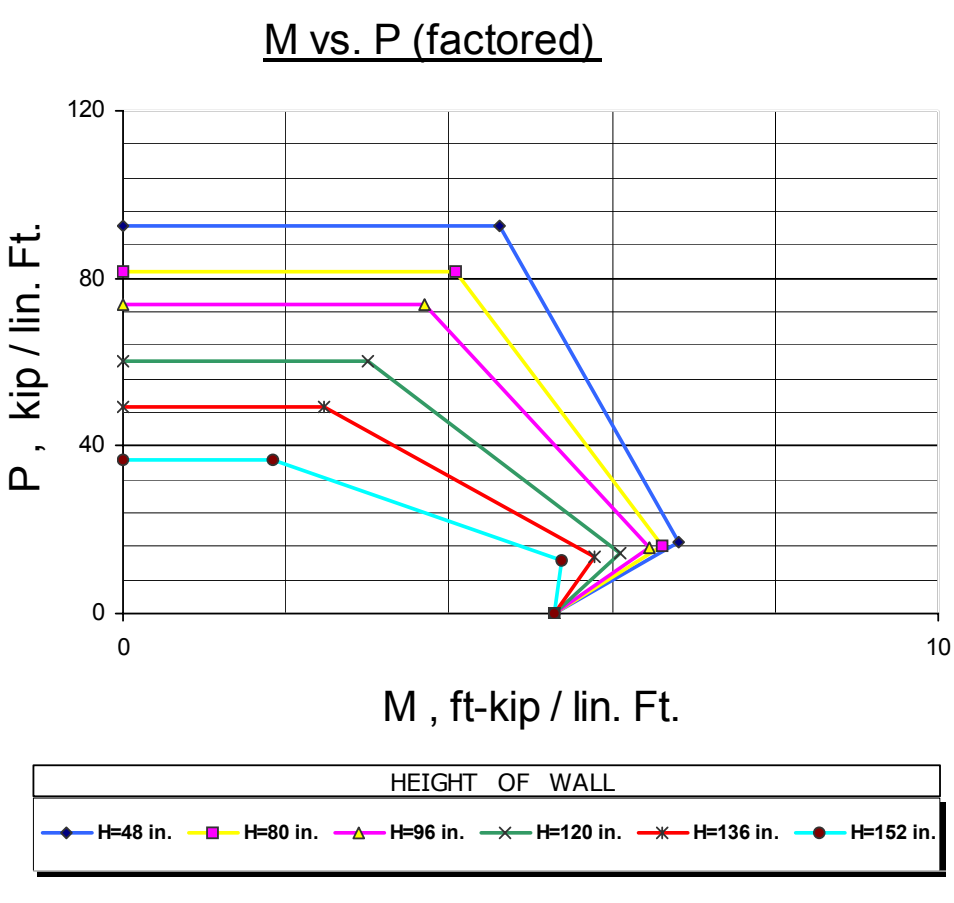
B-6.2. Interaction Diagrams for Structural Reinforced Armopanel™ Concrete Walls

k (effective length factor) =1	f'c=3,550 psi	fy=60,000 psi
Armopanel™ Concrete Wall. Interaction Diagram		
VERTICAL REINFORCEMENT	# 5 @ 16"	
THICKNESS OF CONCRETE CORE	6"	

FLEXURE AND AXIAL STRENGTH IN *VERTICAL* DIRECTION per linear foot



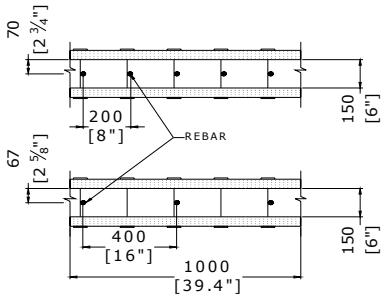
FLEXURE FACTORED LOAD STRENGTH IN *HORIZONTAL* DIRECTION per linear foot (factored)		1.23 , ft-kip / lin. Ft.
SHEAR CAPACITY	V (factored)	3.56 , kips / lin. Ft.

NOTE:
Vertical reinforcement should be placed within middle third of the concrete wall.

FIG. B-6.2.1

Supplementary table to 6" Concrete Wall Interaction Diagram
Minimum Vertical Reinforcement Required

Concrete Strength = 3,500 psi
Steel Strength = 60,000 psi
Vertical reinforcement should be placed within middle third of the concrete wall



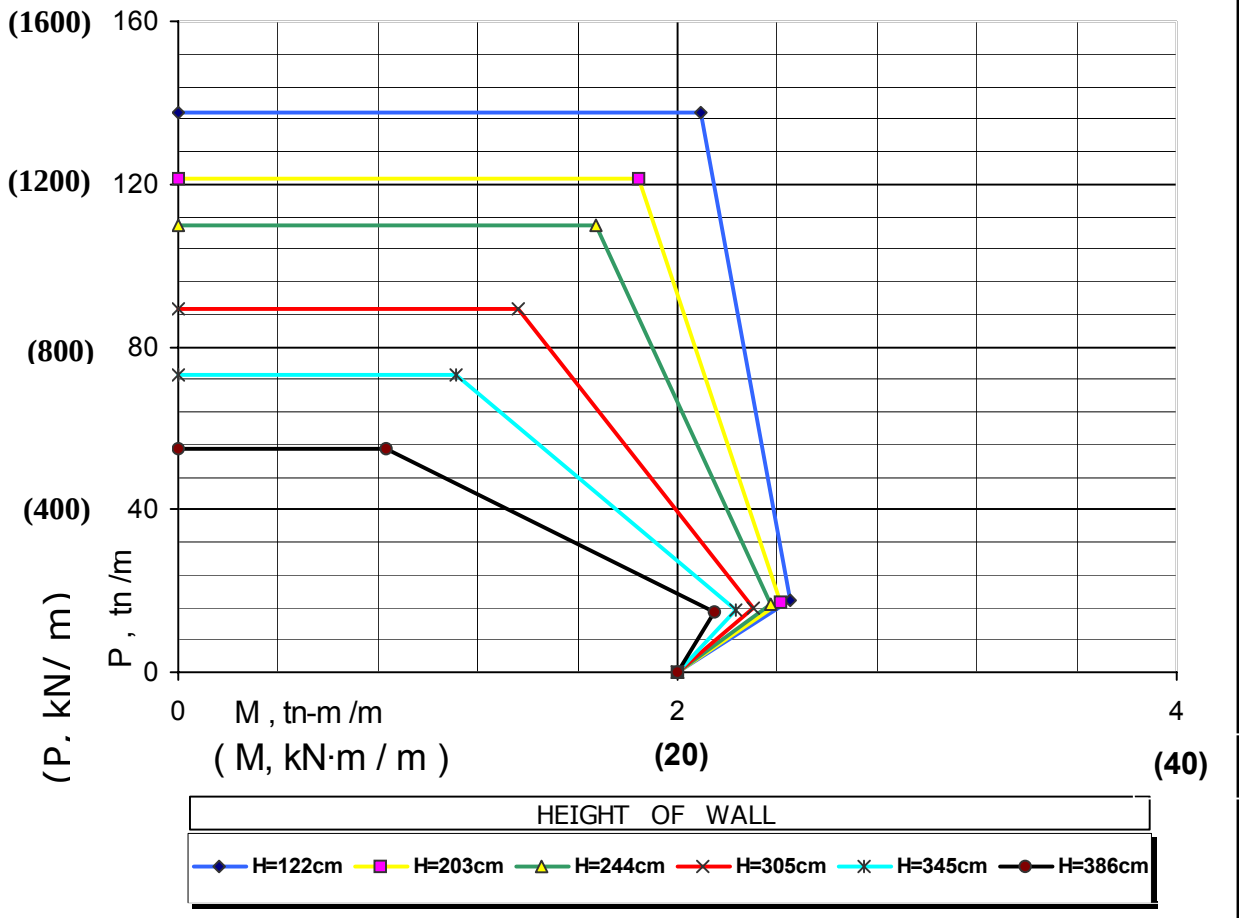
Wall Height per Storey (ft)	M, kip·ft	P , kip							
		16	24	32	40	48	60	74	80
6	6,6		Design Required						
	6,3			Design Required					
	6				Design Required				
	5,7	#5 @ 16"				Design Required			
	5,4						Design Required		
	4,9	D12 @ 8"						Design Required	
	4,4								Design Required
	4,1								
8	6,4		Design Required						
	6,08			Design Required					
	5,6				Design Required				
	5,4	#5 @ 16"				Design Required			
	5						Design Required		
	4,4	D12 @ 8"						Design Required	
	3,7								Design Required
10	6		Design Required						
	5,5			Design Required					
	5	#5 @ 16"			Design Required				
	4,4						Design Required		
	3,8	D12 @ 8"						Design Required	
	3								Design Required
12	5		Design Required						
	3,8	#5 @ 16"		Design Required					
	2,5				Design Required				
	1,9	D12 @ 8"						Design Required	

