Estimating

- To find the number of courses you will need take your total wall height in inches and divide by your form height.
- To get the total number of corner forms required, multiply the number of courses by the number of corners on the building.
- For the straight forms, add up the outside perimeter of the building and divide by 4, then subtract the number of building corners. The remaining number is the total number of straight forms required for one course.
- Multiply the straight forms per course by the number of courses to get the total number of straight blocks, including openings.
- Add Corner blocks and straight blocks for the total number of forms.
- Calculate the areas of windows and doors, and divide by 5.33 square feet to get the number of forms saved at the openings.
- Subtract the forms saved at openings from the total number of forms for a solid wall.
- Add 1-3% for waste (the lower percentage if you're more experienced). Minimal waste is accomplished by placing cut pieces larger than 1 web and 2 foam bars back into the wall. See example on the next page.

Note:
An estimating program is available on the ECO-Block web site at
www.eco-block.com

Technical Tip: When shipped, the corner forms will be packaged 6 to a bundle, 50% Left Hand & 50% Right Hand. This will automatically stagger the joints 16" on center.

Example:

Number of courses

Wall Height (in inches)/Form Height = 112” / 16” = 7 courses total

Number of Corner Forms

(# of courses) x (# of building corners) = 7 x 6 = 42 corner forms
(50% L. Hand=21, 50% R. Hand=21)

Number of Straight Forms per course

(Outside perimeter/4) – (# of building corners)
(158/4) – 6 = 40-6 = 34 straight forms per course

Total number of Straight Forms

(# of straight forms per course) x (# of courses) =
34 x 7 = 238 total straight forms (without openings)

Total Forms

(Total # of straight forms) + (Total # of corner forms) =
238 + 42 = 280 total forms (without openings)

Straight Forms saved at openings

(Sq. Ft. of all openings)/(Sq. Ft. per form)
76 sq. ft. of openings / 5.33 sq. ft. =14 straight forms saved

Total forms needed

(Total forms) – (Forms saved at openings) =
280 – 14 = 266 total forms needed

Waste Factor

(total forms) x (1% waste factor)
266 x 1.01 = 269 total forms

Connectors

- Take the total number of Standard and Brick-Ledge forms and multiply by the number of connectors per block according to the system you are using (see chart below).
- In order to increase the holding capacity of the bottom course of forms, extra connectors can be added. If you choose to add the extra connectors, you will need to take the perimeter length/4 and multiply by 6 (6 extra connectors per block)
- Take the number of corner forms and multiply by the number of connectors per block according to the system you are using (see chart below)
- Add these together for a total connector count.

System	Form Type	# Of Connectors per Block
Standard	Corner	8
Standard	Standard	12
Standard	Brick-ledge	12
Commercial	Corner	12
Commercial	Standard	18
Commercial	Brick-Ledge	Not Available

Example:

Connectors:

Straight forms + brick-ledge = 231 x 12 = 2,772

Corner forms = 44 x 8 = 352

Number of blocks per course: 158’/4’ = 40

Extra bottom course connectors: 40 x 6 = 240

2,772 + 352 + 240 = 3,364 Connectors total

Concrete

- Take the total number of forms (not including waste) and divided by the number of blocks filled per cubic yard according to system type and core size.
- One cubic yard of concrete will fill:

System	Core Size	# Of Blocks Filled/yd^3	yd^3 Per Block
Standard	4”	15.0	.066
Standard	6”	10.0	.099
Standard	8”	7.5	.131
Standard	10”	6.0	.164
Commercial	4”	10.0	.099
Commercial	6”	6.75	.143
Commercial	8”	5.0	.197
Commercial	10”	4.0	.246

Example:

Concrete:

Straight forms + corners = 224 + 42 = 266 total forms without waste.

266/6-inch forms = 266/10 = 26.6 cu. yds.

