1 Clause 3.3)

			MAXIMUM DESIGN LOAD IN COMPRESSION (N_d) WITH DIFFERENT ECCENTRICITIES											
Wall height H (mm)	h_{ef} = 0.75 H (mm)	S_r = h_{ef}/t	e_x = 8.7mm		e_x = 10mm		e_x = 20mm		e_x = 30mm		e_x = 40mm		e_x = 50mm	
			ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)
1600	1200	6	1.00	471	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
2000	1500	7.5	1.00	471	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
2400	1800	9	1.00	473	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
2800	2100	10.5	0.98	460	0.97	455	0.88	414	0.77	363	0.66	311	0.55	259
3200	2400	12	0.95	446	0.94	440	0.87	409	0.77	363	0.66	311	0.55	259
3600	2700	13.5	0.91	429	0.90	424	0.83	393	0.77	362	0.66	311	0.55	259
4000	3000	15	0.87	411	0.86	405	0.79	374	0.73	343	0.66	311	0.55	259
4400	3300	16.5	0.83	390	0.82	385	0.75	354	0.69	323	0.62	292	0.55	259
4800	3600	18	0.78	368	0.77	363	0.70	331	0.64	300	0.57	269	0.51	238
5200	3900	19.5	0.73	344	0.72	338	0.65	307	0.59	276	0.52	245	0.45	214
5600	4200	21	0.67	318	0.66	312	0.60	281	0.53	250	0.46	219	0.40	188
6000	4500	22.5	0.61	289	0.60	284	0.54	253	0.47	222	0.40	191	0.34	160
6400	4800	24	0.55	259	0.54	254	0.47	223	0.41	192	0.34	161	0.28	129
6800	5100	25.5	0.48	227	0.47	222	0.40	191	0.34	160	0.27	129	0.21	97
7200	5400	27	0.41	193	0.40	188	0.33	157	0.27	126	0.20	95	0.13	63
			e_x/t_b = 0.05										e_x/t_b = 0.30	

NOTES:

Linear interpolation between all values in the table is permitted, but do not extrapolate.

a_v is the effective height multiplier. a_v = 0.75 applies to walls that have enhanced resistance to lateral movement top and bottom, e.g. walls built off concrete slabs or footings at the bottom and supporting slabs at the top.
e_x is the effective eccentricity at the top of the wall. t is the thickness of the wall (= 200mm), and t_b is the equivalent bedded thickness of the wall (= 174mm)

Short walls:
When $S_r \leq 6$ and $e_x/t_b \leq 0.05$, walls can be designed for compression only (i.e. there is no need to design for bending).
When $S_r \leq 6$ and $0.05 < e_x/t_b \leq 0.5$, walls must be designed for combined bending and compression. This is accounted for when using the above table.
When $S_r \leq 6$ and $e_x/t_b > 0.5$, walls may be designed as a member in bending only, disregarding the vertical load.

Slender walls:
When $6 < S_r < 27$ the wall can be designed in the same manner as short walls but the design moment must be increased to account for lateral deflection of the wall panel. This is accounted for in the above table. (Note that BS 5628-2 classifies walls with $S_r > 12$ as slender walls, however the limit from BS 5628-1 has been adopted as this is more conservative, and as mortarless walls are designed as unreinforced in compression.)

Grout:
The minimum permissible grout strength (cube strength) is the unconfined compressive strength of the block, however the grout strength is not to be less than C25/30 (to BS 8500). Check also the requirements of BS 5628-2:2005 for exposure situations E1 to E4 and the requirements for minimum cement content (starts at 315 kg/m^3) and minimum free w/c ratio (refer BS 5628-2:2005 Table 15).

Table CH200-20-2

200 MORTARLESS WALL (CHAMFERED BLOCKS)

Block: 20 MPa **Wall Span: VERTICAL** a_v **= 1.0**
Grout: C16/20 min. Category 1 masonry units (refer BS 5628-1 Clause 3.3)