Loads are given per liner foot. FIG.B-6.2.2
For Horizontal Reinforcement - Refer to Min. Reinforcement Requirements, of ACI 318-99

k (effective length factor) =1	f'c = 25 Mpa	fy=400 Mpa
Armopanel™ Concrete Wall. Interaction Diagram		
VERTICAL REINFORCEMENT:	15M @ 400 mm	(10M @ 200 mm)
THICKNESS OF CONCRETE CORE	150 mm	

FLEXURE AND AXIAL STRENGTH IN *VERTICAL* DIRECTION per linear meter

M vs. P (factored)



FLEXURE FACTORED LOAD STRENGTH IN *HORIZONTAL* DIRECTION per linear meter (factored)	**0.56 tn-m /m (5.6 kN·m /m)**
SHEAR CAPACITY — **V (factored)**	**5.30 tn /m (53.0 kN /m)**

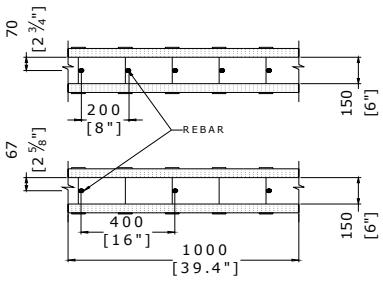
NOTE:
Vertical reinforcement should be placed within middle third of the concrete wall.

FIG. B-6.2.3

Supplementary table to 150 mm Concrete Wall Interaction Diagram
Minimum Vertical Reinforcement Required

Concrete Strength = 25 MPa
Steel Strength = 400 MPa

Vertical reinforcement should be placed within middle third of the concrete wall



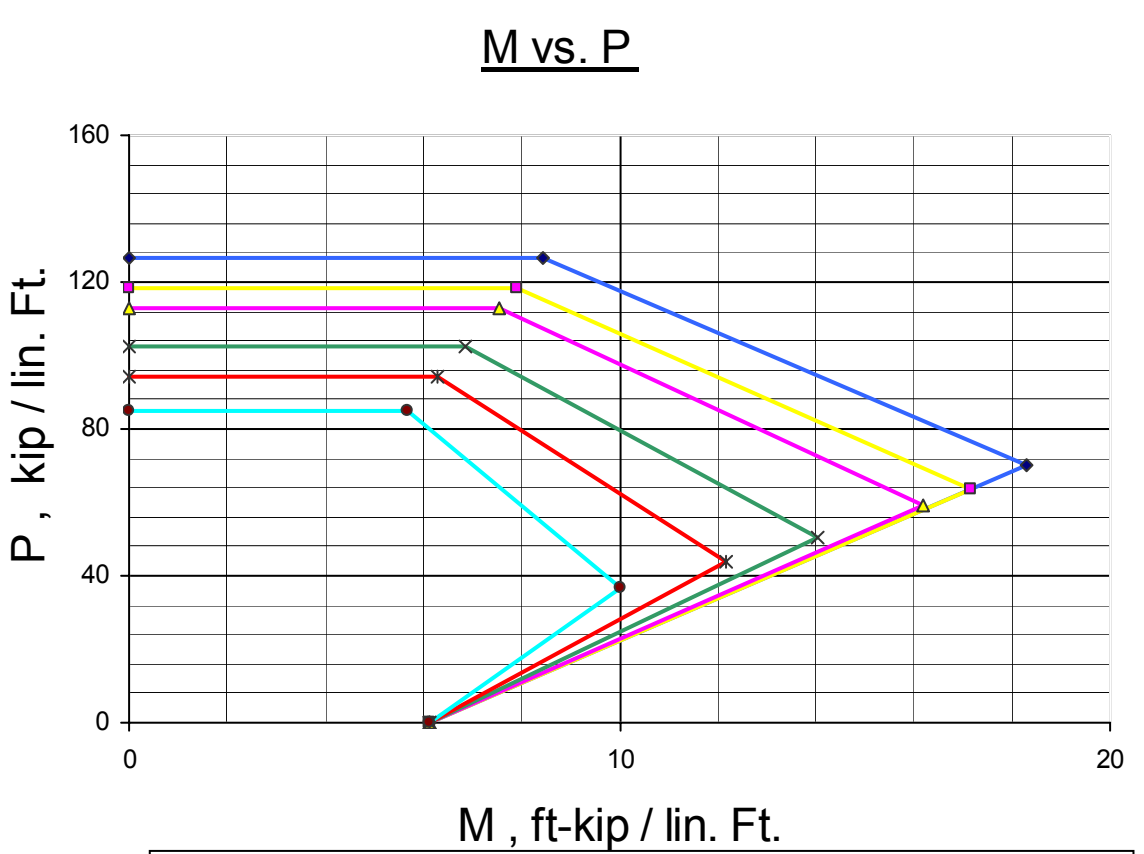
Wall Height per Storey (m)	M, kN·m	P , kN						
		160	400	560	720	880	1120	1200
2,03	23,8							
	23							
	22							
	21	**15M@400**						
	20,5							
	19	**D12@200**						
	18,5							
2,44	23,5							
	22							
	21	**15M@400**						
	19,5							
	18,5	**D12@200**						
	17							
3,05	23							
	20							
	18	**15M@400**						
	16							
	14	**D12@200**						
3,86	21,5							
	13	**15M@400**						
	8,5	**D12@200**						

Design Required

Loads are given per liner meter. FIG. B-6.2.4
For Horizontal Reinforcement - Refer to Min. Reinforcement Requirements, of CSA A23.3-94

k (effective length factor) =1	f'c=3,500 psi	fy=60,000 psi
Armopanel™ Concrete Wall. Interaction Diagram		
VERTICAL REINFORCEMENT:	# 5 @ 16" EF	
THICKNESS OF CONCRETE CORE	8"	

FLEXURE AND AXIAL FACTORED LOAD STRENGTH IN *VERTICAL* DIRECTION per linear foot



FLEXURE FACTORED LOAD STRENGTH IN *HORIZONTAL* DIRECTION per linear foot		2.84 , ft-kip / lin. Ft.
FACTORED SHEAR CAPACITY	V	8.03 , kips / lin. Ft.

