

Nexcem Inc. Table W-1a: Basement Wall Design Table - 1 or 2 Story Residential
SEISMIC GROUND ACCELERATION (PGA) ≤ 0.60

	Min. Concrete Thickness (mm / in)	Bar Size	Vertical reinforcing spacing with rebar in center of concrete wall thickness (mm, centre to centre 305mm = 12")																
			Basement Wall Unsupported Wall Height																
			ft	9				10				11				12			
			m	2.74				3.05				3.35				3.66			
				Backfill Height				Backfill Height				Backfill Height				Backfill Height			
			ft	6.0	7.0	8.0	8.5	7.0	8.0	9.0	9.5	8.0	9.0	10.0	10.5	9.0	10.0	11.0	11.5
m	1.83	2.13	2.44	2.59	2.13	2.44	2.74	2.90	2.44	2.74	3.05	3.20	2.74	3.05	3.35	3.51			
8" WF	125 / 4 7/8"	15M / #5	305	305	305	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
		20M / #6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
10" WF (R-14), 12" WF (R-22) 14" WF (R-28), 16" WF (R-36)	136 / 5.5"	15M / #5	305	305	305	305	305	305	n/a	n/a	305	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
		20M / #8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
10" WF (R-8), 12" WF (R-14)	174 / 6 7/8"	15M / #5	305	305	305	305	305	305	305	305	305	305	305*	305*	305	305*	n/a	n/a	
		20M / #6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	305	305	n/a	305	305*	n/a	
14" WF (R-22), 16" (R-28)	190 / 7.5"	15M / #5	305	305	305	305	305	305	305	305	305	305	305*	305*	305	305*	n/a	n/a	
		20M / #6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	305	305	n/a	305	305*	305*	
12" WF (R-8), 14" WF (R-14) 16" (R-22)	228 / 9"	15M / #5	305	305	305	305	305	305	305	305	305	305	305	305	305	305	305*	305*	
		20M / #6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	305	305	
14" WF (R-8), 16" WF (R-14)	250 / 10.5"	15M / #5	305	305	305	305	305	305	305	305	305	305	305	305	305	305	305	305*	
		20M / #6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	305	
16" WF (R-8)	316 / 12.5"	15M / #5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
		20M / #6	305	305	305	305	305	305	305	305	305	305	305	305	305	305	305	305	

* Centre of vertical rebar positioned at 75mm / 3.0" from inside face (tension face) of concrete and not in the centre of the concrete wall thickness

Notes:

- 1 If an insulated block type is used that isn't listed above, for design purposes, use the block above with an equivalent minimum concrete thickness or smaller
- 2 The above design table assumes a concrete strength of 25 MPa / 3500psi at 28 days and a reinforcing steel yield strength of 400 Mpa / 58 ksi.
- 3 All concrete materials and testing to conform to CSA A23.1 and A23.2 and ACI 318 (latest revision). Reinforcing steel to be deformed bar conforming to CSA G30.18 (latest revision).
- 4 Soil parameters: Soil density = 18.0 kN/m³ / 115 pcf, K₀ = 0.50
- 5 All walls to be reinforced horizontally with minimum 10M (#3) @ 610mm (24") c/c.
- 6 The above table assumes the backfill height is equal to the unsupported wall height minus 150mm / 6".
- 7 Vertical reinforcing is assumed to be in the centre of the concrete thickness, unless noted with an asterisk.
- 8 This design table is valid for basement walls of a 1 or 2 story residential building. Only wall self weight used in increasing moment capacity. Conservatively based on 8ft wall heights above grade.
- 9 This table is for gravity and out of plane loading only.



Nexcem Inc. Table W-1b: Basement Wall Design Table
SEISMIC GROUND ACCELERATION (PGA) ≤ 0.60

	Min. Concrete Thickness (mm / in)	Bar Size	Vertical reinforcing spacing with rebar in center of concrete wall thickness (mm, centre to centre 305mm = 12")																
			Backfill Equivalent Fluid Density																
			kg / m3	720				883				963				1200			
			pcf	45				55				60				75			
				Unsupported Height (m)				Unsupported Height (m)				Unsupported Height (m)				Unsupported Height (m)			
			ft	9.0	10.0	11.0	12.0	9.0	10.0	11.0	12.0	9.0	10.0	11.0	12.0	9.0	10.0	11.0	12.0
m	2.74	3.05	3.35	3.66	2.74	3.05	3.35	3.66	2.74	3.05	3.35	3.66	2.74	3.05	3.35	3.66			
8" WF	125 / 4 7/8"	15M / #5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
		20M / #6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
10" WF (R-14), 12" WF (R-22) 14" WF (R-28), 16" WF (R-36)	136 / 5.5"	15M / #5	305	n/a	n/a	n/a	305	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
		20M / #8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
10" WF (R-8), 12" WF (R-14)	174 / 6 7/8"	15M / #5	305	305	305	n/a	305	305	305*	n/a	305	305	305*	n/a	305	n/a	n/a	n/a	
		20M / #6	n/a	n/a	n/a	305	n/a	n/a	305	305*	n/a	n/a	305	n/a	n/a	n/a	n/a	n/a	
14" WF (R-22), 16" (R-28)	190 / 7.5"	15M / #5	305	305	305	305*	305	305	305*	n/a	305	305	n/a	n/a	305	305*	n/a	n/a	
		20M / #6	n/a	n/a	n/a	305	n/a	n/a	305	305*	n/a	n/a	305*	305*	n/a	n/a	305*	n/a	
12" WF (R-8), 14" WF (R-14) 16" (R-22)	228 / 9"	15M / #5	305	305	305	305	305	305	305	305*	305	305	305	n/a	305	305	305*	n/a	
		20M / #6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	305	n/a	n/a	n/a	305	n/a	n/a	305	305	
14" WF (R-8), 16" WF (R-14)	250 / 10.5"	15M / #5	305	305	305	305	305	305	305	305	305	305	305	305	305	305	305	305*	
		20M / #6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	305	
16" WF (R-8)	316 / 12.5"	15M / #5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
		20M / #6	305	305	305	305	305	305	305	305	305	305	305	305	305	305	305	305	

* Centre of vertical rebar positioned at 75mm / 3.0" from inside face (tension face) of concrete and not in the centre of the concrete wall thickness

Notes:

- 1 If an insulated block type is used that isn't listed above, for design purposes, use the block above with an equivalent minimum concrete thickness or smaller
- 2 The above design table assumes a concrete strength of 25 MPa / 3500psi at 28 days and a reinforcing steel yield strength of 400 Mpa / 58 ksi.
- 3 All concrete materials and testing to conform to CSA A23.1 and A23.2 and ACI 318 (latest revision). Reinforcing steel to be deformed bar conforming to CSA G30.18 (latest revision).
- 4 All walls to be reinforced horizontally with minimum 10M (#3) @ 610mm (24") c/c.
- 5 The above table assumes the backfill height is equal to the unsupported wall height minus 150mm / 6".
- 6 Vertical reinforcing is assumed to be in the centre of the concrete thickness, unless noted with an asterisk.
- 7 This design table is valid for basement walls of a 1 or 2 story residential building, Assumptions used:
 Roof : Tributary area of 7.62m / 25ft (total roof truss span of 15.25m / 50ft), Specified Snow load = 3 kPa / 62.5 psf, Dead load = 1.1 kPa / 23 psf
 Second Floor Loading : Tributary area of 3.81m / 12.5ft (total joist span of 7.62m / 25ft), Live Load = 2.4 kPa / 50 psf, Dead load = 1.5 kPa / 31 psf
 First Floor Loading : Tributary area of 3.81m / 12.5ft (total joist span of 7.62m / 25ft), Live Load = 2.4 kPa / 50 psf, Dead load = 1.5 kPa / 31 psf
- 8 This table is for gravity and out of plane loading only.
- 9 If PGA is > 0.60 or other parameters are beyond the the limitations of this table, consult Nexcem for project specific calculations and interaction diagrams
- 10 Backfill Equivalent Fluid Density = γK_0



Nexcem Inc. Table W-2: Above Grade Wall Design Table - Main Floor Walls (1 or 2 story Residential)

Wall Type	Wall Weight psf kPa		S(T _a) M _v I _E (R _d R ₀)	Seismic Equivalent Specified Wind Load (kPa)	Min. Concrete Thickness (mm / in)	Vertical reinforcing spacing with rebar in center of concrete wall thickness (mm, centre to centre 305mm = 12")																			
						Specified Wind Load (1/50 year load)																			
						mph		88					101					140							
						kPa		0.96					1.25					2.40							
						psf		20					26					50							
Bar Size	ft	Unsupported Height					Unsupported Height					Unsupported Height													
		11.5	13.5	14.0	15.0	20.0	24.0	11.5	12.5	14.0	15.0	20.0	24.0	10.5	14.0	15.0	16.0	18.0	20.0						
	m	3.51	4.12	4.27	4.57	6.10	7.32	3.51	3.81	4.27	4.57	6.10	7.32	3.20	4.27	4.57	4.88	5.49	6.10						
8" WF	73	3.5	≤ 0.60	0.67	125 / 4 7/8"	10M / #3	305	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a					
			≤ 0.40	0.44		#4 (1/2")	610	n/a	n/a	n/a	n/a	n/a	305	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a				
			≤ 0.20	0.22		15M / #5	610	n/a	n/a	n/a	n/a	n/a	305	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
10" WF (R-14) 12" WF (R-22) 14" WF (R-28) 16" WF (R-36)	88	4.2	≤ 0.60	0.80	136 / 5.5"	10M / #3	305	305	n/a	n/a	n/a	n/a	305	305	n/a	n/a	n/a	n/a	305	n/a	n/a				
			≤ 0.40	0.53		15M / #5	610	610	305	n/a	n/a	n/a	610	610	305	n/a	n/a	n/a	610	n/a	n/a				
			≤ 0.20	0.27		20M / #6	n/a	n/a	n/a	305	n/a	n/a	n/a	n/a	305	n/a	n/a	n/a	n/a	305	n/a	n/a			
10" WF (R-8) 12" WF (R-14)	95	4.5	≤ 0.60	0.86	174 / 6 7/8"	10M / #3	305	305	305	305	n/a	n/a	305	305	305	n/a	n/a	n/a	305	n/a	n/a				
			≤ 0.40	0.57			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a				
			≤ 0.20	0.29		15M / #5	610	610	610	610	n/a	n/a	610	610	610	305	n/a	n/a	610	n/a	n/a				
14" WF (R-22) 16" (R-28)	105	5.0	≤ 0.60	0.95	190 / 7.5"	10M / #3	305	305	305	305	n/a	n/a	305	305	305	305	n/a	n/a	305	n/a	n/a				
			≤ 0.40	0.63		15M / #5	610	610	610	610	305	n/a	610	610	610	610	n/a	n/a	610	305	n/a				
			≤ 0.20	0.32		20M / #6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	305	305	n/a			
12" WF (R-8) 14" WF (R-14) 16" (R-22)	123	5.8	≤ 0.60	1.10	228 / 9"	10M / #3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a					
			≤ 0.40	0.74		15M / #5	305	305	305	305	305	305	305	305	305	305	n/a	305	305	305	305				
			≤ 0.20	0.37		20M / #6	610	610	610	610	610	610	610	610	610	610	305	610	610	610	610				
14" WF (R-8) 16" WF (R-14)	136	6.5	≤ 0.60	1.24	250 / 10.5"	10M / #3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a					
			≤ 0.40	0.83		15M / #5	305	305	305	305	305	305	305	305	305	305	305	305	305	305					
			≤ 0.20	0.41		20M / #6	610	610	610	610	610	610	610	610	610	610	610	610	610	610					
16" WF (R-8)	149	7.1	≤ 0.60	1.35	316 / 12.5"	10M / #3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a						
			≤ 0.40	0.90		15M / #5	305	305	305	305	305	305	305	305	305	305	305	305	305	305					
			≤ 0.20	0.45		20M / #6	610	610	610	610	610	610	610	610	610	610	610	610	610	610					