THE FOLLOWING REBAR ESTIMATION ASSUMES CERTAIN AMOUNTS, SIZES, AND POSITIONING OF THE REBAR **SOLELY FOR THE PURPOSES OF PROVIDING AN EXAMPLE. IN AN ACTUAL BUILDING THESE SPECIFICATIONS WILL COME FROM THE ENGINEER OR APPROVED ENGINEERING TABLES, AND MAY BE DIFFERENT FROM WHAT IS ASSUMED HERE:**

For the purpose of this example let's assume the following:

- (1) #4 horizontally at the top of the wall and at the 1/3 points of the wall.
- (1) #4 every 2' on center vertically
- (1) #4 vertical along either side of each opening, an extra #4 horizontally atop each opening, and one short diagonal bar at the top corners of each opening.
- **NOTE: Rebar overlaps at least 40 bar diameters on each end (d_b * 40), where d_b is the diameter of the smaller bar.**
  For example: # 4 (4/8" or ½") bar = ½" x 40 = 20 inches
  (See the chart on the following page for rebar sizes).
- Add the three extra bars that go over each opening.
- Determine the total number of feet you will need to cover with your rebar. To accomplish this multiply your perimeter by the total number of horizontal rebar courses.
- When you have the total number of feet, divide this number by the length that each bar will reach (Make sure you account for your overlap)
- Add on the verticals, including one extra along each side of an opening.
- Add 1-3 % for waste

Example:
The perimeter is 158'. If you use 20' rebar and they overlap at each end by 20", each bar reaches 18'4". Since there are three horizontal courses, the bars must cover a total of 3 x 158 = 474 feet. At 18'4" per bar, that will require 474'/18'4" = 26 bars. Each opening requires (1) 6 foot bar horizontally and (2) 2' bars diagonally. That is 10' of rebar per opening with (4) openings that is 10 x 4 = 40' of rebar or (2) 20' bars. To get the total of 20' bars, simply add the two totals together, 26 + 2 = 28 bars.

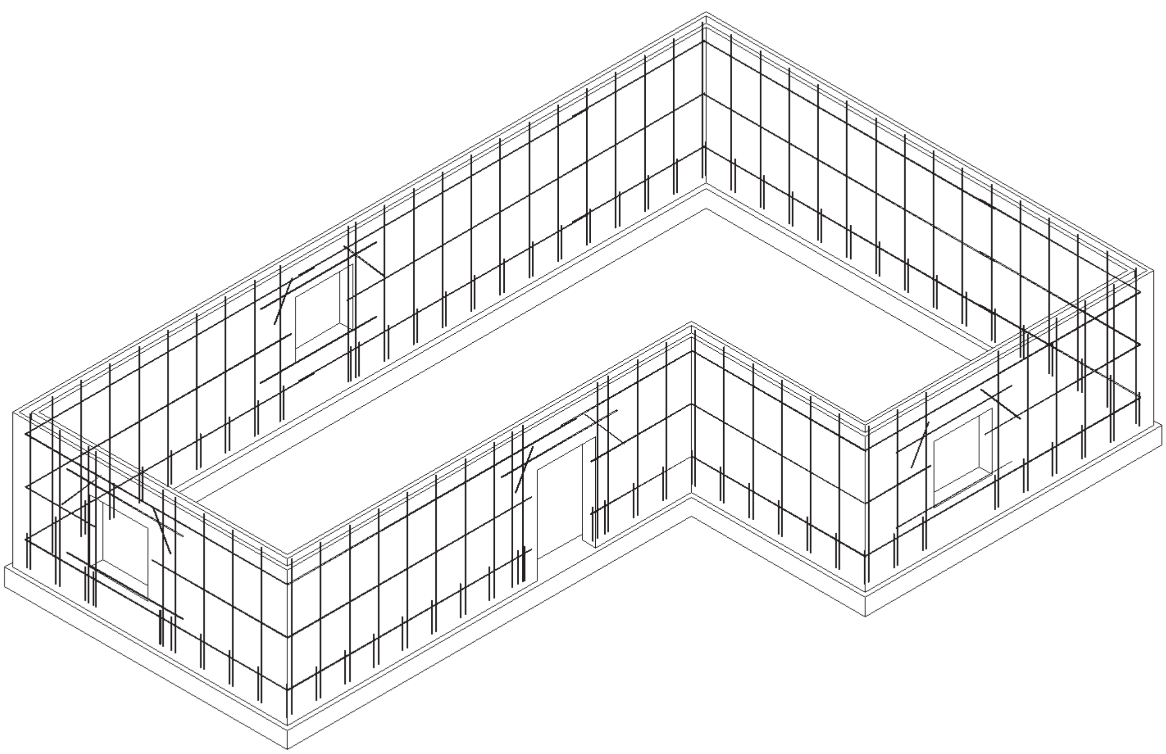
The vertical bars must fall every 2' on center, so take 158/2 = 79 bars. Additionally, each of the (4) openings requires a vertical bar on each side for a total of (8) additional bars. The total vertical bar count is 79 + 8 = 87 vertical bars. At each vertical position you will need one dowel in the footing to match your vertical bars, so you will need 87 dowels.

Add 3% waste:	28 x 1.03 = 29 20' bars
	87 x 1.03 = 90 dowels
	87 x 1.03 = 90 9'1" bars

Notes:

- If you build another story with ECO-Block on top of this, ensure you have the necessary amount of bar to meet your lap requirements extended above the top of the first story level (d_b * 40).
- You can order your corner bars pre-bent so you don't have to bend them yourself (i.e. #4 bar, 48" long bent in half to 90° allows for (2) 24" legs).
- Horizontal rebar provides temperature and crack control, while vertical rebar provides for side loads like wind, and vertical superimposed loads.

Bar Size Designation	Nominal Diameter (inches)
#3	.375
#4	.500
#5	.625
#6	.750
#7	.875
#8	1.0
#9	1.128
#10	1.270



To achieve optimum results when building an ECO-Block structure, the ideal crew would consist of:

- One experienced person (who understands level, plumb and square)
- Two laborers

LABOR GUIDELINES

The question is frequently asked-"how much labor is required to install ECO-Block ICFs?"

After carefully monitoring many past projects, the following guidelines have been developed. These labor rate guidelines assume that the footings or concrete slab are in place and ready to accept the first course of forms. These rates also assume a standard height of 8 feet. The labor rates include erecting the forms, erecting and stripping the alignment system, placing re-bar and concrete, and cleaning the site.

Below Grade Walls: Guidelines vary from .05 to .07 man-hrs/ft^2 of wall area.

In other words, if a person was being paid $20.00/hr and was experienced, the labor cost would be .05 man-hrs/ft^2 x $20.00/hr = $1.00/$ft^2$ of wall area.

If the person was being paid \$20.00/hr but was less experienced or the building more complicated, then the labor figure could be higher at .07 man-hrs/ft^2 or \$1.40/ ft^2 of wall.

Above grade walls: Guidelines vary from .07 to .09 man-hrs/ft^2 of wall area.

These guidelines are higher due to the fact that there are usually more window and door openings as well as more climbing required. Applying the above guidelines at a pay rate of \$20.00/hr @.07 man-hrs/ft^2 would equal \$1.40/ ft^2 of wall area. At the higher rate of .09 man-hrs/ft^2 @ \$20.00/hr rate would equal \$1.80/ft^2 of wall.

These labor rates are offered only as guidelines, and may vary depending on the complexity of the project and experience of the installer.

FOUNDATION

Pick a crew for the footing or slab that's good enough to make it level (within ±1/4 inch). This is very important when the first course of block is laid. A level footing/foundation will eliminate the requirements to shim or shave block to achieve a level wall.

Note: Formed footings are more accurate

HVAC

Building a home with ECO-Block will create a structure that is super-insulated and therefore needs to have the HVAC system sized accordingly. Typically you can expect to see a 25 – 30% reduction in your unit size. For best results consult an engineer experienced with ICF construction.