			MAXIMUM DESIGN LOAD IN COMPRESSION (N_d) WITH DIFFERENT ECCENTRICITIES											
Wall height H (mm)	$h_{ef} = H$ (mm)	$S_r = h_{ef}/t$	e_x = 8.7mm		e_x = 10mm		e_x = 20mm		e_x = 30mm		e_x = 40mm		e_x = 50mm	
			ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)
1200	1200	6	1.00	471	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
1600	1600	8	1.00	471	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
2000	2000	10	0.99	465	0.98	459	0.88	414	0.77	363	0.66	311	0.55	259
2400	2400	12	0.95	446	0.94	440	0.87	409	0.77	363	0.66	311	0.55	259
2800	2800	14	0.90	423	0.89	418	0.82	387	0.76	356	0.66	311	0.55	259
3200	3200	16	0.84	397	0.83	392	0.77	361	0.70	330	0.63	299	0.55	259
3600	3600	18	0.78	368	0.77	363	0.70	331	0.64	300	0.57	269	0.51	238
4000	4000	20	0.71	335	0.70	330	0.63	299	0.57	268	0.50	237	0.44	205
4400	4400	22	0.64	299	0.62	293	0.56	262	0.49	231	0.43	200	0.36	169
4800	4800	24	0.55	259	0.54	254	0.47	223	0.41	192	0.34	161	0.28	129
5200	5200	26	0.46	216	0.45	211	0.38	180	0.32	148	0.25	117	0.18	86
5400	5400	27	0.41	193	0.40	188	0.33	157	0.27	126	0.20	95	0.13	63
			e_x/t_b = 0.05										e_x/t_b = 0.30	

NOTES:

Linear interpolation between all values in the table is permitted, but do not extrapolate.

a_v is the effective height multiplier. a_v = 1.0 applies to walls that have simple resistance to lateral movement top and bottom, e.g. walls restrained by timber framed floors or roofs top and bottom.
e_x is the effective eccentricity at the top of the wall. t is the thickness of the wall (= 200mm), and t_b is the equivalent bedded thickness of the wall (= 174mm)

Short walls:
When $S_r \leq 6$ and $e_x/t_b \leq 0.05$, walls can be designed for compression only (i.e. there is no need to design for bending).
When $S_r \leq 6$ and $0.05 < e_x/t_b \leq 0.5$, walls must be designed for combined bending and compression. This is accounted for when using the above table.
When $S_r \leq 6$ and $e_x/t_b > 0.5$, walls may be designed as a member in bending only, disregarding the vertical load.

Slender walls:
When $6 < S_r < 27$ the wall can be designed in the same manner as short walls but the design moment must be increased to account for lateral deflection of the wall panel. This is accounted for in the above table. (Note that BS 5628-2 classifies walls with $S_r > 12$ as slender walls, however the limit from BS 5628-1 has been adopted as this is more conservative, and as mortarless walls are designed as unreinforced in compression.)

Grout:
The minimum permissible grout strength (cube strength) is the unconfined compressive strength of the block, however the grout strength is not to be less than C25/30 (to BS 8500). Check also the requirements of BS 5628-2:2005 for exposure situations E1 to E4 and the requirements for minimum cement content (starts at 315 kg/m^3) and minimum free w/c ratio (refer BS 5628-2:2005 Table 15).

Table CL200-20-1

200 MORTARLESS WALL (CHAMFERED BLOCKS)

Block: 20 MPa **Wall Span: HORIZONTAL** a_h **= 0.75**

Grout: C16/20 min. Category 1 masonry units (refer BS 5628-1 Clause 3.3)

Wall Length L (mm)	L_{ef} = 0.75 L (mm)	$S_r = L_{ef}/t$	MAXIMUM DESIGN LOAD IN COMPRESSION (N_d) WITH DIFFERENT ECCENTRICITIES											
			e_x = 8.7mm		e_x = 10mm		e_x = 20mm		e_x = 30mm		e_x = 40mm		e_x = 50mm	
			ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)
1200	900	4.5	1.00	471	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
1600	1200	6	1.00	471	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
2000	1500	7.5	1.00	471	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
2400	1800	9	1.00	473	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
2800	2100	10.5	0.98	460	0.97	455	0.88	414	0.77	363	0.66	311	0.55	259
3200	2400	12	0.95	446	0.94	440	0.87	409	0.77	363	0.66	311	0.55	259
3600	2700	13.5	0.91	429	0.90	424	0.83	393	0.77	362	0.66	311	0.55	259
4000	3000	15	0.87	411	0.86	405	0.79	374	0.73	343	0.66	311	0.55	259
4400	3300	16.5	0.83	390	0.82	385	0.75	354	0.69	323	0.62	292	0.55	259
4800	3600	18	0.78	368	0.77	363	0.70	331	0.64	300	0.57	269	0.51	238
5200	3900	19.5	0.73	344	0.72	338	0.65	307	0.59	276	0.52	245	0.45	214
5600	4200	21	0.67	318	0.66	312	0.60	281	0.53	250	0.46	219	0.40	188
6000	4500	22.5	0.61	289	0.60	284	0.54	253	0.47	222	0.40	191	0.34	160
6400	4800	24	0.55	259	0.54	254	0.47	223	0.41	192	0.34	161	0.28	129
6800	5100	25.5	0.48	227	0.47	222	0.40	191	0.34	160	0.27	129	0.21	97
7200	5400	27	0.41	193	0.40	188	0.33	157	0.27	126	0.20	95	0.13	63
			e_x/t_b = 0.05										e_x/t_b = 0.30	