305mm = 12"

610mm = 24"

Notes:

- 1 If an insulated block type is used that isn't listed above, for design purposes, use the block above with an equivalent minimum concrete thickness or smaller
- 2 The above design table assumes a concrete strength of 25 MPa / 3500psi at 28 days and a reinforcing steel yield strength of 400 Mpa / 58 ksi.
- 3 All concrete materials and testing to conform to CSA A23.1 and A23.2 and ACI 318 (latest revision). Reinforcing steel to be deformed bar conforming to CSA G30.18 (latest revision).
- 4 All walls to be reinforced horizontally with minimum 10M (#3) @ 610mm (24") c/c.
- 5 This design table is valid for basement walls of a 1 or 2 story residential building, Assumptions used:
 Roof : Tributary area of 7.62m / 25ft (total roof truss span of 15.25m / 50ft), Specified Snow load = 3 kPa / 62.5 psf, Dead load = 1.1 kPa / 23 psf
 Second Floor Loading : Tributary area of 3.81m / 12.5ft (total joist span of 7.62m / 25ft), Live Load = 2.4 kPa / 50 psf, Dead load = 1.5 kPa / 31 psf
 First Floor Loading : Tributary area of 3.81m / 12.5ft (total joist span of 7.62m / 25ft), Live Load = 2.4 kPa / 50 psf, Dead load = 1.5 kPa / 31 psf
- 6 This table is for gravity and out of plane loading only.



Nexcem Inc. Table W-3: Above Grade Wall Design Table - Second Floor

Wall Type	Wall Weight psf kPa		S(T _a) M _v I _E (R _d R _o)	Seismic Equivalent Specified Wind Load (kPa)	Min. Concrete Thickness (mm / in)	Vertical reinforcing spacing with rebar in center of concrete wall thickness (mm, centre to centre 305mm = 12")																	
						Specified Wind Load (1/50 year load)																	
						mph		77				88				101				140			
						kPa		0.72				0.96				1.25				2.40			
						psf		15				20				26				50			
Bar Size	ft	Unsupported Height (m)				Unsupported Height (m)				Unsupported Height (m)				Unsupported Height (m)									
		9.0	10.0	11.0	12.0	9.0	10.0	11.0	12.0	9.0	10.0	11.0	12.0	9.0	10.0	11.0	12.0						
m	m	2.74	3.05	3.35	3.66	2.74	3.05	3.35	3.66	2.74	3.05	3.35	3.66	2.74	3.05	3.35	3.66						
8" WF	73	3.5	≤ 0.60	0.67	125 / 4 7/8"	10M / #3	305	305	305	305	305	305	305	n/a	n/a	n/a	n/a	n/a	n/a				
			≤ 0.40	0.44		#4 (1/2")	610	610	610	610	610	610	610	610	n/a	305	305	305	n/a	n/a	n/a	n/a	
			≤ 0.20	0.22		15M / #5	610	610	610	610	610	610	610	610	n/a	305	305	305	n/a	n/a	n/a	n/a	
10" WF (R-14) 12" WF (R-22) 14" WF (R-28) 16" WF (R-36)	88	4.2	≤ 0.60	0.80	136 / 5.5"	10M / #3	305	305	305	305	305	305	305	305	305	305	305	305	305				
			≤ 0.40	0.53		15M / #5	610	610	610	610	610	610	610	610	610	610	610	610	610	n/a	n/a		
			≤ 0.20	0.27		20M / #6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	305	305	
10" WF (R-8) 12" WF (R-14)	95	4.5	≤ 0.60	0.86	174 / 6 7/8"	10M / #3	305	305	305	305	305	305	305	305	305	305	305	305	305				
			≤ 0.20	0.29		15M / #5	610	610	610	610	610	610	610	610	610	610	610	610	610	610	n/a	n/a	
14" WF (R-22) 16" (R-28)	105	5.0	≤ 0.60	0.95	190 / 7.5"	10M / #3	305	305	305	305	305	305	305	305	305	305	305	305	305				
			≤ 0.40	0.63		15M / #5	610	610	610	610	610	610	610	610	610	610	610	610	610	305	305		
			≤ 0.20	0.32		20M / #6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
12" WF (R-8) 14" WF (R-14) 16" (R-22)	123	5.8	≤ 0.60	1.10	228 / 9"	10M / #3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a				
			≤ 0.40	0.74		15M / #5	305	305	305	305	305	305	305	305	305	305	305	305	305	305			
			≤ 0.20	0.37		20M / #6	610	610	610	610	610	610	610	610	610	610	610	610	610	610	610		
14" WF (R-8) 16" WF (R-14)	136	6.5	≤ 0.60	1.24	250 / 10.5"	10M / #3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a				
			≤ 0.40	0.83		15M / #5	305	305	305	305	305	305	305	305	305	305	305	305	305	305			
			≤ 0.20	0.41		20M / #6	610	610	610	610	610	610	610	610	610	610	610	610	610	610			
16" WF (R-8)	149	7.1	≤ 0.60	1.35	316 / 12.5"	10M / #3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a				
			≤ 0.40	0.90		15M / #5	305	305	305	305	305	305	305	305	305	305	305	305	305	305			
			≤ 0.20	0.45		20M / #6	610	610	610	610	610	610	610	610	610	610	610	610	610	610			

305mm = 12" 610mm = 24"

Notes:

- 1 If an insulated block type is used that isn't listed above, for design purposes, use the block above with an equivalent minimum concrete thickness or smaller
- 2 The above design table assumes a concrete strength of 25 MPa / 3500psi at 28 days and a reinforcing steel yield strength of 400 Mpa / 58 ksi.
- 3 All concrete materials and testing to conform to CSA A23.1 and A23.2 and ACI 318 (latest revision). Reinforcing steel to be deformed bar conforming to CSA G30.18 (latest revision).
- 4 All walls to be reinforced horizontally with minimum 10M (#3) @ 610mm (24") c/c.
- 5 This design table is valid for basement walls of a 1 or 2 story residential building, Assumptions used:
 Roof : Tributary area of 7.62m / 25ft (total roof truss span of 15.25m / 50ft), Specified Snow load = 3 kPa / 62.5 psf, Dead load = 1.1 kPa / 23 psf
 Second Floor Loading : Tributary area of 3.81m / 12.5ft (total joist span of 7.62m / 25ft), Live Load = 2.4 kPa / 50 psf, Dead load = 1.5 kPa / 31 psf
 First Floor Loading : Tributary area of 3.81m / 12.5ft (total joist span of 7.62m / 25ft), Live Load = 2.4 kPa / 50 psf, Dead load = 1.5 kPa / 31 psf
- 6 This table is for gravity and out of plane loading only.



Nexcem Inc. Table W-4: Table For Lintel Design

LINTEL DETAIL	MINIMUM HEIGHT OF LINTEL (mm / in)	CONCRETE CORE THICKNESS (mm / in)	LONGITUDINAL REINFORCEMENT ⁶	STIRRUPS REQUIRED ⁶	MAXIMUM OPENING WIDTH (mm / in)					
					NON-LOAD BEARING	SUPPORTING ROOF	SUPPORTING ONE FLOOR	SUPPORTING ONE FLOOR AND ROOF	SUPPORTING TWO FLOORS	SUPPORTING TWO FLOORS AND ROOF
NL-1	305 / 12	125 / 5	1 - 15M	NO	915 / 36	n/a	n/a	n/a	n/a	n/a
NL-1	610 / 24	125 / 5	1 - 15M	NO	1525 / 60	610 / 24	610 / 24	n/a	n/a	n/a
NL-1	915 / 36	125 / 5	1 - 15M	NO	3660 / 144	1220 / 48	1220 / 48	610 / 24	610 / 24	n/a
NL-1	1220 / 48	125 / 5	1 - 15M	NO	4880 / 192	1830 / 72	1830 / 72	1525 / 60	915 / 36	915 / 36
NL-1	1525 / 60	125 / 5	1 - 15M	NO	6100 / 240	1830 / 72	1830 / 72	1525 / 60	1220 / 48	1220 / 48
NL-2	305 / 12	125 / 5	1 - 15M	NO	1220 / 48	n/a	n/a	n/a	n/a	n/a
NL-3	305 / 12	125 / 5	1 - 15M	NO	2440 / 96	1220 / 48	1220 / 48	610 / 24	610 / 24	n/a
NL-4	305 / 12	125 / 5	1 - 15M	YES	2440 / 96	2135 / 84	2135 / 84	1525 / 60	1525 / 60	1220 / 48
NL-4	305 / 12	125 / 5	1 - 20M	YES	2440 / 96	2440 / 96	2440 / 96	1830 / 72	1830 / 72	1525 / 60
NL-5	305 / 12	175 / 7	2 - 15M	YES	2440 / 96	2745 / 108	2745 / 108	2135 / 84	2135 / 84	1525 / 60
NL-6	610 / 24	125 / 5	1 - 15M	NO	6100 / 240	1830 / 72	1830 / 72	915 / 36	915 / 36	610 / 24
NL-7	610 / 24	125 / 5	1 - 15M	YES	6100 / 240	3310 / 132	3355 / 132	2440 / 96	2440 / 96	2135 / 84
NL-7	610 / 24	125 / 5	1 - 20M	YES	6100 / 240	3965 / 156	3965 / 156	3050 / 120	3050 / 120	2440 / 96
NL-8	610 / 24	175 / 7	2 - 15M	YES	6100 / 240	4575 / 180	4575 / 180	3355 / 132	3355 / 132	2745 / 108
NL-8	610 / 24	175 / 7	2 - 20M	YES	6100 / 240	5490 / 216	5490 / 216	3965 / 156	3965 / 156	3355 / 132

n/a = not allowed

Notes:

- 1 Larger opening widths may be permitted if reviewed and confirmed by a professional engineer
- 2 The above design table assumes a concrete strength of 25 MPa / 3500psi at 28 days and a reinforcing steel yield strength of 400 Mpa / 58 ksi.
- 3 All concrete materials and testing to conform to CSA A23.1 and A23.2 and ACI 318 (latest revision). Reinforcing steel to be deformed bar conforming to CSA G30.18 (latest revision).
- 4 All walls to be reinforced horizontally with minimum 10M (#3) @ 610mm (24") c/c.
- 5 Loading Assumptions used:
 Roof : Tributary area of 7.62m / 25ft (total roof truss span of 15.25m / 50ft), Specified Snow load = 3 kPa / 62.5 psf, Dead load = 1.1 kPa / 23 psf
 Second Floor Loading : Tributary area of 3.81m / 12.5ft (total joist span of 7.62m / 25ft), Live Load = 2.4 kPa / 50 psf, Dead load = 1.5 kPa / 31 psf
 First Floor Loading : Tributary area of 3.81m / 12.5ft (total joist span of 7.62m / 25ft), Live Load = 2.4 kPa / 50 psf, Dead load = 1.5 kPa / 31 psf
- 6 Refer to detail drawing for reinforcement requirements
- 7 GFRP substitution not permitted unless designed by a professional engineer.