NOTE:
Vertical reinforcement should be covered by
1 ½" thick concrete

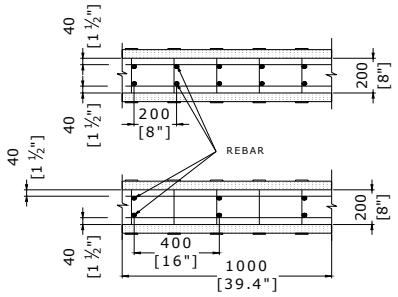
FIG. B-6.2.5

Supplementary table to 8" Concrete Wall Interaction Diagram

Minimum Vertical Reinforcement Requierd

Concrete Strength = 3,500 psi
Steel Strength = 60,000 psi

Reinforcing steel must be placed on the each side of the wall.
Clear concrete cover = 1 1/2"



Wall Height per Story (ft)	M, kip·ft	P , kip							
		24	40	56	72	85	102	112	118
6	10,2								
	13								
	15,5						Design Required		
	15,8	#5 @ 16"							
	13,8								
	10,5	D12 @ 8"							
	9								
	7,9								
8	10,2								
	13								
	15,5						Design Required		
	14	#5 @ 16"							
	12								
	9,2	D12 @ 8"							
	7,5								
10	10								
	12,2								
	13,3						Design Required		
	11	#5 @ 16"							
	9								
	6,8	D12 @ 8"							
12	9,7								
	9,8								
	8,3	#5 @ 16"					Design Required		
	6,9								
	5,6	D12 @ 8"							

Loads are given per liner foot.

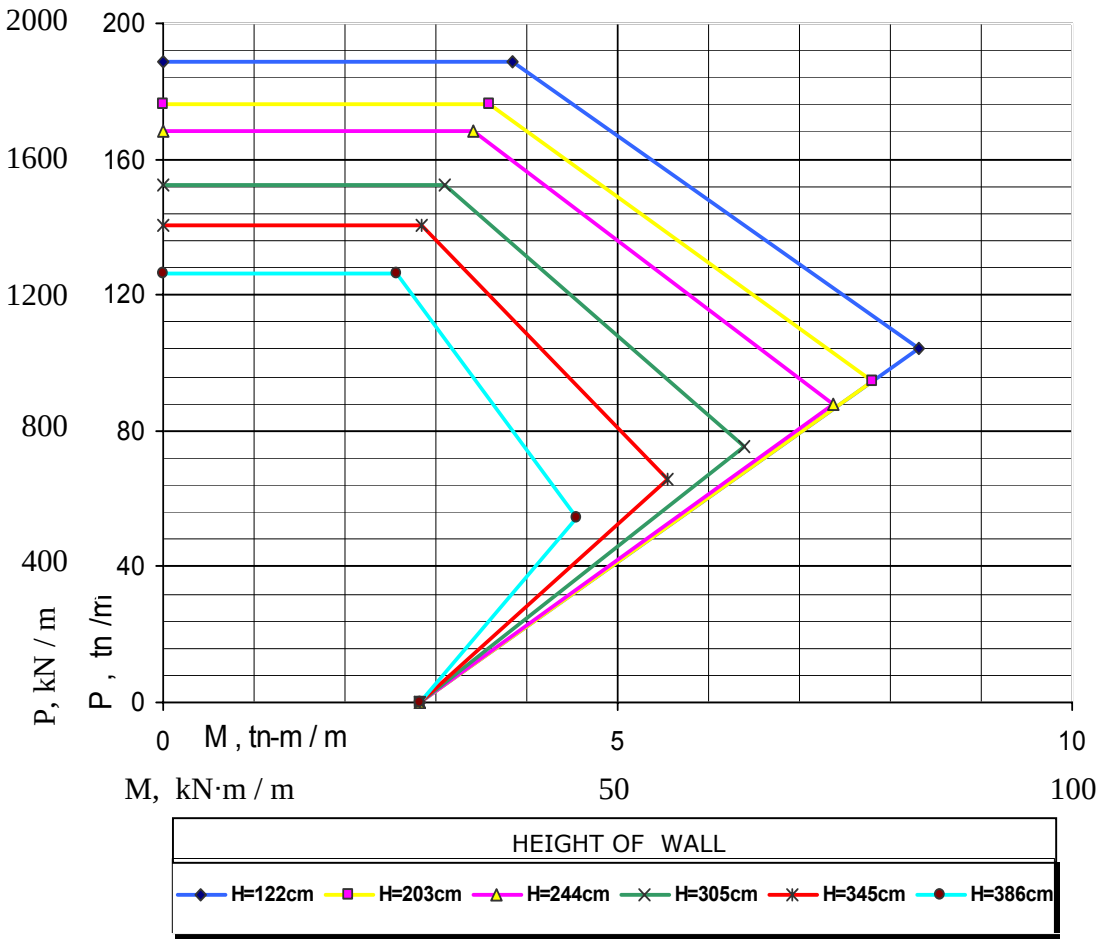
FIG. B-6.2.6

For Horizontal Reinforcement – Refer to Min. Reinforcement Requirements, of ACI 318-99

k (effective length factor) =1	f'c = 25 Mpa	fy = 400 MPa
Armopanel™ Concrete Wall. Interaction Diagram		
VERTICAL REINFORCEMENT:	15M @ 400 mm EF	(10M @ 200 mm)
THICKNESS OF CONCRETE CORE	200 mm	

FLEXURE AND AXIAL FACTORED LOAD STRENGTH IN *VERTICAL* DIRECTION per linear meter

M vs. P



FLEXURE FACTORED LOAD STRENGTH IN *HORIZONTAL* DIRECTION per linear meter		1.29 tn-m /m (12.9 kN·m /m)
FACTORED SHEAR CAPACITY	V	11.96 tn /m (119.6 kN /m)