NOTES:

Linear interpolation between all values in the table is permitted, but do not extrapolate.

a_h is the effective length multiplier. a_h = 0.75 applies to walls that have enhanced resistance to lateral movement both ends, e.g. walls restrained by fully bonded intersecting walls at both ends.
e_x is the effective eccentricity at the top of the wall. t is the thickness of the wall (= 200mm), and t_b is the equivalent bedded thickness of the wall (= 174mm)

Short walls:
When $S_r \leq 6$ and $e_x/t_b \leq 0.05$, walls can be designed for compression only (i.e. there is no need to design for bending).
When $S_r \leq 6$ and $0.05 < e_x/t_b \leq 0.5$, walls must be designed for combined bending and compression. This is accounted for when using the above table.
When $S_r \leq 6$ and $e_x/t_b > 0.5$, walls may be designed as a member in bending only, disregarding the vertical load.

Slender walls:
When $6 < S_r < 27$ the wall can be designed in the same manner as short walls but the design moment must be increased to account for lateral deflection of the wall panel. This is accounted for in the above table. (Note that BS 5628-2 classifies walls with $S_r > 12$ as slender walls, however the limit from BS 5628-1 has been adopted as this is more conservative, and as mortarless walls are designed as unreinforced in compression.)

Grout:
The minimum permissible grout strength (cube strength) is the unconfined compressive strength of the block, however the grout strength is not to be less than C25/30 (to BS 8500). Check also the requirements of BS 5628-2:2005 for exposure situations E1 to E4 and the requirements for minimum cement content (starts at 315 kg/m^3) and minimum free w/c ratio (refer BS 5628-2:2005 Table 15).

Table CL200-20-2

200 MORTARLESS WALL (CHAMFERED BLOCKS)

Block: 20 MPa **Wall Span: HORIZONTAL** **a_h = 1.0**

Grout: C16/20 min. Category 1 masonry units (refer BS 5628-1 Clause 3.3)

			MAXIMUM DESIGN LOAD IN COMPRESSION (N_d) WITH DIFFERENT ECCENTRICITIES											
Wall Length L (mm)	L_{ef} = 1.0 L (mm)	S_r = L_{ef}/t	e_x = 8.7mm		e_x = 10mm		e_x = 20mm		e_x = 30mm		e_x = 40mm		e_x = 50mm	
			ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)
1200	1200	6	1.00	471	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
1600	1600	8	1.00	471	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
2000	2000	10	0.99	465	0.98	459	0.88	414	0.77	363	0.66	311	0.55	259
2400	2400	12	0.95	446	0.94	440	0.87	409	0.77	363	0.66	311	0.55	259
2800	2800	14	0.90	423	0.89	418	0.82	387	0.76	356	0.66	311	0.55	259
3200	3200	16	0.84	397	0.83	392	0.77	361	0.70	330	0.63	299	0.55	259
3600	3600	18	0.78	368	0.77	363	0.70	331	0.64	300	0.57	269	0.51	238
4000	4000	20	0.71	335	0.70	330	0.63	299	0.57	268	0.50	237	0.44	205
4400	4400	22	0.64	299	0.62	293	0.56	262	0.49	231	0.43	200	0.36	169
4800	4800	24	0.55	259	0.54	254	0.47	223	0.41	192	0.34	161	0.28	129
5200	5200	26	0.46	216	0.45	211	0.38	180	0.32	148	0.25	117	0.18	86
5400	5400	27	0.41	193	0.40	188	0.33	157	0.27	126	0.20	95	0.13	63
			e_x/t_b = 0.05										e_x/t_b = 0.30	