Nexcem Inc. Table W-5: Above Grade Wall Design Table - Concentrated Vertical Reinforcement for Shear Walls in SFRS

$$S(T_d) M_v I_E / (R_d R_o) \leq 0.60$$

Second Floor Walls of Two Story ICF Structure Supporting Wood Frame Roof (Total length of shear wall required = 7ft) or First Floor Walls of One Story ICF Structure Supporting Wood Frame Roof (Total length of shear wall required = 7ft) (Second Floor Wall heights limited to 10ft)					
Wall Height		Number of Concentrated Vertical 15M Reinforcing Bars at End of Each Shear Wall in Designated SFRS			
		Number and length of shear walls in designated SFRS			
ft	m	1 x 8'-0"	2 x 4'-0"	3 x 3'-0"	5 x 2'-0"
8	2.4	1	1	2	2
9	2.7	1	1	2	2
10	3.0	1	1	2	2
11	3.4	1	1	2	2
12	3.7	2	2	2	2
14	4.3	2	2	2	2
16	4.9	2	2	2	2
First Floor Walls of Two Story ICF Structure Supporting Wood Frame Roof (Total length of shear wall required = 13ft) or Basement Walls of One Story ICF Structure Supporting Wood Frame Roof (Total length of shear wall required = 13ft)					
Wall Height		Number of Concentrated Vertical 15M Reinforcing Bars at End of Each Shear Wall in Designated SFRS			
		Number and length of shear walls in designated SFRS			
ft	m	1 x 13'-0"	2 x 6'-6"	3 x 4'-6"	6 x 2'-0"
8	2.4	1	1	2	2
9	2.7	1	1	2	2
10	3.0	1	1	2	2
11	3.4	1	1	2	2
12	3.7	2	2	2	2
14	4.3	2	2	2	2
16	4.9	2	2	2	2
Basement Walls of Two Story ICF Structure Supporting Wood Frame Roof (Total length of shear wall required = 22ft)					

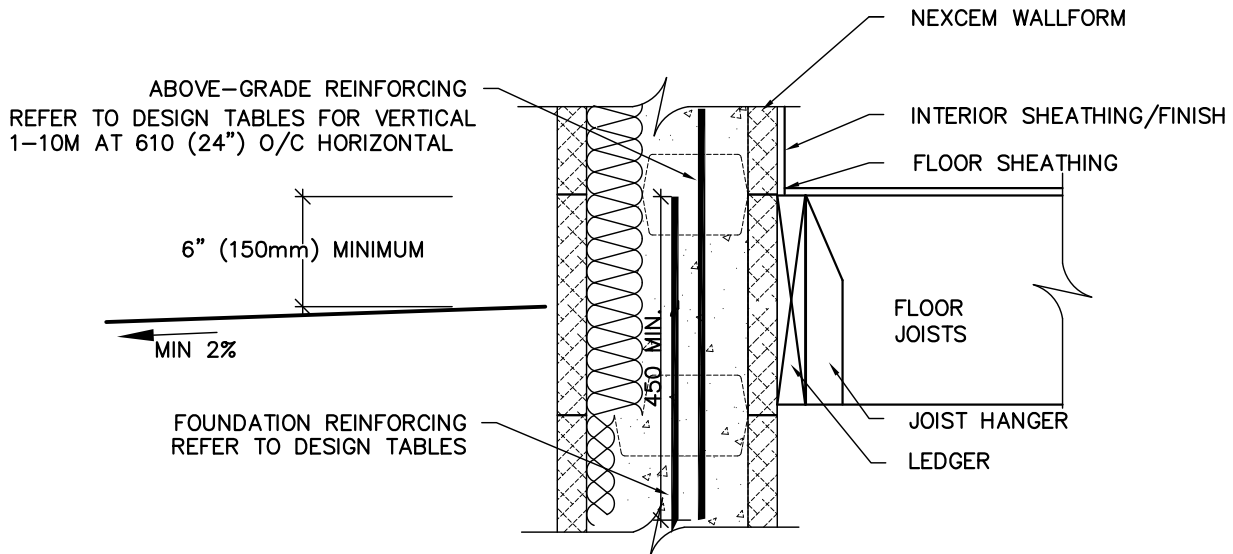
Shear wall reinforcing in designated SFRS is 15 @ 12" o/c vertical and 15M @ 12" o/c horizontal if providing total length required
 Shear wall reinforcing in designated SFRS is 15 @ 12" o/c vertical and 10M @ 12" o/c horizontal if providing total length required x 1.33
 Non designated SFRS walls reinforced as per Tables W1 - W-3
 Ensure continuity of designated SFRS to footing

Notes:

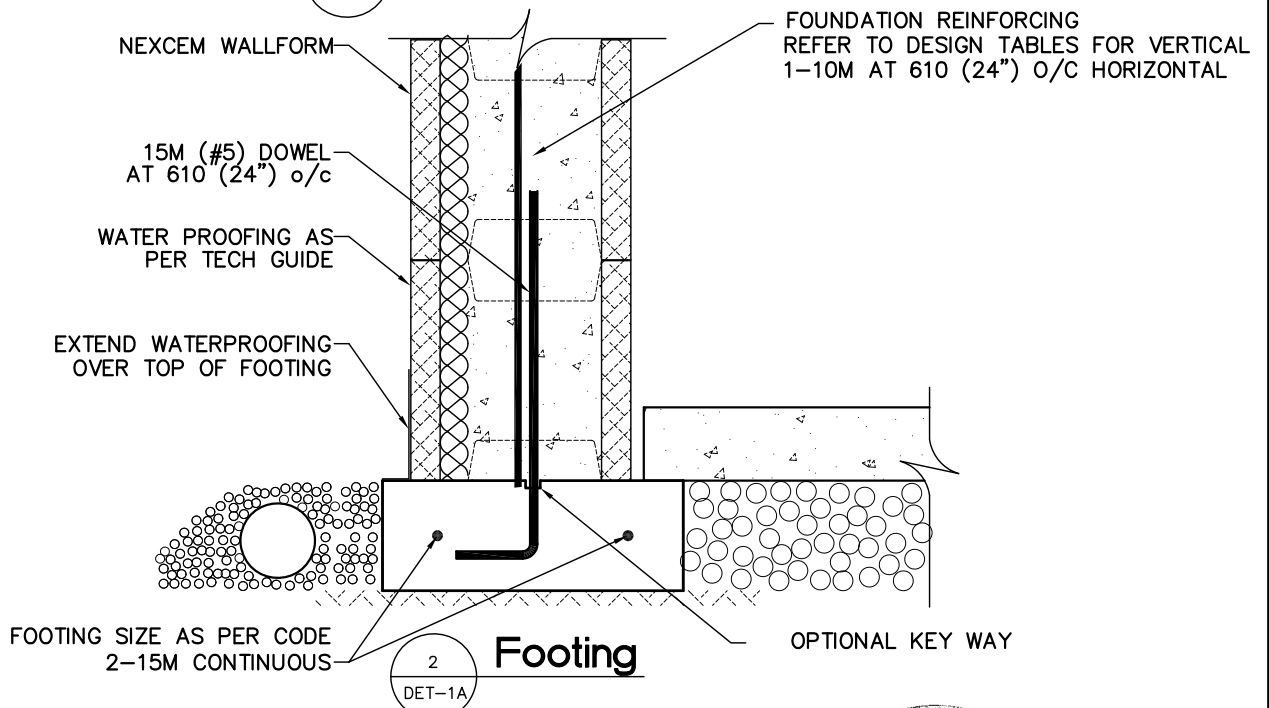
- 1 If an insulated block type is used that isn't listed above, for design purposes, use the block above with an equivalent minimum concrete thickness or smaller
- 2 The above design table assumes a concrete strength of 25 MPa / 3500psi at 28 days and a reinforcing steel yield strength of 400 Mpa / 58 ksi.
- 3 All concrete materials and testing to conform to CSA A23.1 and A23.2 and ACI 318 (latest revision). Reinforcing steel to be deformed bar conforming to CSA G30.18 (latest revision).
- 4 All walls to be reinforced horizontally with minimum 10M (#3) @ 610mm (24") c/c.
- 5 This design table is valid for basement walls of a 1 or 2 story residential building, Assumptions used:
 Roof : Specified Snow load = 3 kPa / 62.5 psf, Dead load = 1.1 kPa / 23 psf
 Second Floor Loading : Dead load = 1.5 kPa / 31 psf
 First Floor Loading : Dead load = 1.5 kPa / 31 psf
- 6 Total Building Area: 300m² / 3227ft². Adjust minimum wall length proportionately based on actual floor area
 Example: 340 m² building area requires 340 / 300 = 1.13 increase in minimum wall lengths above
 Multiply minimum wall lengths in above table by 1.13
- 7 This table is for seismic in-plane loading
- 8 Total length of shear wall is minimum required in each direction



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 NOT PERMITTED



1 **Top of Foundation**
 DET-1A



2 **Footing**
 DET-1A

TITLE: **Typical Foundation w/ Nexcem Above-Grade**

PROJECT:



SCALE: NTS
JOB NO: n/a
DWG NO:

MIN 1 – 15M OVER OPENINGS
(SEE LINTEL DESIGN TABLES FOR
MORE INFORMATION).

PROVIDE THE SAME NUMBER
OF VERT. BARS AS THOSE
INTERUPTED BY OPENING ON
EA. SIDE OF OPENING WITHIN
24" OF OPENING, TYPICAL

FIN. FLOOR

SEE DESIGN TABLES AND REINFORCING
SCHEDULES FOR VERT. AND HORIZ.
REINFORCING IN WALL (BEYOND THAT
SHOWN FOR LINTEL DESIGN).

GENERAL NOTES FOR OPENINGS IN WALLS:

1. ENSURE MINIMUM 610mm (24") BETWEEN TWO WALL OPENINGS
2. ENSURE MINIMUM 610mm (24") REMAINS BETWEEN THE EDGE OF AN OPENING AND THE END OF A WALL
3. A PROFESSIONAL ENGINEER SHOULD BE CONSULTED WHERE ANY OF THE ABOVE RULES CANNOT BE FOLLOWED OR WHERE THE HEIGHT TO LENGTH RATIO OF A WALL EXCEEDS 1 (PER STOREY).