NOTE:
Vertical reinforcement should be covered by 40 mm thick concrete

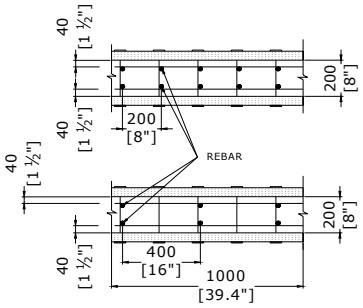
FIG. B-6.2.7

Supplementary table to 200 mm Concrete Wall Interaction Diagram

Minimum Vertical Reinforcement Required

Concrete Strength = 25 MPa
Steel Strength = 400 MPa

Reinforcing steel must be placed on the each side of the wall.
Clear concrete cover=40mm



Wall Height per Storey (m.)	M, kN·m	P , kN						
		560	800	1040	1280	1520	1680	1760
2,03	56		Design Required					
	69			Design Required				
	73				Design Required			
	61	15M@400				Design Required		
	48						Design Required	
	40	D12@200						Design Required
	35							
2,44	56		Design Required					
	69			Design Required				
	65	15M@400			Design Required			
	54					Design Required		
	43	D12@200					Design Required	
	34							
3,05	54		Design Required					
	63			Design Required				
	52	15M@400			Design Required			
	42					Design Required		
	31	D12@200						
3,86	45		Design Required					
	38			Design Required				
	32	15M@400			Design Required			
	25	D12@200						

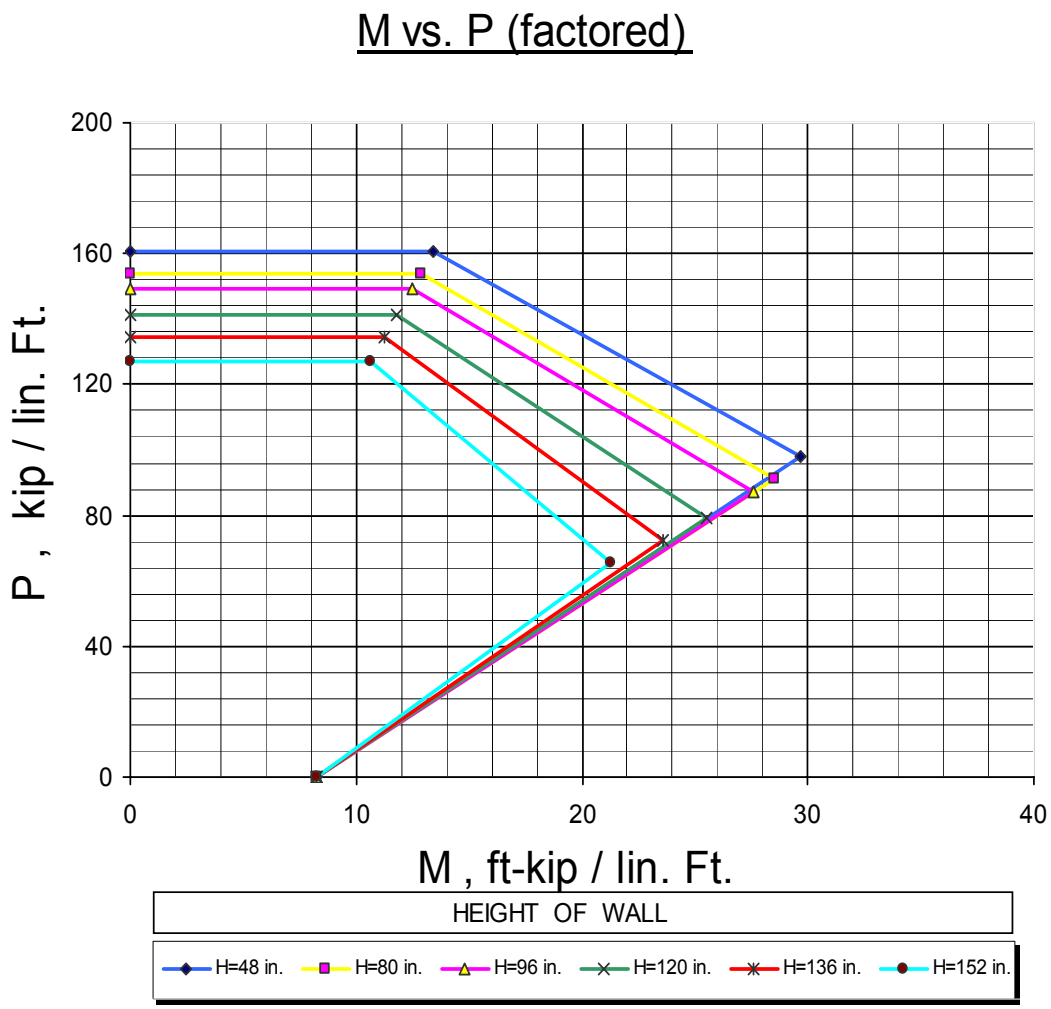
Loads are given per liner meter.

FIG. B-6.2.8

For Horizontal Reinforcement – Refer to Min. Reinforcement Requirements, of CSA A23.3-94

k (effective length factor) =1	f'c=3,500 psi	fy=60,000 psi
Armopanel™ Concrete Wall. Interaction Diagram		
VERTICAL REINFORCEMENT:	# 5 @ 16" EF	
THICKNESS OF CONCRETE CORE	10"	

FLEXURE AND AXIAL FACTORED LOAD STRENGTH IN *VERTICAL* DIRECTION per linear foot



FLEXURE FACTORED LOAD STRENGTH IN *HORIZONTAL* DIRECTION per linear foot	3.87 , ft-kip / lin. Ft.
FACTORED SHEAR CAPACITY — V (factored)	10.90 , kips / lin. Ft.

NOTE:
Vertical reinforcement should be covered by 1 ½" thick concrete.

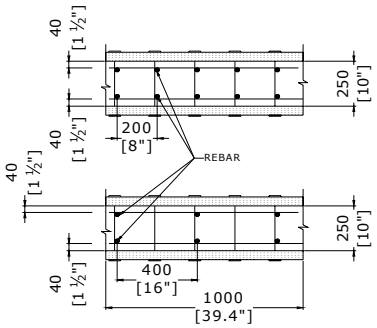
FIG. B-6.2.9

Supplementary table to 10" Concrete Wall Interaction Diagram

Minimum Vertical Reinforcement Required

Concrete Strength = 3,500 psi
Steel Strength = 60,000 psi

Reinforcing steel must be placed on the each side of the wall.
Clear concrete cover = 1 1/2"



Wall Height per Story (ft)	M, kip·ft	P , kip							
		40	64	88	112	127	141	149	154
6	17		Design Required						
	22,5								
	27,5								
	21,5	#5 @ 16"							
	19,5								
	16,5	D12 @ 8"							
	14								
	12,8								
8	17		Design Required						
	22,5								
	27,5								
	21,6	#5 @ 16"							
	17,8								
	14,5	D12 @ 8"							
	12,4								
10	17		Design Required						
	22,5								
	21,5								
	18,5	#5 @ 16"							
	14,8								
	11,7	D12 @ 8"							
12	16		Design Required						
	21								
	17,2	#5 @ 16"							
	14,3								
	10,6	D12 @ 8"							

Loads are given per liner foot.