NOTES:

Linear interpolation between all values in the table is permitted, but do not extrapolate.

a_h is the effective length multiplier. a_h = 1.0 applies to walls that have simple resistance to lateral movement both ends, e.g. walls restrained by timber framed intersecting walls at both ends.
e_x is the effective eccentricity at the top of the wall. t is the thickness of the wall (= 200mm), and t_b is the equivalent bedded thickness of the wall (= 174mm)

Short walls:
When $S_r \leq 6$ and $e_x/t_b \leq 0.05$, walls can be designed for compression only (i.e. there is no need to design for bending).
When $S_r \leq 6$ and $0.05 < e_x/t_b \leq 0.5$, walls must be designed for combined bending and compression. This is accounted for when using the above table.
When $S_r \leq 6$ and $e_x/t_b > 0.5$, walls may be designed as a member in bending only, disregarding the vertical load.

Slender walls:
When $6 < S_r < 27$ the wall can be designed in the same manner as short walls but the design moment must be increased to account for lateral deflection of the wall panel. This is accounted for in the above table. (Note that BS 5628-2 classifies walls with $S_r > 12$ as slender walls, however the limit from BS 5628-1 has been adopted as this is more conservative, and as mortarless walls are designed as unreinforced in compression.)

Grout:
The minimum permissible grout strength (cube strength) is the unconfined compressive strength of the block, however the grout strength is not to be less than C25/30 (to BS 8500). Check also the requirements of BS 5628-2:2005 for exposure situations E1 to E4 and the requirements for minimum cement content (starts at 315 kg/m^3) and minimum free w/c ratio (refer BS 5628-2:2005 Table 15).

Table CL200-20-3

200 MORTARLESS WALL (CHAMFERED BLOCKS)

Block: 20 MPa **Wall Span: HORIZONTAL** **a_h = 2.0**

Grout: C16/20 min. Category 1 masonry units (refer BS 5628-1 Clause 3.3)

			MAXIMUM DESIGN LOAD IN COMPRESSION (N_d) WITH DIFFERENT ECCENTRICITIES											
Wall Length **L** (mm)	L_{ef} = 2.0 L (mm)	S_r = L_{ef}/t	e_x = 8.7mm		e_x = 10mm		e_x = 20mm		e_x = 30mm		e_x = 40mm		e_x = 50mm	
			ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)
600	1200	6	1.00	471	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
800	1600	8	1.00	471	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
1000	2000	10	0.99	465	0.98	459	0.88	414	0.77	363	0.66	311	0.55	259
1200	2400	12	0.95	446	0.94	440	0.87	409	0.77	363	0.66	311	0.55	259
1400	2800	14	0.90	423	0.89	418	0.82	387	0.76	356	0.66	311	0.55	259
1600	3200	16	0.84	397	0.83	392	0.77	361	0.70	330	0.63	299	0.55	259
1800	3600	18	0.78	368	0.77	363	0.70	331	0.64	300	0.57	269	0.51	238
2000	4000	20	0.71	335	0.70	330	0.63	299	0.57	268	0.50	237	0.44	205
2200	4400	22	0.64	299	0.62	293	0.56	262	0.49	231	0.43	200	0.36	169
2400	4800	24	0.55	259	0.54	254	0.47	223	0.41	192	0.34	161	0.28	129
2600	5200	26	0.46	216	0.45	211	0.38	180	0.32	148	0.25	117	0.18	86
2700	5400	27	0.41	193	0.40	188	0.33	157	0.27	126	0.20	95	0.13	63
			e_x/t_b = 0.05										e_x/t_b = 0.30	

NOTES:

Linear interpolation between all values in the table is permitted, but do not extrapolate.

a_h is the effective length multiplier. a_h = 2.0 applies to walls that have enhanced resistance to lateral movement at one end that have a free edge at the other end.
e_x is the effective eccentricity at the top of the wall. t is the thickness of the wall (= 200mm), and t_b is the equivalent bedded thickness of the wall (= 174mm)

Short walls:
When $S_r \le 6$ and $e_x/t_b \le 0.05$, walls can be designed for compression only (i.e. there is no need to design for bending).
When $S_r \le 6$ and $0.05 < e_x/t_b \le 0.5$, walls must be designed for combined bending and compression. This is accounted for when using the above table.
When $S_r \le 6$ and $e_x/t_b > 0.5$, walls may be designed as a member in bending only, disregarding the vertical load.