TYPICAL OPENING DETAIL

TITLE: **WALL OPENING DETAIL**

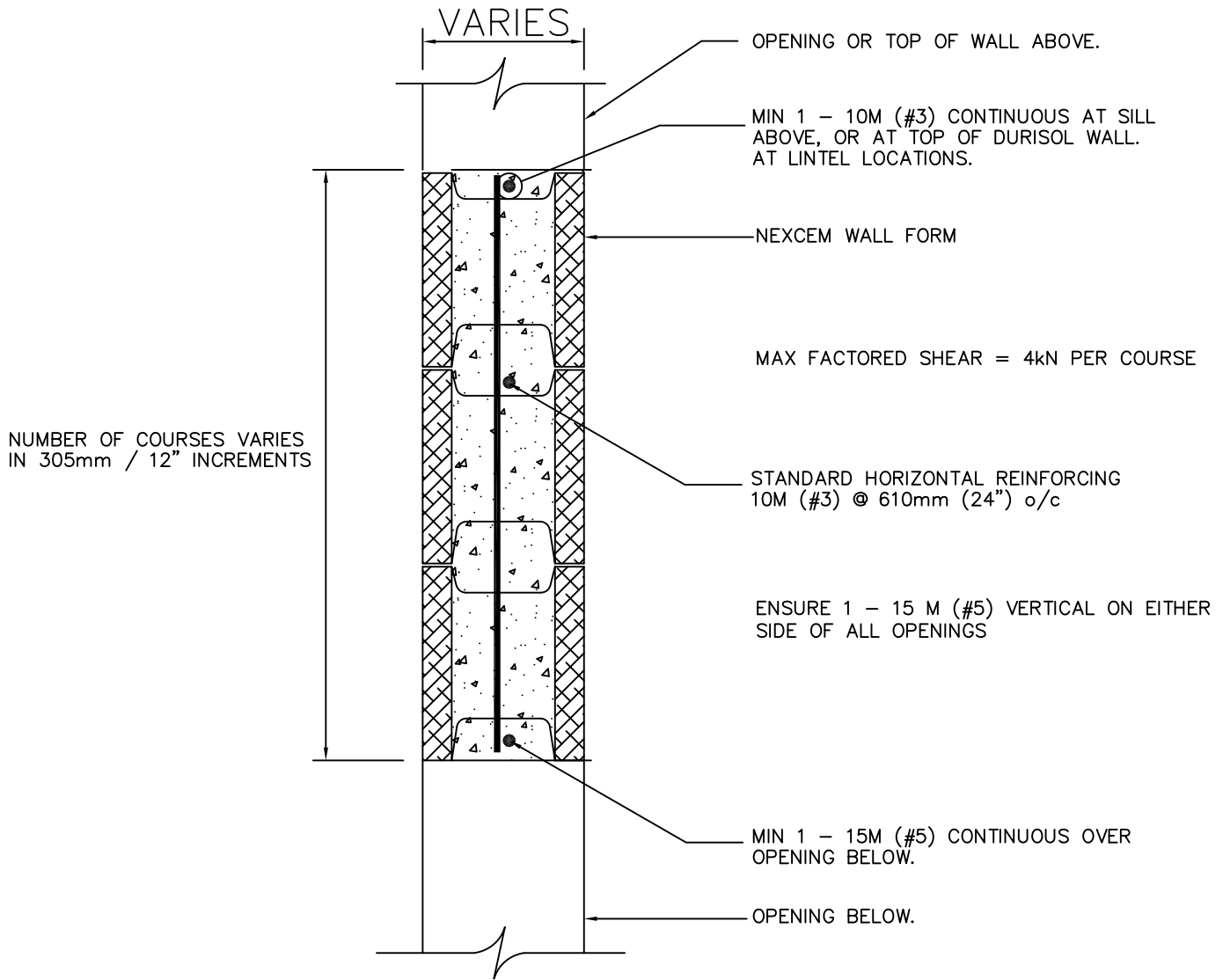
PROJECT:



SCALE:
NTS

JOB NO:
n/a

DWG NO:



APPLICABLE WALL SYSTEM: 8" R-8, 10" R-14, 12" R-22, 14" R-28, 16" R-36 OR ANY OTHER WALL FORM WITH MINIMUM 125mm (5") CORE WIDTH

TITLE: LINTEL NL-1

PROJECT:

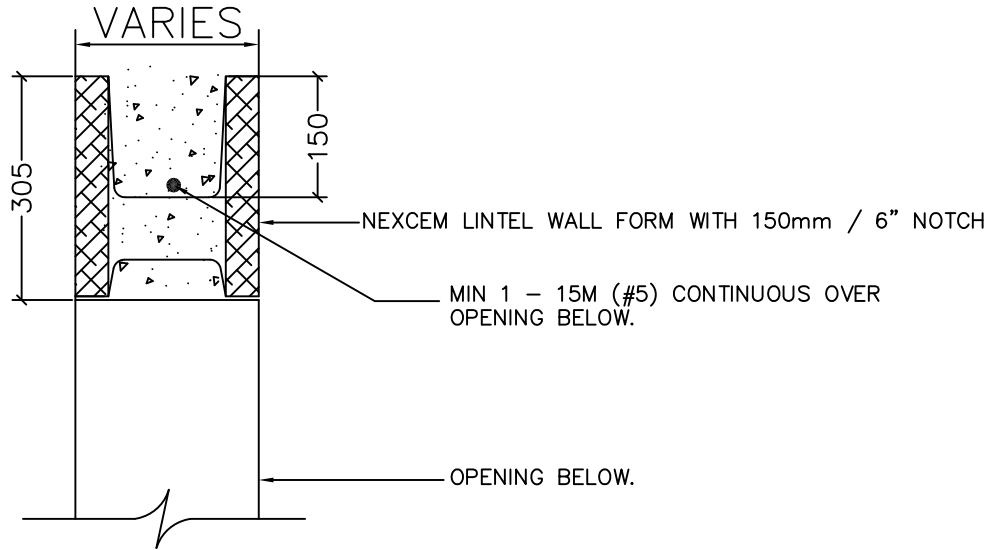


SCALE: NTS

JOB NO: n/a

DWG NO:

ENSURE 1 – 15 M (#5) VERTICAL ON EITHER SIDE OF ALL OPENINGS



APPLICABLE WALL SYSTEM: 8" R-8, 10" R-14, 12" R-22, 14" R-28, 16" R-36 OR ANY OTHER WALL FORM WITH MINIMUM 125mm (5") CORE WIDTH

TITLE: LINTEL NL-2

PROJECT:



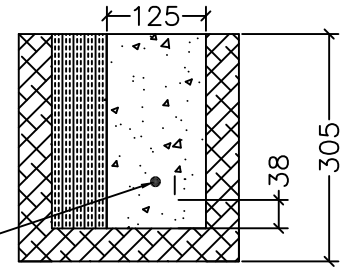
SCALE: NTS

JOB NO: n/a

DWG NO:

APPLICABLE WALL SYSTEMS: 8" R-8,
10" R-14, 12" R-22, 14" R-28, 16"
R-36 OR ANY OTHER WALLFORM WITH
MIN 125mm (5") CONCRETE CORE

BRACE BOTH SIDES OF LINTEL
TO PREVENT BLOWOUT AT TIME
OF CONCRETE POUR

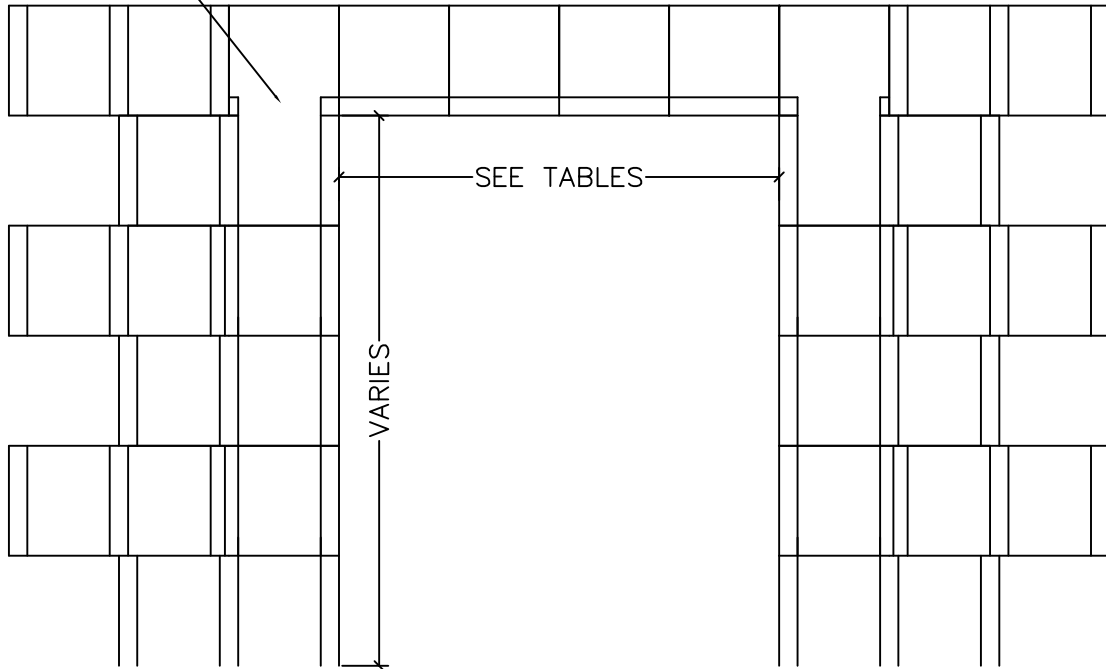


1 - 15M (#5) LONGITUDINAL REINFORCEMENT BOTTOM
OVER LINTEL LOCATIONS. REBAR TO EXTEND MIN
610mm (24") PAST EDGE OF OPENING.

MAINTAIN 38mm
(1.5") CONCRETE
COVER IN ALL
DIRECTIONS.

ENSURE BOTTOM
OF LINTEL
SUPPORT IS
CUTOUT TO ALLOW
FLOW OF CONCRETE

LINTEL WALLFORM
CUT ON-SITE. SEE
ABOVE SECTION.



