

ARXX ICF Code Compliance

New York State

- 2006 International Building Code
- 2006 International Residential Code
- 2009 International Energy Code

2006 IRC - Section R404.4 Insulating concrete form foundation walls

IRC recognizes insulated concrete forms (ICFs) as stay-in-place concrete formwork and the ARXX Prime, Edge and Steel ICFs are flat wall concrete forms.

R404.4 Insulating concrete form foundation walls: *Insulating concrete form (ICF) foundation walls shall be designed and constructed in accordance with the provisions of this section or in accordance with provisions of ACI 318. When ACI 318 or the provisions of this section are used to design insulating concrete form foundations walls, project drawings, typical details and specifications are not required to bear the seal of the architect or engineer responsible for design, unless otherwise required by the state law of the jurisdiction having authority.*

Below Grade Tables for ICFs:

Tables R404.4(1) and R404.4(2) specify minimum reinforcement for 5.5" and 7.5" nominal Flat ICF Foundation Walls. ARXX Prime ICFs are 6.25" and 8.875" thick concrete, ARXX Edge and Steel ICFs are 6" and 8" thick concrete.

ARXX has prescriptive engineering design tables per ACI 318 and ICC that may be used in place of the IRC code tables. Refer to footnote 'b' on Tables R404.4(1) and (2).

ARXX ICFs products have been evaluated by the ICC-ES and have the following evaluation report listed showing the ARXX product is compliant to the 2009 IBC and IRC.

- ESR-1182 Evaluation Report posted on the ICC web site and the ARXX web site.

www.arxx.com

www.icc-es.org/Evaluation_Reports/



TABLE R404.4(1)
5.5-INCH THICK FLAT ICF FOUNDATION WALLS^{a, b, c, d}

HEIGHT OF BASEMENT WALL (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^e (feet)	MINIMUM VERTICAL REINFORCEMENT SIZE AND SPACING ^f		
		Soil group I ^f	Soil group II ^f	Soil group III ^f
8	4	#4@48"	#4@48"	#4@48"
	5	#4@48"	#3@12"; #4@22"; #5@32"	#3@8"; #4@14"; #5@20"; #6@26"
	6	#3@12"; #4@22"; #5@30";	#3@8"; #4@14"; #5@20"; #6@24"	#3@6"; #4@10"; #5@14"; #6@20"
	7	#3@8"; #4@14"; #5@22"; #6@26"	#3@5"; #4@10"; #5@14"; #6@18"	#3@4"; #4@6"; #5@10"; #6@14"
9	4	#4@48"	#4@48"	#4@48"
	5	#4@48"	#3@12"; #4@20"; #5@28"; #6@36"	#3@8"; #4@14"; #5@20"; #6@22"
	6	#3@10"; #4@20"; #5@28"; #6@34"	#3@6"; #4@12"; #5@18"; #6@20"	#4@8"; #5@14"; #6@16"
	7	#3@8"; #4@14"; #5@20"; #6@22"	#4@8"; #5@12"; #6@16"	#4@6"; #5@10"; #6@12"
	8	#3@6"; #4@10"; #5@14"; #6@16"	#4@6"; #5@10"; #6@12"	#4@4"; #5@6"; #6@8"
10	4	#4@48"	#4@48"	#4@48"
	5	#4@48"	#3@10"; #4@18"; #5@26"; #6@30"	#3@6"; #4@14"; #5@18"; #6@20"
	6	#3@10"; #4@18"; #5@24"; #6@30"	#3@6"; #4@12"; #5@16"; #6@18"	#3@4"; #4@8"; #5@12"; #6@14"
	7	#3@6"; #4@12"; #5@16"; #6@18"	#3@4"; #4@8"; #5@12"	#4@6"; #5@8"; #6@10"
	8	#4@8"; #5@12"; #6@14"	#4@6"; #5@8"; #6@12"	#4@4"; #5@6"; #6@8"
	9	#4@6"; #5@10"; #6@12"	#4@4"; #5@6"; #6@8"	#5@4"; #6@6"

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa.

- This table is based on concrete with a minimum specified concrete strength of 2500 psi, reinforcing steel with a minimum yield strength of 40,000 psi. When reinforcing steel with a minimum yield strength of 60,000 psi is used, the spacing of the reinforcement shall be increased to 1.5 times the spacing value in the table but in no case greater than 48 inches on center.
- This table is not intended to prohibit the use of an ICF manufacturer's tables based on engineering analysis in accordance with ACI 318.
- Deflection criteria: $L/240$.
- Interpolation between rebar sizes and spacing is not permitted.
- Unbalanced backfill height is the difference in height of the exterior and interior finished ground. Where an interior concrete slab is provided, the unbalanced backfill height shall be measured from the exterior finished ground level to the top of the interior concrete slab.
- Soil classes are in accordance with the Unified Soil Classification System. Refer to Table R405.1.