Slender walls:
When $6 < S_r < 27$ the wall can be designed in the same manner as short walls but the design moment must be increased to account for lateral deflection of the wall panel. This is accounted for in the above table. (Note that BS 5628-2 classifies walls with $S_r > 12$ as slender walls, however the limit from BS 5628-1 has been adopted as this is more conservative, and as mortarless walls are designed as unreinforced in compression.)

Grout:
The minimum permissible grout strength (cube strength) is the unconfined compressive strength of the block, however the grout strength is not to be less than C25/30 (to BS 8500). Check also the requirements of BS 5628-2:2005 for exposure situations E1 to E4 and the requirements for minimum cement content (starts at 315 kg/m^3) and minimum free w/c ratio (refer BS 5628-2:2005 Table 15).

Table CL200-20-4

200 MORTARLESS WALL (CHAMFERED BLOCKS)

Block: 20 MPa **Wall Span: HORIZONTAL** **a_h = 2.5**

Grout: C16/20 min. Category 1 masonry units (refer BS 5628-1 Clause 3.3)

Wall Length L (mm)	L_{ef} = 2.5 L (mm)	S_r = L_{ef}/t	MAXIMUM DESIGN LOAD IN COMPRESSION (N_d) WITH DIFFERENT ECCENTRICITIES											
			e_x = 8.7mm		e_x = 10mm		e_x = 20mm		e_x = 30mm		e_x = 40mm		e_x = 50mm	
			ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)	ß	N_d (kN/m)
600	1500	7.5	1.00	471	0.99	466	0.88	414	0.77	363	0.66	311	0.55	259
800	2000	10	0.99	465	0.98	459	0.88	414	0.77	363	0.66	311	0.55	259
1000	2500	12.5	0.94	441	0.92	435	0.88	414	0.77	363	0.66	311	0.55	259
1200	3000	15	0.87	411	0.86	405	0.79	374	0.77	363	0.66	311	0.55	259
1400	3500	17.5	0.80	376	0.79	370	0.72	339	0.65	308	0.59	277	0.52	246
1600	4000	20	0.71	335	0.70	330	0.63	299	0.57	268	0.50	237	0.44	205
1800	4500	22.5	0.61	289	0.60	284	0.54	253	0.47	222	0.40	191	0.34	160
2000	5000	25	0.51	238	0.49	233	0.43	202	0.36	170	0.30	139	0.23	108
2100	5250	26.25	0.45	211	0.44	205	0.37	174	0.30	143	0.24	112	0.17	81
			e_x/t_b = 0.05										e_x/t_b = 0.30	

NOTES:

Linear interpolation between all values in the table is permitted, but do not extrapolate.

a_h is the effective length multiplier. a_h = 2.5 applies to walls that have simple resistance to lateral movement at one end that have a free edge at the other end.
e_x is the effective eccentricity at the top of the wall. t is the thickness of the wall (= 200mm), and t_b is the equivalent bedded thickness of the wall (= 174mm)

Short walls:
When $S_r \leq 6$ and $e_x/t_b \leq 0.05$, walls can be designed for compression only (i.e. there is no need to design for bending).
When $S_r \leq 6$ and $0.05 < e_x/t_b \leq 0.5$, walls must be designed for combined bending and compression. This is accounted for when using the above table.
When $S_r \leq 6$ and $e_x/t_b > 0.5$, walls may be designed as a member in bending only, disregarding the vertical load.

Slender walls:
When $6 < S_r < 27$ the wall can be designed in the same manner as short walls but the design moment must be increased to account for lateral deflection of the wall panel. This is accounted for in the above table. (Note that BS 5628-2 classifies walls with $S_r > 12$ as slender walls, however the limit from BS 5628-1 has been adopted as this is more conservative, and as mortarless walls are designed as unreinforced in compression.)

Grout:
The minimum permissible grout strength (cube strength) is the unconfined compressive strength of the block, however the grout strength is not to be less than C25/30 (to BS 8500). Check also the requirements of BS 5628-2:2005 for exposure situations E1 to E4 and the requirements for minimum cement content (starts at 315 kg/m^3) and minimum free w/c ratio (refer BS 5628-2:2005 Table 15).