TITLE: LINTEL NL-3

PROJECT:



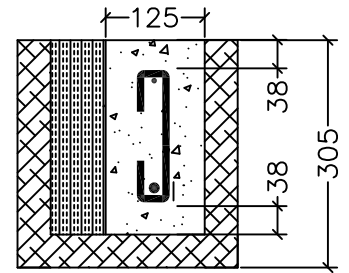
SCALE:
NTS

JOB NO:
n/a

DWG NO:

BRACE BOTH SIDES OF LINTEL
TO PREVENT BLOWOUT AT TIME
OF CONCRETE POUR

APPLICABLE WALL SYSTEMS: 8" R-8,
10" R-14, 12" R-22, 14" R-28, 16"
R-36 OR ANY OTHER WALLFORM WITH
MIN 125mm (5") CONCRETE CORE



ALTERNATE SIDE
OF STIRRUP LEG

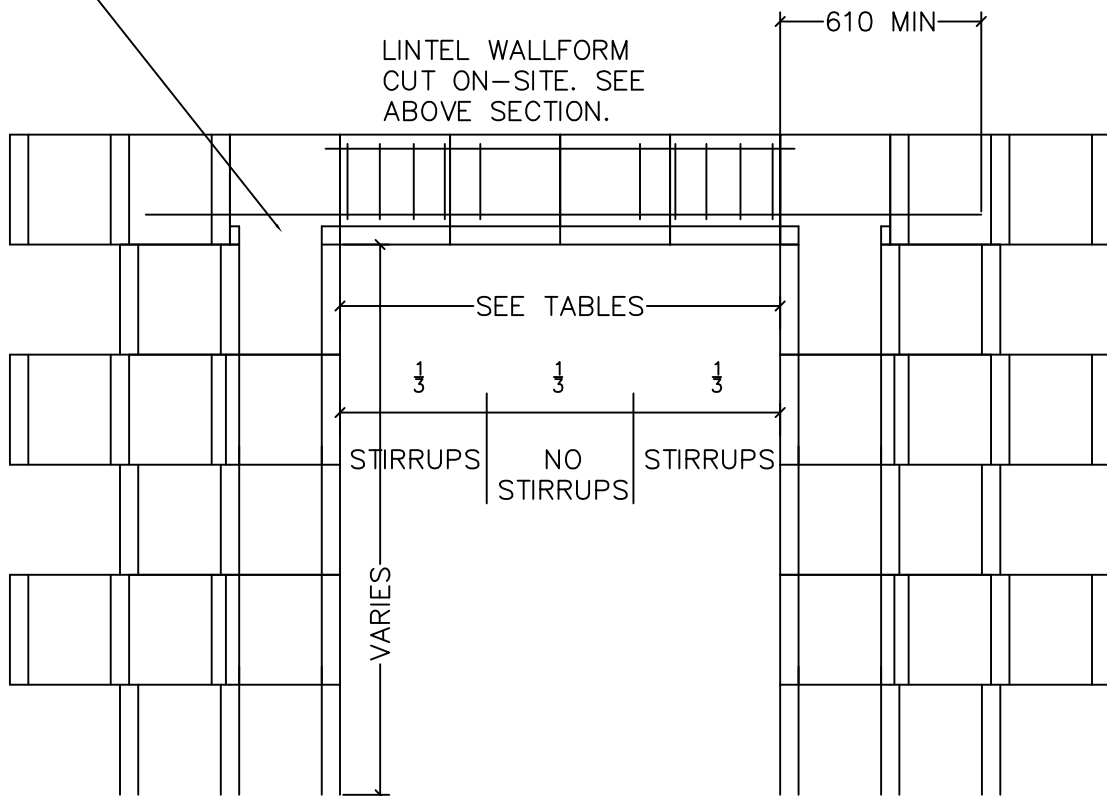
MAINTAIN 38mm (1.5")
CONCRETE COVER IN ALL
DIRECTIONS.

LONGITUDINAL REINFORCEMENT EITHER
1 - 15M (#5) OR 1 - 20M (#6) (REFER TO TABLES)
BOTTOM OVER LINTEL LOCATIONS. EXTEND REBAR MIN
610mm (24") PAST EDGE OF OPENING

ENSURE BOTTOM
OF LINTEL
SUPPORT IS
CUTOUT TO ALLOW
FLOW OF CONCRETE

1-10M (#3) LONGITUDINAL REINFORCEMENT
TOP TO SUPPORT STIRRUPS.

10M (#3) STIRRUPS AT 8" o/c.



TITLE: LINTEL NL-4

PROJECT:



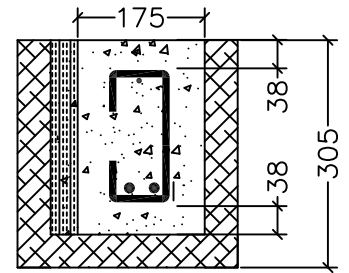
SCALE:
NTS

JOB NO:
n/a

DWG NO:

BRACE BOTH SIDES OF LINTEL
TO PREVENT BLOWOUT AT TIME
OF CONCRETE POUR

APPLICABLE WALL SYSTEMS: 10" R-8,
12" R-14, 14" R-22, 16" R-28 OR
ANY OTHER WALLFORM WITH MIN
175mm (7") CONCRETE CORE



ALTERNATE SIDE
OF STIRRUP LEG

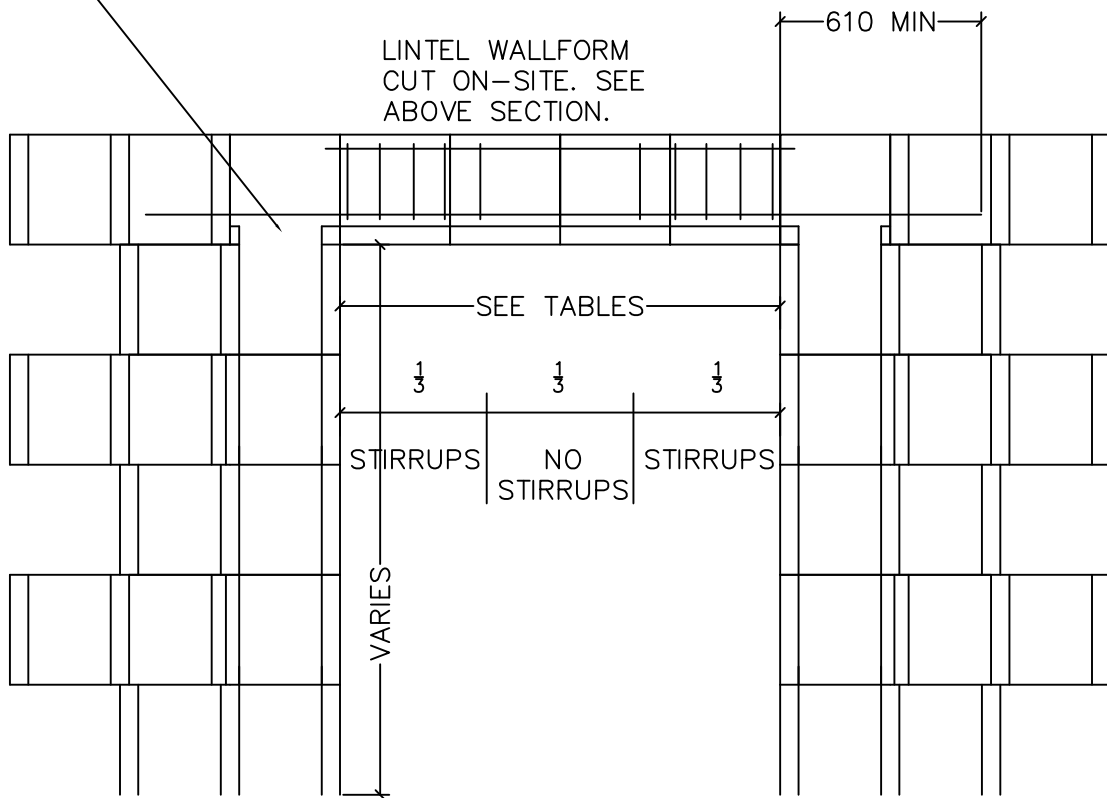
MAINTAIN 38mm (1.5")
CONCRETE COVER IN ALL
DIRECTIONS.

LONGITUDINAL REINFORCEMENT
2 - 15M (#5) (REFER TO TABLES)
BOTTOM OVER LINTEL LOCATIONS. EXTEND REBAR MIN
610mm (24") PAST EDGE OF OPENING

ENSURE BOTTOM
OF LINTEL
SUPPORT IS
CUTOUT TO ALLOW
FLOW OF CONCRETE

1-10M (#3) LONGITUDINAL REINFORCEMENT
TOP TO SUPPORT STIRRUPS.

10M (#3) STIRRUPS AT 8" o/c.



TITLE: LINTEL NL-5

PROJECT:



SCALE:
NTS

JOB NO:
n/a

DWG NO:

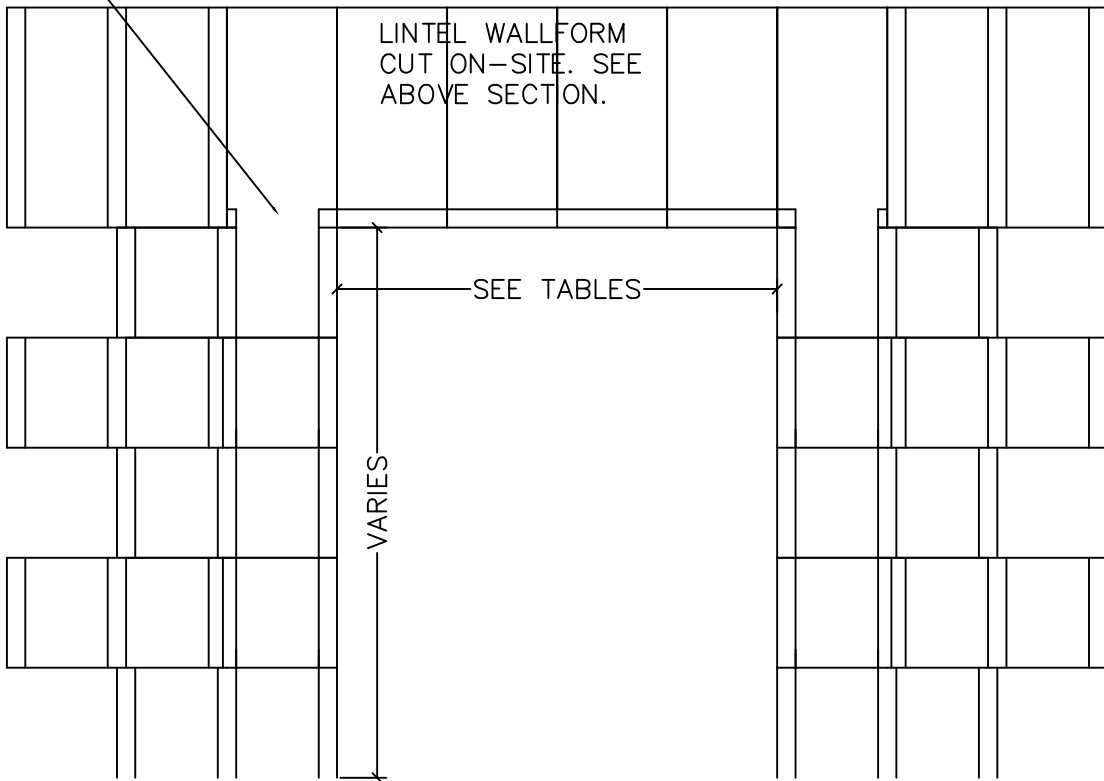
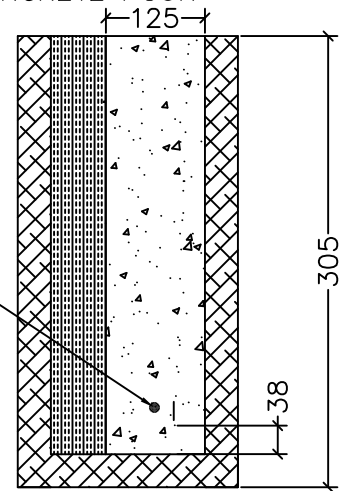
APPLICABLE WALL SYSTEMS: 8" R-8,
10" R-14, 12" R-22, 14" R-28, 16"
R-36 OR ANY OTHER WALLFORM WITH
MIN 125mm (5") CONCRETE CORE

1 - 15M (#5) LONGITUDINAL REINFORCEMENT BOTTOM
OVER LINTEL LOCATIONS. REBAR TO EXTEND MIN
610mm (24") PAST EDGE OF OPENING.

ENSURE BOTTOM
OF LINTEL
SUPPORT IS
CUTOUT TO ALLOW
FLOW OF CONCRETE

MAINTAIN 38mm
(1.5") CONCRETE
COVER IN ALL
DIRECTIONS.