TABLE R404.4(2)
7.5-INCH-THICK FLAT ICF FOUNDATION WALLS^{a, b, c, d, e}

HEIGHT OF BASEMENT WALL (feet)	MAXIMUM UNBALANCED BACKFILL HEIGHT ^e (feet)	MINIMUM VERTICAL REINFORCEMENT SIZE AND SPACING ^e		
		Soil group I ^e	Soil group II ^e	Soil group III ^e
8	6	N/R	N/R	N/R
	7	N/R	#3@8"; #4@14"; #5@20"; #6@28"	#3@6"; #4@10"; #5@16"; #6@20"
9	6	N/R	N/R	#3@8"; #4@14"; #5@20"; #6@28"
	7	N/R	#3@6"; #4@12"; #5@18"; #6@26"	#3@4"; #4@8"; #5@14"; #6@18"
	8	#3@8"; #4@14"; #5@22"; #6@28"	#3@4"; #4@8"; #5@14"; #6@18"	#3@4"; #4@6"; #5@10"; #6@14"
	6	N/R	N/R	#3@6"; #4@12"; #5@18"; #6@26"
10	7	N/R	#3@6"; #4@12"; #5@18"; #6@24"	#3@4"; #4@8"; #5@12"; #6@18"
	8	#3@6"; #4@12"; #5@20"; #6@26"	#3@4"; #4@8"; #5@12"; #6@16"	#3@4"; #4@6"; #5@8"; #6@12"
	9	#3@6"; #4@10"; #5@14"; #6@20"	#3@4"; #4@6"; #5@10"; #6@12"	#4@4"; #5@6"; #6@10"

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa.

- This table is based on concrete with a minimum specified concrete strength of 2500 psi, reinforcing steel with a minimum yield strength of 40,000 psi. When reinforcing steel with a minimum yield strength of 60,000 psi is used, the spacing of the reinforcement shall be increased to 1.5 times the spacing value in the table.
- This table is not intended to prohibit the use of an ICF manufacturer's tables based on engineering analysis in accordance with ACI 318.
- N/R denotes "not required."
- Deflection criteria: $L/240$.
- Interpolation between rebar sizes and spacing is not permitted.
- Unbalanced backfill height is the difference in height of the exterior and interior finished ground. Where an interior concrete slab is provided, the unbalanced backfill height shall be measured from the exterior finished ground level to the top of the interior concrete slab.
- Soil classes are in accordance with the Unified Soil Classification System. Refer to Table R405.1.

New York State

International Energy Conservation Code – IECC 2009

ICFs are recognized as mass walls in the IECC (402.2.4). Computed *R-Value* of the ICF is the two layers (nominal 5”) of EPS insulation without concrete or other materials. ARXX 6” Prime ICFs has a tested *R-Value* of R22.

The IECC recognizes overall wall assemblies as a *U-Factor* and as per attached tables a typical ARXX ICF wall assembly is identified as exceeding the current IECC minimums.

New York State is in climate Zone 4,5 and 6, the IECC tables R402.1.1 and R402.1.3 for Residential Energy Efficiency list the following:

Climate Zone 5				
		Mass Walls Above Grade	Basement Walls	Crawl Space Walls
Table 402.1.1	R-Value	15	15	10
Table 402.1.3	U-Factor	0.060	0.050	0.065

ARXX 6" ICF THERMAL RESISTANCE

Assembly Elements	Thickness (inch)		Thermal Resistance per Inch	Thermal Value		
	Prime	Edge Steel		Prime	Edge	Steel
Outside Air Film				0.17	0.17	0.17
Siding				0.6	0.6	0.6
EPS Insulation	2.625	2.5	4.2	11.025	10.5	10.5
Concrete	6.25	6	0.06	0.375	0.36	0.36
EPS Insulation	2.625	2.5	4.2	11.025	10.5	10.5
1/2" Gypsum Board	0.5		0.9	0.45	0.45	0.45
Inside Air Film				0.68	0.68	0.68
Assembly R Value >				24.325	23.26	23.26
Assembly U Value >				0.041	0.042	0.042
ICF Form Component Nominal R Value >				22	21	21