Fig. B-6.2.10

For Horizontal Reinforcement – Refer to Min. Reinforcement Requirements, of ACI 318-99

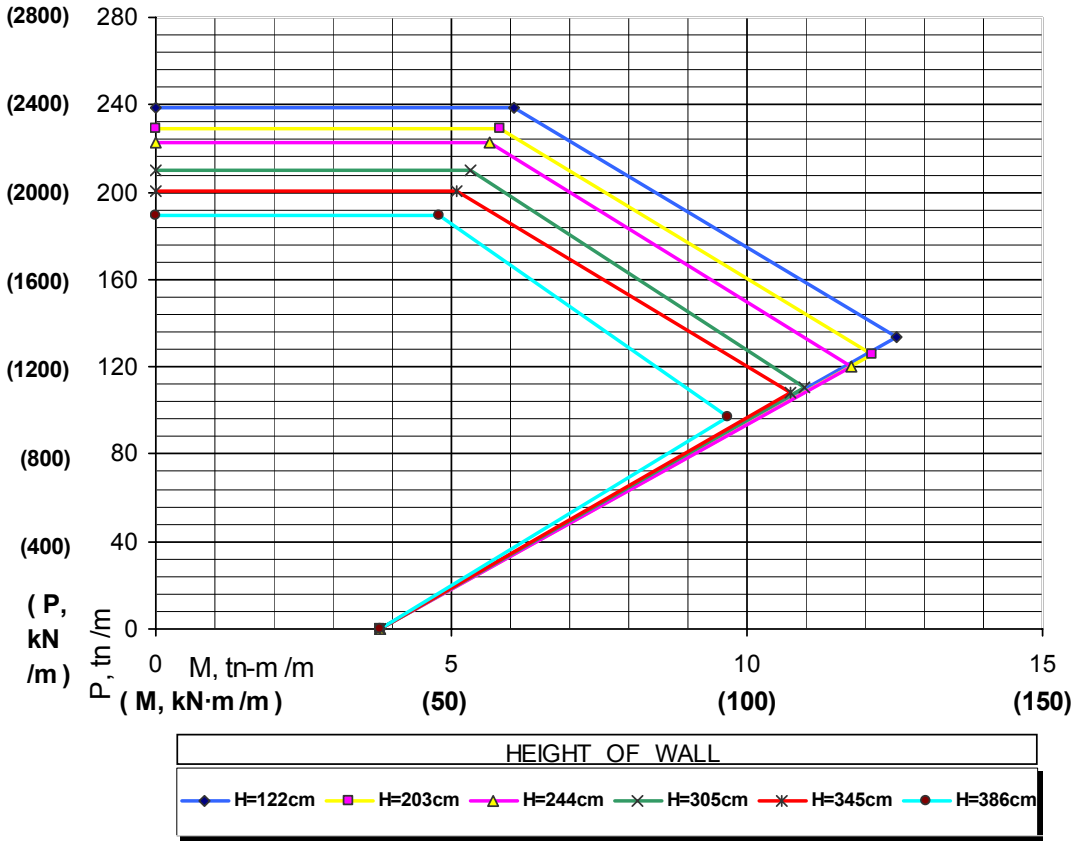
k (effective length factor) =1	f'c = 25 Mpa	fy = 400 Mpa

Armopanel™ Concrete Wall. Interaction Diagram

VERTICAL REINFORCEMENT:	15M @ 400 mm EF	(10M @ 200 mm EF)
THICKNESS OF CONCRETE CORE	250 mm	

FLEXURE AND AXIAL FACTORED LOAD STRENGTH IN *VERTICAL* DIRECTION per linear meter

M vs. P (facotred)



FLEXURE FACTORED LOAD STRENGTH IN *HORIZONTAL* DIRECTION per linear meter	1.75, tn-m /m (17.5 kN·m /m)
FACTORED SHEAR CAPACITY V (factored)	16.22, tn /m (162.2 kN /m)

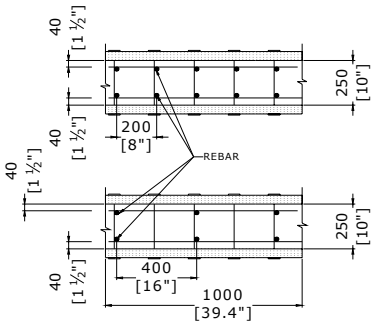
NOTE:
Vertical reinforcement should be covered by 40 mm thick concrete

FIG. B-6.2.11

Supplementary table to 250 mm Concrete Wall Interaction Diagram
Minimum Vertical Reinforcement Required

Concrete Strength = 25 MPa
Steel Strength = 400 MPa

Reinforcing steel must be placed on the each side of the wall.
Clear concrete cover = 40 mm.



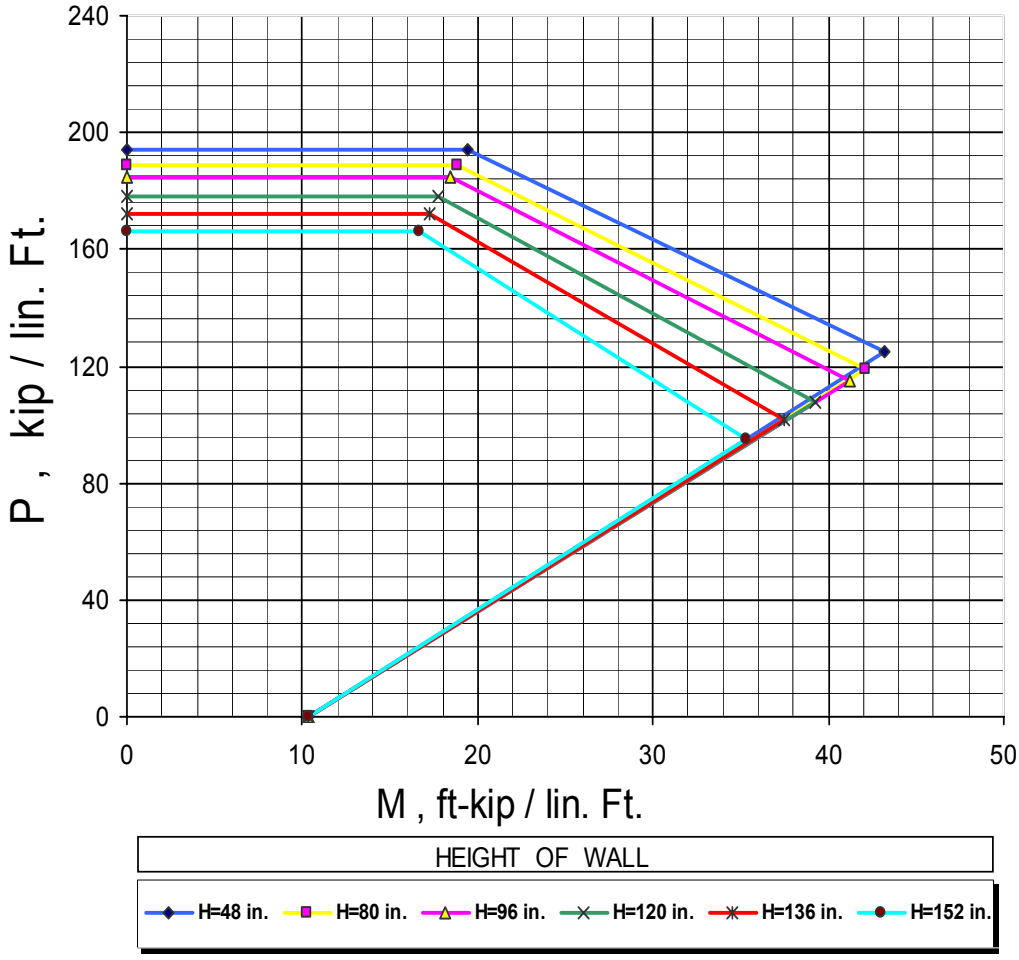
Wall Height per Story (m)	M, kN·m	P , kN							
		560	960	1280	1600	1890	210	222	229
2.03	75						Design Required		
	100								
	120								
	100	15M@400							
	81								
	70	D12@200							
	61								
	58								
2.44	75						Design Required		
	100								
	114								
	94	15M@400							
	76								
	65	D12@200							
	56								
3.05	75						Design Required		
	100								
	100	15M@400							
	82								
	65	D12@200							
	53								
3.86	72						Design Required		
	95								
	80	15M@400							
	63								
	48	D12@200							

Loads are given per liner meter FIG. B-2.12.
For Horizontal Reinforcement – Refer to Min. Reinforcement Requirements, of CSA A23.3-94
.

k (effective length factor) =1	f'c=3,550 psi	fy=60,000 psi
Armopanel™ Concrete Wall. Interaction Diagram		
VERTICAL REINFORCEMENT:	# 5 @ 16" EF	
THICKNESS OF CONCRETE CORE	12"	

FLEXURE AND AXIAL STRENGTH IN *VERTICAL* DIRECTION per linear foot

M vs. P (factored)



FLEXURE FACTORED LOAD STRENGTH IN *HORIZONTAL* DIRECTION per linear foot (factored)		4.90 , ft-kip / lin. Ft.
SHEAR CAPACITY	V (factored)	13.76 , kips / lin. Ft.

NOTE:
Vertical reinfircement should be covered by 1 1/2" thick concrete

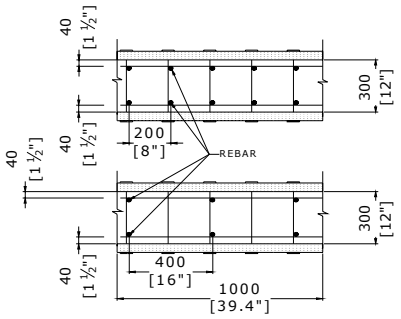
FIG. B-2.13

Supplementary table to 12" Concrete Wall Interaction Diagram

Minimum Vertical Reinforcemnt Required

Concrete Strength = 3,500 psi
Steel Strength = 60,000 psi

Reinforcing steel must be placed on the each side of the wall.
Clear concrete cover = 1 1/2"



Wall Height per Story (ft)	M, kip·ft	P , kip							
		40	96	120	144	166	177	184	188
6	21								
	36								
	41,8						Design Required		
	34	#5 @ 16"							
	26								
	23	D12 @ 8"							
	20								
	18,8								
8	21								
	36								
	39,2						Design Required		
	32	#5 @ 16"							
	24,5								
	21	D12 @ 8"							
	18,4								
10	21								
	36								
	35,2	#5 @ 16"					Design Required		
	28								
	21	D12 @ 8"							
	17,7								
12	21								
	35								
	29	#5 @ 16"					Design Required		
	22,5								
	16,6	D12 @ 8"							

Loads are given per liner foot.

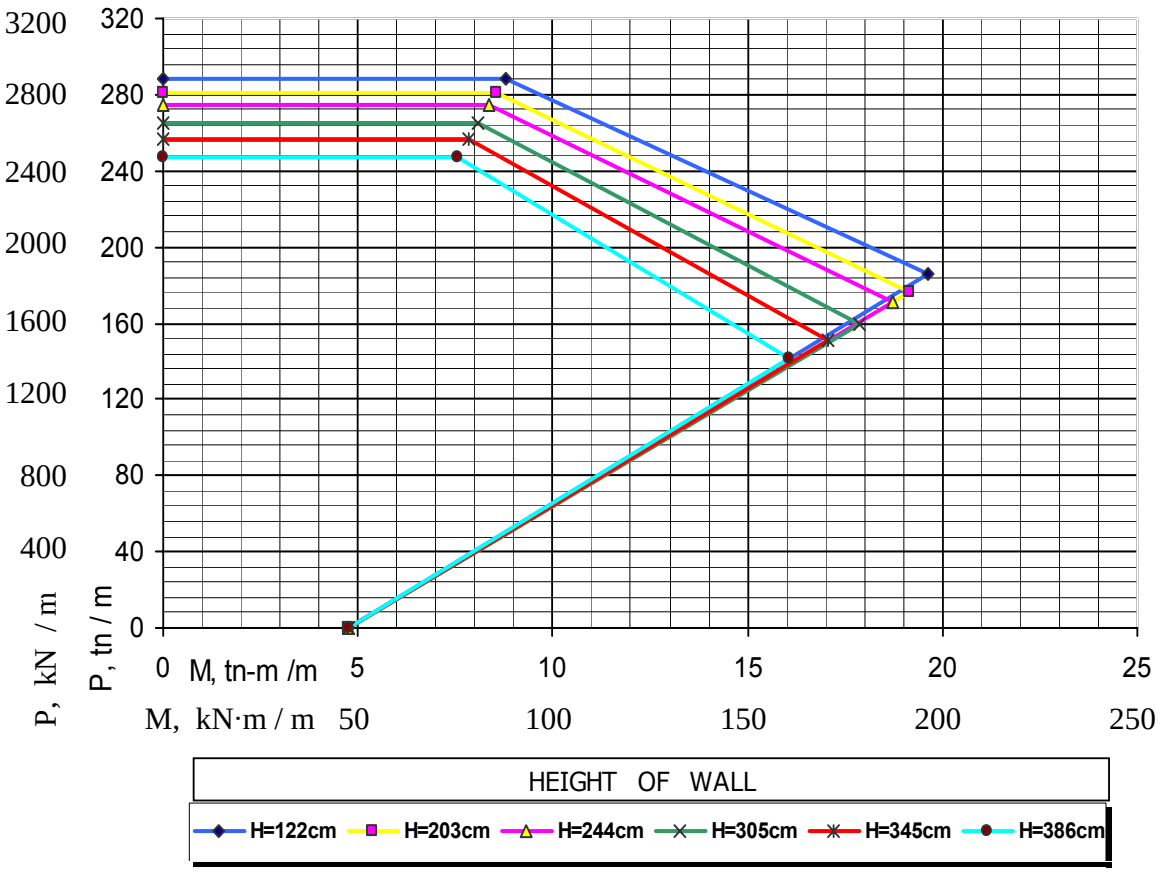
FIG. B-2.14

For Horizontal Reinforcement – Refer to Min. Reinforcement Requirements, of ACI 318-99

k (effective length factor) =1	f' c = 25 MPa	fy = 400 MPa
Armopanel™ Concrete Wall. Interaction Diagram		
VERTICAL REINFORCEMENT:	15M @ 400 mm EF	(10M @ 200 mm EF)
THICKNESS OF CONCRETE CORE	300 mm	

FLEXURE AND AXIAL FACTORED LOAD STRENGTH IN *VERTICAL* DIRECTION per linear meter

M vs. P (factored)



FLEXURE FACTORED LOAD STRENGTH IN *HORIZONTAL* DIRECTION per linear meter		2,22, tn-m /m (22.2 kN·m /m)
FACTORED SHEAR CAPACITY	V (factored)	20,48, tn /m (204.8 kN /m)

NOTE:
Vertical reinforcement should be covered by
40 mm thick concrete

FIG. B-6.2.15

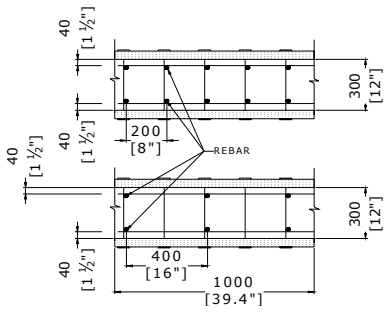
Supplementary table to 300 mm Concrete Wall Interaction Diagram

Minimum Vertical Reinforcement Required

Concrete Strength = 25 MPa
Steel Strength = 400 MPa

Reinforcing steel must be placed on the each side of the wall.

Clear concrete cover = 40 mm.



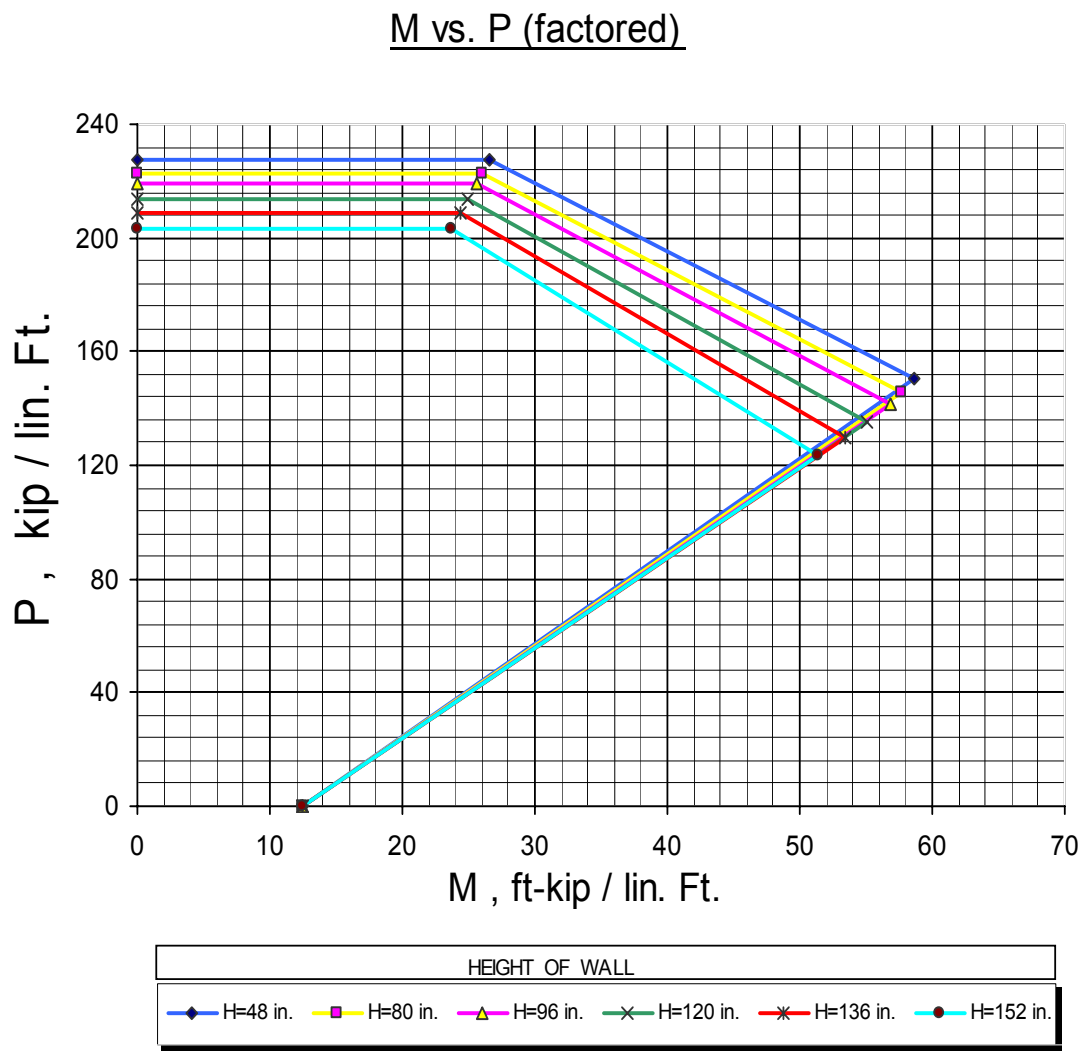
Wall Height per	M, kN·m	P , kN							
		560	1360	1760	2160	2470	2640	2740	2800
2,03	92		Design Required						
	160			Design Required					
	191				Design Required				
	151	15M@400				Design Required			
	120						Design Required		
	103	D12@200						Design Required	
	90								Design Required
	85								
2,44	92		Design Required						
	160			Design Required					
	182				Design Required				
	143	15M@400				Design Required			
	111						Design Required		
	95	D12@200						Design Required	
	83								Design Required
3,05	92		Design Required						
	160			Design Required					
	163	15M@400			Design Required				
	125					Design Required			
	97	D12@200					Design Required		
	80							Design Required	
3,86	92		Design Required						
	155			Design Required					
	133	15M@400			Design Required				
	100					Design Required			
	75	D12@200					Design Required		

Loads are given per liner meter. FIG. B-2.16

For Horizontal Reinforcement – Refer to Min. Reinforcement Requirements, of CSA A23.3-94

k (effective length factor) =1	f'c=3,500 psi	fy=60,000 psi
Armopanel™ Concrete Wall. Interaction Diagram		
VERTICAL REINFORCEMENT:	# 5 @ 16" EF	
THICKNESS OF CONCRETE CORE	14"	

FLEXURE AND AXIAL FACTORED LOAD STRENGTH IN *VERTICAL* DIRECTION per linear foot



FLEXURE FACTORED LOAD STRENGTH IN *HORIZONTAL* DIRECTION per linear foot		5.93 , ft-kip / lin. Ft.
FACTORED SHEAR CAPACITY	V (factored)	16.62 , kips / lin. Ft.

NOTE:
Vertical reinforcement should be covered by
1 ½" thick concrete

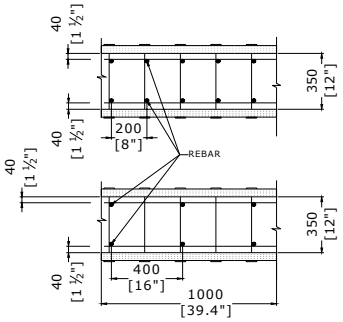
FIG. B-6.2.17

Supplementary table to 14" Concrete Wall Interaction Diagram

Minimum Vertical Reinfocement Required

Concrete Strength = 3,500 psi
Steel Strength = 60,000 psi

Reinforcing steel must be placed on the each side of the wall.
Clear concrete cover = 1 1/2"



Wall Height per	M, kip·ft	P , kip							
		40	120	144	176	203	213	219	222
6	25		Design Required						
	50			Design Required					
	57				Design Required				
	45	#5 @ 16"				Design Required			
	34						Design Required		
	30	D12 @ 8"						Design Required	
	27,8								Design Required
	26								
8	25		Design Required						
	50			Design Required					
	55,8				Design Required				
	43	#5 @ 16"				Design Required			
	32						Design Required		
	28	D12 @ 8"						Design Required	
	25,6								Design Required
10	25		Design Required						
	50			Design Required					
	51,5	#5 @ 16"			Design Required				
	39,5					Design Required			
	29,5	D12 @ 8"					Design Required		
	24,9							Design Required	
12	25		Design Required						
	50			Design Required					
	44	#5 @ 16"			Design Required				
	33					Design Required			
	23,7	D12 @ 8"					Design Required		

Loads are given per liner foot.

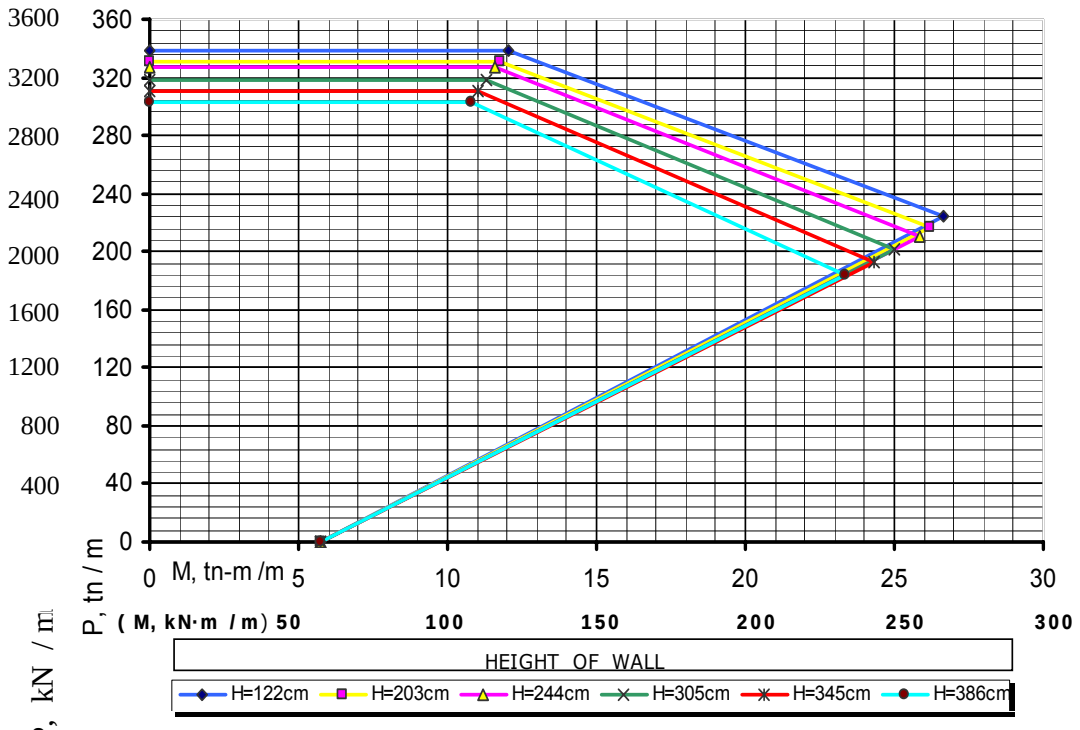
FIG. B-2.18

For Horizontal Reinforcement – Refer to Min. Reinforcement Requirements, of ACI 318-99

k (effective length factor) =1	f'c = 25 MPa	fy = 400 Mpa
Armopanel™ Concrete Wall. Interaction Diagram		
VERTICAL REINFORCEMENT	15M @ 400 mm EF	(10M @ 200 mm EF)
THICKNESS OF CONCRETE CORE	350 mm	

FLEXURE AND AXIAL FACTORED LOAD STRENGTH IN *VERTICAL* DIRECTION per linear meter

M vs. P (factored)



FLEXURE FACTORED LOAD STRENGTH IN *HORIZONTAL* DIRECTION per linear meter		2,69 tn-m /m (26.9 kN·m /m)
FACTORED SHEAR CAPACITY	V (factored)	24,73 tn /m (247.3 kN /m)

NOTE:

FIG. B-2-19

Vertical reinforcement should be covered by 40 mm thick concrete

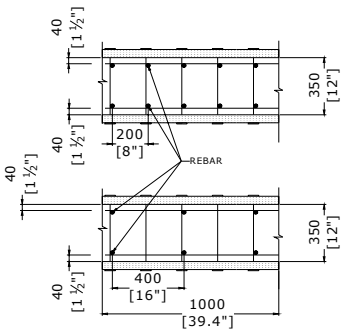
Supplementary table to 350 mm Concrete Wall Interaction Diagram

Minimum Vertical Reinforcement Required

Concrete Strength = 25 MPa
Steel Strength = 400 MPa

Reinforcing steel must be placed on the each side of the wall.

Clear concrete cover = 40 mm.



Wall Height per	M, kN·m	P , kN							
		560	1840	2160	2560	3020	3170	3260	3310
2,03	110		Design Required						
	230			Design Required					
	262				Design Required				
	213	15M@400				Design Required			
	152						Design Required		
	134	D12@200						Design Required	
	122								Design Required
	117								
2,44	110		Design Required						
	230			Design Required					
	251				Design Required				
	204	15M@400				Design Required			
	145						Design Required		
	127	D12@200						Design Required	
	116								Design Required
3,05	110		Design Required						
	230			Design Required					
	232	15M@400			Design Required				
	185					Design Required			
	130	D12@200					Design Required		
	113							Design Required	
3,86	110		Design Required						
	233			Design Required					
	200	15M@400			Design Required				
	155					Design Required			
	107	D12@200					Design Required		

Loads are given per liner meter.

FIG. B-2.20

For Horizontal Reinforcement – Refer to Min. Reinforcement Requirements, of CSA A23.3-94