BRACE BOTH SIDES OF LINTEL
TO PREVENT BLOWOUT AT TIME
OF CONCRETE POUR



TITLE: LINTEL NL-6

PROJECT:



SCALE:
NTS

JOB NO:
n/a

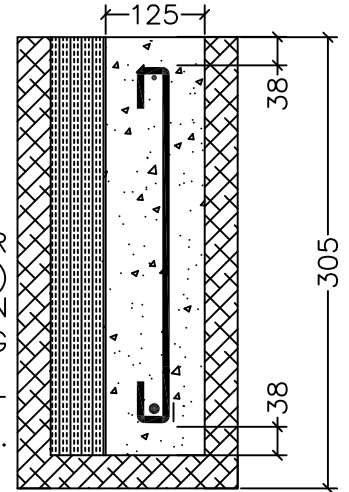
DWG NO:

APPLICABLE WALL SYSTEMS: 8" R-8,
 10" R-14, 12" R-22, 14" R-28, 16"
 R-36 OR ANY OTHER WALLFORM WITH
 MIN 125mm (5") CONCRETE CORE

MAINTAIN 38mm (1.5")
 CONCRETE COVER IN ALL
 DIRECTIONS.

BRACE BOTH SIDES OF LINTEL
 TO PREVENT BLOWOUT AT TIME
 OF CONCRETE POUR

ALTERNATE SIDE
 OF STIRRUP LEG



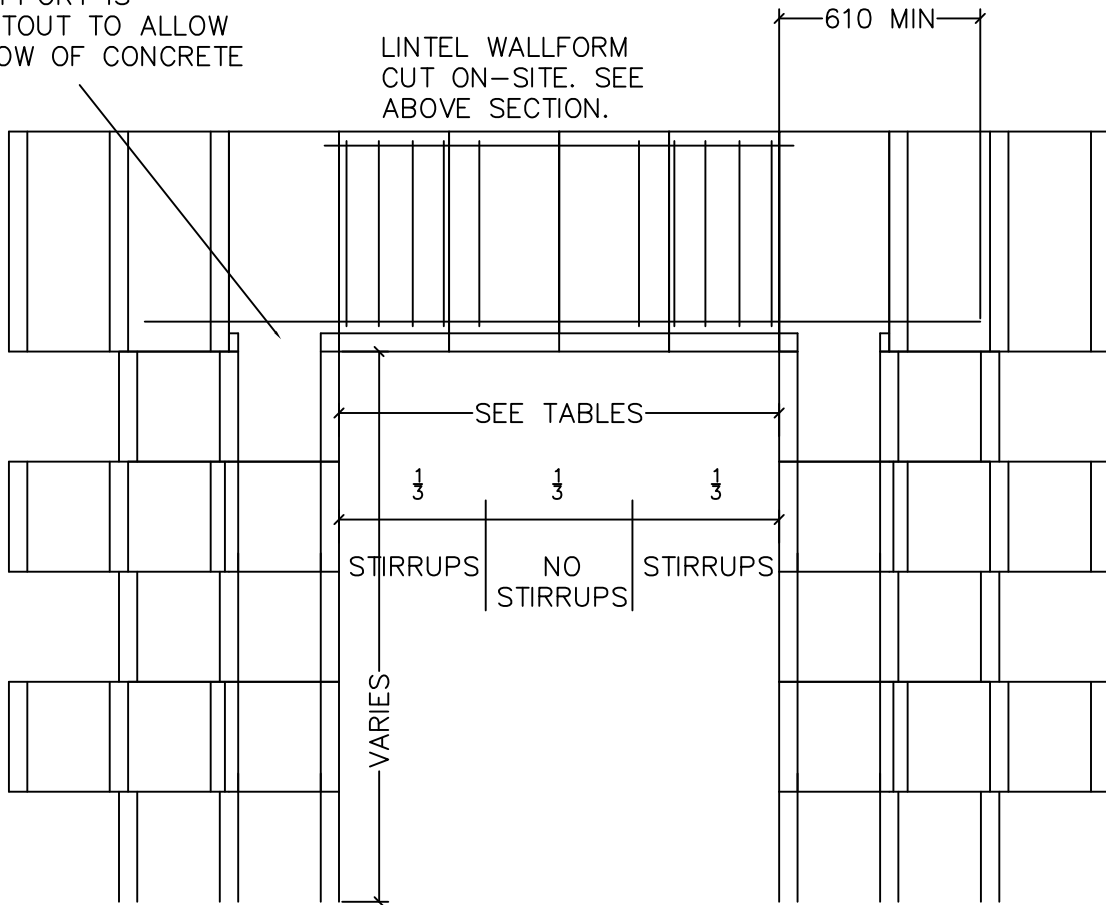
LONGITUDINAL REINFORCEMENT EITHER
 1 - 15M (#5) OR 1 - 20M (#6) (REFER TO TABLES)
 BOTTOM OVER LINTEL LOCATIONS. EXTEND REBAR MIN
 610mm (24") PAST EDGE OF OPENING

1-10M (#3) LONGITUDINAL REINFORCEMENT
 TOP TO SUPPORT STIRRUPS.

10M (#3) STIRRUPS AT 8" o/c.

ENSURE BOTTOM
 OF LINTEL
 SUPPORT IS
 CUTOUT TO ALLOW
 FLOW OF CONCRETE

LINTEL WALLFORM
 CUT ON-SITE. SEE
 ABOVE SECTION.



TITLE: LINTEL NL-7

PROJECT:

SCALE:
 NTS

JOB NO:
 n/a

DWG NO:



APPLICABLE WALL SYSTEMS: 10" R-8,
12" R-14, 14" R-22, 16" R-28 OR
ANY OTHER WALLFORM WITH MIN
175mm (7") CONCRETE CORE

BRACE BOTH SIDES OF LINTEL
TO PREVENT BLOWOUT AT TIME
OF CONCRETE POUR

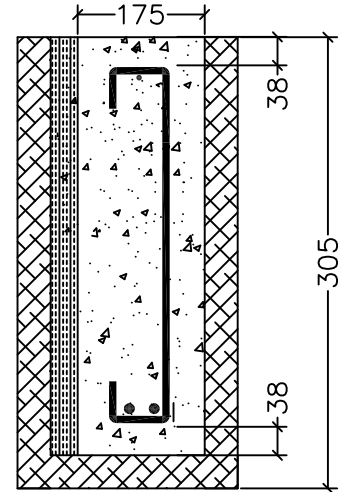
MAINTAIN 38mm (1.5")
CONCRETE COVER IN ALL
DIRECTIONS.

ALTERNATE SIDE
OF STIRRUP LEG

LONGITUDINAL REINFORCEMENT EITHER
2 - 15M (#5) OR 2 - 20M (REFER TO TABLES)
BOTTOM OVER LINTEL LOCATIONS. EXTEND REBAR MIN
610mm (24") PAST EDGE OF OPENING

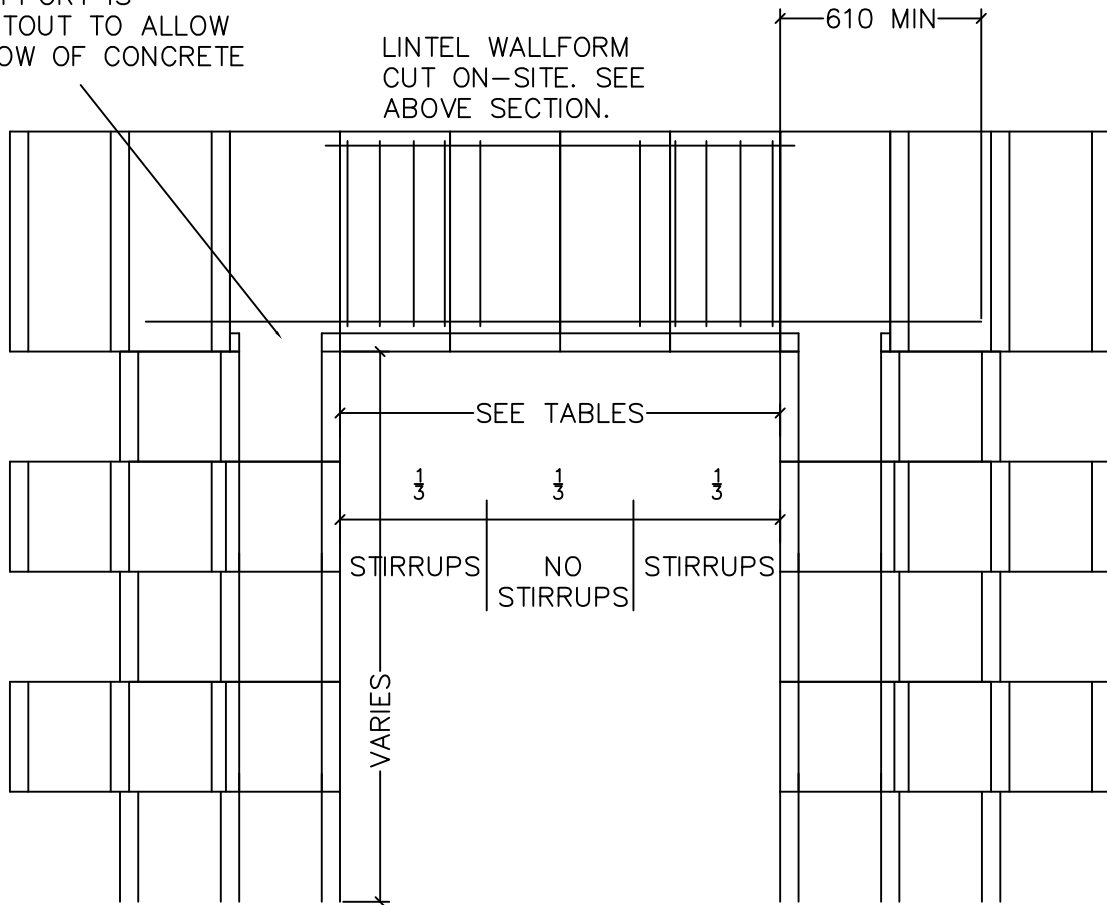
1-10M (#3) LONGITUDINAL REINFORCEMENT
TOP TO SUPPORT STIRRUPS.

10M (#3) STIRRUPS AT 8" o/c.



ENSURE BOTTOM
OF LINTEL
SUPPORT IS
CUTOUT TO ALLOW
FLOW OF CONCRETE

LINTEL WALLFORM
CUT ON-SITE. SEE
ABOVE SECTION.



TITLE: LINTEL NL-8

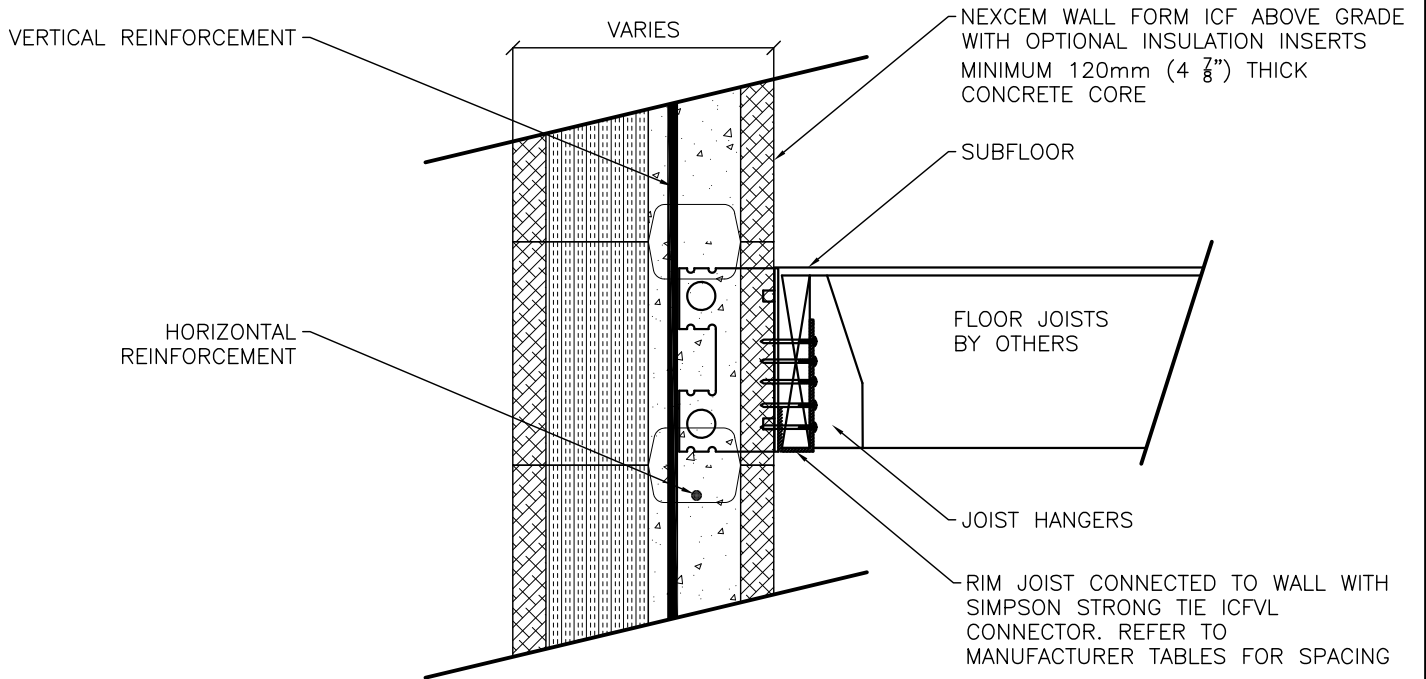
PROJECT:



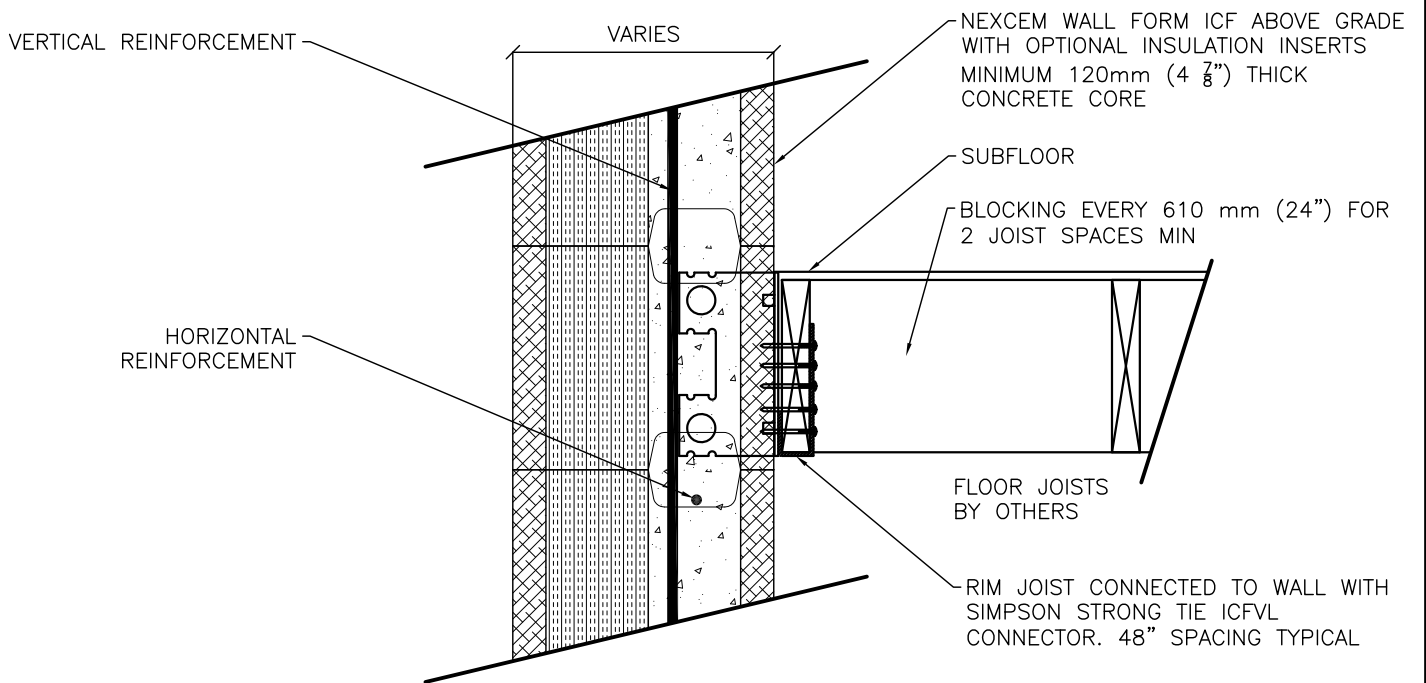
SCALE:
NTS

JOB NO:
n/a

DWG NO:



TYPICAL SECTION – JOISTS PERPENDICULAR



TYPICAL SECTION – JOISTS PARALLEL

TITLE: FLOOR CONNECTION

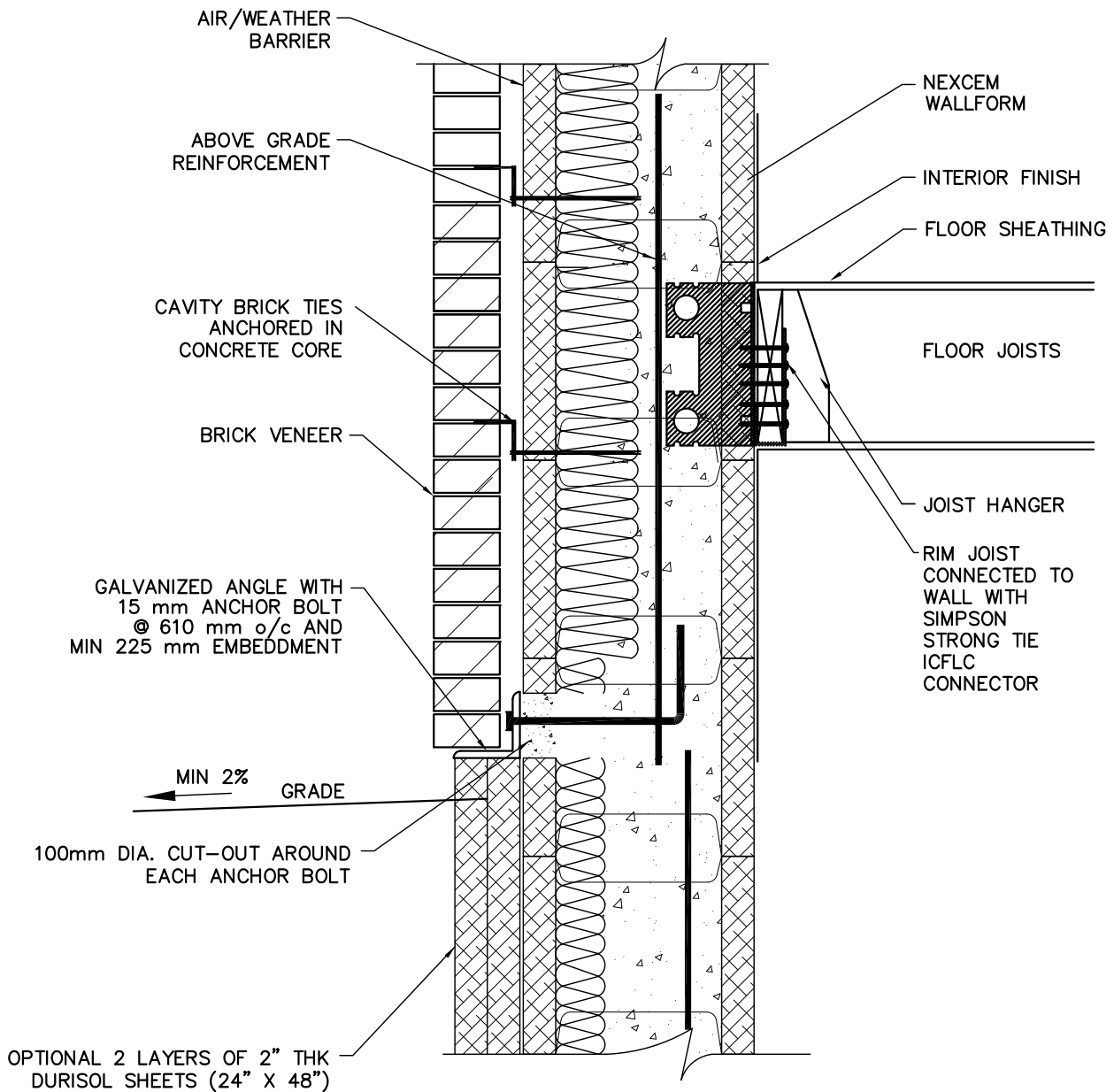
PROJECT:



SCALE:
NTS

JOB NO:
n/a

DWG NO:



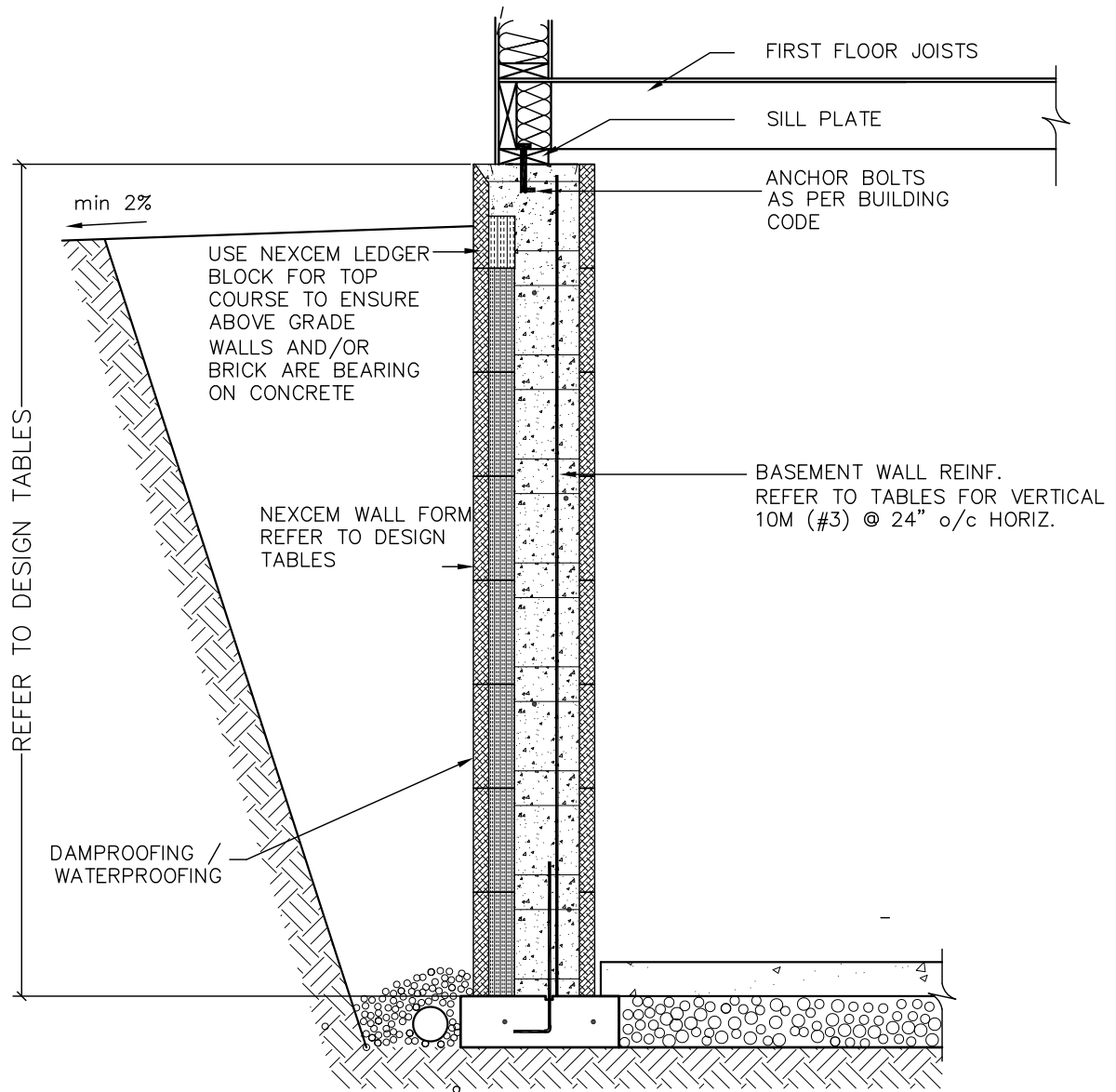
TYPICAL SECTION

TITLE:

PROJECT:



SCALE: NTS
JOB NO: n/a
DWG NO:



TYPICAL SECTION

TITLE:

PROJECT:



SCALE:
NTS

JOB NO:
n/a

DWG NO:

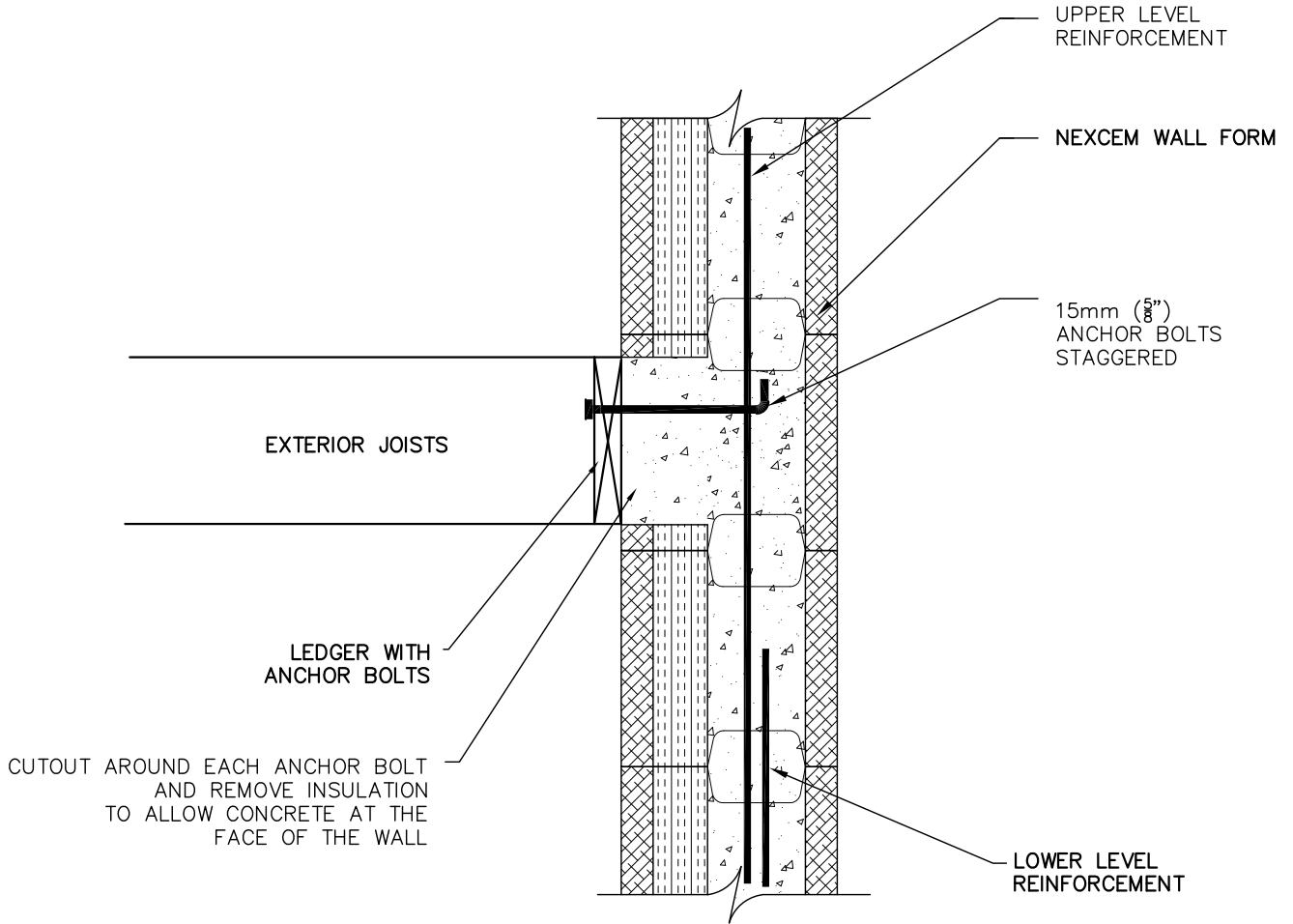
MAX FACTORED SHEAR CAPACITY OF CONCRETE CUT OUT

6" X 6" CUTOUT - $V_c = 9.5 \text{ kN (2100 LBS)}$

JOIST SPAN (mm)	ANCHOR BOLT SPACING (mm)
1220mm (48")	915mm (36")
1830mm (72")	610mm (24")
3660mm (144")	305mm (12")

8" X 8" CUTOUT - $V_c = 16.8 \text{ kN (3750 LBS)}$

JOIST SPAN (mm)	ANCHOR BOLT SPACING (mm)
1830mm (72")	915mm (36")
3050mm (120")	610mm (24")
4880mm (192")	305mm (12")



TYPICAL SECTION

TITLE: **EXTERIOR LEDGER**

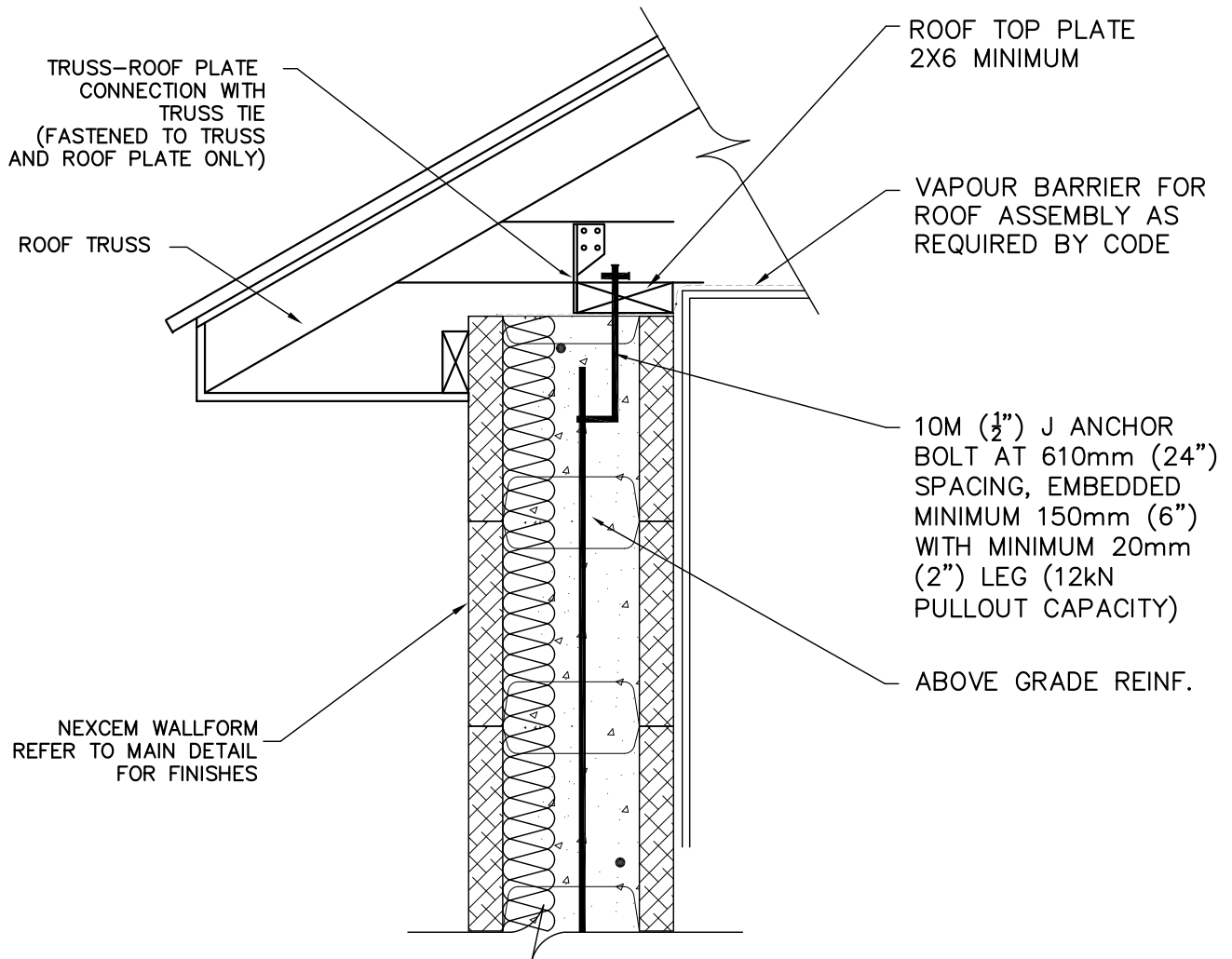
PROJECT:



SCALE:
NTS

JOB NO:
n/a

DWG NO:



TYPICAL SECTION

TITLE: **ROOF CONNECTION**

PROJECT:



SCALE:
NTS

JOB NO:
n/a

DWG NO: